FINANCES OF RETIRED HOUSEHOLDS:
THE EFFECT OF WEALTH- AND INCOME-IMPACTING EVENTS ON INCOME OF RETIRED U.S. HOUSEHOLDS

by

MICHAL POLANOWSKI

(Under the Direction of Robert Nielsen)

ABSTRACT

Retirement income can be affected by a number of wealth- and income-impacting events. Recent economic and political events show that retirement income can be affected by policy changes, economic fluctuations, and poor investment decisions. To better understand the effects of these events, this research investigated numerous potential wealth- and income-impacting events faced by U.S. households. These include potential changes to Social Security benefits; potential default of pension plans; decrease in the value of a household's primary residence; financial market downturns; and increases in out-of-pocket medical expenses. Despite much research on the retirement wealth of U.S. households, there is limited literature on the effects of potential threats to that wealth. Further, there is no research that simulates the effect of the simultaneous occurrence of several wealth- and income-impacting events. To inform this gap in the literature, this study used the 2008 Health and Retirement Survey to annuitize financial and non-financial assets of retired U.S. households. Household income, consisting of income and annuity inflows, was estimated in the presence of five wealth-impacting events. Then, a series of multivariate analyses estimated the differences in retirement income before and after the application of the potential economic or policy shocks. The results indicate that most wealth- and income-impacting events affect the youngest and the least affluent households in the most significant ways. All events increased the percentage of households that were not able to generate income above the poverty threshold. However, two scenarios stood out as particularly troubling for retirees: the possibility of multiple and simultaneous shocks and increase in out-of-pocket medical expenditures. Both of these scenarios moved numerous households from income quintiles 4 and 5 to incomes below the poverty threshold. Income inequalities varied based on the type of event simulated. Changes to Social Security benefits, pensions, and changes to home equity and annual returns had minimal impact on the Gini coefficient. However, out-of-pocket medical expenses and the multiple and simultaneous shock scenarios were associated with increased income inequality.

INDEX WORDS: Retirement Income, Social Security Benefits, Out-of-pocket Medical Expenses, Stock Market Meltdown, Housing Collapse, Pensions Bankruptcy, Life Cycle Hypothesis,

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MICHAL POLANOWSKI

MBA, Wayland Baptist University, 2008

BS, Wayland Baptist University, 2007

BCS, Warsaw Academy of Computer Science, Management and Administration, 2005

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MICHAL POLANOWSKI

Major Professor:	Robert Nielsen
Committee:	Vibha Bhargava Swarn Chatterjee Lance Palmer

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
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DEDICATION

To my family; the one I was born into and the one I have chosen. I would not be able to make it without your help, motivation, and support. Thank you ☺

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CHAPTER 1

INTRODUCTION

Most U.S. households have only four possible sources of retirement income: Social Security benefits, pensions, personal savings and investments, and supplemental work income (Butrica, Smith, & Toder, 2008; Cole & Liebenberg, 2008). According to media reports, Americans have not saved enough for retirement (McConville, 2011; Taylor, Funk, & Clark, 2007). The 2011 Retirement Confidence Survey conducted by the Employee Benefit Research Institute (EBRI) reports that the percentage of workers who are not confident about having enough funds for a comfortable retirement increased from 22% in 2010 to 27% in 2011. This is the highest level reported by EBRI in the 21 years. Also, the percentage of workers who are very confident shrank to 13%, the lowest level since it was first measured. In addition to this drop in confidence, a lower percentage of workers reported saving for retirement (Helman, Copland, & VanDerhei, 2011). In addition, it seems that the most recent economic downturn decreased the retirement readiness of U.S. households by increasing the number of households that are at “at risk” of inadequate retirement income group from 3.8% to 14.3% (VanDerhei, 2011).

However, a number of scholars who analyze the retirement readiness of U.S. households conclude that most households are adequately prepared to retire (Cole & Liebenberg, 2008; Feinschreiber & Laiosa, 2009; Hurd & Rohwedder, 2006; Munnell, Webb, & Golub-Sass, 2007; Scholz & Seshadri, 2008). Indeed, there is evidence that only the least affluent households are not adequately prepared (Butrica, Toder, & Toohey, 2008; Love, Smith, & McNair, 2008).

Nevertheless, the analysis of scholarly publications and other sources of information revealed that there is a noticeable lack of consensus on this topic.

Recent economic and political events show that potentially every source of retirement income can be affected by policy changes, economic fluctuations, and poor investment decisions. Retirement income can be affected by changes to the amount of Social Security benefits, collapse of pension plans, decrease in the value of a household's primary residence, and stock market downturn. In addition, households' finances can be affected by unanticipated out-of-pocket medical expenses. While there is a large amount of research on the retirement finances of U.S. households, there is limited literature that studies the effects of potential threats to those finances. When potential events are considered, the events are treated individually (Brady, 2008; Engen, Gale, Uccello, Carroll, & Laibson, 1999; Love et al., 2008); a practice which fails to account for the possibility that wealth-impacting events may simultaneously occur.

Factors Affecting Retirement Finances

There are numerous factors that affect the finances of retired households; this section provides a brief overview of factors addressed in the proposed research. Each paragraph describes a separate factor included in this research and its affect on retirees' income.

Recent cohorts of retirees rely more on Social Security benefits and less on personal savings than earlier cohorts (Cole & Liebenberg, 2008). In addition, the least affluent households rely on Social Security benefits as their main source of retirement income (Caldera, 2010). In the context of the 2010 Board of Trustees report that cautions that Social Security insolvency could occur by 2037 (Board of Trustees, 2010), it's clear that future retirees must plan for other sources of income. Because of the looming program challenges, changes to Social Security benefits are inevitable. To better understand the effects of possible changes, this study simulates the effects of proposed changes to Social Security benefits. Moreover, it will estimate these changes by income quintiles to capture income-specific effects.

In 2006, 49% of households, age 55 and older, benefitted from a defined benefit pension (Love et al., 2008). Historically, defined benefit pension plans have been an important part of retirees' income (Feinschreiber & Laiosa, 2009; Gustman, Steinmeier, & Tabatabai, 2009). Pensions are especially important for affluent households, as they tend to have a greater percentage of retirement income from that source relative to less affluent households (Gustman et al., 2009). Private defined benefit plans are guaranteed by the Pension Benefit Guaranty Corporation (PBGC). However, in the event of a company's inability to keep its commitments to retirees, the PBGC pays pension benefits at a reduced benefit level. The PBGC has its own solvency challenges. As of September 30, 2010, the PBGC had a deficit of $23.03 billion dollars (Pension Benefit Guaranty Corporation, 2010). The PBGC's potential lack of funds might furthermore decrease or even totally jeopardize pension income guaranteed by this institution. Defined benefit income guaranteed by federal or state authorities is also far from certain. In 2006, about 30% of state and local government pension plans were funded below the 80% level. The 2008 stock market crash increased the percentage of funds with less than 80% of assets to 46% (Munnell, Aubry, & Muldoon, 2008). The most recent research reported 2023 to be the exhaustion date of defined benefit plans for state and local sectors as a whole (Munnell, Aubry, Hurwitz, & Quinby, 2011). With 42 states and the District of Columbia projecting deficits for fiscal year 2012, retirees must plan on state and local pension plan benefits challenges (McNichol, Oliff, & Johnson, 2010). To provide insight into the possible consequences of changes to pension income due to bankruptcies or other economic events, this research estimates the potential effect of pension income reductions. In addition, since pension benefits vary by income, the results will be analyzed by households' income quintiles.

For many households, the primary residence is one of the most valuable elements of net worth (Munnell, Soto, & Aubry, 2007). In addition, for older households, this asset makes up a larger share of wealth as compared to younger households (Love et al., 2008). However, recent events show that home values can change drastically in a short amount of time. Between 2006 and 2007, the U.S. housing market, as measured by the Standard and Poor's/Case-Shiller Home Price Index, experienced the highest values in its history (Maitland & Blitzer, 2010). Afterward, the real estate market experienced a major downturn that erased more than $10 trillion in household wealth between 2007 and the beginning of 2009 (Rosnick & Baker, 2010). Over two years later, many U.S. states are still experiencing falling house prices, and it is difficult to predict when the housing market situation will improve (Guarino & Blitzer, 2011; Timiraos, 2011). This study will estimate the potential effect of an additional decrease in housing equity and potential freeze in the real value of homes on the income of retired U.S. households. The results are analyzed by households' age quintiles, since older households have a greater share of wealth in that asset (Love et al., 2008).

In October of 2007, the Dow Jones Industrial Average peaked at 14,164. Almost six months later, in March of 2008, it was just below 7,000, a decrease of over 50%. By May of 2011, it had recovered to above 12,000, a decline of almost 14% as compared to 2007 (Butrica, Smith, & Toder, 2010; Dow Jones Indexes, 2011). Those fluctuations have affected a number of future retirees. By one estimate (VanDerhei, 2011), between 3.8% and 14.3% of households have been significantly adversely affected by the stock market fluctuation and might be at risk of not having sufficient retirement income. As the U.S. economy recovers from the recession, it is difficult to predict the future of the stock market. Some believe that retiring Baby Boomers who sell their stock investments can potentially negatively impact the stock market performance. This "asset market meltdown hypothesis" has its supporters (Abel, 2001; Shambora, 2006) as well as opponents (Cai, 2004; Poterba, 2001). This research does not attempt to determine whether the asset market meltdown theory is correct but will estimate the effects of a potential stock market decrease on the income of retired U.S. households. Also, because more affluent households have a greater amount of wealth in stocks as opposed to less wealthy households, the results will be estimated by income quintiles (Gustman et al., 2009).

The factors described thus far have focused on income. However, because aging retirees face growing out-of-pocket health expenditures, accounting for these costs has become more necessary when planning for retirement (French & Jones, 2004; Fronstin, Salisbury, & VanDerhei, 2008). A 65-year old couple living to the average life expectancy would need $295,000 to pay premiums for health insurance and out-of-pocket medical expenditures at retirement (Fronstin, 2006). The same couple living to age 95 would need almost $550,000. Almost 95.5% of all adults age 65 and over have some out-of-pocket medical expenses (Butrica, Murphy, & Zedlewski, 2010). In addition, efforts to save enough for retirement can be inadequate given the rapidly growing out-of-pocket medical expenses (Skinner, 2007). To estimate this growing challenge among retirees, this research estimates the effect of increasing out-of-pocket medical expenses by income quintiles.

Research Questions

The following research questions are addressed by this study:

1. *What is the income of retired U.S. households?*

2. *What are the effects of wealth- and income-impacting economic and policy events on the income of retired U.S. households?*

The first research question will be estimated with households' current income streams and the time value of money computations consistent with the life cycle hypothesis. The second research question is more complex and, therefore, is broken down into several components:

2a. *What is the likely effect of proposed changes to Social Security benefits on the income of retired U.S. households?*

2b. *What is the likely effect of pension benefit reductions and outright defaults on the income of retired U.S. households?*

2c. *What are the likely effects of further housing equity reductions on the income of retired U.S. households?*

2d. *What is the likely effect of the stock market's meltdown at varying loss levels on the income of retired U.S. households?*

2e. *What is the likely effect of increased out-of-pocket medical expenses on the income of retired U.S. households?*

2f. *What is the simultaneous effect of wealth- and income-impacting events (2a-2e) on the income of retired U.S. households?*

Contributions of This Study

This research contributes to the retirement and policy literatures in a number of ways. First, it provides a current analysis of retired households' income using timely and appropriate data. Second, it provides a current analysis of numerous single-event wealth, income, and expenditure events, policy changes, and possible market shocks that are likely to affect current and future retirees. Each of these single-event scenarios identified the likely variations in retirees' incomes across income groups given current Social Security benefits, pension, housing, and medical expenditure projections. Finally, to the best of my knowledge, it is the first time that effects of multiple wealth- and income-impacting events on the income of retired U.S. households have been simultaneously estimated. This approach offers researchers and policymakers unique insights into opportunities for the specific program interactions that may occur under varying market and policy conditions.

Further sections of this document are organized as follows. Chapter Two reviews relevant literature and discusses the theoretical framework utilized by this study. Chapter Three presents the methodology that will be used. It contains all the necessary assumptions made in this study as well as the description of the data used. Chapter Four explicates the statistical techniques used to answer the research questions. Finally, Chapter Five contain the research conclusion, a discussion section, potential policy implications of the results, and suggestions for future research.

CHAPTER 2

LITERATURE REVIEW

This literature review has four sections that are concerned with different issues regarding finances of retired U.S. households. The first section discusses different definitions of retirement as literature recognizes several ways to operationalize concept of retirement. Next the elements forming retirement wealth are reviewed. The third part overviews studies on the effects of wealth impacting events on retirement income. The last section focuses on the life cycle theory that forms the theoretical foundation for this study.

Measures of Retirement

It is of great importance and often a great challenge to define the measure of retirement as this will serve as the selection tool for the population of interest. Gustman and Steinmeier (2000) showed that different measurements of retirement yield different sample sizes within the same data set. In addition, previous studies have concluded that the outcomes of research were sensitive to the retirement measurement utilized (Beehr, 1986; Gustman & Steinmeier, 2000; Samwick, 1998). Therefore, an appropriately defined measurement of retirement assures that the study estimates the effect of wealth impacting events on the income of the desired group. Even though the concept of retirement has been frequently researched in the past, selecting the right measurement might be quite challenging as the literature utilizes various measures of retirement (Denton & Spencer, 2009).

When the retirement measure issue is considered on an individual level, a retired person can be an individual who separated from a career job (Hardy, 1991; Quinn, Burkhauser, &

Myers, 1990). Another measure utilized by the literature to characterize individuals as retired is a decreased number of hours worked or decreased income (Gustman & Steinmeier, 2000; Scott, Chen, & Chen, 2007). In addition, researchers employed retirement benefits utilization and self-reported status as measures or retirement (Bernheim, 1987; Han & Moen, 1999). However, each of these approaches can only account for a specific aspect of retirement (Ekerdt & DeViney, 1990).

Furthermore, the situation gets more complicated when the unit of analysis is a household as opposed to an individual. Once the measurement of retirement is established for an individual, the researcher needs to account for households that consist of one or two individuals. While single households can be treated the same way as individuals, households with two individuals can be somewhat problematic as the researcher needs to account for both partners as opposed to just one individual. Just like in the case of retired individuals, the studies that use household as their unit of analysis utilize different definitions of retirement.

From this brief introduction it is clear that the issue of defining retirement is quite challenging as many measures are utilized in the literature. Also, this issue is of great importance as it defines the population of interest that will be further investigated and can potentially influence results. Further parts of this section describe in more detail the different measurements of retirement utilized in literature.

Traditional View

One of the traditional views considers retirement as a structural finish of full-employment in a career job and transition into retirement, which is treated as the end of labor force participation (Hayward, Hardy, & Liu, 1994; Quinn et al., 1990). This view is adequate for individuals who stop work at a certain age and do not participate in any type of paid employment afterward. However, the limitation of this measure is the fact that often it is impossible to distinguish between career job separation that leads to withdrawal from the labor force and one that results in career change (Samwick, 1998). In addition, Gustman and Steinmeier (2000) showed that over 40% of the Health and Retirement Study (HRS) sample did not meet the criteria of ever having a job for more than 10 years at age 45 or older. Over 66% of the HRS sample would not meet the criteria when the duration of a job was extended to 20 years.

Later studies showed that transition to retirement is much more complex and can take different paths (Borland, 2004; Gustman & Steinmeier, 2000). Individuals can have bridge-jobs or phase out their employment over a course of several years (Kantarci & Van Soest, 2008). Furthermore, the transition to retirement might not be permanent. Almost 40% of workers who exit the labor force between the ages of 51 and 61 return to work, and 20% of those who exit have a period of part-time employment (Maestas & Zissimopoulos, 2010). Also, the measure of retirement as a separation from a career job additionally requires researchers to define the career job. This additional element can account for extended complexity and findings discrepancies (Ekerdt & DeViney, 1990; Gustman & Steinmeier, 2000).

The literature recognizes that there are several retirement paths and the traditional view is just one of them. The traditional measure of retirement requires additional definition of a career job. However, there is no agreement in the literature about the definition of a career job. As a result of the ambiguity of the traditional measure of retirement and its limited usefulness, this measure might not be the most appropriate indicator of retirement.

Reduced Working Hours or Income

The traditional view defines retirement as a discrete choice. However, a different view is to treat it as a continuing process, with the possibility of utilizing working hours as a measure of retirement (Beehr, 1986). This concept is based on the assumption that retired individuals might want to slowly move out of the labor force. As a result, this measure can account for individuals who are in bridge jobs and slowly transition into retirement. This transition could be estimated using weekly working hours, months worked in a year, or annual income (Reitzes, Mutran, & Fernandez, 1998). For example, one study used at least a 15% decrease in the hours worked as a criterion for categorizing individuals as partially retired (Scott et al., 2007). On the other hand, some researchers utilized a 60% drop in earnings as an indicator of partial retirement and a 100% drop as an indicator of full retirement (Gustman & Steinmeier, 2000). A major disadvantage of this measure of retirement is the fact that it is subjective and that the decrease in hours needs to be different for full-time and part-time workers. In addition, individuals can be classified as retired when they are in the process of changing jobs, acquiring new skills before starting a new job, or when the decrease in their income or work time is involuntarily due to layoffs or personal reasons. Moreover, this objective measure can incorrectly classify individuals who are voluntarily taking time off from the labor market to pursue other activities (Kantarci & Van Soest, 2008). Finally, individuals might agree to a reduced work schedule in exchange for retirement pension benefits and further employment. As such, these individuals can be classified as retired from the benefits and decreased work hours perspectives, but those individuals might not classify themselves as retired (Denton & Spencer, 2009).

Retirement Benefits Received

Another way to classify individuals as retired is to look at the retirement benefits received. Medicare benefits are available to individuals at age 65, and early Social Security benefits are available at age 62. While Medicare benefits are not directly affected by one's current work status, individuals need to be eligible for Social Security or Railroad benefits, or have Medicare-covered government employment in order to be Medicare eligible (Medicare, 2011). Individuals who receive Social Security benefits can engage in paid work, but their benefits can be lowered or be subject to additional taxation (Social Security Administration, 2011a). In addition to Medicare and Social Security benefits, there are a couple of other sources of retirement benefits available to individuals before age 62. Defined contribution plans allow individuals to save for their retirement while participating in the labor market. However, these plans have restrictions on the availability of funds before a certain age. In most cases, the funds cannot be used without a penalty before age 55 if individuals leave their current employer or 59 ½ if they continue working (Internal Revenue Service, 2011). An advantage of defined contribution plans is the ability to be fully employed with the employer who sponsors your plan and withdraw your money after age 59 ½ without any penalty. Defined benefit plans, however, might have work and benefits availability restrictions. Defined benefit plans allow individuals to obtain their retirement benefits before age 59 ½ if by then the plan's requirements have been met. Some plans have benefits eligibility criteria based on years of service and are not based on worker's age. For example, a plan might have a 25 years-of-service requirement, which makes an individual who started work at a company at 20 eligible for benefits as early as age 45. In addition, defined benefit plans might only set restrictions on employment with the employer who provides the benefits. For example, an employee might not be able to receive earned income and defined benefit retirement income from the same employer. However, the same individual will be able to receive the defined benefit retirement income from one employer and receive earned income from another employer (Denton & Spencer, 2009).

Some researchers defined retirement as utilization of defined benefits or Social Security benefits (Haveman, Holden, Romanov, & Wolfe, 2007; Moen, Kim, & Hofmeister, 2001).

Previous studies found that defined benefits are a significant predictor of retirement (Samwick, 1998; Szinovacz & DeViney, 2000). Nevertheless, this measure might exclude individuals who for various reasons are not eligible for Medicare, Social Security benefits, defined benefit plan or defined contribution plan benefits. For example, Love et al. (2008) found that only 49% of households age 55 and up were covered by a defined benefit pension. Also, Hardy and Shuey (2000) reported that women were more likely to be employed part-time, which made them ineligible for benefits from their employers. In addition, this measurement might incorrectly classify individuals as retired when they receive retirement benefits even though those individuals still consider themselves in the labor force and not-retired. Lastly, individuals who draw early retirement benefits can be engaged in other employment; they can be classified as retired from the retirement benefits perspective and as not-retired from the labor force participation perspective (Denton & Spencer, 2009).

This overview of retirement benefits available to individuals showed that there are several different retirement benefits available to individuals. These benefits start at different ages and place different restrictions on the paid work in which individuals can be engaged. Also, because of the historical employment patterns, certain groups might not be eligible for retirement benefits and therefore might be underrepresented in the final sample. As a result of several issues with this measure, retirement status measured by the retirement benefit criteria can be problematic.

Self-Reported Status

The last measure of retirement commonly used in studies is the self-reported status. This concept assumes that individuals know whether or not they are retired and that other measures of retirement should be ignored (Denton & Spencer, 2009). An individual might quit a full-time job, work two or three days a week as a way of staying busy and not as a source of income, and still consider him or herself retired. Individuals who work 1,500 hours but self-report their status as retired may have reduced their work load. Also, individuals who work 1,200 hours but self-report their status as not retired might have specific work arrangements, which applies to individuals employed on 9-month contracts or other seasonal contractors. Thus, the self-reported status could be a more valid indicator of retirement than other measures. Gustman and Steinmeier (2000) stated that the disadvantage of self-reported status is that this is a subjective measure that can potentially mean different things to different individuals. However, they also concluded that this measure is a potentially adequate proxy for retirement (Gustman & Steinmeier, 2000).

Combination Methods

Individual measures of retirement only focus on one aspect of the retirement concept. It is possible that adoption of multiple measures could solve this issue. Previous studies utilized various combinations of retirement measures. Some researchers utilized a combination of labor force exit, reduced working hours, and self-reported retirement status while others utilized a combination of self-reported retirement status and decrease in working hours (Doshi, Cen, & Polsky, 2008; Reitzes et al., 1998; Scott et al., 2007). Also, self-reported status, hours worked, and changes in work commitment were utilized as a hybrid measure of retirement (Gustman & Steinmeier, 2001).

A combination of different retirement measures might satisfy both subjective and objective criteria of retirement. The literature recognizes several different combinations of those measures. However, utilization of these measures requires an additional arbitrary approach to work out issues that arise during the process of combining these measures. Furthermore, the different approaches utilized to solve measurement combination issues could potentially result in different results, which could question the validity of such measures. Therefore, a combination method might create more issues than it actually solves.

Two-person households

Many studies that analyze topics related to retirement focus on an individual as opposed to a household (Gustman & Steinmeier, 2002; Scott et al., 2007). However, when analyzing financial issues, researchers need to recognize that some aspects of consumption and wealth are shared between individuals within a household. Therefore, the individual perspective might not be appropriate when exploring retirement wealth or income issues. Of those studies that analyzed households or families, a number marginalized or omitted the discussion of how they accounted for the retirement status of two-person households (Blau, 2008; Coile & Milligan, 2006; Hurd & Rohwedder, 2008; Venti, Poterba, & Wise, 2011).

Some researchers defined a household as retired when the financial respondent for the household self-reported his or her status as retired (Lahey, Kim, & Newman, 2003). Other researchers, measured households' retirement status with responses from households' head or the spouse (Aguiar & Hurst, 2005; Lundberg, Startz, & Stillman, 2003). Accounting for the head of the household or financial respondent might be correct for single households. However, for two-person households those measurements of retirement status might be flawed as they totally ignore the other spouse. Therefore, accounting for both members of a household might be a more appropriate method. The researchers that accounted for both members used work hours in a year as an indicator of retirement (Bernheim, Skinner, & Weinberg, 2001). Also, self-reported status of both household members was used as a measure of retirement (Bernheim, 1987).

The literature search found only a few papers that accounted for retirement status of two-person households. Some of them used one person's retirement status as a proxy for the household (Aguiar & Hurst, 2005; Lahey et al., 2003; Lundberg et al., 2003). Researchers who decided to account for the retirement status of both members of two-person households made sure that the same retirement criteria were applied to both partners (Bernheim, 1997; Bernheim et al., 2001). Ultimately, this study utilizes self-reported retirement status. Methodology section describes the retirement status in more detail.

Retirement Wealth Items

The definition of retirement wealth is very important, as inclusion or exclusion of certain assets can increase or decrease the total retirement wealth that is used to calculate retirement income. Overstating retirement wealth can potentially overstate the income at retirement. Likewise, understating retirement wealth can potentially understate the income at retirement. The classification and the choice of items used to calculate retirement wealth often vary between studies. Still, most research considers retirement wealth to be a combination of Social Security benefits, defined benefit and defined contribution plans, and financial and non-financial assets.

Social Security

Social Security is a critical element of retirement wealth. As such, Social Security is always included in the research that computes retirement income. However, researchers used many methods to account for Social Security benefits. Among common methods of benefits estimation were utilization of households' permanent income (Yuh, 2011), earnings' projections with regression models (Wolff, 2006), calculations based on earnings history (Munnell & Soto, 2005), and self-reported data (Smith, Soto, & Penner, 2009). The specific method chosen depended on the study design. The overall level of benefits received is influenced by the marital status with married households receiving more Social Security benefits than single households (Brady, 2008). Social Security benefits replace a greater percentage of household retirement income for households with lower income, from 72% for the least affluent single households to 32.3% for the wealthiest single households (Munnell & Soto, 2005).

Defined Benefit and Defined Contribution Plans

Defined benefit and defined contribution plans are vital parts of households' income at retirement. Even though there are differences between DB and DC plans, researchers tend to refer to both plans as pensions. In 2004 over 75% of early boomers were covered or had been covered by a pension plan (Gustman, et al., 2009). Love et al. (2008) found that 52% of households with respondent 55 years or older had some type of pension. They also found that the pension accounted for 12% of households' total wealth. However, that share increased to 35% for the most affluent households. Lastly, pension income varied by marital status and accounted for 23.8 % of retirement benefits for two-person households and 30.6% for single households (Munnell & Soto, 2005).

Financial and Non-financial Wealth

The literature divides wealth into financial and non-financial parts. Financial wealth is comprised of cash and very liquid investment vehicles. Most studies consider checking and saving accounts, stocks, mutual funds, and bonds to be financial wealth (Love et al., 2008; Munnell & Soto, 2005; Skinner, 2007; Venti et al., 2011; Wolff, 2006; Yuh, 2011).

The inclusion of certain elements in the non-financial wealth category varies. Many studies included the value of the primary residence in the non-financial wealth category (Love et al., 2008; Venti et al., 2011; Wolff, 2006). However, some researchers do not advise the inclusion of the primary residence because some retirees do not plan to downsize their houses, take reverse mortgages, or use home equity as a source of retirement income (Bernheim, 1997; Lusardi & Mitchell, 2007; Venti & Wise, 1990). Therefore, some studies excluded households' house values from their calculations (Yuh, 2011), some included this item (Engen et al., 1999), and some provide results that both include and exclude the house equity (Brady, 2008; Cole & Liebenberg, 2008).

The argument for the inclusion of home value is the fact that if two households had identical balance sheets except that one owned a fully paid $500,000 house and the other rented, then ignoring the home equity would make those two households equal in value and equally well prepared for retirement. However, common sense and knowledge of accounting suggests that the homeowner should be better off (Engen et al., 1999). Also, in case of a financial emergency, homeowners can sell their home and receive at least a portion of their home equity in cash (Brady, 2008). Therefore, it makes sense to include at least some percentage of home equity in retirement adequacy calculations. The inclusion of half of home equity increased households' average annual income by over $5,000, and the inclusion of full home equity increased households' income by a little over $10,000, which represents 20% of income (Cole & Liebenberg, 2008).

There are additional items that some researchers have included in households' wealth computations. Some researchers included values of business equity, and commercial property (Skinner, 2007; Venti et al., 2011). One study accounted for vehicles, jewelry, values of life insurance, veterans payments, and food stamps distributions (Love et al., 2008). Of interest is the fact that many studies tend not to account for some non-financial items such as cars, jewelry, and art (Brady, 2008; Cole & Liebenberg, 2008; Munnell & Soto, 2005; Yuh, 2011).

Effects of Wealth- and Income-Impacting Events on Finances of Retirees

The analysis of income of retired U.S. households is only valid if the assumptions of a utilized model are met. Therefore, researchers analyze the finances of retirees under different sets of assumptions (Brady, 2008; Cole & Liebenberg, 2008; Fuchs, 1998; Gustman et al., 2009; Love et al., 2008). This section summarizes some studies that simulated the effects of wealth-impacting events on retirement income. The topics are grouped by the effect and are as follows: Social Security reforms, changes to pension benefits, changes to home value, stock market fluctuations, and changes to healthcare expenses.

Social Security benefits are an important piece of many retirement calculations. While at first it was designed to help only the neediest households, throughout the years Social Security has become an important component of the retirement income of a significant number of U.S. households (Munnell & Soto, 2005). A 2010 AARP report states that 23% of people age 65 and older receive 90% or more of their income from Social Security benefits. About 49% of them received at least 50% of their funds from Social Security benefits (Caldera, 2010). However, changes in the demographic structure of the United States and other economic factors have created a situation in which the Social Security system is no longer self-sustainable and will need to restructure its benefits (Board of Trustees, 2010). A simulation of progressive indexation reform decreased the net retirement income of married single-earner households who make $55,000 and have a college degree by as much as 10.7% (Brady, 2008). A 28% across-the-board cut in benefits reduced the net retirement income of married single-earner households with a high school degree who make less than $35,000 by 26.6% (Brady, 2008). An unexpected 25% cut in Social Security benefits decreased the annualized wealth of the bottom income deciles within the range of 10% and 20% (Love et al., 2008). However, the decrease was not as significant for more affluent households.

Pension benefits are not as widely offered to young workers as they were several decades ago (Soto, Munnell, Golub-Sass, & Vitagliano, 2006). But, pension benefits remain especially important for older households that had more extensive pension coverage during their working days. In 2004, over three quarters of households with a person age 51 to 56 were covered by a pension or had pension coverage in the past (Gustman et al., 2009). In addition, that pension wealth accounted for 23% of households' total wealth and was an important part of their retirement income. Pension plans can cover between 40% and 54% of retirement consumption of individuals age 57 and above who indicate that they have such plans (Feinschreiber & Laiosa, 2009). A literature search found no studies done on the potential effects of negative occurrences affecting those plans. Therefore, it is extremely important to estimate the effects of such unfavorable events.

Another important piece of households' wealth is the value of the home. The potential retirement income can be significantly influenced by housing equity. A simulated 50% decrease in housing wealth reduced the annualized value of wealth by about 10% to 20% (Love et al., 2008). This reduction was the greatest among older households, for whom this asset is the most valuable item on the balance sheet. The drop of housing equity growth from 5% annually to zero decreased the wealth adequacy measure by about 5% (Love et al., 2008). Cole and Liebenberg (2008) obtained very similar results to those of Love et al. (2008).

In 2006, a person age 53 to 58 had, on average, 15.2% of his or her direct investments, IRA, and DC plans wealth in stocks (Gustman et al., 2009). Households with higher stock exposure were more vulnerable to any drops in the stock market that could threaten their income at retirement (Gustman et al., 2009). A simulated 40% decrease in households' stock and mutual funds holdings and retirement plans' assets had a marginal impact of around 2% on the median wealth-earnings ratio (Engen et al., 1999). The researchers stated that the results were so small mainly because stock assets are largely held by the wealthiest families.

Individuals age 65 or older are eligible for a number of Medicare benefits. They receive free of charge Medicare Part A, which covers hospital insurance. They also can purchase Medicare Parts B and D, which cover, respectively, medical insurance and subsidized prescription drug coverage (Monk & Munnell, 2009). While some costs are covered by these plans, the potential increase in the health related expenses could have an impact on finances of retired households. An increase of 5% in elderly household medical expenses decreased the amount available for food and services by more than 10% (Fuchs, 1998). In addition, accounting for health expenses had a minimal effect on retirement readiness when measured in absolute terms (Love et al., 2008). Nevertheless, it had a more significant effect on the least affluent households whose annualized wealth dropped between 10% and 20%.

The review of research done on the effect of wealth-impacting events on the income of retired U.S. households showed that those events can impact households in a significant way. Notably, a search of the literature found that there is no work that simulated the effect of the simultaneous occurrence of several wealth-impacting events on the finances of retired U.S. households.

Theoretical Framework

Retirement income of older U.S. households can be analyzed at one point in time or throughout many time periods. While this study focuses on the 2008 time period, a number of estimations are forward looking and are based on several assumptions about households' consumption and spending. There are several theories that attempt to explain how individuals and households consume and spend their resources over time. The two most prominent and most widely utilized theories are the life cycle hypothesis and permanent income hypothesis. Because of the closeness of their content, both theories are often discussed together. Further paragraphs summarize both theories and highlight their similarities and differences.

The Life Cycle Hypothesis (LCH) is the theoretical framework widely utilized by researchers to study financial behavior of individuals. LCH's development is often attributed to the work of Modigliani and Brumberg (1954). In the early 1950s, Modigliani and his student Brumberg formulated a hypothesis that described the spending habits of individuals. They stated that people make calculated choices about the amount they spend based on the resources available to them over their lives. The LCH's main idea is that individuals make decisions about their consumption levels in relation to their long-term resources, not just their current income. They attempt to smooth out their marginal utility of consumption throughout their lifetime by saving and dissaving resources. This means that individuals strive to keep their consumption fairly constant over different time periods and income levels (Deaton, 2005). The relationship is represented in Figure 1.

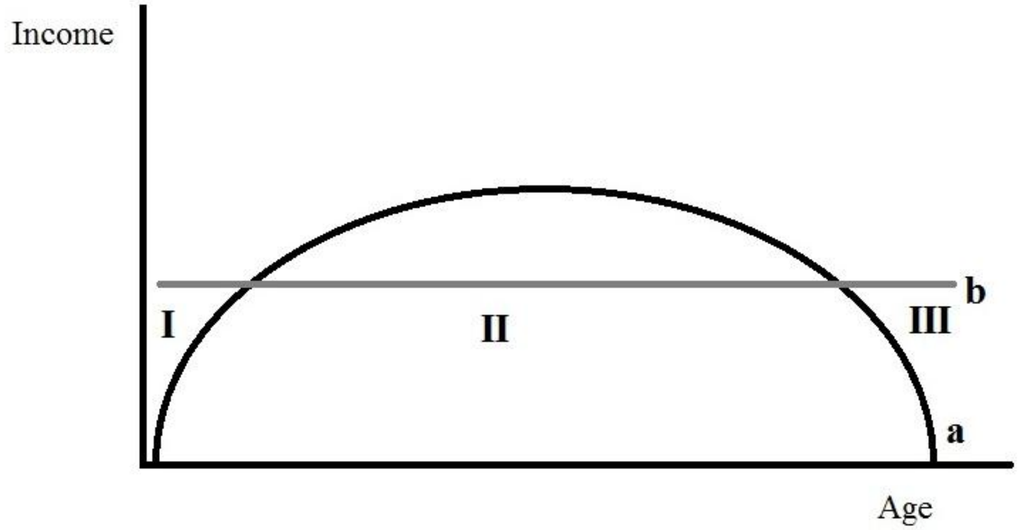

Figure 1. Graphical representation of the Life Cycle Hypothesis.

In Figure 1, the horizontal axis represents a person's age while the vertical axis represents a person's income. As the person gets older, the current income (*a*) increases until it reaches its climax and starts falling. The implication of the constant marginal utility is the fact that people want to keep consumption at a fairly steady level *b*. As a result, young workers, who just started their jobs and whose income *a* is lower than later in their careers, would borrow funds against their future earnings. In Stage I where *a* is less than *b* they borrow money against earnings from Stage II to finance higher consumption than feasible based just on their current income *a* from Stage I. They shift their income from periods of high current earnings to periods of low earnings. Stage II represents later stage of career where workers' current earnings *a* are greater than consumption *b*. During that stage workers start to repay any debt they accrued during stage I and eventually they start to save for periods when the current earnings *a* drop below the consumption level *b*, like retirement. Stage III represents the situation where workers dissave their resources. It is assumed that individuals have no resources left at death.

$$C = \frac{(\mathrm{W} + \mathrm{RY})}{T} \qquad (1)$$

Equation 1 follows Modigliani and Brumberg's assumptions. It denotes that consumption available to people at retirement is equal to the proportion of the amount the household has already saved for retirement (*W*) plus the factor of the number of years to retirement I and the income saved for retirement (*Y*) divided by the amount of years at retirement (*T*). There are a couple critical elements that need to be mentioned about this equation and the LCH. The first element is time (*T*) which is assumed to be finite. The second is the assumption that individuals exhaust all resources at death. When T equals zero, the numerator $W+RY$ also equals zero.
The Life Cycle hypothesis is not the only theory that can be used to analyze households' retirement readiness over many time periods. The other hypothesis that is often discussed alongside of the LCH is Friedman's Permanent Income Hypothesis (PIH). The permanent income hypothesis separates the income into the one that households receive at given period, called current income (*Ci*); the average lifetime income that households use to shape their consumption, called permanent income (*Pi*); and income that is a difference between the current and permanent income, called transitory income (*Ti*).

$$\mathrm{Ti} = \mathrm{Ci} - \mathrm{Pi} \tag{2}$$

Individuals base their consumption on their permanent income (Friedman, 1957). The permanent income tends to be fairly constant through life, and its value is directly related to households' total wealth. Also, expectations about the future tend to influence the value of permanent wealth. These expectations cover financial and nonfinancial information, such as risk, inflation, and mortality. They are assumed to be as important determinants of permanent income as future earnings (Sora, 2004).

$$\mathrm{Pi} = \mathrm{kW} \tag{3}$$

Equation 3 states that permanent income (*Pi*) that is consumed every year equals to a percentage (*K*) times a household's total wealth (*W*). Total wealth is a sum of all a household's current wealth plus the present value of all future income streams. Changes in the current and temporary income have little effect on the consumption levels. Permanent income is based on past events as well as future predictions. To calculate *Pi* one needs to convert *W* into an annuity that each year pays a *k* percent of *W*. Therefore, an increase in the financial wealth should increase permanent income and consumption while a decrease should have the opposite effect. The consumption increase in a given year will not be equal to the increase in the financial wealth. The increase is added to *W*, which serves as a base for the permanent income computations. Therefore, increase or decrease in total wealth by amount *A* will only increase or decrees Pi for given year by *kA*.

The LCH shares many similarities with the PIH. Both assume that individuals are forward looking in their present decisions. This means that the current consumption levels are based on the expectations about future earnings and current resources. In addition, both hypotheses assume that individuals' lifetime earnings vary over time. Thus, individuals borrow and save to even out the income streams. Furthermore, PIH and LCH highlight the reason for saving and borrowing; individuals strive to keep their consumption constant even though they experience income stream fluctuations.

Often, the LCH and PIH are discussed as a cohesive framework. However, there are two important differences between these two hypotheses that are of great importance to this study. The first difference is in the way both account for the time horizon. The LCH assumes that the horizon is finite, individuals can estimate how long they will live and prepare adequately for the duration of their retirement (Jappelli & Modigliani, 1998). On the other hand, PIH assumes this horizon to be infinite; individuals do not plan the time of passing away. While it is smart to assume that individuals' life is finite, the assumption of the correct approximation of an individual's end seems very difficult; the same is true when estimating couples. While the estimation might be difficult for just one household, when the results are aggregated for many households, then the estimations should be accurate for the entire population of interest. The second difference is in the way the two hypotheses account for bequests. In its original form, the LCH did not account for any bequest, whereas the PIH did. The PIH assumes that at retirement an individual consumes only a certain fraction of resources. Therefore, one will always have the remaining fraction left and will not run down all resources.

Poterba (1994) reported that saving continues at retirement. He states that for the population age 70 to 74 the median saving was 1.1% in the U.S. and 6% in Canada. While at first the findings seem to contradict the basic assumptions of the LCH (that individuals are assumed to dissave on retirement), Poterba's results have been explained by the refinement of the standard hypothetical model so that it includes uncertainty, precautionary saving, and accidental bequests. Part of the bequest may be unintentional resulting from excessive wealth accumulation due to precautionary reasons. Risk-averse individuals will attempt to keep a safe level of assets to account for life uncertainty (Modigliani & Brumberg, 1954).

The life cycle hypothesis is used as the theoretical background of this research. The assets that households own are annuitized to create an even income stream that households can utilize throughout their life. The computations follow Modigliani and Brumberg's equation to estimate income available to households. In addition, there is an assumption of no intentional bequest, which means that any bequest motives are unintentional and are the effect of precautionary savings. Chapter 3 describes the development of the models that will be utilized in this study.

CHAPTER 3

METHODOLOGY

The goal of this study is to analyze the finances of retired U.S. households and to estimate the effect of wealth-impacting events on their retirement income. The task is quite challenging because many assumptions need to be made in order to perform the analyses. Among these assumptions are retirement age, the level of benefits, return on investments and other assets, the level of inflation, life expectancy, and the extent of wealth impacting events. Further paragraphs describe the assumptions made in this study and explain the model utilized. This chapter is divided into four sections. The first section describes the data and the sample. The second section provides definitions of variables that are being utilized by this study. Next, the empirical model is introduced and explained. Last, the modifications to empirical model are provided.

Data and Sample

Data

This research uses the 2008 Health and Retirement Study (HRS) survey data. The HRS is a biennial survey sponsored by the National Institute on Aging and conducted by the Survey Research Center of the University of Michigan Health and Retirement Study. HRS provides longitudinal data for over 22,000 respondents on a number of topics. Some examples include retirement plans and attitudes, demographic characteristics, family structures and characteristics, housing, medical health and expenses, and insurance and pension plans (Leacock, 2006).

The first wave of the HRS was administered in 1992 to 12,650 individuals born between 1931 and 1941, and their spouses (Juster & Suzman, 1995). For the next six years additional cohorts were added to the HRS. In 1995, the HRS questionnaire was integrated with Assets and Health Dynamics of the Oldest Old (AHEAD), which covered individuals born in 1890 to 1923. Later, the "Children of the Depression" (CODA) cohort, born 1924-30, and the War Babies (WB) cohort, born 1942-47, were added to the HRS. Starting in 1998, the survey became cross-sectionally representative of the U.S. population age 50 and older. Also, every six years a new six-year cohort is added to the data set (Willis, 1999). In 2004, the Early Baby Boomers (EBB) cohort, born 1948-1953, was added. The 2010 survey data will contain the Middle Baby Boomers (MBB) cohort, born 1954-1959.

The HRS utilizes a multi-stage probability sample design with four selection stages. The first stage is based on the probability proportionate to size selection of U.S. Metropolitan Statistical Areas (MSAs) and non-MSA counties. The second stage of the selection involves sampling of area segments (SSU) within the stage one segments (PSU). Later, a list of all housing units from selected SSU is used in stage three. The third stage contains a systematic selection of housing units from the created list. Finally, age-eligible individuals are selected from housing units obtained from step three. In addition to the core sample obtained from the four stage selection process, the HRS oversamples Black and Hispanic individuals as well as the residents of the state of Florida. As a result of unequal probabilities of selection when working with the HRS data, special sampling weights need to be used (University of Michigan, 2008). Most of the data were collected via telephone interviews. However, in situations when this method was impossible or very difficult to administer, face-to-face interviews were performed. Questions asked varied by the marital status and number of people considered in the household.

People living alone were given questions that apply to them as individuals and as households. People living with another individual were asked only selected questions, while other questions were answered by the spouse or partner. Also, certain questions were answered by a proxy informant. A proxy informant is an individual who answers certain questions when sampled individuals are unable to answer the whole survey or its parts. In addition, the HRS obtained its data through administrative records. The HRS utilizes the Employer Pension Study, the National Death Index, earnings and projected benefits data from the Social Security Administration, W-2 and self-employment data, and Medicare files (Health and Retirement Study, n.d.).

Sample

It is assumed that intra-household resource sharing occurs. Therefore, the unit of analysis is households. A household can consist of one or more individuals. This level of analysis was selected because in the case of finances at retirement certain benefits can be potentially transferred to the surviving spouse. For example, a number of defined benefit plans have surviving spouse provision. Also, after one partner's death, the surviving individual can elect to receive the spouse's Social Security benefits if they are greater than the ones he or she currently receives. Lastly, certain durable assets that can be converted into retirement income are owned by a household not individuals; a home is the most commonly owned asset that can be converted into a retirement income.

This research focuses only on households that are retired and are not living in nursing homes. For this research, the original HRS sample is restricted to 6,314 households (22,561,448 weighted) in which both members self-reported as retired or, in the case of single households, where the respondent self-reported as retired. The Variables section of this chapter provides detailed description of the retirement variable selection process.

Dependent and Independent Variables

Dependent variable

This study utilizes retirement income RI_t as the dependent variable. The variable is defined as the sum of all income streams (IS_t) that a household currently receives and the annuitized value of their financial and non-financial wealth, ACW_t. A detailed description of the empirical model utilized in this study to estimate RI_t is provided later in this chapter.

$$RI_t = IS_t + ACW_t \tag{4}$$

Demographic

A series of demographic variables is utilized in this study to describe the population of retirees analyzed. Those variables and their level of measurement are summarized in Table 1.

Table 1

Demographic Variables

Variable	Variable Description
Race	A household's racial/ethnic variable. Coded as 1 for White/Caucasian, 2 for Black/African American, 3 for Hispanic. Coded as 0 if otherwise[a]
Two-Person Household	Coded as 1 if a household is coded by the HRS as a two-person household. Coded as 0 if otherwise[b]
Age	Represents a respondent's age during the interview for a single or two-person household. A continuous variable.
Education	A household's highest level of education as reported by the respondent. Coded as 0 for less than high-school, 1 for

	GED, 2 for high-school graduate, 3 for some college, 4 for college and above[c]
Gender	Represents a respondent's gender during the interview for a single or two-person household. Coded as 0 for male and 1 for female.

[a] Only the race of the respondent is utilized for single and two-person households.
[b] A household is coded as *Two-Person* if the respondent is married or partnered, or if there are two respondents in the wave-specific household.
[c] The full 2008 sample has 46 cases in which the respondent did not know, refused to answer, or for various reasons his/her file had a missing value for this variable.

Retirement

The literature provides several measures of the retirement concept. The review of literature highlighted the fact that there is no one universally-accepted definition of retirement and no measure will adequately describe all situations (Denton & Spencer, 2009). The fact that individuals have different work and retirement patterns might explain that condition. Some individuals leave work and never return, but they do not consider themselves retired. Others consider themselves retired but still work full-time. A number of individuals receive retirement benefits and still work, while others are retired and still wait for their benefits. A self-reported status can have potential drawbacks as retirement might mean different things to different people. However, individual perception and expectations about current employment might be a key element when considering retirement from the perspective of the life-cycle hypothesis.

Retirement can be seen as changes to income, consumption, and time allocation. It can also represent a past, present, or future shift that might not necessarily be reflected in the data. Therefore, utilization of self-reported status seems to be the most appropriate fit with the life cycle hypothesis as this measure can potentially reflect information not disclosed during the survey process. A self-reported measure of retirement allows for inclusion of members who might have different work patterns than those captured by labor force participation, reduction in working hours or income, or drawing of retirement benefits. In addition, individuals who are partially employed or in the transition phase of their work can still be classified as retired if they perceive their status as so. Moreover, this definition includes individuals who for a variety of reasons might not have retirement benefits.

Bernheim (1987) analyzed dissaving after retirement from the life cycle hypothesis perspective. He utilized self-reported retirement status as the measure of retirement. A single household was considered retired when it self-reported as being retired. A two-person household was considered retired when both members of the household self-reported their status as retired. Households with at least one member whose self-reported status was different from retired were excluded from the analysis. This study follows Bernheim's methodology in terms of the definition of retired households and only includes households whose members self-reported their status as retired. Households whose members self-reported their status as not retired or partially retired were excluded from the final sample. This retirement measure allows for inclusion of households that self-reported as retired even if, for various reasons, they were still employed full- or part-time. Also, the final sample contains households whose members might not be eligible for certain retirement benefits, only worked part-time in the past, did not work for pay, or took care of home and therefore were considered not in the labor force; these households could have been excluded from the final sample if different measures of retirement had been utilized.

Work and retirement variables utilized by this study are summarized in Table 2. All variables are reported for the household level.

Table 2

Work and Retirement Variables

Variable	Variable Description
Retired	Coded as 1 if a household self-reported as retired. Coded as 0 if otherwise[a]
Labor Force Status	Coded as 1 if a household is classified as not in the labor force. Coded as 0 if otherwise[b]

[a] Only the respondent needed to self-report as completely retired in the case of single households. Both partners needed to self-report as completely retired in the case of two-person households.
[b] Only the respondent needed to be classified as retired in the case of single households. Both partners needed to be classified as retired in the case of two-person households.

Poverty Threshold

The poverty threshold measure was utilized to estimate the percent of households whose retirement income falls below the minimum indicated by the U.S. Census Bureau (U.S. Census Bureau, 2011). This measure has been modified from its original form to account for the study design, data deficiencies, and research objectives. Retirement income calculated by this study is the figure used to compare against the poverty threshold. The income definition was extended from the one used by the Census and contains annuitized financial and non-financial assets. The poverty threshold against which households' retirement income is compared were provided in the HRS data and reflect the family structure and age of the family members in 2008. The thresholds were used in their original form and were not modified.

The goal of the measure of poverty utilized in this study was to estimate the percentage of households whose total retirement income falls below the poverty threshold. As a result, this study was able to estimate how households' income streams and financial and estate wealth influence their ability to generate retirement income above the poverty threshold.

Income Inequality

This study utilizes the Gini coefficient as a measure of income inequality. The coefficient measures the proportion of the total area under the diagonal of perfect equality and the Lorenz Curve for the given population. If the area between the line of perfect equality and Lorenz curve is A, and the area under the Lorenz curve is B, then the Gini coefficient can be represented as A/(A+B). The coefficient varies from 0 to 1. The lower values of the Gini coefficient indicate a more equal distribution of income; a value of zero indicates perfect equality. However, the higher values of the Gini coefficient indicate income disproportions, and a value of 1 indicates complete income inequality where a single household receives all the income and the remaining households do not receive any income. This study utilizes the Gini coefficient not to determine whether the Retirement Income distribution is equal or not, but to estimate the effect of wealth-impacting events on income inequality among retired U.S. households.

Independent Variables

This study utilizes a number of different independent variables. Further paragraphs group these variables and provide tables that describe the way they are constructed and their level of measurement.

Income

Retired households have four potential sources of income. They can receive benefits provided by the government, receive payments from employer retirement plans, utilize personal savings and investments, or obtain income from additional work. Table 3 presents income variables that are being utilized in this study. These variables are reported in an annual form and in 2008 dollars. These variables are utilized without any modifications as *Income Streams* in the final model reported in Equation 5.

Table 3

Income Variables

Variable	Variable Description
Earned Income	The net value of a household's total income from wages, salary, bonuses, overtime pay, commissions, tips, second job, military reserve earnings, professional practice, or trade. A continuous variable measured in 2008 dollars.
Capital Income	The net value of a household's business or farm income, self-employed earnings, business income, gross rent, dividend and interest income, trust or royalties, and other asset income. A continuous variable measured in 2008 dollars.
Pension	The sum of a household's income from all pensions and annuities. A continuous variable measured in 2008 dollars.
Social Security DI or SSI	The sum of a household's income from Social Security Disability or Supplemental Security Income. A continuous variable reported in 2008 dollars.
Social Security Benefits (SSB)	The sum of a household's income from Social Security retirement benefits. A continuous variable reported in 2008 dollars.

Variable	Variable Description
Unemployment Benefits	The sum of a household's income from unemployment and worker's compensation. A continuous variable reported in 2008 dollars.
Government Transfers	The sum of a household's income from veteran's benefits, welfare, and food stamps. A continuous variable reported in 2008 dollars.
Other Income	The sum of a household's income from alimony, other income, and lump sums from insurance, pension, and inheritance. A continuous variable reported in 2008 dollars.
Income Stream[a]	The total of a household's incomes streams. A continuous variable reported in 2008 dollars.
Asset Income[a]	The sum income streams from the annuitized value of households' financial and non-financial wealth.
Retirement Income[a]	The sum of household's Income Stream and Asset Income. A continuous variable reported in 2008 dollars.

Note. The reference period is one year.
[a] Equations 4, 5, and 11 provide detailed information on these variables.

Wealth

This study will annuitize portfolio and other estate assets in order to estimate households' annual annuitized income streams. Table 4 provides the list of households' assets and the way they are measured. Those assets will later be utilized in the annuitized income streams calculations.

Table 4

Financial and Non-Financial Assets Variables

Variable	Variable Description
Primary Residence	The net value of a household's primary residence whether it is a home, farm or ranch, mobile, home, or condominium. A continuous variable measured in 2008 dollars.
Secondary Residence	The net value of a secondary residence not including investment property. A continuous variable measured in 2008 dollars.
Other Real Estate	The net value of any real estate other than primary and secondary residences, such as land, rental real estate, a partnership, or money owed to a household on a land contract or mortgage. A continuous variable measured in 2008 dollars.
Business or Farm Assets	The net value of a business or asset that a household owns and did not report earlier in the survey. A continuous variable measured in 2008 dollars.
IRA/Keogh	The net value of all IRA and Keogh accounts a household owns. A continuous variable measured in 2008 dollars.

Variable	Variable Description
Stocks	The net value of all stocks and stock mutual funds held outside a household's retirement accounts. A continuous variable measured in 2008 dollars.
Checking or Saving Accounts	The net value of a household's checking, saving, and money market funds. A continuous variable measured in 2008 dollars.
CDs, Gov. Bonds, and Bills	The net value of a household's certificates of deposit, government savings bonds, or Treasury bills. A continuous variable measured in 2008 dollars.
Bonds	The net value of a household's corporate, municipal, government, or foreign bonds, or any bond funds. A continuous variable measured in 2008 dollars.
Other Assets	The net value of a household's other savings or assets, such as jewelry, money owed to a household by others, a collection for investment purposes, rights in a trust or estate where members of the household are the beneficiary, or an annuity that have not already been reported. A continuous variable measured in 2008 dollars.

Note. The reference period is one year.

To calculate a precise measure of annual income, financial and non-financial assets should be decreased by any liabilities that households might have. This allows utilization of a net value of each asset, which is later converted into annual income streams. Table 5 describes households' financial liabilities.

Table 5

Financial Liabilities Variables

Variable	Variable Description
Mortgage	The net value of first and second mortgages or land contract on the primary residence. A continuous variable measured in 2008 dollars.
Other Home Loans	The net value of all of a household's "other" loans and home equity line of credit other than the *Mortgage* variable. A continuous variable measured in 2008 dollars.
Secondary Mortgage	The net value of all mortgages and loans against the second residence. A continuous variable measured in 2008 dollars.
Other Debt	The net value of any debt that a has not been reported earlier, such as credit card balances, medical debt, life insurance policy loans, loans from relatives, and so forth. A continuous variable reported in 2008 dollars.

Note. The reference period is one year.

Mortality Tables

This study follows Love et al. (2008) and uses official Social Security Administration (SSA) actuarial life tables. An actuarial life table represents probabilities of a person living or dying at a specific age and their estimated life expectancy. The official tables are carefully constructed and can be used to analyze the probability of surviving to a very old age (Bell &

Miller, 2005). These tables are used for the calculations of a portfolio assets and estate values. A more detailed description is provided later in this chapter

Economic and Return on Assets Indicators

This research utilizes external data sources for historical performance of stocks, bonds, bills and inflation. This information is published by Ibbotson Associates (2008). The Ibbotson Yearbook provides the United States' historical performance data from 1926 to the present. This information is represented in Table 6.

Table 6

Historical Economic and Investment Performance

Variables	Value
Inflation	3.00%[a]
Large Company Stock	9.62%[b]
90/10 Portfolio	9.03%[c]
80/20 Portfolio	8.44%[c]
70/30 Portfolio	7.85%[c]
60/40 Portfolio	7.26%[c]
50/50 Portfolio	6.67%[c]
40/60 Portfolio	6.07%[c]
30/70 Portfolio	5.48%[c]
20/80 Portfolio	4.89%[c]
10/90 Portfolio	4.30%[c]
Treasury Bills	3.71%[c]
Real Estate Return	3.93%[d]

Variables	Value
Personal Loan Rate	13.78%[e]
Mortgage Rate	7.66%[f]

[a] The compound annual inflation rate over the 1926-2008 period. Ibbotson Yearbook provides a real rate of return over inflation of 0.7% over the 1926-2008 period. This value was added to the inflation rate calculated over the 1926-2008 period.
[b] Returns are based on S&P 500 total returns. The value represents geometric mean calculations.
[c] The variable describes the proportion of a portfolio's assets invested in stocks and treasury. bills. Provides geometric returns over the 1926-2008 period.
[d] Geometric return over the 1926-2008 period based on the Nominal Home Price Index calculated by the author.
[e] Historical averages from November 1994 to May 2011 computed using the Federal Reserve Data.
[f] Historical averages from April 1986 to September 2011 computed using the HSH Data.

Additional Variable

This study utilizes an additional variable to calculate final estimations. This variable is employed throughout different phases of analysis. Table 7 presents an additional variable utilized and its level of measurement.

Table 7

Additional Variable

Variable	Variable Description
Out-of-Pocket Med. Exp.	The sum of a household's annual out-of-pocket medical expenses. A continuous variable measured in 2008 dollars.[a]

[a] The original variable is recorded for a 24-month period. The variable utilized has been divided by two to represent one year of a household's out-of-pocket medical expenses. The variable includes expenses from: hospital, nursing home, doctor visits, dental care, outpatient surgery, prescription drugs, home health care, and special facilities.

Data Analysis

This research employs analysis of variance (ANOVA) to test the impact of changes proposed in research questions 2a – 2f between the quintiles and a series of paired t-tests to assess the differences between the same quintiles. This study also reports the mean percentage of decrease in retirement income for each age and income quintile. The mean percentage of decrease for each quintile is computed such that the percentage decrease in retirement income is first calculated on the household level and then the mean value of these percentage decreases is taken for each quintile separately.

Empirical Model

Calculation of Retirement Income

This study utilizes Equation 4 to calculate income of retired households, *RI*.

$$RI_t = IS_t + ACW_t \tag{4}$$

RI is equal to the sum of total income streams, *IS,* that the household currently receives and the annuitized value of their financial and non-financial wealth ACW_t. Further sections of this document describe each element of the equation separately.

Income Streams

This study utilizes self-reported retirement status as a measure of retirement. Therefore, it is possible that some households that self-report as retired can exhibit work related characteristics that would not classify them as retired. This is extremely important when considering income streams because there is a possibility that some households are still full-time employed or do not utilize certain retirement benefits. The *IS* variable comprises different income streams that households reported as receiving. These values are taken directly from the survey, and they are not adjusted in any way.

$$IS_t = WI_t + SSI_t + SSB_t + UB_t + GT_t + \ OI_t \tag{5}$$

The *IS* variable consists of work income (WI_t) which represents the net value of a household's total income from wage, salary, bonuses, overtime pay, commissions, tips, second job, military reserve earnings, professional practice, or trade. The Social Security benefits variable (SSI_t) describes the sum of a household's income from Social Security disability or Supplemental Security income. Social Security benefits (SSB_t) is the sum of a household's income from Social Security retirement program. The UB_t variable is the sum of a household's income from unemployment and worker's compensation. Government transfers (GT_t) is the sum of a household's income from veteran's benefits, and welfare. Lastly, other income (OI_t) represents the sum of a household's income from rent, alimony, lump sum from insurance, pension, inheritance, or other income.

Annuitized Value of Financial and Non-financial Wealth

The annuitized value of households' financial and non-financial wealth follows the life cycle hypothesis in which households utilize their assets to keep their marginal consumption at a constant level. A number of different financial and non-financial assets are annuitized in order to estimate the amount of income that a household can receive if its total wealth was annuitized. When annuitizing wealth, there is a need to account for single and two-person households as they tend to have different consumptions needs. Annuitization of a single household's wealth is a straightforward process that follows Equation 6.

$$PVW = AW * \frac{1-(1+i)^{-n}}{i} \tag{6}$$

Households Present Value of Wealth (*PVW)* equals the annual payment that a household receives (*AW)* multiplied by the present value of annuity interest factor, where n equals individual's life expectancy and *I* represents the real interest rate that is calculated using Equation 7.

$$i = \frac{1+return\ on\ investment}{1+inflation} - 1 \tag{7}$$

Equation 7 represents the real interest rate calculation in which the inflation value is taken from the Ibbotson Associates (2008) yearbook and is reported in Table 6. Return on investment variable varies by the type of asset being converted. Portfolio, stocks, bonds, and real estate will have different returns on investment and therefore will have different real interest rates. After transforming Equation 6, the annuitized wealth payments of single households are computed using Equation 8.

$$AW = \frac{PVW * i}{1-(1+i)^{-n}} \tag{8}$$

When both members of a household are alive, then the annuity is increased by the economies of scale multiplier α. This study follows Love et al., (2008) and sets α equal to 1.67. This means that during the period when a household includes two members, there is an increase in consumption. This increase does not equal double the value of a single individual's consumption as certain costs are not conditioned on the number of people living in the household (e.g., estate taxes or mortgage payments). Therefore, Equation 6 should be modified to account for the 0.67 increase in funds to cover higher consumption.

$$PVW = AW * \frac{1-(1+i)^{-n}}{i} + 0.67AW * \frac{1-(1+i)^{-n'}}{i} \tag{9}$$

The first part of Equation 9 is identical to Equation 6. The second part of the equation accounts for the increase in the consumption associated with an additional member in the household. Therefore, the consumption during the period when two people are alive (*n'*) needs to represent the increase in consumption of 0.67. Equation 9 is later transformed to solve for the annuitized wealth. The final model used is reported in Equation 10.

$$AW = \frac{PVW * i}{1.67 - (1+i)^{-n} - 0.67 * (1+i)^{-n'}} \tag{10}$$

The annuitized comprehensive wealth (ACW_t) is a sum of annuitized various components of net-wealth. The ACW_t assumes that all wealth is not perfectly fungible. The idea behind this is the fact that different wealth categories have different historical growth and therefore can be expected to yield different investment returns. The ACW_t consists of annuitized portfolio wealth (PFW_t) and annuitized estate wealth (EFW_t).

$$\begin{aligned} ACW_t = {} & PFW_t \sum [(S_t, B_t, CD_t, CA_t, OA_t, IRA_t, P_t, CI_t) - (OD_t)] \\ & + EFW_t \sum [(PR_t, SR_t, ORA_t, BFA_t, BI_t) - (MD_t, OHL_t, SM_t)] \end{aligned} \tag{11}$$

The wealth has been divided into two primary elements. The Portfolio Financial Wealth PFW_t comprises financial wealth elements decreased by any debt that a household has; it is a net portfolio wealth measure. PFW_t is the sum of stocks (S_t), bonds (B_t), CDs (CD_t), checking or savings accounts (CA_t), other assets (OA_t), IRA/Keogh accounts (IRA_t), pension (P_t), and capital income (CI_t), less any other debt (OD_t). Of importance is the fact that pension and capital income have been reassigned to wealth categories so they are not counted for the second time when households' wealth is annuitized.

The second expression in Equation 11 is the annuitized estate financial wealth (EFW_t). The expression represents the net value of the sum of the primary residence (PR_t), secondary residence (SR_t), other real estate assets (ORA_t), business or farm assets (BFA_t), and business asset income (BI_t), less any mortgage debt (MD_t), other home loans (OHL_t), and secondary mortgage (SM_t). Detailed information about these variables can be found in Tables 4 and 5. The net value of these variables is annuitized using a real interest rate with appropriate indicators from Table 6. A detailed description of other variables is presented in Table 4.

The net-value of the portfolio is annuitized according to the appropriate real interest rate. The interest rate depends on the portfolio composition and household age. If a household owns only one asset in its portfolio, then this asset's real interest rate is calculated using the appropriate value from Table 6. If a household owns more than one asset, then appropriate portfolio allocation returns are utilized. The allocation follows a life-cycle investing approach in which the proportion of stocks to bonds is estimated using households' age (Kintzel, 2007). According to this approach, a household's age is subtracted from 100 to determine the percentage of a portfolio's wealth to be invested in stocks. The remaining percentage of the portfolio's wealth will be invested in bonds, bills, notes, and similar investment vehicles. For example, a 65 year old has an assumed portfolio of 35% invested in stocks and 65% invested in bonds. The idea behind this strategy is to minimize an older household's exposure to more volatile and therefore risky investments like stocks. As a result, the older the household, the smaller the percentage of the portfolio that will be invested in stocks and the greater the percentage that will be invested in bonds. Older households will have less volatile and less risky portfolios. Because of the data limitations, it is only possible to estimate a portion of their IRA/Keogh accounts invested in stocks and bonds for some households. Households who are missing this variable have their portfolios estimated based on their ages. Age will be used to classify households' accounts into one of six portfolios. Table 8 has information about the portfolio classification.

Table 8

Households' Portfolio Classification Based on Age

Households' Age	Portfolio Classification
90 and older	10/90 Portfolio

89 to 80	20/80 Portfolio
79 to 70	30/70 Portfolio
69 to 60	40/60 Portfolio
59 to 50	50/50 Portfolio
49 and Younger	60/40 Portfolio

After determining the percentage allocation of IRA/Keogh accounts, households' total portfolio allocation will be estimated. The total portfolio includes stocks, bonds, CDs, checking or saving accounts, and amounts of IRA/Keogh accounts allocated to stocks and bonds. This is done to determine households' total portfolio returns. The study will consider the proportion of households' total assets invested in stocks and bonds and estimate a portfolio ratio (PR_t) of total stock assets (SA_t) to the total portfolio value that consists of stock assets (SA_t) and other investment assets (OIA_t).

$$PR_t = \frac{SA_t}{SA_t + OIA_t} \tag{12}$$

Total stock assets comprise stocks (S_t) and a percentage of IRA/Keogh accounts classified as stocks. Other investment assets include lower risk/return assets, such as bonds (B_t), CDs (CD_t), checking or savings accounts (CA_t), and a percentage of IRA/Keogh accounts that is classified as bonds.

The PR_t variable is then used to assign households to one of the portfolios described in Table 6. In a situation in which a household does not own any stocks but has all its investments allocated in other investment assets, the treasury bills' rate of return is used. Also, in a situation in which a household only owns stocks, the large company stocks rate of return is utilized. All returns utilized in this study are adjusted for inflation.

Modifications to the Empirical Model

Further paragraphs in this section describe in detail the changes that will be made to the basic empirical model in order to account for additional research questions this study poses. Of importance is the fact that each research question has three levels of market, policy, or expenditure shock modifications. This allows for estimation of the effects of different occurrences on the income of retired U.S. households, offering upper and lower bounds of the estimates.

2a. *What is the likely effect of proposed changes to Social Security benefits on the income of retired U.S. households?*

The possible insolvency of the Social Security System has been acknowledged by the Board of Trustees several times (Board of Trustees, 2008, 2009, 2010). The Board of Trustees reports provided some solutions that could potentially help with the financial issues that are projected to come. The 2008 proposal suggested an immediate 11.5% decrease in benefits accompanied by an increase in payroll taxes. The following year, the 2009 Board of Trustees report suggested a 13.3% decrease in benefits and an additional increase in payroll taxes. The most recent report recommends a 12.0% reduction in benefits and an increase in payroll taxes. Different Board of Trustees' reports present different recommendations. However, all recent recommendations propose an immediate reduction in benefits of at least 11.0%. This study explores different possibilities and potentially different benefit reductions. The first reduction will represent a 4.0% immediate decrease in Social Security benefits. The second scenario analyzes an 8.0% reduction in benefits. The last scenario follows the 2010 Board of Trustees report and estimates the effects of a 12.0% decrease in benefits.

2b. *What is the likely effect of pension benefit reductions and outright defaults on the income of retired U.S. households?*

Pension income cuts are a real possibility in the current economic environment. Local and state pensions are underfunded, employers freeze pensions, and the PBGC has a 21.6 billion dollar deficit, which might jeopardize its ability to fulfill its commitments (Pension Benefit Guaranty Corporation, 2010). This study models three situations in which individual benefits are decreased. They simulate situations where the PBGC assumes the benefit obligations, has insolvency issues, and goes bankrupt. The modifications will decrease benefits by 25.0%, cap them at PBGC's maximum, and will drop them to zero.

2c. *What are the likely effects of further housing equity reductions on the income of retired U.S. households?*

The 2008 HRS data set reports home prices for the 2008 period. However, since then property values have decreased even more. Additionally, (Shiller, 2006) reports that the real price increase of homes in the U.S. has been close to zero since 1890 to the late 1990s. This study explores three types of adjustment to housing equity: wealth adjustment, rate of return modification, and change in the wealth and rate of return. Wealth adjustment represents a price alteration that reflects the difference in the survey data and real world events. Based on Shiller's data, home prices have decreased by approximately 20.0%. Therefore, the first modification will decrease all housing estate wealth by 20.0% and continue the annuitized computations using standard real estate returns. The second modification targets the returns on real estate. As noted earlier, the real price of homes in the U.S. virtually has not changed between 1890 and the late 1990s. Therefore, the second modification targets the real return rate and sets it equal to zero, while keeping the estate wealth at the 2008 level. The last modification decreases the estate wealth by 20.0% and sets the real return rate to zero.

2d. *What is the likely effect of the stock market's meltdown at varying loss levels on the income of retired U.S. households?*

There are striking similarities between the current U.S. economic situation and that of Japan from two decades ago (Clark, 2011). There is a possibility that as soon as the government stops stimulating the economy, the economy could fall into a recession and the stock market could experience an additional drop and prolonged period of underperformance (Clark, 2011). In addition, retiring Baby Boomers could start the potential asset market meltdown, which would also have a negative impact on the economy and the stock market. While this research does not attempt to answer the question of whether these events will happen, it does estimate the potential effects of these events on the income of retired individuals. There are three simulations presented in this section. All simulations estimate the effects simultaneous decrease in the portfolio principal and the long term performance of the entire portfolio.

The first simulation decreases a household portfolio's stock base by 10.0% and decreases the portfolio's annual nominal returns by 1.5% percent. When calculating a household's portfolio decrease, the changes are made directly to a household's portfolio as assigned based on their age. The second simulation decreases a household's portfolio by 20.0% and decreases the portfolio's annual nominal returns by 3.0%. The last simulation decreases a household's portfolio by 30.0% and decreases the portfolio's annual nominal returns by 4.5%. These different levels allow for estimation of various impacts that the possible asset market meltdown could have on the income of retired U.S. households.

2e. *What is the likely impact of increased out-of-pocket healthcare expenses on the income of retired U.S. households?*

An increase in out-of-pocket expenses can have very extensive consequences for U.S. households. Director of Congressional Budget office Douglas W. Elmendorf (2011) performed long-term analysis of the impact of changes to Medicare and Medicaid benefits. He described a benchmark as a 65-year-old individual with average health and covered by a plan similar to Medicare. Under the simulation, the individual share of health-care expense including co-pays, out-of-pocket expenses, and premiums would increase by 61.0% in 2022 and 68.0% in 2030. Elmendorf assumed that individual states have flexibility about the distribution of benefits; each state decides what percent of co-pay, out-of-pocket expenses, and premiums it subsidies. Therefore, it is impossible to estimate how individual states' decisions affect the out-of-pocket expenses. Still, it is safe to assume out-of-pocket expenses are likely to increase.

This study estimates the impact of three levels of increases of out-of-pocket medical expenses on the income of retired U.S. households. The model assumes that households experience 50.0%, 100.0%, and 150.0% increases in their current out-of-pocket medical expenses.

This study assumes that households already budget their ongoing out-of-pocket medical expenses; therefore, only the increase portion is subtracted from the final RI_t calculations. The model utilized is provided in Equation 13. The model is identical to Equation 4, but accounts for the increase in the out-of-pocket medical expenses (OOP_t).

$$RI_t = IS_t + ACW_t - OOP_t \qquad (13)$$

2f. *What is the likely simultaneous effect of events (2a-2e) on the income of retired U.S. households?*

The simultaneous occurrence of wealth impacting events is a vital element of this research. The global and local economies are interconnected, local events can potentially affect global markets, and vice versa. The 2008 events showed how the U.S. stock and housing markets can affect local, state, federal, and international economies. The goal of this simulation is to estimate the potential impact of events *2a-2e* taking place at the same time. The interconnection of various elements of this study makes this scenario plausible. This study assumes that the events happened in 2008. This allows for estimating the impact that these events have on the income of retired U.S. households. In addition, the simulations have been divided into three separate scenarios.

This research question simulates the simultaneous occurrences of all five events and accounts for changes in SSB, outright default of pension plans, changes to housing equity and returns, stock market meltdown, and an increase in out-of-pocket medical expenses. This simulation accounts for a 12.0% cut in SSB, outright default of pensions, a 20.0% decrease in home equity and 0.0% real returns, a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns, and 150.0% increase in out-of-pocket medical expenses.

While at first this simulation might seem unrealistic, analysis of the events of 2008 and their aftermath might prove that the simulation is in fact closer to the real-life events than many might realize. As the housing bubble burst, the stock and housing markets experienced a dramatic decrease in the overall value of its assets (Dow Jones Indexes, 2011; Rosnick & Baker, 2010). The decrease in the value of stocks was associated with an increase in the insolvency of pension plans (Munnell at al., 2008), which when combined with increasing number of retirees who becomes eligible to receive pension funds might increase the bankruptcy rate among pensions. Also, since the slowdown in the economy is associated with lower financial inflows to state and federal budgets (Aaron, 2010; Rivlin, 2002), the financial distress might affect the ability of the government institutions to provide benefits like Medicare or Social Security at the same level as before the crisis (Aaron, 2010).

Research Questions and Hypotheses

1. *What is the income of retired U.S. households?*

2a. *What is the likely effect of proposed changes to Social Security benefits on the income of retired U.S. households?*

2b. *What is the likely effect of pension benefit reductions and outright defaults on the income of retired U.S. households?*

2c. *What are the likely effects of further housing equity reductions on the income of retired U.S. households?*

2d. *What is the likely effect of the stock market's meltdown at varying loss levels on the income of retired U.S. households?*

2e. *What is the likely effect of increased out-of-pocket medical expenses on the income of retired U.S. households?*

2f. *What is the simultaneous effect of wealth- and income-impacting events (2a-2e) on the income of retired U.S. households?*

Hypothesis for research question 2a

Based on the prior literature that reports the importance of Social Security benefits in the finances of retired U.S. households (Brady, 2008; Caldera, 2010), it is expected that the proposed changes to Social Security benefits will have a significant impact on the income of retired households, especially for households in the lowest income level as their retirement income consists mostly of Social Security benefits.

H_{o2a}: The mean percentage of decrease in the income of retired U.S. households after changes to Social Security benefits is the same among different income households.

H_{a2a}: The mean percentage of decrease in the income of retired U.S. households after changes to the Social Security benefits is different among different income households.

Hypothesis for research question 2b

Pension income is widely present in retired U.S. households and is a very important source of finances at retirement (Feinschreiber & Laiosa, 2009; Gustman et al., 2009). Following the findings of Love et al. (2008), this study expects the most affluent households to be more affected by the negative outcomes for pension benefits as opposed to the least wealthy households.

H_{o2b}: The mean percentage of decrease in the pension income of retired U.S. households is the same among different income households.

H_{a2b}: The mean percentage of decrease in the pension income of retired U.S. households is different among different income households.

Hypothesis for research question 2c

As households get older, home equity represents a more significant percentage of their total wealth (Love et al., 2008). Therefore, older households can be more affected by negative changes to their home equity.

H_{o2c}: The mean percentage of decrease to the income of retired U.S. households is the same among different age groups.

H_{a2c}: The mean percentage of decrease to the income of retired U.S. households is different among different age households.

Hypothesis for research question 2d

More affluent households have a greater amount of wealth in stocks as opposed to less wealthy households (Gustman et al., 2009). As a result, any negative occurrences in a stock market should affect the wealthiest households in the most significant way.

H_{o2d}: The mean percentage of decrease to the income of retired U.S. households as a result of a stock market decline is the same among different income groups.

H_{a2d}: The mean percentage of decrease to the income of retired U.S. households as a result of the stock market meltdown is different among different income households.

Hypothesis for research question 2e

Previous research found that the increase in medical expenses had the most significant effect on the least affluent households (Love et al., 2008). This study follows this finding for Hypothesis 2e.

H_{o2e}: The mean percentage of decrease to the income of retired U.S. households as a result of increased out-of-pocket medical expenses is the same among different income groups.

H_{a2e}: The mean percentage of decrease to the income of retired U.S. households as a result of increased out-of-pocket medical expenses is different among different income households.

Research question 2e

Research question 2f simulates the simultaneous occurrence of events from research questions 2a-2e. It will be the first time that such an extensive simulation will be performed.

Therefore, there is no previous literature on this topic. As a result, this study will only estimate the effects of wealth-impacting events and explore the groups that will be the most significantly affected without stating any hypotheses about the effects of the simulation. It is expected that all age and income quintiles will be worst off, but there is uncertainty to which groups will suffer the most.

CHAPTER 4

RESULTS

This chapter contains the results of the data analysis. Descriptive statistics were utilized to create a profile of retired U.S. households and further analyze the effect of wealth-impacting events on income at retirement. The final model has a sample size of 6,314 representing 22,561,448 retired U.S. households.

Because of the complex sample design of the HRS, which oversamples Hispanics, Blacks, and households in the state of Florida, use of special weighting is required to compensate for the unequal selection probabilities of these groups. The HRS provides sampling error codes (STRATUM and SECU) that allow accounting for the complex survey design and more accurate standard error estimates (Health and Retirement Study, 2008). Per HRS guidelines, the Taylor series variance estimation method was used to estimate standard errors in all analyses. A number of variables contained cases with extreme values that severely influenced the estimation of the standard error. These variables were retained and top coded to minimize their influence on the standard error estimations. The detailed treatment of variables is provided in the Appendix A. All values provided in the tables were weighted on the household level.

Table 9

Demographic Characteristics of Retired Households (N= 6,314; 22,561,448 weighted)

Variables	Mean (Median)	S.E.	Min	Max	Percent
Race/Ethnicity					
White non-Hispanic		1.160	0	1	82.78
Black non-Hispanic		0.593	0	1	9.19
Hispanic		0.804	0	1	5.54
Other		0.473	0	1	2.48
Two-Person Household		1.110	0	1	44.79
Age	73.51 (72.85)	0.216	44	106	
Education					
Less Than High School		0.879	0	1	21.92
High School Graduate		0.815	0	1	38.45
College Graduate		0.973	0	1	39.62
Gender					
Female		0.619	0	1	37.90
Male		0.619	0	1	62.10

Means, medians, percentages, and standard errors of the households' demographic characteristics at the time of the 2008 interviews are shown in Table 9. A majority of the households are White (82.8%), 9.1% of households are Black, 5.6% are Hispanic, and 2.4% of households are of other races. Almost a half , 45.3%, of households is two-person households. The mean age of retired households is 73.6. Households with less than high school education represent 22.0% of the retirees, households that graduated from high school or have a GED represent 38.5% of the total sample, and college graduates account for 39.6% of households. Male headed households account for 62.1% of the final sample.

Table 10

Retirement Descriptive Statistics of Sample of Retirees (N= 6,314; 22,561,448 weighted)

Variables	Mean (Median)	SE	Min	Max	Percent
Labor Forced Status					
Retired		0.392	0	1	96.16

Information on retirement characteristics is provided in Table 10. Out of the total sample of households who self-reported their status as retired, 96.2% would be classified as retired under the labor force status measure.

Table 11

Income Descriptive Statistics (N= 6,314; 22,561,448 weighted)

Variables	Mean (Median)	SE	Min	Max	Percent[a]
Earned Income	1,802.68 (0.00)	235.122	0.00	175,000.00	7.54
Capital Income	7,979.22 (217.85)	980.417	0.00	3,000,480.00	63.23

Variables	Mean (Median)	SE	Min	Max	Percent[a]
Pension	11,796.00 (1,917.12)	565.088	0.00	479,020.00	54.61
Social Security DI or SSI	1,096.91 (0.00)	93.600	0.00	49,154.00	10.94
Social Security Benefits	13,960.00 (13,191.00)	201.091	0.00	86,582.00	87.36
Unemployment Benefits	30.46 (0.00)	10.812	0.00	19,170.00	0.74
Government Transfers	1,344.60 (0.00)	140.570	0.00	98,400.00	14.29
Other Income	1,058.14 (0.00)	119.222	0.00	40,000.00	6.06
Sum of Income Elements	39,068.00 (26,875.00)	1,492.373	0.00	3,010,980	99.38
Income Streams[b]	19,293.00 (15,590.00)	380.078	0.00	188,200.00	96.50

[a] Percent of households with a non-zero value.
[b] This variable is utilized in this study when computing income of retired households. It does not account for pension and capital income variables so there is no double accounting for income and wealth assets.

Income descriptive statistics are provided in Table 11. Three sources of income play a very important role in retired households' total income. Capital assets generate income of $7,932 a year; pension provides retirees with $11,784 a year; and Social Security benefits generate around $14,007 a year. These three sources of income generate over 80% of income stream of retired households.

Table 12

Financial and Non-Financial Assets (N= 6,314; 22,561,448 weighted)

Variables	Mean (Median)	SE	Min	Max	Percent[a]
Primary Residence	192,706.00 (114,213.00)	16,421.000	0.00	25,000,000.00	74.51
Secondary Residence	22,422.00 (0.00)	2,256.132	0.00	3,000,000.00	13.33
Other Real Estate	32,860.00 (0.00)	3,829.422	0.00	4,000,000.00	10.41
Business or Farm Assets	18,345.00 (0.00)	2,611.772	0.00	3,000,000.00	4.36
IRA/Keogh	71,770.00 (0.00)	4,607.152	0.00	3,000,000.00	37.72
Stocks	87,065.00 (0.00)	7,071.072	0.00	11,676710.90	28.56
Checking or Saving Accounts	32,217.00 (5,976.88)	1,955.521	0.00	2,000,000.00	86.25
CDs, Gov. Bonds, and Bills	23,784.00 (0.00)	1,565.155	0.00	1,000,000.00	29.70
Bonds	10,674.00	1,452.939	0.00	1,138,000.00	7.10

Variables	Mean (Median)	SE	Min	Max	Percent[a]
	(0.00)				
Other Assets	11,871.00	875.337	0.00	2,000,000.00	15.31
	(0.00)				
Total Assets	502,701.00	28,835.000	0.00	40,3000,000.00	93.79
	(221,437.00)				

[a] Percent of households with a non-zero value.

On average, the value of the primary residence represents households' most expensive asset. The average values of Stocks and IRA/Keogh assets represent the second and third highest assets with $86,949 and $71,494 respectively. The combination of secondary residence and other real estate assets also accounts for a significant portion of households assets. Lastly, values of bonds and CDs, Gov. Bonds, and bills variables represent quite an important portion of households' assets.

Table 13

Financial Liabilities and Out-of-Pocket Medical Expenses (N= 6,314; 22,561,448 weighted)

Variables	Mean (Median)	SE	Min	Max	Percent[a]
Mortgage	18,641	1,254.168	0.00	1,100,000.00	18.39
	(0.00)				
Secondary Mortgage	1,596.38	408.739	0.00	600,000.00	1.55
	(0.00)				
Other Home Loans	2,690.68	374.405	0.00	300,000.00	6.52

Variables	Mean (Median)	SE	Min	Max	Percent[a]
	(0.00)				
Other Debt	2,998.69	443.147	0.00	1,900,000.00	23.46
	(0.00)				
Total Liabilities	25,927.00	1,748.745	0.00	1,900,000.00	37.68
	(0.00)				
Out-of-Pocket Med. Exp.	4,536.84	240.765	0.00	601,000.00	92.10
	(2,216.45)				

[a] Percent of households with a non-zero value.

As reported in Table 13, mortgage represents the most significant liability of retired U.S. households. The mean values of the secondary mortgage, other home loans, and other debts also represent quite substantial dollar amounts. Of interest is the fact that the mean annual out-of-pocket medical expenses are over $4,500 per household.

Table 14

Household Income Variables (N= 6,314; 22,561,448 weighted)

Variables	Mean (Median)	SE	Min	Max	Percent [a]
Retirement Income	56,671.00	1,867.873	-40,326.00	2,311,666.00	99.81
	(34,009.00)				
Income Stream	19,293.00	380.078	0.00	188,200.00	96.50
	(15,590.00)				
Annuitized Income					

Variables	Mean (Median)	SE	Min	Max	Percent [a]
Financial Income	21,012.00 (4,224.26)	1,038.118	-103,697.00	1,653,213.00	92.40
Estate Income	16,366.00 (6,572.64)	1074.167	-23,632.00	2,210,788.00	75.89

Note. Retirement income equals to the sum of income streams and annuitize financial and estate incomes. See Methodology section and equation 4,5 and 11 for more detail.
[a] Percent of households with a non-zero value.

Research Question 1

What is the income of retired US households? As shown in Table 14, the sample of retirees analyzed in this study had an average retirement income of $56,671. Information on mean retirement income by age quintiles is presented in Table 15. Based on the ANOVA results in Table 16, the oldest retirees have statistically significantly different mean retirement income from the remaining four age quintiles. Also, the youngest age quintile has mean retirement income statistically significantly different from the age quintile 4. Retirement incomes of age quintile 2 and age quintile 4 were significantly different from each other on the 0.1 level. Analysis of variance did not show any other statistically significant differences in mean retirement incomes of different age quintiles.

Table 15

Mean Retirement Income by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	43,153.00	2,261.473	-40,326.00	1,654,405.00
Age Q2	51,215.00	2,762.399	-4,348.06	1,654,405.00

Age Q3	51,775.00	3,012.715	-40,326.00	738,068.00
Age Q4	61,329.00	3,624.772	-2,324.14	2,311,666.00
Age Q5	81,336.00	4,204.650	-1,017.04	1,849,876.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Table 16

ANOVA Results of Mean Retirement Income by Retirement Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2		--			
Age Q3			--		
Age Q4	***	*		--	
Age Q5	***	***	***	***	--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*$p < .1$. **$p < .05$. ***$p < .01$

The mean retirement income grouped by income quintiles is presented in Table 17. The lowest income quintile has a mean retirement income of a little over $9,500. The mean retirement income of the fifth income quintile is greater by $147,801 than the mean retirement income of the first income quintile. By design, all income quintiles have mean retirement incomes statistically significantly different from each other.

Table 17

Mean Retirement Income by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,558.72	170.496	-40,326.00	14,947.00
Income Q2	21,281.00	160.149	14,978.00	27,173.00
Income Q3	34,069.00	198.768	27,188.00	41,992.00
Income Q4	55,123.00	374.071	41,943.00	71,292.00
Income Q5	157,360.00	6,252.326	71,351.00	2,311,666.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Table 18

Poverty by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Total Percent[a]	Min	Max	SE[b]	Quintile Percent[c]
Households in Poverty	15.39	0.00	1.00	0.786	
by Age Quintiles					
Quintile 1	6.92	0.00	1.00	0.581	24.29
Quintile 2	2.13	0.00	1.00	0.162	11.68
Quintile 3	2.01	0.00	1.00	0.174	13.23
Quintile 4	2.13	0.00	1.00	0.234	11.21
Quintile 5	2.20	0.00	1.00	0.240	11.52
by					

Variables	Total Percent[a]	Min	Max	SE[b]	Quintile Percent[c]
Income Quintile					
Quintile 1	14.38	0.00	1.00	0.783	70.11
Quintile 2	0.95	0.00	1.00	0.143	4.92
Quintile 3	0.05	0.00	1.00	0.040	0.21
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Standard Error of Percent.
[c] Describes the percentage of the quintile that is in poverty.

Nearly 15.4% of households who self-reported their status as retired did not generate annual retirement income above their poverty threshold. Households in the first age quintile have the greatest percentage of households with retirement income below the poverty threshold. To understand this result, the characteristic of this group needs to be explained. The first age quintile contained individuals between the ages of 44 and 67. Some households in this age quintile were still not eligible for Social Security benefits that start at 62 and as a result reported no change to their Social Security benefits. In addition, following the Life Cycle Hypothesis, some households can potentially be in the process of accumulating wealth that they plan to utilize during the latter parts of their retirement. This explanation paired with greater life expectancy can result in lower income streams from financial and estate wealth streams and consequently lower retirement income. On the other hand, other explanations for this phenomenon could be that the youngest group of retirees was not adequately prepared for retirement and has saved less for retirement than households in other age quintiles. This explanation would follow reports of various media and surveys stating that young households do not save enough for retirement and that many of them are in a group that is at risk of not having sufficient retirement income (Helman, Copland, & VanDerhei, 2011; McConville, 2011; Taylor et al., 2007)

The results of Gini coefficient estimations revealed that the coefficient for retirement income distribution was 0.527. Analysis of the distribution by the population percentages revealed that the bottom 60.0% of retired households shared 23.4% of the total Retirement Income, while the top 5.0% of retired households shared 27.4% of the total Retirement Income.

Table 19

Gini Coefficient (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.527	
Percentile of Population		
10		1.25
20		3.46
40		11.00
50		16.50
60		23.40
80		43.60
90		60.00
95		72.60
99		91.80

Research Question 2a

What is the likely effect of proposed changes to Social Security benefits on the income of retired U.S. households? This research estimated the impact of 4.0%, 8.0%, and 12.0% cuts to the Social Security benefits on retirement income, poverty, and income inequalities among retired U.S. households.

Table 20

Mean Retirement Income and Percentage of Decrease Before and After a 4.0% Cut in SSB by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	4% SSB Cut	
Variables	Mean	Mean	Percent Change[a]
Age Q1	43,153.00	42,769.00	-1.26
Age Q2	51,215.00	50,545.00	-2.10
Age Q3	51,775.00	51,128.00	-2.00
Age Q4	61,329.00	60,692.00	-1.92
Age Q5	81,336.00	80,772.00	-1.64
Income Q1	9,558.72	9,303.35	-2.46
Income Q2	21,281.00	20,802.00	-2.34
Income Q3	34,069.00	33,436.00	-1.92
Income Q4	55,123.00	54,417.00	-1.33
Income Q5	157,360.00	156,641.00	-0.63

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significant at the 0.01 level for all age and income quintiles.

The results of a 4.0% cut in Social Security benefits (SSB) by age and income quintiles are provided in Table 20, which summarizes results of those cuts on the mean retirement income and the percentage decrease in the mean retirement income associated with the cuts. More detailed results of analyses can be found in Appendix B.

A 4.0% cut in SSB affected various age quintiles differently. The most significant impact was on age quintiles 2 and 3. The decrease in those quintiles is comparable to the findings of Cole & Liebenberg (2008), in which the most recent groups of retirees relied more on SSB income and therefore were the most severely affected by the changes in SSB stream. However, the changes to the first age quintile were not in line with those findings possibly because of the age composition of this quintile. The lower age boundary of this quintile is age 44. This age is too young for households to qualify for SSB, which can explain the low percentage change in retirement income as a result of a 4.0% cut in SSB.

The analysis of cuts in SSB by income quintiles revealed that the severities of these cuts vary by income quintile. The findings of this simulation are in line with Love et al. (2008). Households who belong to the first two income quintiles were the most significantly affected by the 4.0% cuts in SSB. Households in the fifth income quintile had a mean retirement income decrease of 0.6%, which is a four times smaller percentage decrease than the decrease for the first income quintile. The findings can be explained by the fact that the least wealthy individuals receive the greatest percentage of their income from Social Security benefits, while the most affluent households have retirement income coming from multiple income streams. Analysis of variance revealed that households in different income quintiles had statistically significantly different percentage decrease to the retirement income. Only households in the first and second income quintiles had the mean percentage decrease that was not statistically different from each other. More detailed information is provided in Table 22.

It is important to mention that households' income quintile association is constant and comes from the mean retirement income before any wealth and income simulations. Therefore, no wealth impacting events shift households in or out of their income quintile. For example, a household that was in income quintile two before the simulations will be considered in income quintile two throughout this study.

Table 21

ANOVA Results of Mean Percentage of Decrease in Retirement Income After a 4.0% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***	***		--	
Age Q5	***	***	***	***	--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

Table 22

ANOVA Results of Mean Percentage of Decrease in Retirement Income After a 4.0% Cut in SSB by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2		--			
Income Q3	***	***	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*$p < .1$. **$p < .05$. ***$p < .01$

The effects of cuts to SSB were associated with an increase in the percentage of households not able to generate enough income above the poverty threshold. A 4.0% decrease in SSB was associated with almost a 0.8% increase in the percentage of households in poverty. In addition, the percentage of households below the poverty threshold among all age quintiles increased. The percentage of households below the poverty threshold increased only for households in the first three income quintiles. The top two income quintiles did not have households below the poverty threshold.

Table 23

Poverty Before and After a 4.0% Cut in SSB by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		4% SSB Cut	
Variables	Total Pcnt[a]	Quintile Pcnt[b]	Total Pcnt[a]	Quintile Pcnt[b]
Households in Poverty	15.39		16.14	
by Age Quintiles				
Quintile 1	6.92	24.29	7.01	24.60
Quintile 2	2.13	11.68	2.29	12.54
Quintile 3	2.01	13.23	2.09	13.79
Quintile 4	2.13	11.21	2.23	11.77
Quintile 5	2.20	11.52	2.52	13.20
by Income Quintile				
Quintile 1	14.38	70.11	15.07	73.47
Quintile 2	0.95	4.92	1.02	5.28
Quintile 3	0.05	0.21	0.05	0.27
Quintile 4	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

Cuts to the SSB were associated with an increased Gini coefficient, which means that the income inequalities among retired US households increased. Also, the majority of households experienced a decrease in their overall share of retirement income. Only the top 1.0% of the population received a greater share of the overall retirement income: Their share increased from 8.2% to 8.3%.

Table 24

Gini Coefficient Before and After a 4.0% Cut in SSB (n= 6,586)

	Baseline		4% SSB Cut	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.531	
Pcnt of Population				
10		1.25		1.23
20		3.46		3.39
40		11.00		10.90
50		16.50		16.30
60		23.40		23.10
80		43.60		43.30
90		60.00		59.70
95		72.60		72.40
99		91.80		91.70

The results of an 8.0% cut in SSB by age and income quintiles are provided in Table 25. More detailed results are provided in Appendix B.

Results of an 8.0% cut in SSB were similar to the 4.0% cuts. The most significant impact was on age quintiles 2 and 3, while age quintile 1 experienced the smallest percentage change. Households who belong to the first two income quintiles were the most significantly affected by the 8.0% cuts; their income dropped on average by almost 5.0%. Households in the fifth income quintile experienced the smallest percentage drop in their retirement income, a decrease of almost 1.3%.

Table 25

Mean Retirement Income Before and After 4.0% and 8.0% Cuts in SSB by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	4% SSB Cut		8% SSB Cut	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	42,769.00	-1.26	42,386.00	-2.56
Age Q2	51,215.00	50,545.00	-2.10	49,875.00	-4.28
Age Q3	51,775.00	51,128.00	-2.00	50,482.00	-4.07
Age Q4	61,329.00	60,692.00	-1.92	60,054.0	-3.91
Age Q5	81,336.00	80,772.00	-1.64	80,204.00	-3.34
Income Q1	9,558.72	9,303.35	-2.46	9,047.99	-4.99
Income Q2	21,281.00	20,802.00	-2.34	20,322.00	-4.80
Income Q3	34,069.00	33,436.00	-1.92	32,803.00	-3.93
Income Q4	55,123.00	54,417.00	-1.33	53,712.00	-2.70

	Baseline	4% SSB Cut		8% SSB Cut	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Income Q5	157,360.00	156,641.00	-0.63	155,922.00	-1.27

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

Table 26

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After an 8.0% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***	***		--	
Age Q5	***	***	***	***	--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*$p < .1$. **$p < .05$. ***$p < .01$

Results of the ANOVA analysis of the mean percentage of decrease in retirement income by age and income quintiles are presented in Tables 26 and 27. Only the changes between age quintile 2 and age quintile 3 and age quintile 3 and age quintile 4 were not significantly different from each other. This means that these age quintiles could experience a reduction in their retirement income of similar magnitudes. The remaining changes to retirement income of different age quintiles were significantly different at the 0.01.

Analysis of changes to retirement income by income quintiles revealed that only changes to income quintile 1 and income quintile 2 were not statistically significantly different from each other. Comparisons of changes to mean retirement income by income quintiles suggest that the mean percentage of decrease to the mean retirement income was quintile specific; each income change was characteristic for the given quintile. The results of ANOVA analyses were significant at the 0.01 level.

Table 27

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After an 8.0% Cut in SSB by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2		--			
Income Q3	***	***	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

The 8.0% decrease in SSB was associated with a greater percentage of households generating retirement income below the poverty threshold. An 8.0% decrease in SSB was associated with almost a 1.5% increase in the percentage of such households. All age quintiles exhibited an increase in the percentage of households which fell below the poverty threshold.

However, only households in the first two income quintiles increased the percentage of households with inadequate retirement income. As in the case of the 4.0% cuts in SSB, the top two income quintiles did not exhibit increases in the percentage of households below the poverty threshold. Similarly, the top two income quintiles did not have households below the poverty threshold.

Table 28

Poverty Before and After 4.0% and 8.0% Cuts in SSB by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		4% SSB Cut		8% SSB Cut	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		16.14		16.78	
by Age Quintiles						
Quintile 1	6.92	24.29	7.01	24.60	7.16	25.14
Quintile 2	2.13	11.68	2.29	12.54	2.42	13.26
Quintile 3	2.01	13.23	2.09	13.79	2.18	14.38
Quintile 4	2.13	11.21	2.23	11.77	2.35	12.38
Quintile 5	2.20	11.52	2.52	13.20	2.66	13.93
by Income Quintile						
Quintile 1	14.38	70.11	15.07	73.47	15.51	75.62
Quintile 2	0.95	4.92	1.02	5.28	1.21	6.26

	Baseline		4% SSB Cut		8% SSB Cut	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Quintile 3	0.05	0.21	0.05	0.27	0.05	0.27
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

An increase in the cuts to the SSB was associated with an additional increase to the Gini coefficient. The additional cuts were associated with a 0.007 or 1.3% increase in the index of income inequality.

Table 29

Gini Coefficient Before and After 4.0% and 8.0% Cuts in SSB (n= 6,586)

	Baseline		4% SSB Cut		8% SSB Cut	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.531		0.534	
Pcnt of Population						
10		1.25		1.23		1.21

	Baseline		4% SSB Cut		8% SSB Cut	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
20		3.46		3.39		3.33
40		11.00		10.90		10.70
50		16.50		16.30		16.10
60		23.40		23.10		22.80
80		43.60		43.30		43.00
90		60.00		59.70		59.40
95		72.60		72.40		72.20
99		91.80		91.70		91.60

The results of a 12.0% cut in SSB analyzed by age and income quintiles are provided in Table 30. More detailed results are provided in Appendix B.

Effects of a 12.0% cut in SSB were similar to the 4.0% and 8.0% cuts. Similarly, the most significant impact of those cuts was on age quintiles 2 and 3, while age quintile 1 experienced the smallest percentage change. The analysis of a 12% cut in SSB by income quintiles also follows a similar pattern to the 4.0% and 8.0% cuts. Households who belong to the first two income quintiles were the most significantly affected by the 12.0% cuts; their income dropped on average by around 7.5%. Households in the fifth income quintile had a mean retirement income decrease of a little over 1.9%, which is the smallest decrease among all income quintiles.

Table 30

Mean Retirement Income Before and After 4.0%, 8.0%, and 12.0% Cuts in SSB by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	4% SSB Cut		8% SSB Cut		12% SSB Cut	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	42,769.00	-1.26	42,386.00	-2.56	42,002.00	-3.91
Age Q2	51,215.00	50,545.00	-2.10	49,875.00	-4.28	49,206.00	-6.55
Age Q3	51,775.00	51,128.00	-2.00	50,482.00	-4.07	49,836.00	-6.22
Age Q4	61,329.00	60,692.00	-1.92	60,054.0	-3.91	59,417.00	-5.97
Age Q5	81,336.00	80,772.00	-1.64	80,204.00	-3.34	79,643.00	-5.09
Income Q1	9,558.72	9,303.35	-2.46	9,047.99	-4.99	8,792.62	-7.58
Income Q2	21,281.00	20,802.00	-2.34	20,322.00	-4.80	19,843.00	-7.36
Income Q3	34,069.00	33,436.00	-1.92	32,803.00	-3.93	32,170.00	-6.03
Income Q4	55,123.00	54,417.00	-1.33	53,712.00	-2.70	53,007.00	-4.13
Income Q5	157,360.00	156,641.00	-0.63	155,922.00	-1.27	155,203.00	-1.93

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

Results of the ANOVA analysis of the mean percentage of decrease in retirement income by age and income quintiles are presented in Tables 31 and 32. Only changes between age quintile 2 and age quintile 3 and age quintile 3 and age quintile 4 were not statistically different from each other. This means that these age quintiles experienced a reduction in their retirement income of similar magnitude. Changes to retirement income of different age quintiles were significantly different from each other at the 0.01 level.

Table 31

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 12.0% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***	***		--	
Age Q5	***	***	***	***	--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*$p < .1$. **$p < .05$. ***$p < .01$

Analysis of changes to retirement income by income quintiles revealed that only changes to income quintile 1 and income quintile 2 were not statistically significantly different from each other. Other comparisons of percentage changes to retirement income highlighted that decreases were specific for individual income quintiles, which means that the smallest decrease to income quintile 5 is statistically significantly different from much greater mean percentage of decrease to income quintile 1 or 2. The results are significant at the 0.01 level.

Table 32

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 12.0% Cut in SSB by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2		--			
Income Q3	***	***	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income Quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
**p* < .1. ***p* < .05. ****p* < .01

The 12.0% decrease in SSB was associated with a greater percentage of households falling below the poverty threshold than before the cuts. The decrease in SSB was associated with a 2.0% increase in the percentage of households below the poverty threshold. All age quintiles exhibited an increase in the percentage of households who fell below the poverty threshold as a result of 12.0% cuts. However, only households in the first three income quintiles increased the percentage of households with inadequate retirement income. Unlike the 4.0% and 8.0% cuts, the 12.0% cut also affected the percentage of households below the poverty threshold in the third income quintile; this quintile's percentage contribution to the total poverty threshold increased by 0.1%. Similar to the case of the 4.0% and 8.0% cuts in SSB, the top two income quintiles did not exhibit an increase in the percentage of households below the poverty threshold as a result of a 12.0% cut in SSB. Also, the top two income quintiles did not have any households with retirement income below the poverty threshold.

Table 33

Poverty Before and After 4.0%, 8.0%, and 12.0% Cuts in SSB by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		4% SSB Cut		8% SSB Cut		12% SSB Cut	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		16.14		16.78		17.40	
by Age Quintiles								
Quintile 1	6.92	24.29	7.01	24.60	7.16	25.14	7.26	25.51
Quintile 2	2.13	11.68	2.29	12.54	2.42	13.26	2.62	14.31
Quintile 3	2.01	13.23	2.09	13.79	2.18	14.38	2.24	14.74
Quintile 4	2.13	11.21	2.23	11.77	2.35	12.38	2.51	13.22
Quintile 5	2.20	11.52	2.52	13.20	2.66	13.93	2.78	14.55
by Income Quintile								
Quintile 1	14.38	70.11	15.07	73.47	15.51	75.62	15.96	77.80
Quintile 2	0.95	4.92	1.02	5.28	1.21	6.26	1.34	6.93
Quintile 3	0.05	0.21	0.05	0.27	0.05	0.27	0.10	0.55
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

An increase in the cuts in the SSB was associated with an additional increase in the Gini coefficient. The additional cuts were associated with a 0.011 or 2.1% increase in the index of retirement income inequality.

Table 34

Gini Coefficient Before and After 4.0%, 8.0%, and 12.0% Cuts in SSB (n= 6,586)

	Baseline		4% SSB Cut		8% SSB Cut		12% SSB Cut	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.531		0.534		0.538	
Pcnt of Population								
10		1.25		1.23		1.21		1.18
20		3.46		3.39		3.33		3.27
40		11.00		10.90		10.70		10.50
50		16.50		16.30		16.10		15.80
60		23.40		23.10		22.80		22.50
80		43.60		43.30		43.00		42.70
90		60.00		59.70		59.40		59.10
95		72.60		72.40		72.20		72.00
99		91.80		91.70		91.60		91.70

Before the analysis of changes to the retirement income as a result of changes to the SSB benefits, this study hypothesized that the percentage decrease in the income of retired U.S. households after changes in the SSB would be different among different income households. The analysis of mean income of retirement income by income quintiles and ANOVA analysis of percentage changes to retirement income by income quintiles revealed that changes to retirement income associated with changes to SSB are income quintile specific. This means that the study rejects the null hypothesis that the changes to retirement income are the same among different income households.

Research Question 2b

What are the likely effects of pension benefit reductions and outright defaults on the income of retired U.S. households? This research estimated the impact of a 25.0% decrease in pensions, a 50.0% decrease in pensions, and an outright default of pensions on retirement income, poverty rates, and income inequalities among retired U.S. households.

Table 35

Mean Retirement Income and Mean Percentage of Decrease Before and After a 25.0% Cut in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	25% Cuts	
Variables	Mean	Mean	Percent Change[a]
Age Q1	43,153.00	43,013.00	-0.72
Age Q2	51,215.00	51,034.00	-0.51
Age Q3	51,775.00	51,553.00	-0.53
Age Q4	61,329.00	61,082.00	-0.56

	Baseline	25% Cuts	
Variables	Mean	Mean	Percent Change[a]
Age Q5	81,336.00	80,986.00	-0.73
Income Q1	9,558.72	9,494.21	-1.12
Income Q2	21,281.00	21,159.00	-0.58
Income Q3	34,069.00	33,877.00	-0.57
Income Q4	55,123.00	54,836.00	-0.53
Income Q5	157,360.00	156,936.00	-0.33

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The results of a 25.0% cut in pensions by age and income quintiles are provided in Table 35, which summarizes the results of those cuts in the mean retirement income and the mean percentage of decrease in the mean retirement income associated with the cuts. More detailed results of these analyses can be found in Appendix C.

A 25.0% cut in pensions affected various age quintiles in a somewhat uniform fashion. The most significant impact was on age quintiles 1 and 5. Those two groups experienced decreases in their mean retirement income of 0.7%. These income decreases might be explained by the fact that the youngest households might self-report as retired because they receive pension benefits. Still, this group might not be old enough to claim SSB. Therefore, pensions can provide a much greater share of retirement income of the youngest retired households. However, the oldest households might experience a high decrease to their retirement income as a result of a greater percentage of households who actually have pensions than younger retired households (Soto, Munnell, Golub-Sass, & Vitagliano, 2006).

The analysis of cuts in pensions by income quintiles revealed that the severities of these cuts varied by income quintile. Households that belonged to the first income quintile were the most significantly affected by the cuts while households in the fifth income quintile had the smallest mean percentage of decrease in their retirement income.

Table 36

ANOVA Results of Mean Percentage of Decrease in Retirement Income After a 25.0% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	**	--			
Age Q3			--		
Age Q4				--	
Age Q5		**			--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
**p* < .1. ***p* < .05. ****p* < .01

As shown in Table 36, only mean percentage of decrease in retirement income between age quintiles 1 and 2, and age quintiles 2 and 5 were significantly different from each other. The results were significant at the 0.05 level. The ANOVA results did not indicate any other significant changes between different age quintiles.

As shown in Table 37, the mean percentage of decrease in the retirement income by income quintiles were only significant between income quintiles 1, 5 and remaining four quintiles. The changes were significant at the 0.01 level for income quintile 1, where for income quintile 5 results were significant at 0.05 and 0.1 levels. Other comparisons between remaining income quintiles were not statistically significant, which might indicate that the changes affected those income quintiles in a somewhat similar fashion in the matter of mean percentage of decrease in retirement income.

Table 37

ANOVA Results of Mean Percentage of Decrease in Retirement Income After a 25.0% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***		--		
Income Q4	***			--	
Income Q5	***	***	**	*	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
$^*p < .1$. $^{**}p < .05$. $^{***}p < .01$

The effects of a 25.0% drop in pensions were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 0.2% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. However, the analysis by income quintile revealed that only households in the first three income quintiles increased the percentage of households below the poverty threshold. The top two income quintiles did not have any households below the poverty threshold.

Table 38

Poverty Before and After a 25.0% Cut in Pensions by Age and Income Quintiles *(N= 6,314; 22,561,448 weighted)*

	Baseline		25% Cuts	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		15.54	
by Age Quintiles				
Quintile 1	6.92	24.29	6.96	24.42
Quintile 2	2.13	11.68	2.14	11.68
Quintile 3	2.01	13.23	2.04	13.45
Quintile 4	2.13	11.21	2.16	11.39
Quintile 5	2.20	11.52	2.25	11.77
by Income Quintile				
Quintile 1	14.38	70.11	14.54	70.85
Quintile 2	0.95	4.92	0.95	4.92
Quintile 3	0.05	0.21	0.05	0.27
Quintile 4	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

As shown in Table 39, a 25.0% cut in pensions was associated with a very minimal increase in the Gini coefficient. Because this increase was so minute, it might be safe to conclude that the 25.0% drop did not affect the income inequality. This result followed the ANOVA analysis results that showed the mean percentage of decrease were not significant for four income quintiles.

Table 39

Gini Coefficient Before and After a 25.0% Cut in Pensions (n= 6,586)

	Baseline		25% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.528	
Pcnt of Population				
10		1.25		1.24
20		3.46		3.44
40		11.00		11.00
50		16.50		16.50
60		23.40		23.30

	Baseline		25% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
80		43.60		43.60
90		60.00		59.90
95		72.60		72.60
99		91.80		91.80

The results of a 50.0% cut in pensions are shown in Table 40. As in the case of the 25.0% cuts, households in age quintiles 1 and 5 had the highest mean percentage of decrease in their retirement income. Analysis by income quintiles also followed the pattern of the 25.0% cuts as income quintile 1 also experienced the highest mean percentage decrease.

Table 40

Mean Retirement Income Before and After 25.0% and 50.0% Cuts in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	25% Cuts		50% Cuts	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	43,013.00	-0.72	42,872.00	-1.48
Age Q2	51,215.00	51,034.00	-0.51	50,853.00	-1.02
Age Q3	51,775.00	51,553.00	-0.53	51,330.00	-1.07
Age Q4	61,329.00	61,082.00	-0.56	60,834.00	-1.13
Age Q5	81,336.00	80,986.00	-0.73	80,635.00	-1.47

	Baseline	25% Cuts		50% Cuts	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Income Q1	9,558.72	9,494.21	-1.12	9,427.69	-2.29
Income Q2	21,281.00	21,159.00	-0.58	21,035.00	-1.17
Income Q3	34,069.00	33,877.00	-0.57	33,684.00	-1.14
Income Q4	55,123.00	54,836.00	-0.53	54,549.00	-1.06
Income Q5	157,360.00	156,936.00	-0.33	156,512.00	-0.65

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

As shown in Table 41, the mean percentage of decrease in retirement income of households in age quintile 1 was significantly different from changes experienced by households in age quintiles 2 and 3. In addition, households in age quintile 2 had different changes from households in age quintile 5.

Table 41

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 50.0% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	**	--			
Age Q3	*		--		

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q4				--	
Age Q5		*			--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

The ANOVA analysis of the mean percentage of decrease by income quintiles revealed that households in income quintiles 1 and 5 had significantly different changes from households in all other income quintiles. The changes were significant at 0.01, 0.05, and 0.1 levels.

Table 42

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 50.0% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***		--		
Income Q4	***			--	
Income Q5	***	***	**	*	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

The effects of a 50.0% drop in pensions were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 0.3% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. However, the analysis by income quintile revealed that only households in the first three income quintiles increased the percentage of households below the poverty threshold as a result of the cuts in pensions. The top two income quintiles did not have any households below the poverty threshold.

Table 43

Poverty Before and After 25.0% and 50.0% Cuts in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		25% Cuts		50% Cuts	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		15.54		15.68	
by Age Quintiles						
Quintile 1	6.92	24.29	6.96	24.42	7.00	24.58
Quintile 2	2.13	11.68	2.14	11.68	2.16	11.84
Quintile 3	2.01	13.23	2.04	13.45	2.04	13.45
Quintile 4	2.13	11.21	2.16	11.39	2.18	11.50
Quintile 5	2.20	11.52	2.25	11.77	2.30	12.03
by Income Quintile						
Quintile 1	14.38	70.11	14.54	70.85	14.64	71.35
Quintile 2	0.95	4.92	0.95	4.92	1.00	5.15
Quintile 3	0.05	0.21	0.05	0.27	0.05	0.27
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00

	Baseline		25% Cuts		50% Cuts	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

As shown in Table 44, a 50.0% drop in pensions was associated with a minimal increase in the Gini coefficient. The increase of 0.002 was so minute that it might be safe to conclude that the 50.0% drop basically did not affect the income inequality. These findings follow the ANOVA analysis results that showed that for three income quintiles the mean percentages of changes were not significant, and only the wealthiest and the least wealthy households experienced significant changes.

Table 44

Gini Coefficient Before and After 25.0% and 50.0% Cuts in Pensions (n= 6,586)

	Baseline		25% Cuts		50% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.528		0.529	
Pcnt of Population						

	Baseline		25% Cuts		50% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
10		1.25		1.24		1.24
20		3.46		3.44		3.43
40		11.00		11.00		11.00
50		16.50		16.50		16.40
60		23.40		23.30		23.20
80		43.60		43.60		43.50
90		60.00		59.90		59.80
95		72.60		72.60		72.50
99		91.80		91.80		91.90

The results for 100.0% cuts in pensions are shown in Table 45. As in the case of 25.0% and 50.0% cuts, households in age quintiles 1 and 5 had the highest mean percentage of decrease in their retirement income. Analysis by income quintiles also followed the pattern of 25.0% and 50.0% cuts as income quintile 1 also experienced the highest mean percentage decrease.

Table 45

Mean Retirement Income Before and After 25.0%, 50.0%, and 100.0% Cuts in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	25% Cuts		50% Cuts		100% Cuts	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	43,013.00	-0.72	42,872.00	-1.48	42,384.00	-2.99
Age Q2	51,215.00	51,034.00	-0.51	50,853.00	-1.02	50,487.00	-2.06
Age Q3	51,775.00	51,553.00	-0.53	51,330.00	-1.07	50,881.00	-2.16
Age Q4	61,329.00	61,082.00	-0.56	60,834.00	-1.13	59,334.00	-2.29
Age Q5	81,336.00	80,986.00	-0.73	80,635.00	-1.47	79,932.00	-2.94
Income Q1	9,558.72	9,494.21	-1.12	9,427.69	-2.29	9,288.76	-4.64
Income Q2	21,281.00	21,159.00	-0.58	21,035.00	-1.17	20,779.00	-2.39
Income Q3	34,069.00	33,877.00	-0.57	33,684.00	-1.14	33,295.00	-2.29
Income Q4	55,123.00	54,836.00	-0.53	54,549.00	-1.06	53,973.00	-2.12
Income Q5	157,360.00	156,936.00	-0.33	156,512.00	-0.65	155,663.00	-1.30

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

Table 46

ANOVA Results of Mean Percentage of Decrease in Retirement Income After a 100.0% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	**	--			
Age Q3	*		--		
Age Q4				--	
Age Q5		*			--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

As shown in Table 46, the mean percentage of decrease in retirement income of households in age quintile 1 was significantly different from changes experienced by households in age quintiles 2 and 3. In addition, households in age quintile 2 had different changes from households in age quintile 5.

The ANOVA analysis of the mean percentage of decrease by income quintiles revealed that households in income quintiles 1 and 5 had significantly different changes from households in all other income quintiles. The changes were significant at 0.01, 0.05, and 0.1 levels.

Table 47

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 100.0% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***		--		
Income Q4	***			--	
Income Q5	***	***	**	*	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

The effects of a 100.0% drop in pensions were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 0.7% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. However, the analysis by income quintile revealed that only households in the first two income quintiles increased the percentage of households below the poverty threshold as a result of the cuts in pensions. The top three income quintiles did not have any households below the poverty threshold.

Table 48

Poverty Before and After 25.0%, 50.0%, and 100.0% Cuts in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		25% Cuts		50% Cuts		100% Cuts	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		15.54		15.68		16.05	
by Age Quintiles								
Quintile 1	6.92	24.29	6.96	24.42	7.00	24.58	7.13	25.03
Quintile 2	2.13	11.68	2.14	11.68	2.16	11.84	2.26	12.36
Quintile 3	2.01	13.23	2.04	13.45	2.04	13.45	2.07	13.65
Quintile 4	2.13	11.21	2.16	11.39	2.18	11.50	2.20	11.57
Quintile 5	2.20	11.52	2.25	11.77	2.30	12.03	2.39	12.55
by Income Quintile								
Quintile 1	14.38	70.11	14.54	70.85	14.64	71.35	14.82	72.24
Quintile 2	0.95	4.92	0.95	4.92	1.00	5.15	1.18	6.09
Quintile 3	0.05	0.21	0.05	0.27	0.05	0.27	0.05	0.27
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile.

As shown in Table 49, a 100.0% drop in pensions was associated with a minimal increase in the Gini coefficient. The increase of 0.004 was so minute that it might be safe to conclude that the 100.0% drop basically did not affect the income inequality. These findings follow the ANOVA analysis results which showed the mean percentages of changes for three income quintiles were not significant, and only the wealthiest and the least wealthy households experienced significant changes.

Table 49

Gini Coefficient Before and After 25.0%, 50.0%, and 100.0% Cuts in Pensions (N = 6,586)

	Baseline		25% Cuts		50% Cuts		100% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.528		0.529		0.531	
Pcnt of Population								
10		1.25		1.24		1.24		1.22
20		3.46		3.44		3.43		3.40
40		11.00		11.00		11.00		10.90
50		16.50		16.50		16.40		16.30
60		23.40		23.30		23.20		23.10
80		43.60		43.60		43.50		43.30

	Baseline		25% Cuts		50% Cuts		100% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
90		60.00		59.90		59.80		59.70
95		72.60		72.60		72.50		72.40
99		91.80		91.80		91.90		91.90

Before the analysis of changes in the retirement income as a result of changes in pensions, this study hypothesized that the mean percentage of decrease in the income of retired U.S. households after changes in pensions would be different among different income households. The analysis of mean income of retirement income by income quintiles and ANOVA analysis of percentage changes to retirement income by income quintiles revealed that the mean percentage of decrease was income quintile specific, so the study rejects the null hypothesis that the changes in retirement income were the same among different income households. The conclusions were based on consistent ANOVA results that indicated that the least and the most affluent households experienced a significant mean percentage of decrease in their income.

Research Question 2c

What are the likely effects of further housing equity reductions on the income of retired U.S. households? This research estimated the impact of a 20.0% decrease in housing equity; a 0.0% real growth of housing equity; and a 20.0% decrease in housing equity and a 0.0% real growth of housing equity occurring simultaneously.

Table 50

Mean Retirement Income and the Mean Percentage of Decrease Before and After a 20.0% Decrease in Home Equity by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	20% Cut	
Variables	Mean	Mean	Percent Change[a]
Age Q1	43,153.00	41,526.00	-3.84
Age Q2	51,215.00	49,099.00	-4.01
Age Q3	51,775.00	49,601.00	-4.41
Age Q4	61,329.00	57,940.00	-4.84
Age Q5	81,336.00	77,672.00	-4.64
Income Q1	9,558.72	9,284.22	-2.89
Income Q2	21,281.00	20,271.00	-4.55
Income Q3	34,069.00	32,303.00	-5.15
Income Q4	55,123.00	52,418.00	-4.94
Income Q5	157,360.00	150,732.00	-4.05

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The result of a 20.0% decrease in home equity by age and income quintiles are provided in Table 50, which contains a summary of results of the impact of those cuts to the mean retirement income and the mean percentage of decrease in the mean retirement income associated with the cuts. More detailed tables of results presented in this section can be found in Appendix D.

A 20.0% decrease in the home equity affected various age quintiles differently. The retirement income of the two youngest age quintiles was the least affected by the changes in housing equity. However, the Retirement Income of the three oldest age quintiles experienced the greatest mean percentage of decrease in comparison to the two youngest age quintiles. One explanation for this result can be found in the annuitization of home equity. Income from home equity, as a percentage of total retirement income, might be smaller for younger households as a result of conversion of home equity into an annuity. For example, younger households have on average a greater life expectancy, and, therefore, the annual annuity payment from the same home equity tends to be smaller in comparison to older households in which the life expectancy and payout periods tend to be shorter.

The analysis of changes in retirement income by income quintiles revealed that households in income quintile 1 experienced the smallest changes in their retirement income. This change might be the result of many households in income quintile 1 which might not be able to afford to own their homes. In addition, many of the less affluent households rely mostly on government transfers in comparison to the more affluent households which rely less on government transfers. In summary, low home ownership combined with high reliance on government transfers might explain the results. Income quintiles 2, 3, and 4 experienced the greatest mean percentage of decrease in their retirement income. Households in the income quintile 5 experienced the second smallest change in their retirement income as a result of a 20.0% decrease in their home equity. This small change might be the result of the wealthiest households having multiple income streams, and home equity income tends to be just one of many ways of funding their retirement.

The ANOVA analysis of changes in retirement income as a result of a 20.0% decrease in home equity demonstrated that not all households were affected equally. The oldest households in age quintiles 4 and 5 had the mean percentage of decrease to their retirement income significantly greater than households in age quintiles 1 and 2. The findings of this study follow the results of Love et al. (2008), who also found that decrease in housing equity is more severe for older households. The analysis of changes by income quintiles showed that households in income quintile 1 had significantly different changes in retirement income in comparison to changes in retirement income experienced by households in income quintiles 2, 3, 4, and 5. In addition, the mean percentage of decrease in retirement income for the most affluent households was significantly different from changes experienced by less wealthy households.

Table 51

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 20% Decrease in Home Equity by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2		--			
Age Q3	**		--		
Age Q4	***	***		--	
Age Q5	***	***			--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

Table 52

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 20% Decrease in Home Equity by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	**	--		
Income Q4	***			--	
Income Q5	***	**	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

The effects of a 20.0% drop in home equity were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. All age quintiles experienced an increase in the percentage of households below the poverty threshold. However, the analysis by income quintile revealed that only households in the first three income quintiles increased the percentage of households below the poverty threshold. The top two income quintiles did not have any households below the poverty threshold.

Table 53

Poverty Before and After a 20.0% Decrease in Home Equity by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		20% Cut	
Variables	Total Percent[a]	Quintile Percent[b]	Total Percent[a]	Quintile Percent[b]
Households in Poverty	15.39		16.19	
by Age Quintiles				
Quintile 1	6.92	24.29	7.14	25.08
Quintile 2	2.13	11.68	2.26	12.35
Quintile 3	2.01	13.23	2.10	13.82
Quintile 4	2.13	11.21	2.26	11.90
Quintile 5	2.20	11.52	2.43	12.73
by Income Quintile				
Quintile 1	14.38	70.11	14.87	72.47
Quintile 2	0.95	4.92	1.24	6.40
Quintile 3	0.05	0.21	0.08	0.42
Quintile 4	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

A 20.0% drop in home equity was associated with a minimal increase in the Gini coefficient. The drop in home equity was associated with only marginal increase in Retirement Income inequality.

Table 54

Gini Coefficient Before and After a 20.0% Decrease in Home Equity (n= 6,586)

	Baseline		4% SSB Cut	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.528	
Percentile of Population				
10		1.25		1.27
20		3.46		3.50
40		11.00		11.00
50		16.50		16.50
60		23.40		23.30
80		43.60		43.50
90		60.00		59.90
95		72.60		72.50
99		91.80		92.00

The results of a 0.0% real growth of real estate by age and income quintiles are provided in Table 25. More detailed results are provided in Appendix D.

Results of a 0.0% real growth of real estate were slightly different from the 20.0% decrease in home equity. The most noticeable difference was in the magnitude of the effect. Households in age quintile 1 experienced the greatest mean percentage of decrease in their retirement income as a result of the 0.0% real growth. Their income decreased on average by 1.7%. On the other hand, households in age quintile 5 experienced the smallest drop in their retirement income with the mean percentage of decrease of 0.9%. Analysis of the 0.0% real growth by income quintile revealed that the least affluent households experienced the smallest mean percentage of decrease in their retirement income; however, households in income quintiles 3, 4, and 5 had the greatest mean percentage of decrease in their retirement income.

Table 55

Mean Retirement Income and the Mean Percentage of Decrease Before and After a 20.0% Decrease in Home Equity and a 0.0% Real Growth of Real Estate by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	20% Cut		0% Growth	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	41,526.00	-3.84	42,308.00	-1.69
Age Q2	51,215.00	49,099.00	-4.01	49,875.00	-1.54
Age Q3	51,775.00	49,601.00	-4.41	50,875.00	-1.44
Age Q4	61,329.00	57,940.00	-4.84	60,308.00	-1.28
Age Q5	81,336.00	77,672.00	-4.64	80,509.00	-0.89

	Baseline	20% Cut		0% Growth	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Income Q1	9,558.72	9,284.22	-2.89	9,482.06	-0.85
Income Q2	21,281.00	20,271.00	-4.55	20,997.00	-1.30
Income Q3	34,069.00	32,303.00	-5.15	33,518.00	-1.61
Income Q4	55,123.00	52,418.00	-4.94	54,250.00	-1.59
Income Q5	157,360.00	150,73.00	-4.05	154,665.00	-1.62

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

Results of the ANOVA analysis of the mean percentage of decrease in retirement income by age and income quintiles are presented in Table 56 and Table 57. Households in age quintiles 1 and 5 experienced the highest and the lowest mean percentages of change, respectively, in their retirement income. Those results were significantly different from the results of households in other age quintiles. Only the mean percentage of decrease in retirement income of households in age incomes 2 and 3 were not significant.

Table 56

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 0.0% Real Growth of Real Estate by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q2	*	--			
Age Q3	***		--		
Age Q4	***	***	*	--	
Age Q5	***	***	***	***	--

Note. Age Quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

The analysis of the mean percentage of decrease in retirement income by income quintiles revealed that only changes in income quintiles 1 and 2 were significantly different from changes in other income quintiles. Those two income quintiles experienced the lowest mean percentage of decrease in their retirement income. The remaining three income quintiles had the highest mean percentage of decrease in their retirement income. Those changes were not significantly different from each other among income quintiles 3, 4, and 5.

Table 57

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 0.0% Real Growth of Real Estate by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	***	--		
Income Q4	***	***		--	
Income Q5	***	***			--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

*p < .1. **p < .05. ***p < .01

A 0.0% real growth of real estate was associated with an increase in the percentage of households that generated retirement income below the poverty threshold. A 0.0% real growth was associated with a 0.2% increase in the percentage of such households. All age quintiles exhibited an increase in the percentage of households which fell below the poverty threshold. As in the case of the 20.0% decrease in home equity, the top two income quintiles did not exhibit an increase in the percentage of households below the poverty threshold.

Table 58

Poverty Before and After a 20.0% Decrease in Home Equity and a 0.0% Real Growth of Real Estate by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		20% Cut		0% Growth	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		16.19		15.57	
by Age Quintiles						
Quintile 1	6.92	24.29	7.14	25.08	7.02	24.65
Quintile 2	2.13	11.68	2.26	12.35	2.15	11.77
Quintile 3	2.01	13.23	2.10	13.82	2.02	13.30
Quintile 4	2.13	11.21	2.26	11.90	2.16	11.38
Quintile 5	2.20	11.52	2.43	12.73	2.22	11.64
by Income Quintile						

	Baseline		20% Cut		0% Growth	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Quintile 1	14.38	70.11	14.87	72.47	15.51	70.91
Quintile 2	0.95	4.92	1.24	6.40	1.21	5.03
Quintile 3	0.05	0.21	0.08	0.42	0.05	0.27
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

A 0.0% real growth of real estate was associated with a marginal decrease in the Gini coefficient. The coefficient changed from 0.527 to 0.526. This change indicates that income inequalities can potentially decrease. One explanation for this situation can be the fact that, on average, less affluent households tend to have a smaller percentage of home owners, and as a result, their retirement income was affected less by a 0.0% real growth. At the same time, retirement income of more wealthy households that tend to have a greater percentage of home owners was, on average, affected more by such an event. As a result, income inequality can decrease.

Table 59

Gini Coefficient Before and After a 20.0% Decrease in Home Equity and a 0.0% Real Growth of Real Estate (n= 6,586)

	Baseline		20% Cut		0% Growth	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.528		0.526	
Pcnt of Population						
10		1.25		1.27		1.26
20		3.46		3.50		3.48
40		11.00		11.00		11.10
50		16.50		16.50		16.50
60		23.40		23.30		23.40
80		43.60		43.50		43.70
90		60.00		59.90		60.00
95		72.60		72.50		72.70
99		91.80		92.00		91.80

The results of a 20.0% decrease to home equity and a 0.0% real growth analyzed by age and income quintiles are provided in Table 60. More detailed results are provided in Appendix D.

Effects of a 20.0% decrease in home equity and a 0.0% real growth were similar among different age quintiles. The mean percentage of decrease in age quintile 4 was the greatest, while the mean percentage of decrease in age quintile 1 was the smallest. However, differences between age quintiles 1, 2, and 5 were not far apart from each other. Analysis by income quintiles showed that households in Income quintile 1 experienced the smallest mean percentage of decrease in their income. Households in income quintile 3 experienced the greatest mean percentage of decrease in their retirement income.

Table 60

Mean Retirement Income and the Mean Percentage of Decrease After a 20.0% Decrease in Home Equity, a 0.0% Real Growth, and a 20.0% Decrease in Home Equity and a 0.0% Real Growth by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	20% Cut		0% Growth		20% Cut and 0%	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	41,526.00	-3.84	42,308.00	-1.69	40,829.00	-5.29
Age Q2	51,215.00	49,099.00	-4.01	49,875.00	-1.54	48,225.00	-5.31
Age Q3	51,775.00	49,601.00	-4.41	50,875.00	-1.44	48,830.00	-5.62
Age Q4	61,329.00	57,940.00	-4.84	60,308.00	-1.28	57,082.00	-5.91
Age Q5	81,336.00	77,672.00	-4.64	80,509.00	-0.89	76,963.00	-5.41
Income Q1	9,558.72	9,284.22	-2.89	9,482.06	-0.85	9,226.16	-3.73
Income Q2	21,281.00	20,271.00	-4.55	20,997.00	-1.30	20,052.00	-5.60
Income Q3	34,069.00	32,303.00	-5.15	33,518.00	-1.61	31,863.00	-6.46
Income Q4	55,123.00	52,418.00	-4.94	54,250.00	-1.59	51,704.00	-6.24

	Baseline	20% Cut		0% Growth		20% Cut and 0%	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]	Mean	Percent Change[a]
Income Q5	157,360.00	150,73.00	-4.05	154,665.00	-1.62	148,391.00	-5.47

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

Results of the ANOVA analysis of the mean percentage of decrease in retirement income by age and income quintiles are presented in Table 61 and Table 62. Analysis of the mean percentage of decrease in retirement income by age quintiles revealed that most households experienced uniform decreases. Only the mean percentage of decrease between age quintiles 1 and 4, and age quintiles 2 and 4 were statistically different from each other. The changes were significant respectively at the 0.05 and 0.1 levels.

Table 61

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 20.0% Decrease in Home Equity and a 0.0% Real Growth of Real Estate by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2		--			
Age Q3			--		
Age Q4	**	*		--	

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q5					--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

Analysis of changes to retirement income by income quintiles revealed that the mean percentage of decrease to income quintile 1 were statistically significantly different from all other income quintiles. Also, only the mean percentage of decrease between income quintiles 2 and 5, and income quintiles 3 and 4 were not significantly different from each other. Other comparisons were significant at either the 0.01 or 0.05 levels.

Table 62

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 20.0% Decrease in Home Equity and a 0.0% Real Growth of Real Estate by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	***	--		
Income Q4	***	**		--	
Income Q5	***		***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

A 20.0% decrease in home equity and a 0.0% real growth were associated with a greater percentage of households that fell below the poverty threshold as compared to before the simulations. The changes were associated with a 1.1% increase in the percentage of households below the poverty threshold. Just as before the simulations, age income 1 accounted for the greatest percentage of households with retirement income below the poverty threshold. Only households in the first three income quintiles increased the percentage of households with inadequate retirement income while the top two income quintiles did not exhibit an increase in the percentage of households below the poverty threshold.

Table 63

Poverty Before and After a 20.0% Decrease in Home Equity, a 0.0% Real Growth, and a 20.0% Decrease in Home Equity and a 0.0% Real Growth by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		20% Cut		0% Growth		20% Cut and 0%	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		16.19		15.57		16.53	
by Age Quintiles								
Quintile 1	6.92	24.29	7.14	25.08	7.02	24.65	7.40	25.97
Quintile 2	2.13	11.68	2.26	12.35	2.15	11.77	2.27	12.43
Quintile 3	2.01	13.23	2.10	13.82	2.02	13.30	2.14	14.11
Quintile 4	2.13	11.21	2.26	11.90	2.16	11.38	2.27	11.94
Quintile 5	2.20	11.52	2.43	12.73	2.22	11.64	2.45	12.85
by Income Quintile								

	Baseline		20% Cut		0% Growth		20% Cut and 0%	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Quintile 1	14.38	70.11	14.87	72.47	15.51	70.91	15.05	73.36
Quintile 2	0.95	4.92	1.24	6.40	1.21	5.03	1.38	7.14
Quintile 3	0.05	0.21	0.08	0.42	0.05	0.27	0.10	0.51
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

A 20.0% decrease in home equity and a 0.0% real growth were not associated with changes to the overall Gini coefficient. In other words, the simulation did not change the retirement income inequality among retired U.S. households.

Table 64

Gini Coefficient Before After a 20.0% Decrease in Home Equity, a 0.0% Real Growth, and a 20.0% Decrease in Home Equity and a 0.0% Real Growth (n= 6,586)

	Baseline		20% Cut		0% Growth		20% Cut and 0%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.528		0.526		0.527	

	Baseline		20% Cut		0% Growth		20% Cut and 0%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Pcnt of Population								
10		1.25		1.27		1.26		1.27
20		3.46		3.50		3.48		3.52
40		11.00		11.00		11.10		11.10
50		16.50		16.50		16.50		16.50
60		23.40		23.30		23.40		23.30
80		43.60		43.50		43.70		43.50
90		60.00		59.90		60.00		60.00
95		72.60		72.50		72.70		72.60
99		91.80		92.00		91.80		91.90

This study hypothesized that a 20.0% decrease in home equity and a 0.0% real growth will be associated with the same percentage decrease to the income of retired U.S. households among different age groups. The null hypothesis can be rejected based on individual simulations of a 20.0% decrease in home equity and a 0.0% real growth. In both cases, the mean percentage of decrease in retirement income was different among different age groups. However, the results of a combined simulation were inconclusive due to the fact that there were only two pairs of age quintiles with significant mean percentage of decrease in their retirement income. Only households in age quintiles 4 and 1, and age quintiles 4 and 2, had incomes that were significantly different from each other. The differences were significant at the 0.05 and 0.1 levels. If we use a 0.1 confidence level, then it can be assumed that out of ten pairs analyzed, one pair will be significant by chance. This means that out of ten comparisons from Table 61, only one comparison might be significant as a result of true differences between age incomes. In addition, the comparison of the mean percentage of decrease between age income 1 and 5, which are the youngest and the oldest groups, is not statistically significant. Therefore, based on the following contradictory results, it is difficult to categorically reject the null hypothesis.

Research Question 2d

What is the likely effect of the stock market's meltdown at varying loss levels on the income of retired U.S. households? This research estimated the impact of three simulations on the retirement income, poverty rates, and income inequalities among retired U.S. households. The first simulation decreased households' portfolios stock share by 10.0% and decreased portfolios' annual returns by 1.5%. Households' portfolio decreases were directly related to the stock portion as assigned based on their age and available information. The second simulation decreased households' portfolios stock share by 20.0% and decreased portfolios' annual returns by 3.0%. The last simulation decreased a households' portfolios stock share by 30.0% and decreased portfolios' annual returns by 4.5%. These different levels allow for estimation of various impacts that the possible asset market meltdown could have on the income of retired U.S. households.

Table 65

Mean Retirement Income and the Mean Percentage of Decrease Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	10% / 1.5%	
Variables	Mean	Mean	Percent Change[a]
Age Q1	43,153.00	40.861.00	-3.36
Age Q2	51,215.00	48,752.00	-2.78
Age Q3	51,775.00	49,329.00	-2.73
Age Q4	61,329.00	58,719.00	-2.55
Age Q5	81,336.00	77,548.00	-2.44
Income Q1	9,558.72	9,491.21	-0.91
Income Q2	21,281.00	21,013.00	-1.25
Income Q3	34,069.00	32,250.00	-2.37
Income Q4	55,123.00	53,048.00	-3.73
Income Q5	157,360.00	147,574.00	-5.72

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The results of a 10.0% decrease in portfolios' stock assets and a 1.5% decreased in portfolios' annual returns by age and income quintiles are provided in Table 65, which summarizes the results of those cuts on the mean retirement income and the mean percentage decrease in the mean retirement income associated with the cuts. More detailed results of the analyses can be found in Appendix E.

As shown in Table 65, a 10.0% decrease in portfolios' stock assets and a 1.5% decrease in portfolios' annual returns were associated with somewhat similar outcomes by age quintile. The youngest households were the most severely affected, and the oldest households experienced the lowest mean percentage of decrease in their retirement income. Analysis by income quintile showed that the less affluent households were the least affected by the first scenario, while the most affluent households experienced the greatest mean percentage of decrease in their retirement income. The results were consistent with Gustman et al. (2009), who also found that retirement income of households with higher stock exposure was more vulnerable to any drops in the stock market.

The ANOVA analysis of a 10.0% decrease in portfolios' stock assets and a 1.5% decrease in portfolios' annual returns by age quintiles revealed that the severities of these cuts vary by age quintile. The youngest households were the only group with a significant mean percentage of decrease in their retirement income. Their changes were significant at the 0.01 level. Households in the remaining four age quintiles had changes that were not significantly different from each other.

Table 66

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 10.0% Decrease in Stocks and a 1.5% decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

As shown in Table 67, the ANOVA analysis of a 10.0% decrease in portfolios' stock assets and a 1.5% decrease in portfolios' annual returns by income quintiles revealed that the severities of these changes vary by income quintile. Analysis of variance revealed that households in different income quintiles had a different mean percentage of decrease in the retirement income. Only households in the first and the second income quintiles had a mean percentage of decrease that was statistically different from each other at the 0.1 level. The remaining comparisons were significant at the 0.01 level. The results further confirm that on average, the severity of changes increased with the income quintile. This can be explained by the fact that the more affluent households have a greater percentage of their wealth invested in a stock market.

Table 67

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	*	--			
Income Q3	***	***	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*$p < .1$. **$p < .05$. ***$p < .01$

The effects of a 10.0% decrease in portfolios' stock assets and a 1.5% decrease in portfolios' annual returns were associated with an increase in the percentage of households not able to generate enough income above the poverty threshold. Those changes were associated with almost a 0.2% increase in the percentage of households in poverty. In addition, the percentage of households below the poverty threshold among all age quintiles increased. The percentage of households below the poverty threshold increased only for households in the first three income quintiles. The top two income quintiles did not have households below the poverty threshold.

Table 68

Poverty Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		10% / 1.5%	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		15.56	
by Age Quintiles				
Quintile 1	6.92	24.29	7.08	24.85
Quintile 2	2.13	11.68	2.14	11.68
Quintile 3	2.01	13.23	2.02	13.35
Quintile 4	2.13	11.21	2.13	11.21
Quintile 5	2.20	11.52	2.20	11.52
by Income Quintile				
Quintile 1	14.38	70.11	14.48	70.59
Quintile 2	0.95	4.92	1.03	5.32
Quintile 3	0.05	0.21	0.05	0.27
Quintile 4	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

A 10.0% decrease in portfolios' stock assets and a 1.5% decrease in portfolios' annual returns were associated with a decrease in the Gini coefficient, which means that the income inequalities among retired US households decreased. This can be explained by the fact the most affluent households were the ones that lost the most of their retirement income as a result of the first simulation.

Table 69

Gini Coefficient Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns (n= 6,586)

	Baseline		10% / 1.5%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.518	
Pcnt of Population				
10		1.25		1.30
20		3.46		3.60
40		11.00		11.40
50		16.50		17.10
60		23.40		24.10
80		43.60		44.50

	Baseline		10% / 1.5%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
90		60.00		60.80
95		72.60		72.20
99		91.80		92.30

The summary results of a 20.0% decrease in portfolios' stock assets and a 3.0% decrease in portfolios' annual returns are provided in Table 70. More detailed results are provided in Appendix E.

As in the case of the first scenario, households in age quintile 1 had the highest mean percentage of decrease in their retirement income. Analysis by income quintiles also followed the pattern of the first scenario as income quintile 5 also experienced the highest mean percentage decrease.

Table 70

Mean Retirement Income and the Mean Percentage of Decrease Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns, and After a 20.0% Decrease in Stocks and a 3.0% Decrease in Portfolio Returns by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	10% / 1.5%		20% / 3%	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	40.861.00	-3.36	38,867.00	-6.30

	Baseline	10% / 1.5%		20% / 3%	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q2	51,215.00	48,752.00	-2.78	46,554.00	-5.28
Age Q3	51,775.00	49,329.00	-2.73	47,112.00	-5.21
Age Q4	61,329.00	58,719.00	-2.55	56,318.00	-4.92
Age Q5	81,336.00	77,548.00	-2.44	73.982.00	-4.75
Income Q1	9,558.72	9,491.21	-0.91	9,429.55	-1.73
Income Q2	21,281.00	21,013.00	-1.25	20,768.00	-2.39
Income Q3	34,069.00	32,250.00	-2.37	32,507.00	-4.52
Income Q4	55,123.00	53,048.00	-3.73	51,174.00	-7.09
Income Q5	157,360.00	147,574.00	-5.72	138,691.00	-10.90

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

As shown in Table 71, the mean percentage of decrease in retirement income of households in age quintile 1 was significantly different from changes experienced by households in age quintiles 2, 3, 4, and 5. In addition, comparison of the mean percentage of decrease between age quintiles 2, 3, 4, and 5 were not statistically different from each other.

Table 71

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 20.0% Decrease in Stocks and a 3.0% Decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

The ANOVA analysis of the mean percentage of decrease by income quintiles revealed that households in all income quintiles had significantly different decreases from each other. The changes were income-quintile specific and increased with retirement income levels.

Table 72

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 20.0% Decrease in Stocks and a 3.0% Decrease in Portfolio Returns by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	**	--			
Income Q3	***	***	--		

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

The effects of a 20.0% decrease in portfolios’ stock assets and a 3.0% decrease in portfolios’ annual returns were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 0.3% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. However, the analysis by income quintile revealed that only households in the first three income quintiles increased the percentage of households below the poverty threshold. The top two income quintiles did not have any households below the poverty threshold.

Table 73

Poverty Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns, and After a 20.0% Decrease in Stocks and a 3.0% Decrease in Portfolio Returns by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		10% / 1.5%		20% / 3%	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		15.56		15.68	
by Age Quintiles						

	Baseline		10% / 1.5%		20% / 3%	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Quintile 1	6.92	24.29	7.08	24.85	7.08	24.85
Quintile 2	2.13	11.68	2.14	11.68	2.14	11.68
Quintile 3	2.01	13.23	2.02	13.35	2.06	13.56
Quintile 4	2.13	11.21	2.13	11.21	2.16	11.39
Quintile 5	2.20	11.52	2.20	11.52	2.25	11.80
by						
Income Quintile						
Quintile 1	14.38	70.11	14.48	70.59	14.57	71.02
Quintile 2	0.95	4.92	1.03	5.32	1.03	5.32
Quintile 3	0.05	0.21	0.05	0.27	0.08	0.43
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

As shown in Table 74, a 20.0% decrease in portfolios' stock assets and a 3.0% decrease in portfolios' annual returns were associated with a decrease in the Gini coefficient. These findings follow the ANOVA analysis results, which showed that for all income quintiles, the mean percentages of change were significant and that these changes increased with an increase in retirement income quintiles.

Table 74

Gini Coefficient Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns, and After a 20.0% Decrease in Stocks and a 3.0% Decrease in Portfolio Returns (n= 6,586)

	Baseline		10% / 1.5%		20% / 3%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.518		0.509	
Pcnt of Population						
10		1.25		1.30		1.35
20		3.46		3.60		3.74
40		11.00		11.40		11.80
50		16.50		17.10		17.60
60		23.40		24.10		24.70
80		43.60		44.50		45.30
90		60.00		60.80		61.50
95		72.60		72.20		73.70
99		91.80		92.30		91.90

The results of a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns are shown in Table 75. As in the case of previous two simulations of portfolio performance, households in age quintile 1 had the highest mean percentage of decrease in their retirement income, while the households in the fifth age quintile had the smallest mean percentage of decrease. Analysis by income quintiles also followed the pattern of the previous two simulations as income quintile 1 also experienced the lowest mean percentage of decrease, while the highest income quintile had the highest mean percentage of decrease.

Table 75

Mean Retirement Income and the Mean Percentage of Decrease Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns, After a 20.0% Decrease in Stocks and a 3.0% Decrease in Portfolio Returns, and After a 30.0% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	10% / 1.5%		20% / 3%		30% / 4.5%	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	40.861.00	-3.36	38,867.00	-6.30	37,152.00	-8.85
Age Q2	51,215.00	48,752.00	-2.78	46,554.00	-5.28	44,610.00	-7.49
Age Q3	51,775.00	49,329.00	-2.73	47,112.00	-5.21	45,112.00	-7.47
Age Q4	61,329.00	58,719.00	-2.55	56,318.00	-4.92	54,116.00	-7.10
Age Q5	81,336.00	77,548.00	-2.44	73.982.00	-4.75	70,628.00	-6.93
Income Q1	9,558.72	9,491.21	-0.91	9,429.55	-1.73	9,373.35	-2.45
Income Q2	21,281.00	21,013.00	-1.25	20,768.00	-2.39	20,545.00	-3.43
Income Q3	34,069.00	32,250.00	-2.37	32,507.00	-4.52	31,837.00	-6.46
Income Q4	55,123.00	53,048.00	-3.73	51,174.00	-7.09	49,489.00	-10.12
Income Q5	157,360.00	147,574.00	-5.72	138,691.00	-10.90	130,664.00	-15.55

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

As shown in Table 76, the mean percentage of decrease in retirement income of households in age quintile 1 was significantly different from the mean percentage of decrease experienced by households in all other age quintiles. In addition, households in age quintiles 2, 3, 4, and 5 had a mean percentage of decrease that was not significantly different from each other.

The ANOVA analysis of the mean percentage of decrease by income quintiles revealed that mean percentage of decrease experienced by different income quintiles was significantly different from the mean percentage of decrease experienced by all other income quintiles. The changes were significant at the 0.01 and 0.05 levels.

Table 76

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 30.0% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

Table 77

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 30.0% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	**	--			
Income Q3	***	***	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

As shown in Table 78, the effects of a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 0.7% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. However, the analysis by income quintile revealed that only households in the first three income quintiles increased the percentage of households below the poverty threshold. The top two income quintiles did not have any households below the poverty threshold.

Table 78

Poverty Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns, After a 20.0% Decrease in Stocks and a 3.0% Decrease in Portfolio Returns, and After a 30.0% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		10% / 1.5%		20% / 3%		30% / 4.5%	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		15.56		15.68		16.09	
by Age Quintiles								
Quintile 1	6.92	24.29	7.08	24.85	7.08	24.85	7.37	25.88
Quintile 2	2.13	11.68	2.14	11.68	2.14	11.68	2.18	11.92
Quintile 3	2.01	13.23	2.02	13.35	2.06	13.56	2.06	13.56
Quintile 4	2.13	11.21	2.13	11.21	2.16	11.39	2.16	11.39
Quintile 5	2.20	11.52	2.20	11.52	2.25	11.80	2.32	12.18
by Income Quintile								
Quintile 1	14.38	70.11	14.48	70.59	14.57	71.02	14.67	71.50
Quintile 2	0.95	4.92	1.03	5.32	1.03	5.32	1.34	6.93
Quintile 3	0.05	0.21	0.05	0.27	0.08	0.43	0.08	0.43
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

As shown in Table 79, a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns were associated with a decrease in the Gini coefficient. These findings follow the ANOVA analysis results, which showed the mean percentages of change for households in higher income quintiles were greater than the mean percentage of decrease experienced by households in lower income quintiles.

Table 79

Gini Coefficient Before and After a 10.0% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns, After a 20.0% Decrease in Stocks and a 3.0% Decrease in Portfolio Returns, and After a 30.0% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns (n= 6,586)

	Baseline		10% / 1.5%		20% / 3%		30% / 4.5%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.518		0.509		0.501	
Pcnt of Population								
10		1.25		1.30		1.35		1.39
20		3.46		3.60		3.74		3.87
40		11.00		11.40		11.80		12.20

	Baseline		10% / 1.5%		20% / 3%		30% / 4.5%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
50		16.50		17.10		17.60		18.10
60		23.40		24.10		24.70		25.40
80		43.60		44.50		45.30		46.00
90		60.00		60.80		61.50		62.20
95		72.60		72.20		73.70		74.30
99		91.80		92.30		91.90		92.20

Before the analysis of changes in the retirement income as a result of changes in portfolios' stock assets and in portfolios' annual returns, this study hypothesized that the mean percentage of decrease in the income of retired U.S. households would be different among different income households. The ANOVA analysis of mean percentage of decrease by income quintiles revealed that decreases to retirement income associated with changes in portfolios' stock assets and in portfolios' annual returns were income quintile specific, so the study rejects the null hypothesis that the decreases in the retirement income are the same among different income households.

Research Question 2e

What are the likely effects of increased out-of-pocket medical expenses on the income of retired U.S. households? This research estimated the impact of 50.0%, 100.0%, and 150.0% increases in out-of-pocket medical expenses on retirement income, poverty rates, and income inequalities among retired U.S. households.

Table 80

Mean Retirement Income and the Mean Percentage of Decrease Before and After a 50.0% Increase in Out-of-Pocket Medical Expenses by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	50%	
Variables	Mean	Mean	Percent Change[a]
Age Q1	43,153.00	41,058.00	-9.18
Age Q2	51,215.00	49,244.00	-6.02
Age Q3	51,775.00	49,703.00	-6.28
Age Q4	61,329.00	59,185.00	-6.32
Age Q5	81,336.00	79,236.00	-6.19
Income Q1	9,558.72	8,387.37	-13.28
Income Q2	21,281.00	19,464.00	-8.55
Income Q3	34,069.00	31,724.00	-7.02
Income Q4	55,123.00	52,723.00	-4.38
Income Q5	157,360.00	154,700.00	-2.15

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The results of a 50.0% increase in out-of-pocket medical expenses by age and income quintiles are provided in Table 80, which summarizes the results of those cuts in the mean retirement income and the mean percentage of decrease in the mean retirement income associated with the increases. More detailed results of these analyses can be found in Appendix F.

A 50.0% increase in out-of-pocket medical expenses affected various age quintiles in a somewhat uniform fashion with the exception of age quintile 1, which experienced the greatest mean percentage of decrease. Households in age quintile 1 experienced, on average, a 9.2% decrease in their retirement income. The mean percentage of decrease between age quintiles 2 to 5 was smaller than the percentage of decrease for age quintile 1. Households in age quintiles 2 to 5 experienced mean percentage of deceases that ranged from 6.0% to 6.3%.

The analysis of the effects of increased out-of-pocket medical expenses by income quintiles revealed the severities of these cuts varied by income quintile. The mean percentage of decrease was greatest for the least affluent households and decreased as households' wealth increased. Households in the highest income quintile had the smallest percentage of decrease as a result of increased out-of-pocket medical expenses.

Table 81

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After 50.0% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
$*p < .1$. $**p < .05$. $***p < .01$

As shown in Table 81, only the mean percentage of decrease in retirement income between age quintile 1 and all other age quintiles wa significantly different. The results were significant at the 0.01 level. The ANOVA results did not indicate any other significant changes between different age quintiles. In conclusion, changes between age quintiles 2 to 5 were not significantly different from each other, which indicates that households in those income categories experienced a similar mean percentage of decrease.

As shown in Table 82, the mean percentage of decrease in the retirement income by income quintiles was significant among all income quintiles. The changes were significant at the 0.01 level for most income quintiles. Only the mean percentage of change between income quintiles 2 and 3 was significant at the 0.05 level.

Table 82

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 50.0% Increase in Out-of-Pocket Medical Expenses by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	**	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

*p < .1. **p < .05. ***p < .01

As shown in Table 83, the effects of a 50.0% increase in out-of-pocket medical expenses were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 2.6% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold; however, the analysis by income quintile revealed that only households in the first three income quintiles increased the percentage of households below the poverty threshold. The top two income quintiles did not have any households below the poverty threshold.

Table 83

Poverty Before and After a 50.0% Increase in Out-of-Pocket Medical Expenses by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		50%	
Variables	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]
Households in Poverty	15.39		18.01	
by Age Quintiles				
Quintile 1	6.92	24.29	7.58	26.60
Quintile 2	2.13	11.68	2.56	14.01
Quintile 3	2.01	13.23	2.34	15.45
Quintile 4	2.13	11.21	2.62	13.81
Quintile 5	2.20	11.52	2.90	15.20

	Baseline		50%	
Variables	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]
by				
Income Quintile	14.38	70.11	15.89	77.45
Quintile 1	0.95	4.92	1.84	9.54
Quintile 2	0.05	0.21	0.27	1.43
Quintile 3	0.00	0.00	0.00	0.00
Quintile 4	0.00	0.00	0.00	0.00
Quintile 5				

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

As shown in Table 84, a 50.0% increase in out-of-pocket medical expenses was associated with an increase in the Gini coefficient. The increase in out-of-pocket medical expenses was income-quintile related. The least affluent households were more affected than the more affluent households, and therefore, there was an increase in the income inequality.

Table 84

Gini Coefficient Before and After a 50.0% Increase in Out-of-Pocket Medical Expenses (n= 6,586)

	Baseline		50%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.543	
Pcnt of Population				
10		1.25		0.99
20		3.46		3.05
40		11.00		10.20
50		16.50		15.50
60		23.40		22.20
80		43.60		42.40
90		60.00		59.00
95		72.60		71.80
99		91.80		91.70

The results of a 100.0% increase in out-of-pocket medical expenses by age and income quintiles are provided in Table 85, which summarizes the results of those cuts in the mean retirement income and the percentage of decrease in the mean retirement income associated with the increases. More detailed results of these analyses can be found in Appendix F.

Table 85

Mean Retirement Income and the Mean Percentage of Decrease Before and After 50.0% and 100.0% Increases in Out-of-Pocket Medical Expenses by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	50%		100%	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	41,058.00	-9.18	38,963.00	-18.36
Age Q2	51,215.00	49,244.00	-6.02	47,273.00	-12.04
Age Q3	51,775.00	49,703.00	-6.28	47,632.00	-12.56
Age Q4	61,329.00	59,185.00	-6.32	57,041.00	-12.63
Age Q5	81,336.00	79,236.00	-6.19	77,135.00	-12.37
Income Q1	9,558.72	8,387.37	-13.28	7,216.01	-26.56
Income Q2	21,281.00	19,464.00	-8.55	17,647.00	-17.10
Income Q3	34,069.00	31,724.00	-7.02	29,379.00	-14.04
Income Q4	55,123.00	52,723.00	-4.38	50,324.00	-8.75
Income Q5	157,360.00	154,700.00	-2.15	152,041.00	-4.30

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

A 100.0% increase in out-of-pocket medical expenses affected various age quintiles in a somewhat uniform fashion with the exception of age quintile 1, which experienced the greatest mean percentage of decrease. Households in age quintile 1 experienced, on average, a 19.4% decrease in their retirement income. The mean percentages of decrease between age quintiles 2 to 5 were smaller than the percentage of decrease for age quintile 1. The results of this simulation followed the results obtained for a 50.0% increase in out-of-pocket medical expenses.

As shown in Table 85, the analysis of the effects of increased out-of-pocket medical expenses by income quintiles revealed the severities of these cuts varied by income quintile. The mean percentage of decrease was the greatest for the least affluent households and decreased as households' wealth increased. Households in the highest income quintile had the smallest mean percentage of decrease as a result of increased out-of-pocket medical expenses.

Table 86

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 100.0% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

As shown in Table 86, only the mean percentage of decrease in retirement income between age quintiles 1 and all other age quintiles was significantly different. The results were significant at the 0.01 level. The ANOVA results did not indicate any other significant changes between different age quintiles. In conclusion, the mean percentage of decrease for age quintiles 2 to 5 was not significantly different, which indicates that households in those income categories experienced a similar mean percentage of decrease.

As shown in Table 87, the mean percentage of decrease in the retirement income by income quintiles was significant between all income quintiles. The changes were significant at the 0.01 level for most income quintiles. Only the mean percentage of decrease between income quintiles 2 and 3 was significant at the 0.05 level.

Table 87

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After 100.0% Increase in Out-of-Pocket Medical Expenses by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	**	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

As shown in Table 88, the effects of a 100.0% increase in out-of-pocket medical expenses were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This increase was associated with a 5.2% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. The analysis by income quintile revealed that only households in the first four income quintiles increased the percentage of households below the poverty threshold. This is the first time that there were households from income quintile 4 that were not able to generate income above the poverty threshold. There were not any households with retirement income below the poverty threshold from the last income quintile.

Table 88

Poverty Before and After 50.0% and 100.0% Increases in Out-of-Pocket Medical Expenses by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		50%		100%	
Variables	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]
Households in Poverty	15.39		18.01		20.60	
by Age Quintiles						
Quintile 1	6.92	24.29	7.58	26.60	8.24	28.92
Quintile 2	2.13	11.68	2.56	14.01	3.14	17.19
Quintile 3	2.01	13.23	2.34	15.45	2.72	17.95
Quintile 4	2.13	11.21	2.62	13.81	3.16	16.66
Quintile 5	2.20	11.52	2.90	15.20	3.33	17.48

by						
Income Quintile						
Quintile 1	14.38	70.11	15.89	77.45	16.65	81.15
Quintile 2	0.95	4.92	1.84	9.54	3.12	16.13
Quintile 3	0.05	0.21	0.27	1.43	0.75	3.94
Quintile 4	0.00	0.00	0.00	0.00	0.08	0.41
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

As shown in Table 89, a 100.0% increase in out-of-pocket medical expenses was associated with an increase in the Gini coefficient. An increase in out-of-pocket medical expenses was income-quintile related. The least affluent households were more affected than the more affluent households, and therefore, there was an increase in the income inequality.

Table 89

Gini Coefficient Before and After 50.0% and 100.0% Increases in Out-of-Pocket Medical Expenses (n= 6,586)

	Baseline		50%		100%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.543		0.563	

	Baseline		50%		100%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Pcnt of Population						
10		1.25		0.99		0.39
20		3.46		3.05		2.31
40		11.00		10.20		9.11
50		16.50		15.50		14.30
60		23.40		22.20		20.90
80		43.60		42.40		41.00
90		60.00		59.00		57.80
95		72.60		71.80		71.00
99		91.80		91.70		91.40

The results of a 150.0% increase in out-of-pocket medical expenses by age and income quintiles are provided in Table 90, which summarizes the results of those cuts in the mean retirement income and the mean percentage of decrease in the retirement income associated with the increases. More detailed results of these analyses can be found in Appendix F.

Table 90

Mean Retirement Income and the Mean Percentage of Decrease Before and After 50.0%, 100.0%, and 150.0% Increases in Out-of-Pocket Medical Expenses by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	50%		100%		150%	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	41,058.00	-9.18	38,963.00	-18.36	36,868.00	-27.53
Age Q2	51,215.00	49,244.00	-6.02	47,273.00	-12.04	45,302.00	-18.06
Age Q3	51,775.00	49,703.00	-6.28	47,632.00	-12.56	45,560.00	-18.84
Age Q4	61,329.00	59,185.00	-6.32	57,041.00	-12.63	54,896.00	-18.95
Age Q5	81,336.00	79,236.00	-6.19	77,135.00	-12.37	75,035.00	-18.56
Income Q1	9,558.72	8,387.37	-13.28	7,216.01	-26.56	6,044.66	-39.84
Income Q2	21,281.00	19,464.00	-8.55	17,647.00	-17.10	15,829.00	-25.64
Income Q3	34,069.00	31,724.00	-7.02	29,379.00	-14.04	27,033.00	-21.07
Income Q4	55,123.00	52,723.00	-4.38	50,324.00	-8.75	47,925.00	-13.13
Income Q5	157,360.00	154,700.00	-2.15	152,041.00	-4.30	148,391.00	-6.45

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

A 150.0% increase in out-of-pocket medical expenses affected various age quintiles in a somewhat uniform fashion with the exception of age quintile 1, which experienced the greatest mean percentage of decrease. Households in age quintile 1 experienced, on average, a 27.5% decrease in their retirement income. The mean percentage of decrease between age quintiles 2 to 5 was smaller than the mean percentage of decrease for age quintile 1.

The analysis of the effects of increased out-of-pocket medical expenses by income quintiles revealed that the severities of the effects varied by income quintile. The mean percentage of decrease was the greatest for the least affluent households and decreased as households' wealth increased. Households in the highest income quintile had the smallest mean percentage of decrease as a result of increased out-of-pocket medical expenses.

Table 91

ANOVA Results of the Mean Percentage of Decrease in Retirement After a 150.0% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

As shown in Table 91, only the mean percentage of decrease in retirement income between age quintiles 1 and all other age quintiles was significantly different. The results were significant at the 0.01 level. The ANOVA results did not indicate any other significant changes between different age quintiles. In conclusion, changes between age quintiles 2 to 5 were not significantly different from each other, which indicates that households in those income categories experienced a similar mean percentage of decrease.

As shown in Table 92, the mean percentage of decrease in the retirement income by income quintiles was significant between all income quintiles. The changes were significant at the 0.01 level for most income quintiles. Only the mean percentage of decrease between income quintiles 2 and 3 was significant at the 0.05 level.

Table 92

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 150.0% Increase in Out-of-Pocket Medical Expenses by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	**	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

As shown in Table 93, the effects of a 150.0% increase in out-of-pocket medical expenses were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with an 8.3% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. The analysis by income quintile revealed that only households in the last income quintiles did not have anybody with a retirement income below the poverty threshold. In addition, 83.6% of households in income quintile 1 had income below the poverty threshold.

Table 93

Poverty Before and After 50.0%, 100.0%, and 150.0% Increases in Out-of-Pocket Medical Expenses by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		50%		100%		150%	
Variables	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]
Households in Poverty	15.39		18.01		20.60		23.68	
by Age Quintiles								
Quintile 1	6.92	24.29	7.58	26.60	8.24	28.92	9.16	32.15
Quintile 2	2.13	11.68	2.56	14.01	3.14	17.19	3.76	20.59
Quintile 3	2.01	13.23	2.34	15.45	2.72	17.95	3.22	21.20
Quintile 4	2.13	11.21	2.62	13.81	3.16	16.66	3.82	20.13
Quintile 5	2.20	11.52	2.90	15.20	3.33	17.48	3.72	19.50
by Income Quintile								
Quintile 1	14.38	70.11	15.89	77.45	16.65	81.15	17.15	83.60
Quintile 2	0.95	4.92	1.84	9.54	3.12	16.13	4.87	25.17
Quintile 3	0.05	0.21	0.27	1.43	0.75	3.94	1.42	7.44
Quintile 4	0.00	0.00	0.00	0.00	0.08	0.41	0.25	1.23
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

As shown in Table 94, a 150.0% increase in out-of-pocket medical expenses was associated with an increase in the Gini coefficient. An increase in out-of-pocket medical expenses was income-quintile related. The least affluent households were more affected than the more affluent households, and therefore, there was an increase in the income inequality.

Table 94

Gini Coefficient Before and Before and After 50.0%, 100.0%, and 150.0% Increases in Out-of-Pocket Medical Expenses (n= 6,586)

	Baseline		50%		100%		150%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.543		0.563		0.588	
Pcnt of Population								
10		1.25		0.99		0.39		-0.47
20		3.46		3.05		2.31		1.34
40		11.00		10.20		9.11		7.77
50		16.50		15.50		14.30		12.80
60		23.40		22.20		20.90		19.30

	Baseline		50%		100%		150%	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
80		43.60		42.40		41.00		39.60
90		60.00		59.00		57.80		56.70
95		72.60		71.80		71.00		70.10
99		91.80		91.70		91.40		91.10

Before the analysis of the mean percentage of decrease in the retirement income as a result of increased out-of-pocket medical expenses, this study hypothesized the mean percentage of decrease to the income of retired U.S. households as a result of increased out-of-pocket medical expenses is the same among different income groups. The analysis of the mean percentage of decrease by income quintiles revealed that the decreases were income quintile specific, so the study rejects the null hypothesis that the changes in retirement income were the same among different income households. The conclusions were based on consistent ANOVA results that indicated that the least affluent households experienced the most significant mean percentage of decrease in their income.

Research Question 2f

What are the likely effects of the simultaneous effect of wealth- and income-impacting events (2a-2e) on the income of retired U.S. households? This research estimated the impact of the simultaneous occurrences of all five events and accounts for changes in SSB, outright default of pension plans, changes to housing equity and returns, stock market meltdown, and an increase in out-of-pocket medical expenses (Scenario X). The goal of this scenario is to estimate the effects of the worst situation on the retirement income, poverty rates, and the index of income inequality.

The results of a 12.0% cut in SSB, outright default of pensions, a 20.0% decrease in home equity and a 0.0% real returns, a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns, and a 150.0% increase in out-of-pocket medical expenses (Scenario X) are provided in Table 95, which summarizes the results of those cuts in the mean retirement income and the mean percentage of decrease in the retirement income associated with the Scenario X simulation. More detailed results of these analyses can be found in Appendix G.

Table 95

Mean Retirement Income and the Mean Percentage of Decrease Before and After the Scenarios X Simulation by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	Scenario X	
Variables	Mean	Mean	Percent Change[a]
Age Q1	43,153.00	27,024.00	-47.72
Age Q2	51,215.00	33,185.00	-38.71
Age Q3	51,775.00	33,344.00	-39.60
Age Q4	61,329.00	40,743.00	-39.60
Age Q5	81,336.00	57,054.00	-38.65
Income Q1	9,491.21	4,551.10	-57.92
Income Q2	21,013.00	12,042.00	-43.48
Income Q3	32,250.00	20,126.00	-41.33
Income Q4	53,048.00	35,895.00	-34.98

	Baseline	Scenario X	
Variables	Mean	Mean	Percent Change[a]
Income Q5	147,574.00	110,226.00	-30.34

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The Scenario X simulation affected various age quintiles in a somewhat uniform fashion with the exception of age quintile 1, which experienced the greatest mean percentage of decrease. Households in age quintile 1 experienced, on average, a 47.7% decrease in their retirement income. The mean percentage of decrease among age quintiles 2 to 5 was smaller than the mean percentage of decrease for age quintile 1. Households in age quintiles 2 to 5 experienced a mean percentage of decease that ranged from 38.7% to 39.6%.

The analysis of the effects of the Scenario X simulation by income quintiles revealed that the severities of these cuts varied by income quintile. The mean percentage of decrease was the greatest for the least affluent households and decreased as households' wealth increased. Households in the highest income quintile had the smallest mean percentage of decrease as a result of the Scenario X simulation.

Table 96

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After the Scenario X Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

As shown in Table 96, only the mean percentage of decrease in retirement income between age quintiles 1 and all other age quintiles was significantly different. The results were significant at the 0.01 level. The ANOVA results did not indicate any other significant changes between different age quintiles. In conclusion, changes among age quintiles 2 to 5 were not significantly different from each other, which indicate that households in those income categories experienced a similar mean percentage of decrease.

As shown in Table 97, the mean percentage of decrease in the retirement income by income quintiles was significant between most income quintiles. The changes were significant at the 0.01 level for most income quintiles. However, the mean percentage of decrease between income quintiles 2 and 3 was not significant, and the mean percentage of decrease between income quintiles 4 and 5 was significant at the 0.1 level.

Table 97

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After the Scenario X Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***		--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	*	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

As shown in Table 98, effects of the Scenario X simulation were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. The simulation was associated with a 16.0% increase in the percentage of households in poverty; the percentage of households below the poverty threshold more than doubled. All age and income quintiles had households below the poverty threshold. The severity of effects also affected households in the highest income quintile, putting 0.4% of them below the poverty threshold.

Table 98

Poverty Before and After Scenario X Simulation by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		Scenario X	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	15.39		31.43	
by Age Quintiles				
Quintile 1	6.92	24.29	11.80	41.44
Quintile 2	2.13	11.68	5.31	29.05
Quintile 3	2.01	13.23	4.38	28.88
Quintile 4	2.13	11.21	4.98	26.24
Quintile 5	2.20	11.52	4.94	25.94
by Income Quintile				
Quintile 1	14.38	70.11	18.98	92.50
Quintile 2	0.95	4.92	8.26	42.75
Quintile 3	0.05	0.21	3.39	17.80
Quintile 4	0.00	0.00	0.71	3.54
Quintile 5	0.00	0.00	0.08	0.39

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

As shown in Table 99, the Scenario X simulation was associated with changes to the overall Gini coefficient. The wealth impacting events affected the least wealthy individual in a more severe way than they did the more affluent households. As a result, the income inequality increased, which resulted in an increase of 0.070 in the Gini coefficient.

Table 99

Gini Coefficient Before and After Scenario X Simulation (n= 6,586)

	Baseline		Scenario X	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.597	
Pcnt of Population				
10		1.25		-1.40
20		3.46		0.52
40		11.00		7.13
50		16.50		12.30
60		23.40		18.90
80		43.60		39.40
90		60.00		56.90
95		72.60		70.40

	Baseline		Scenario X	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
99		91.80		91.20

Before the simulations, this study did not hypothesize about the potential effects of the simultaneous occurrences of wealth- and income-impacting events because it was the first time such simulations were performed. After analysis of the mean percentage of decrease and ANOVA analysis by age and income quintiles, this research concluded that the effects of Scenario X simulations affected the youngest group of retirees and the least affluent retired households in the most severe way. While all age and income quintiles experienced reductions in their mean retirement income, households in the first age income quintiles and households in the first income quintile were consistently the most severely affected by the simulations.

Summary

In summary, the results indicated that most of the wealth- and income-impacting events affected the youngest and the least affluent households in the most significant way. All events increased the percentage of households that were not able to generate income above the poverty threshold. However, only the Scenario X simulation, and 100.0% and 150.0% increase in out-of-pocket medical expenses moved some households from income quintiles 4 and 5 below the poverty threshold. Income inequalities varied based on the type of event that was simulated. Changes to SSB, pensions, and changes to home equity and annual returns had minimal impact on the Gini coefficient. However, out-of-pocket medical expenses and Scenario X simulations were associated with much greater mean changes to the index of income inequality.

CHAPTER 5

DISCUSSION

This chapter begins by providing a brief summary of the study. Then, a discussion of the primary findings of this study and of how these findings relate to theory and prior empirical work is provided. This is followed by a discussion of the contributions to the literature section that highlights the intellectual value this research brings to the area of retirement and financial planning. Later, in light of the study design and findings of this study, limitations and strengths are discussed. Afterwards, based on the results of the study, implications and conclusions are drawn regarding the income of retired U.S. households. Suggestions for future research close this chapter.

Summary of the Study

When it comes to the extent of retirement readiness of U.S. households, the evidence remains divided. According to recent reports, Americans have not saved enough for retirement (McConville, 2011; Taylor et al., 2007), many are not confident about having enough funds for a comfortable retirement (Helman et al., 2011), and some could be negatively affected by the most recent economic downturn (VanDerhei, 2011). However, many researchers have concluded that most households are adequately prepared to retire (Cole & Liebenberg, 2008; Feinschreiber & Laiosa, 2009; Hurd & Rohwedder, 2006; Munnell et al., 2007; Scholz & Seshadri, 2008), and only the least affluent households are not sufficiently equipped for retirement (Butrica et al., 2008; Love et al., 2008).

Most retired U.S. households utilize only Social Security benefits, pensions, personal savings and investments, and supplemental work income as their sources of retirement income (Butrica et a., 2008; Cole & Liebenberg, 2008). However, recent economic and political events have shown that potentially every source of retirement income can be affected by policy changes, economic fluctuations, poor savings and investment decisions, or health care expenses.

There is a great deal of research on the retirement finances of U.S. households, but there is limited literature that studies the effects of potential threats to those finances. When potential events are considered, those negative events are treated individually (Brady, 2008; Engen et al., 1999; Love et al., 2008), a practice which fails to account for the possibility that wealth-impacting events may occur simultaneously.

While there is an unlimited number of factors that can affect retired households' finances, this study focused on five that have been identified by previous studies as influential at retirement. These factors are changes to Social Security benefits, reductions in pensions, decrease in home equity and reduction in housing returns, stock market turbulence, and increasing out-of-pocket medical expenses.

Although prior research provides insights into the potential extent of effects these factors might have on the income of retired U.S. households, this study is the first to estimate the effects of simultaneous shocks. Because the multiple potential shocks are expected to affect households differently depending on age and income levels, this study analyzed the effects of wealth and income events on the retirement income of retired U.S. households by age and income quintiles.

The Life Cycle Hypothesis (LCH) was used as the theoretical background of this research. Households' assets were annuitized to create an even retirement income stream. The computations followed Modigliani and Brumberg's equation to estimate income available to households. Consistent with LCH, there was an assumption of no intentional bequest, which means that any bequest motives are unintentional and are the effect of precautionary savings.

This research used the Health and Retirement Study (HRS) survey data, and the unit of analysis was households whose members self-identified as being retired and not living in nursing homes. This resulted in a final sample of 6,314 households (22,561,448 weighted).

Findings

1. *What is the income of retired U.S. households?*

The first objective of this study was to estimate the retirement income of retired U.S. households. The sample of retired households analyzed in this study had a mean retirement income of $56,671.

The analysis of the retirement income by age quintiles revealed that many households had similar incomes. There were two significant differences. The youngest age quintile (quintile 1) had a mean retirement income significantly lower than age quintiles 4 and 5. This can be explained by the fact that households in age quintile 1 were between ages 44 and 67. As a result, they were not eligible for some of the retirement benefits available to them from the government. For example, in 2008, early Social Security benefits were available at age 62, which means that households that were 44 still had 18 years before they were eligible for SSB. The analysis by age quintile also revealed that the oldest age quintile had a mean retirement income significantly greater than that of all other age quintiles. The LCH can explain this result as it assumes that households utilize all their wealth at retirement. For older households, home equity makes up a larger share of their wealth compared to younger households (Love et al., 2008). But, many households do not plan and do not utilize their home equity to fund their retirement (Munnell et al., 2007). As a result, the sample had a number of older households who did not use their home equity to finance their retirement.

The analysis of retirement income by income quintiles revealed that the first three income quintiles had mean retirement incomes below the mean retirement income of $56,671for all households; their means were $9,558, $21,281, and $34,069. Households in income quintile 4 had their mean income the closest to the overall mean with a mean retirement income of $55,123. Households in the highest income quintile had a mean retirement income almost three times greater than the overall mean for all retired households; their mean was $157,360. The comparison of means by income quintile revealed that there were many households with income below the mean and a small number of households with incomes above that mean. Those results were in line with the estimated median income of $34,009. In conclusion, analyzing retirement income without accounting for different income quintiles can be deceiving as the distribution of the results was skewed with wealthy households impacting the overall mean of all retired U.S. households.

2a. What is the likely effect of proposed changes to Social Security benefits on the income of retired U.S. households?

Based on the previous literature, this study expected changes to Social Security benefits to have a significant impact on the income of retired households, especially for households in the lowest income level as their retirement income consists mostly of Social Security benefits (Brady, 2008; Caldera, 2010; Munnell & Soto, 2005). Based on the review of literature, a null and an alternative hypothesis were formulated:

H_{o2a}: The mean percentage of decrease in the income of retired U.S. households after changes to Social Security benefits is the same among different income households.

H_{a2a}: The mean percentage of decrease in the income of retired U.S. households after changes to the Social Security benefits is different among different income households.

Cuts to SSB had the most significant impact on households in age quintiles 2 and 3, while households in age quintile 1 experienced the smallest mean percentage of decrease. This indicates that households with a head of the household age 68 to 76 were the most affected by this simulation.

Analysis of decreases to retirement income by income quintiles revealed that only the mean percentage of decreases for income quintiles 1 and 2 were not significantly different from each other. Other comparisons of the mean percentage of decrease to retirement income highlighted that the magnitude of decreases was income-quintile specific. As such, the smallest decrease was experienced by households in income quintile 5 while the highest decrease was observed for income quintiles 2 and 3. The findings for the lowest income quintiles were in line with findings of Love et al. (2008). The magnitude of the mean percentage of decrease was proportionally comparable for both studies. However, this study found that the mean percentages of decrease were also significant for the more affluent households, a result different from that obtained by Love et al. (2008).

Analysis of mean income of retirement income and ANOVA analysis by income quintiles revealed that changes in SSB were income quintile specific. The results followed earlier research that found that the least affluent households rely more heavily on SSB as their main source of retirement income (Caldera, 2010). Based on the results of analyses, the study rejects the null hypothesis that the changes in retirement income were the same among different income households.

In conclusion, the analysis revealed the least wealthy households and households between ages 68 and 76 are likely to be the most significantly affected by changes in SSB. Also, based on the changes to the Gini coefficient, inequalities among retired U.S. households might increase as a result of changes in their SSB.

2b. What is the likely effect of pension benefit reductions and outright defaults on the income of retired U.S. households?

A literature search found no studies on the potential effects of negative occurrences to pensions. Therefore, it was extremely important to estimate the effects of such unfavorable events. Pensions are especially important for affluent households, as they tend to have a greater percentage of retirement income from that source relative to less affluent households (Gustman et al., 2009). Also, for the top 10.0% of households, pension wealth accounted for a greater percentage of total wealth compared to the mean value for all households (Love et al., 2008). Based on those facts, this study developed a null and an alternative hypothesis:

H_{o2b}: The mean percentage of decrease in the pension income of retired U.S. households is the same among different income households.

H_{a2b}: The mean percentage of decrease in the pension income of retired U.S. households is different among different income households.

Cuts in pensions affected various age quintiles in a somewhat uniform fashion. The most significant impact was on age quintiles 1 and 5. These two age quintiles experienced the highest mean percentage of decrease. These results might be explained by the fact that the youngest households might self-report as retired because they receive pension benefits. Still, this group might not be old enough to claim Social Security benefits. Therefore, pensions can provide a much greater share of retirement income of the youngest retired households. However, the oldest households might experience a high decrease to their retirement income because a greater percentage of those households actually have pensions compared to younger retired households (Soto et al., 2006) and a greater percentage of their retirement income is from this source (Gustman et al., 2009).

The analysis of cuts in pensions by income quintiles revealed that the severity of these cuts varied by income quintile. Households that belonged to the first income quintile were the most significantly affected by the cuts while households in the fifth income quintile had the smallest mean percentage of decrease in their retirement income. The results were different from those obtained by Gustman et al. (2009) and Love et al. (2008). However, the results can be explained by the data deficiencies on pensions that influenced the study design. The HRS data set has limited information on pensions and as the result pensions had to be treated uniformly as a wealth asset; although, it is possible that a portion of those plans could be treated as a retirement income element if appropriate information were available. It is possible that if the information were available then the results for pensions as an income asset were in line with Gustman et al. (2009) and Love et al. (2008).

The analysis of mean percentage of decrease in retirement income by income quintiles and ANOVA analysis revealed that changes in pensions were income-quintile specific. Therefore, the study rejects the null hypothesis that the mean percentage of decrease in retirement income was the same among different income households. Estimations indicate that the least and the most affluent households experienced a significant mean percentage of decrease in their income, while the mean percentages of decrease among the middle three income quintiles was not statistically different.

2c. What are the likely effects of further housing equity reductions on the income of retired U.S. households?

As households get older, home equity represents a more significant percentage of their total wealth (Love et al., 2008). As a result, a simulated decrease in housing wealth reduced the annualized value of wealth, and this reduction was the greatest among older households (Love et al., 2008). This study developed a null and an alternative hypothesis:

H_{o2c}: The mean percentage of decrease to the income of retired U.S. households is the same among different age groups.

H_{a2c}: The mean percentage of decrease to the income of retired U.S. households is different among different age households.

The three simulations estimated by this study were not only different in magnitudes, but also different in areas of home equity they affected. As a result, these simulations were considered separately.

The first simulation decreased the home equity by 20.0%. As a result, the retirement income of the two youngest age quintiles was the least affected by the changes in housing equity. However, the retirement income of the three oldest age quintiles experienced the greatest mean percentage of decrease in comparison to the two youngest age quintiles. The ANOVA analysis revealed that the retirement income of households in age quintiles 4 and 5 had a mean percentage of decrease significantly greater than households in age quintiles 1 and 2. The findings of this study followed the results of Love et al. (2008), who also found that decrease in housing equity is more severe for older households. One explanation for this result can be found in the annuitization of home equity. Income from home equity, as a percentage of total retirement income, might be smaller for younger households as a result of conversion of home equity into an annuity. Younger households have longer life expectancy and therefore their annuities result in lower estate income as compared to older households with the same level of estate wealth.

The analysis of effects of 20.0% decrease in home equity by income quintiles revealed that households in income quintile 1 experienced the smallest mean percentage of decrease in their retirement income; households in the income quintile 5 experienced the second smallest mean percentage decrease; and income quintiles 2, 3, and 4 experienced the greatest mean percentage of decrease in their retirement income. The results might be associated with the fact that many households in income quintile 1 are not homeowners whereas the wealthiest households have higher rates of homeownerships (James III & Sharpe, 2007). The ANOVA analysis of the mean percentage of decrease by income quintiles showed that households in income quintile 1 had significantly different decrease in their retirement income in comparison to the mean percentage of decrease in retirement income experienced by households in income quintiles 2, 3, 4, and 5. Also, the mean percentage of decrease in retirement income for the most affluent households was significantly different from the decrease experienced by less wealthy households.

The second simulation estimated by this study reduced the real growth of real estate to 0.0%. The results of this simulation were different from the 20.0% decrease in home equity. The most noticeable difference was in the magnitude of the effect. Households in age quintile 1 experienced the greatest mean percentage of decrease in their retirement income as a result of the 0.0% real growth, which was not the case for the 20.0% decrease in home equity. Also, households in age quintile 5 experienced the smallest mean percentage of decrease in their retirement income; they had one of the greatest mean percentages of decrease as a result of the

20.0% decrease. The ANOVA results confirmed that the mean percentage of decrease in age quintiles 1 and 5 was statistically significant.

The results of analysis of the 0.0% real growth by income quintile were similar to the results of the 20.0% decrease. The least affluent households experienced the smallest mean percentage of decrease in their retirement income, and households in income quintiles 3, 4, and 5 had the greatest mean percentage of decrease in their retirement income. ANOVA results by income quintiles revealed that only changes in income quintiles 1 and 2 were significantly different from the mean percentage of decrease in other income quintiles. The mean percentage of decrease for households in income quintiles 3, 4, and 5 did not differ significantly.

The third simulation simultaneously decreased home equity by 20.0% and reduced the real growth of real estate to 0.0%. The effects of this simulation were similar among different age quintiles. Only the mean percentage of decrease between age quintiles 4 and 1 and age quintiles 4 and 2 were significantly different. The mean percentages of decrease between remaining age quintiles were not significantly different, which indicates that the simulation affected most age quintiles uniformly.

The results of the third simulation by income quintiles were similar to results for simulations 1 and 2. Households in the first income quintile experienced the lowest mean percentage of decrease in their retirement income, while households in income quintiles 2, 3, and 4 experienced the greatest mean percentage of decrease. The ANOVA results supported those findings as all mean percentages of decrease were significant except income quintiles 2 and 5, and income quintiles 3 and 4, which were not statistically different.

Before this analysis of changes in the retirement income, this study hypothesized that the 20.0% decrease in home equity and 0.0% real growth would be associated with the same mean percentage of decrease in the income of retired U.S. households among different age groups. The null hypothesis can be rejected based on individual simulations of a 20.0% decrease in home equity and 0.0% real growth. In both cases, the mean percentage of decrease in retirement income was significantly different among different age groups. The results of the first simulation followed the findings of Love et al. (2008). The results of the second simulation followed the LCH as the youngest households, which have the greatest life expectancy and the longest compounding periods, experienced the greatest mean percentage of decrease to their retirement income. Also, the oldest households with the shortest life expectancy and the shortest compounding periods experienced the smallest mean percentage of decrease.

However, the results of a combined simulation were open to doubt. This conclusion is based on the fact that there were only two pairs of age quintiles with a significant mean percentage of decrease in their retirement income. Only households in age quintiles 4 and 1, and age quintiles 4 and 2 had a mean percentage of decrease that was significantly different from each other. Yet, the comparison of the mean percentage of decrease between age income 1 and 5, the youngest and the oldest groups respectively, was not statistically significant. Therefore, based on the following contradictory results from the third simulation, it is difficult to categorically reject the null hypothesis.

2d. What is the likely effect of the stock market's meltdown at varying loss levels on the income of retired U.S. households?

More affluent households tend to have a greater share of wealth in stocks as opposed to less wealthy households (Gustman et al., 2009). Therefore, any negative occurrences in a stock market should affect the wealthiest households the most. Based on this fact, this study formulated a null and an alternative hypothesis:

H_{o2d}: The mean percentage of decrease in the income of retired U.S. households as a result of a stock market decline is the same among different income groups.

H_{a2d}: The mean percentage of decrease in the income of retired U.S. households as a result of the stock market meltdown differs among households of differing income.

The results of decreases in portfolios' stock assets and in portfolios' annual returns were associated with somewhat similar outcomes by age quintile. The youngest households were the most severely affected, while the oldest households experienced the lowest mean percentage of decrease in their retirement income. However, only the mean percentage of decrease for age quintile 1 was significant. Annuitization process and life expectancy could explain this process, but the results are not significant for older households. Therefore, it is possible that the youngest households have a greater percentage of their retirement income from portfolio assets as opposed to the older households. This theory can be supported by the fact that a share of the youngest households was not yet eligible for SSB and therefore do not receive a portion of their income from this source.

Analysis by income quintile revealed that the severities of the mean percentages of decrease varied by income quintile. As a result, less affluent households were the least affected, while the most affluent households, with a higher stock exposure, were the most affected; the ANOVA results supported those findings. Furthermore, the results were consistent with Gustman et al. (2009), who also found that retirement income of households with higher stock exposure was more vulnerable to a drop in the stock market.

Before the analysis of the mean percentage of decrease in the retirement income as a result of changes in portfolios' stock assets and in portfolios' annual returns, this study hypothesized that the mean percentage of decrease in the income of retired U.S. households would vary among households of differing income. The ANOVA results by income quintiles revealed that the mean percentage of decrease in the retirement income was income-quintile specific. As a result, the study rejected the null hypothesis that the changes in retirement income were the same among different income households.

The results followed findings of Gustman et al. (2009) but were somewhat different from the results obtained by Engen et al. (1999). However, Engen et al. designed their research differently[1]; still, this study found that for each income and age quintile, the changes were significantly different. A paired t-test showed that mean values before and after the simulations were different at the 0.01 level.

2e. What is the likely effect of increased out-of-pocket medical expenses on the income of retired U.S. households?

Accounting for out-of-pocket health expenditures has become necessary when planning for retirement (French & Jones, 2004; Fronstin et al., 2008). Previous research found that an increase in elderly household medical expenses decreased the amount of money available for food and services (Fuchs, 1998). Also an increase in medical expenses affected the least affluent households the most (Love et al., 2008). Based on the review of literature, this study formulated a null and an alternative hypothesis:

H_{o2e}: The mean percentage of decrease in the income of retired U.S. households as a result of increased out-of-pocket medical expenses is the same among different income groups.

[1] They reduced each household's actual wealth by 40 percent of its stock and mutual fund holdings. They assumed that retirement funds were divided equally between stocks and other assets, by 20 percent of balances in DC pensions, Individual Retirement Accounts, Keogh plans, and 401 (k) plans. However, their assumption had two major flaws. First, they assumed that the funds were equally divided between stocks and other assets. Also, they did not account for the fact that some households might own stocks outside the retirement accounts. This study accounted for both of those facts.

H_{a2e}: The mean percentage of decrease in the income of retired U.S. households as a result of increased out-of-pocket medical expenses differs among households of differing income.

An increase in out-of-pocket medical expenses affected various age quintiles in a somewhat uniform fashion with the exception of age quintile 1, which experienced the greatest mean percentage of decrease. The ANOVA results revealed that the mean percentages of decrease between these age quintiles were significantly different from each other.

Also, the analysis of effects of an increase in out-of-pocket medical expenses by income quintiles revealed that the severities of these increases varied by income quintile. The mean percentage of decrease was the greatest for the least affluent households and decreased as households' wealth increased. Households in the highest income quintile had the smallest mean percentage of decrease; the results were significant at the 0.01 and 0.05 levels.

Before the analysis of the mean percentage of decrease in the retirement income as a result of increased out-of-pocket medical expenses, this study hypothesized that the mean percentage of decrease is the same among different income groups. The analysis of mean percentages of change by income quintiles revealed that the mean percentage of decrease was income quintile specific. As a result, the study rejected the null hypothesis that the mean percentage of decrease in retirement income was the same among different income households. The results were consistent with the findings of Love et al. (2008) and Fuchs, (1998). The magnitude of the mean percentage of decrease can be interpreted as support for a greater necessity to account for out-of-pocket medical expenses at retirement (French & Jones, 2004; Fronstin et al., 2008).

2f. *What is the simultaneous effect of wealth- and income-impacting events (2a-2e) on the income of retired U.S. households?*

Research question 2f simulated the simultaneous occurrence of events from research questions 2a-2e. This study represented the first time that such an extensive simulation had been performed. Therefore, there was no previous literature on this topic, and this study was unable to form any hypothesis regarding this research question. The simulation accounted for a 12.0% cut in SSB, outright default of pensions, a 20.0% decrease in home equity and 0.0% real returns, a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns, and a 150.0% increase in out-of-pocket medical expenses (Scenario X).

As a result of the Scenario X simulation, age quintile 1 experienced the greatest mean percentage of decrease, while age quintiles 2 to 5 experienced a homogeneous mean percentage of decrease. The findings were supported by the ANOVA results as only the mean percentage of decrease between age quintile 1 and all other age quintiles was significant while all other comparisons were not significant.

The analysis of the effects of the Scenario X simulation by income quintiles revealed that the severities of these effects varied by income quintile. The mean percentage of decrease was the greatest for the least affluent households and decreased in magnitude as households' wealth increased. Households in the highest income quintile had the smallest mean percentage of decrease as a result of the Scenario X simulation. ANOVA results confirmed that the majority of the mean percentage of decrease differed significantly from each other. Only the mean percentage of decrease between income quintiles 2 and 3 was not significant.

Before the simulations, this study did not hypothesize with regard to the effects of the Scenario X simulations on different age and income quintiles. This study represented the first time that the simultaneous occurrences of so many effects were analyzed, so no prior literature was available for the establishment of a hypothesis. In summary, the results of the simulation showed that the youngest and the least affluent households were the most severely affected by the outcomes of the simulations. Households in age quintiles 2 to 5 experienced a somewhat similar mean percentage of decrease to their retirement incomes. Analysis by income quintiles revealed that the effects of the simulation were income-quintile specific, and in a great majority of cases, the least affluent households were more severely affected.

Poverty

This study also explored the effects of wealth- and income-impacting events on households' ability to generate retirement income above the poverty threshold. The goal of this analysis was to estimate the mean percentage of increase in those households and, as a result, the additional burden placed on the U.S. budget as those households become eligible for additional benefits.

Nearly 15.4% of households who self-reported their status as retired did not generate annual retirement income above their poverty threshold. The first age and income quintiles had the greatest percentage of households with retirement income below the poverty threshold. The results for the youngest retirees followed reports of various media and surveys which stated that young households do not save enough for retirement and that many of them belong to a group that is at risk of not having sufficient retirement income (Helman et al., 2011; McConville, 2011; Taylor et al., 2007). The results for the least affluent households agree with the findings of some researchers who found that only the least affluent households might not have enough financial resources at retirement (Butrica et al., 2008; Love at al., 2008). This section summarizes only the effects of the final simulation for each research question on the percentages of households with retirement income below the poverty threshold.

The effects of all wealth and income events increased the percentage of households with retirement income below the poverty threshold. All simulations affected households in all age quintiles. However, most simulations affected only the first three income quintiles, which left the last two income quintiles unaffected. Still, there were some simulations that affected the most affluent households.

The 12.0% decrease in SSB was associated with a greater percentage of households that fell below the poverty threshold than before the decrease. Additionally, the decrease was associated with a 2.0% increase in the percentage of households below the poverty threshold. All age quintiles exhibited an increase in the percentage of households that fell below the poverty threshold; however, only households in the first three income quintiles increased the percentage of households with inadequate retirement income.

The effects of a 100.0% drop in pensions were associated with a 0.7% increase in the percentage of households that were not able to generate enough income above the poverty threshold. All age quintiles had households below the poverty threshold; however, the analysis by income quintile revealed that only households in the bottom two income quintiles increased the percentage of households below the poverty threshold.

The 20.0% decrease in home equity and 0.0% real growth were associated with a 1.1% increase in households that fell below the poverty threshold. All age quintiles had households below the poverty threshold, but only households in the first three income quintiles caused the percentage of households with inadequate retirement income to increase.

The effects of a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns were associated with a 0.7% increase in the percentage of households that were not able to generate enough income above the poverty threshold. All age quintiles had households below the poverty threshold, but only households in the first three income quintiles were associated with an increase in the percentage of households below the poverty threshold.

The effects of a 150% increase in the out-of-pocket medical expenses were associated with an 8.29% increase in the percentage of households that were not able to generate enough income above the poverty threshold. All age quintiles experienced an increase in the percentage of households below the poverty thresholds, while only the first four income quintiles had households that were not able to generate enough income above the poverty threshold.

The effects of the Scenario X simulation were associated with a 16.0% increase in the percentage of households that were not able to generate retirement income above the poverty threshold, which is the highest percentage among all simulations. Additionally, all age and income quintiles had households with retirement income below the poverty threshold.

In summary, as shown by the results of those simulations, individual wealth and income effects did not affect the retirement income of retired households as negatively as the combined effects did. The effects for the Scenario X simulation were associated with a greater percentage of households below the poverty threshold than the combined effect of all five effects analyzed separately. For the sum of individual effects, the combined percentage of households with retirement income below the poverty threshold was 4.5%. However, the Scenario X simulation was associated with an increase of 16.0% in households with retirement income below the poverty threshold.

The most important conclusion from this section is that policymakers, financial planners, and individual households need to understand that most individual wealth and income affecting events are not as threatening as the potential combination of those effects. Additionally, as the 2008 events showed, the interconnection of financial markets should be of concern as troubles in the real estate sector impacted the stock market sector, which negatively impacted the economy, job markets, pensions, government budgets, and many other financial areas. All those areas influence retirement decisions and/or retirement income of current and future retirees. Therefore, when preparing policies and planning for retirement, focus should not only be placed on individual effects but also on the potential interactive outcomes of more than one potential negative wealth- or income-impacting event.

Income Inequality

This study utilized the Gini coefficient to measure the effects of various wealth and income affecting events on the retirement income inequalities. The goal was not to determine whether the retirement income distribution was equal or unequal but to evaluate the affects of different events on the inequality. This approach allowed observation of the macroeconomic effects of those events as well as understanding of the bigger picture of the simulations.

The baseline Gini coefficient of income inequality was 0.527. This section summarizes only the effects of the final simulation of each research question on the Gini coefficient. A decrease in the SSB was associated with a 0.011 increase in the Gini coefficient, which indicated that the income inequality increased slightly. A 100.0% drop in pensions was associated with a minimal increase of 0.004 in the Gini coefficient. A simulation of a 20.0% decrease in home equity and 0.0% real growth was not associated with changes to the overall Gini coefficient.

A simulation of a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns was associated with a decrease of 0.026 in the Gini coefficient, which indicated that the income inequality has decreased. This result could be expected due to the fact that more wealthy individuals were more severely affected by this simulation than were less affluent households. A 150.0% increase in out-of-pocket medical expenses was associated with a 0.061 increase in the Gini coefficient. The Scenario X simulation was associated with a 0.070 change to the overall Gini coefficient.

In summary, most wealth and income impacting events were associated with an increase in retirement income inequalities. While not all events significantly increased the Gini coefficient in absolute terms, one simulation did exhibit a decrease in the coefficient. A 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns affected the wealthiest households in more severely than less affluent households; as a result, the Gini coefficient decreased.

The results of the Gini coefficient are intended primarily for policymakers, who are concerned about the gaps between different income groups. As a result, policymakers can asses which wealth- and income-impacting events increased, had a minimal effect on, and decreased those gaps; such information should assist policymakers in designing laws that address these issues accordingly.

Contribution to the Literature

This research contributes to retirement and policy literature in a number of ways. First, it provides a current analysis of retired households' income using timely and appropriate data. Therefore, policymakers receive the most recent information on retirement income by age and income quintiles. In addition, policymakers receive an estimation of the percentage of households that were not able to generate income above the poverty threshold. Also, this study provides the results of the Gini coefficient of income inequality among retired U.S. households, thereby allowing policymakers to evaluate the impact of potential bills on the overall retirement income inequality among retirees.

Second, this study provides a current analysis of the effects of numerous single wealth- and income-impacting events on the income of retired U.S. households. Each of these single-event scenarios identifies likely variations in retirees' incomes across age and income groups given current Social Security benefits, pension, housing, and medical expenditure projections.

Third, the research in this study represents the first time that an analysis of negative occurrences with regards to pensions has been performed. As a result, the academic community, financial planners, and policymakers gain a better understanding of the effects of changes in pensions.

Finally, a substantial body of literature has examined the wealth of retired households. However, only a small number of researchers have examined the effects of changes to that wealth on retired households (Brady, 2008; Cole & Liebenberg, 2008; Engen et al., 1999; Fuchs, 1998; Gustman et al., 2009; Love et al., 2008). Furthermore, this study, as far as can be determined, also represents the first time that the simultaneous effects of multiple wealth- and income-impacting events on the income of retired U.S. households have been estimated. This approach offers researchers and policymakers a unique insight into opportunities for specific program interactions that may occur under varying market and policy conditions.

The results of a literature search on the retirement readiness of U.S. households have mixed results. Some studies reported that households were prepared for retirement (Cole & Liebenberg, 2008; Feinschreiber & Laiosa, 2009; Hurd & Rohwedder, 2006; Munnell et al., 2007; Scholz & Seshadri, 2008), while other researchers concluded that only the least affluent households were not sufficiently prepared for retirement (Butrica et al., 2008; Love et al., 2008). The analysis of households with retirement income below the poverty thresholds by age and income quintiles showed that almost 71% of households in the first income quintile had retirement income levels below the poverty threshold, which is in line with the findings of Butrica et al., (2008) and Love et al. (2008), who stated that the least wealthy households are not sufficiently prepared for retirement. In addition, this study showed that 24.3% of the youngest group of retirees lived below the poverty threshold, which is two times higher than the average of 11.9% for the last four age quintiles. This finding should also be addressed by financial planners and policymakers as it might indicate an undesirable trend.

Limitations and Strengths

The purpose of this study is to provide a comprehensive work that estimates the effects of various wealth- and income-impacting events on the income of retired U.S. households. Such an examination presents many challenges, and some of the events examined can act as limitations to this study. Four major limitations are discussed in this section.

This study utilized the LCH as its theoretical framework, which influenced the way households' assets were treated. All assets were annuitized with appropriate discount rates. However, other research has shown that some assets, such as home equity, might not follow LCH's assumptions as some households do not plan to utilize home equity as an additional source of income at retirement (Munnell et al., 2007). As a result, it is possible that the value of households' retirement income was overstated for some households. On the other hand, an increase in the number of new reverse mortgages (U.S. Department of Housing and Urban Development, 2011) potentially indicates that the situation has been changing and that the utilization of reverse mortgages has become a more accepted form of funding retirement. In addition, utilization of the LCH required a set of assumptions about the discount rates, which is a difficult task. As a result, some of the study's results might be appropriate only when the specific set of assumptions about the discount rates is met but not valid when these assumptions are not fulfilled.

The review of literature section contains a discussion of several ways in which households can be classified as retired. This study utilized the self-reported method, because it was the best fit for the type of research questions and the theoretical framework that this study used. However, it is possible that other definitions of retirement could be of greater use when different research objectives or groups of interest were analyzed. Researchers should carefully select the best method for classifying retired households so the final sample adequately addresses the research objectives and accurately selects the groups of interest to the researchers.

A number of limitations are associated with the data set utilized. This research considered two potential data sets for this study; these were the Survey of Consumer Finances (SCF) and Health and Retirement Study (HRS). The SCF has more detailed financial information but has limited information on retirees. The HRS data set has more detailed information on retirees but has less detailed information on households' finances. Finally, the HRS data set was selected as it creates an acceptable compromise between the information on households' finances and retirees. However, some important implications are associated with this decision. First, the information on retirement assets lacks the detail provided by the SCF data set. As a result, some compromises were made; the age-weighted portfolio allocation was one of them. Also, the decision was made not to adjust negative values for the retirement income variable. Negative values indicated that households have more debt outflows than income inflows. Actually, some households with negative retirement income could file for bankruptcy and, potentially, bring their negative incomes to zero or even move to positive regions. Furthermore, prior studies indicated that home values might have been inaccurately reported (Kiel & Zabel, 1999; Venti & Wise, 2002). Also, the practice of underestimation of wealth by more affluent individuals has been identified (Davies & Shorrocks, 2000). Thus, the quality of self-reported financial variables may be questionable.

Finally, pension variables available to the general public were insufficient for the type of analysis that this study performed. As a result, pensions were treated as a financial asset and not an income stream[2]; there was no reliable way of distinguishing pension assets from income (Venti, 2011). Also, the distinction between private and public pensions was unfeasible. Even though the estimation of pensions is an important piece of this study, the researcher recognizes that more detailed information on pensions would allow for an additional level of analysis.

Strengths of the Research

Despite the limitations, this research has a number of strengths. First, the research question is appropriate to recent financial and social events in the U.S., considering the fact that the number of older adults in the United States is increasing (Lewis & Cho, 2011). An insight into their finances and into the effect of wealth- and income-impacting events on those finances is of great value to policymakers and professionals.

Second, the data for this research were drawn from the Health and Retirement Study, a nationally representative data set that allowed estimations to be applied to all retired households in the United States. This fact enables the policymakers to base their decisions on results that are representative of all retirees in the U.S. Third, this study used the most appropriate data set available, which included both detailed information on financial variables, out-of-pocket medical

[2] Appendix section includes analysis that treats pension variable as income.

expenses, and retirement information. While some compromises were made, the HRS data set reflects the best fit for the theory and research questions utilized. Fourth, theory was used throughout this study to motivate not only the variable choice and hypotheses but also to influence the methodology selection and explain the results. Such assimilation was not commonly seen in other empirical works based on the LCH as the theory was generally only used to select the variables and form the hypotheses. Fifth, the results benefit policymakers and financial planners by providing greater insight into the effects of simultaneous occurrences of wealth- and income-impacting events; the approach of this methodology represented real-life events more accurately. Finally, this study contributes to the current literature in relation to finances of retired households by providing information that was not available previously. The analysis of the effect of pensions decreases, and the simultaneous occurrence of wealth and income events have not been estimated previously. The results of estimations allow educators, financial planners, and policymakers to better understand the impact of those events on the retirement income of retired U.S. households.

Implications

Implications for Educators

The results of this study are of importance to educators as they provide further evidence that a group of retirees exists which is going to live below the poverty threshold. Thus, there are many retirees who are not able to maintain their current living standard.

In addition, this study estimated wealth- and income-impacting events that threaten households' ability to have retirement income above the poverty threshold. Even though retirement readiness is a topic of great importance to educators, risk management and accounting for unexpected events that can threaten such readiness should also be accounted for when analyzing retired households' finances.

This study explored a new area of research. Previously, the research community offered little insight into the effects of simultaneous occurrences of wealth- and income-impacting events. With this research, new possibilities are being created in which studies simulate events that better represent real-life economic events, because economic markets are interconnected, and often, events in one area can influence other seemingly unrelated areas of the economy.

Implications for Financial Planners

Risk management should be a part of every comprehensive financial plan. While all results of this study should be of importance to practitioners, financial planners should pay particular attention to the results of simultaneous occurrences of wealth- and income-impacting events. To mitigate the risks associated with these events, financial planners should employ a strategy that combines increased savings, fixed income financial vehicles, insurance products, and increased diversification in income streams. This strategy should help households to maximize their probability of having retirement income above the poverty threshold.

In addition, the results of the simulations showed that the youngest group of retirees had almost twice as many households with retirement income below the poverty threshold. To counteract this effect, financial planners should focus on creating retirement plans that account for the simulations from this research and suggest saving a greater percentage of their current income. Too often, a solution for inadequate saving rates is a greater percentage of exposure to the stock market, which can have some drastic consequences in the event of a potential market meltdown or a prolonged period of unusually low market returns. It is possible to over-save for retirement, as it also possible to under-save. Out of these two options, the first one is probably more appealing at retirement than the second one; especially if we consider potential wealth- and income-impacting events. Therefore, financial planners should encourage their clients to save a greater percentage of their current income and build a financial buffer that will be able to absorb a portion of wealth- and income-impacting events.

Implications for Policymakers

Policymakers can help households to become adequately prepared for retirement through various government policies. A set of multiple incentives can be made to help workers save for retirement and encourage higher percentage contributions to retirement plans. Tax incentives should help nudge households into desired saving behaviors just as we observed after the passage of the tax deferred contribution regulation (Moor & Mitchell, 1997).

In addition, government policies can focus on encouraging diversification and proper asset allocations. This task would be more difficult to implement, because the personal freedoms associated with asset allocation could potentially be infringed upon. However, if designed properly, certain tax benefits could encourage households to invest in a diversified portfolio of stocks, bonds, mutual funds, annuity and insurance products, real estate, and hedge funds. As a result, households would be rewarded for an increased variety of potential income streams and decreased potential risk of negative effects of wealth- and income-impacting events.

Suggestions for Future Research

Future research should focus on wealth- and income-impacting events that can threaten the income of retired U.S. households. Based on the extensive literature that analyzed the finances of retired households, it is safe to state that the academic community has a solid grasp of that topic. However, based on the slight amount of research done on the threats to those finances, the academic community should focus their research on those areas, as this study showed, in which simultaneous occurrences of certain events can have devastating effects on households' retirement income.

In addition, future research should also explore other events that can potentially affect the income of retired U.S. households. The increasing cost of living that is associated with rising prices is a factor that should be considered when analyzing retirement. Most research, including this study, uses historical averages of inflation. However, an estimation of the situation in which households experience a prolonged period of high inflation would be of value to many academics, financial planners, and policymakers. In addition to studies about inflation, previous research found that many households carry their mortgage debt with them to retirement (Green-Pimentel, 2009). Researchers could also estimate the effects of the increases in the rates of mortgages on the income of retired U.S. households.

Moreover, of interest to academics, practitioners, and policymakers could be the replication of parts of this research with a data set that provides more detailed information on pensions. Such studies would allow for distinguishing the wealth and income portion of pensions as well as designing experiments in which only private, PBGC insured, or local and state government pensions are negatively affected. Moreover, the potential loss of pension wealth and income is not the only benefit that can be lost by retired U.S. households. Many pensions provide additional benefits, such as health and disability insurance, that are not covered under PBGC (Pension Benefit Guaranty Corporation, 2010). Accounting for these factors would be a natural extension of this research and more detailed data on pensions would allow for a more precise estimation of the true effect of declines in pensions on the income of retired U.S. households.

Increasing out-of-pocket medical expenses create noticeable budget constraints when planning for retirement (French & Jones, 2004; Fronstin et al., 2008). Furthermore, increased longevity at retirement causes an even greater demand for capital to cover potential medical expenses (Fronstin, 2006). Researchers could consider models that account for different medical expenses. A possible improvement would be an estimation of a lump sum of capital that would be required to fund potential future households' medical expenses based on their health records. Also, accounting for existing medical insurance, co-pays, limits, and other elements would also be of great value to the academic community.

Finally, researchers whose work focuses on more applicable solutions to financial problems faced by households could design a financial product that would address some of the weaknesses of current investment vehicles. Currently, there are many different annuity products, reverse mortgages, mutual funds, and stock and bond derivatives. Use of the longitudinal nature of HRS would allow researchers to test new and current financial products and estimate savings or losses experienced by families as a result of the utilization of those products during the wealth and income affecting simulations. Later, those products could be offered to the general public as a way of avoiding risks associated with negative wealth- and income-impacting events.

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APPENDIX A

Adjustments to Extreme Observations

A number of variables had extreme observations that influenced point estimates and standard errors. There were a number of income variables that needed to be recoded. Pension income had a case in which an individual reported earning $60,000,000 a year. This case was recoded to the second highest value of $479,020. The unemployment or workers compensation income variable had only 34 cases. Even though the standard error of mean is quite substantial, the variable had a minuscule effect on the final computations and therefore, has not been adjusted. The Other Income variable had three observations that were classified as outliers; they were top coded at the $40,000 level.

Asset variables also needed some adjustments to minimize their influence on the standard errors. The second home and other real estate variables had one influential observation each. These were changed to the $3,000,000 and $4,000,000 levels, respectively. The business or farm assets and other assets variables had three observations each that influenced estimation of the standard errors; their values were changed to $3,000,000. The CDs, Gov. Bonds, and Bills variable had 5 influential cases that were recoded to $1,138,000 values. The assets 2nd home mortgage variable has 407 observations. Recoding had minimal effect on the standard error. This study utilizes net values of estate assets, and therefore, the variable was not utilized in a direct way. As a result, this variable was left unchanged.

APPENDIX B

Additional Tables for the Research Question 2a

Mean Retirement Income After a 4% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	42,769.00	2,257.120	-41,186.00	1,653,196.00
Age Q2	50,545.00	2,758.842	-4,712.86	1,653,196.00
Age Q3	51,128.00	3,006.636	-41,186.00	737,024.00
Age Q4	60,692.00	3,621.037	-2,562.70	2,310,865.00
Age Q5	80,772.00	4201.301	-1,017.04	1,849,588.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

The Mean Percentage of Decrease in Retirement Income After a 4% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-1.26***	0.051	-4.00	0.00
Age Q2	-2.10***	0.055	-4.00	0.00
Age Q3	-2.00***	0.056	-4.00	0.00
Age Q4	-1.92***	0.046	-4.00	0.00
Age Q5	-1.64***	0.046	-4.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After 4% Cut in SSB by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,303.35	167.423	-41,186.00	14,738.00
Income Q2	20,802.00	160.989	14,253.00	27,151.00
Income Q3	33,436.00	200.137	26,166.00	41,741.00
Income Q4	54,417.00	371.035	40,751.00	70,700.00
Income Q5	156,641.00	6,248.706	70,199.00	2,310,865.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

ANOVA Results of the Mean Percentage of Decrease After a 4% Cut in SSB *by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)*

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	***	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

The Mean Percentage of Decrease in Retirement Income After a 4% Cut in SSB by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-2.46***	0.054	-4.00	0.00
Income Q2	-2.34***	0.058	-4.00	0.00
Income Q3	-1.92***	0.051	-4.00	0.00
Income Q4	-1.33***	0.031	-4.00	0.00
Income Q5	-0.63***	0.019	-2.84	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 4% Cut in SSB (N= 6,314; 22,561,448 weighted)

Variables	SE[a]	Min	Max	Total Percent[b]	Quintile Percent[c]
Households in Poverty	0.816	0.00	1.00	16.14	
by Age Quintiles					
Quintile 1	0.581	0.00	1.00	7.01	24.60
Quintile 2	0.193	0.00	1.00	2.29	12.54
Quintile 3	0.171	0.00	1.00	2.09	13.79
Quintile 4	0.244	0.00	1.00	2.23	11.77
Quintile 5	0.240	0.00	1.00	2.52	13.20
by					
Income Quintile					

Variables	SE [a]	Min	Max	Total Percent [b]	Quintile Percent [c]
Quintile 1	0.810	0.00	1.00	15.07	73.47
Quintile 2	0.146	0.00	1.00	1.02	5.28
Quintile 3	0.040	0.00	1.00	0.05	0.27
Quintile 4	0.000	0.00	1.00	0.00	0.00
Quintile 5	0.000	0.00	1.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Standard Error of Percent.
[b] Describes the percentage of the total sample that comes from this quintile.
[c] Describes the percentage of a given quintile that is in poverty.

Mean Retirement Income After a 8% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	42,386.00	2,252.874	-42,047.00	1,651,986.00
Age Q2	49,875.00	2,755.336	-5,077.66	1,651,986.00
Age Q3	50,482.00	3,000.602	-42,047.00	735,980.00
Age Q4	60,054.00	3,617.334	-2,801.26	2,310,064.00
Age Q5	80,204.00	4,197.971	-1,017.04	1,849,300.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After an 8% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-2.56***	0.104	-8.00	0.00
Age Q2	-4.28***	0.112	-8.00	0.00
Age Q3	-4.07***	0.114	-8.00	0.00
Age Q4	-3.91***	0.094	-8.00	0.00
Age Q5	-3.34***	0.093	-8.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After 8% Cut in SSB by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,047.99	164.526	-42,047.00	14,685.00
Income Q2	20,322.00	162.631	13,529.00	27,151.00
Income Q3	32,803.00	202.674	25,107.00	41,671.00
Income Q4	53,712.00	368.681	39,250.00	70,473.00
Income Q5	155,922.00	6,245.138	69,047.00	2,310,064.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After an 8% Cut in SSB by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-4.99***	0.109	-8.00	0.00
Income Q2	-4.80***	0.118	-8.00	0.00
Income Q3	-3.93***	0.105	-8.00	0.00
Income Q4	-2.70***	0.063	-8.00	0.00
Income Q5	-1.27***	0.038	-5.86	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After an 8% Cut in SSB (N= 6,314; 22,561,448 weighted)

Variables	SE [a]	Min	Max	Total Percent [b]	Quintile Percent [c]
Households in Poverty	0.830	0.00	1.00	16.78	
by Age Quintiles					
Quintile 1	0.589	0.00	1.00	7.16	25.14
Quintile 2	0.215	0.00	1.00	2.42	13.26
Quintile 3	0.180	0.00	1.00	2.18	14.38
Quintile 4	0.237	0.00	1.00	2.35	12.38
Quintile 5	0.241	0.00	1.00	2.66	13.93
by					
Income Quintile					

Variables	SE [a]	Min	Max	Total Percent [b]	Quintile Percent [c]
Quintile 1	0.832	0.00	1.00	15.51	75.62
Quintile 2	0.168	0.00	1.00	1.21	6.26
Quintile 3	0.040	0.00	1.00	0.05	0.27
Quintile 4	0.000	0.00	1.00	0.00	0.00
Quintile 5	0.000	0.00	1.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Standard Error of Percent.
[b] Describes the percentage of the total sample that comes from this quintile.
[c] Describes the percentage of a given quintile that is in poverty.

Mean Retirement Income After 12% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	42,002.00	2,248.736	-42,908.00	1,650,776.00
Age Q2	49,206.00	2,751.878	-5,442.46	1,650,776.00
Age Q3	49,836.00	2,994.613	-42,908.00	734,936.00
Age Q4	59,417.00	3,613.662	-3,039.82	2,309,263.00
Age Q5	79,643.00	4,194.661	-1,017.04	1,849,012.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 12% Cut in SSB by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-3.91***	0.159	0.00	-12.00
Age Q2	-6.55***	0.171	0.00	-12.00
Age Q3	-6.22***	0.175	0.00	-12.00
Age Q4	-5.97***	0.144	0.00	-12.00
Age Q5	-5.09***	0.140	0.00	-12.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 12% Cut in SSB by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	8,792.62	161.814	-42,908.00	14,685.00
Income Q2	19,843.00	165.055	12,804.00	27,151.00
Income Q3	32,170.00	206.336	24,015.00	41,602.00
Income Q4	53,007.00	367.019	37,671.00	70,356.00
Income Q5	155,203.00	6,241.621	67,795.00	2,309,263.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 12% Cut in SSB by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-7.58***	0.166	-12.00	0.00
Income Q2	-7.36***	0.179	-12.00	0.00
Income Q3	-6.03***	0.163	-12.00	0.00
Income Q4	-4.13***	0.096	-12.00	0.00
Income Q5	-1.93***	0.057	-9.05	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 12% Cut in SSB (N= 6,314; 22,561,448 weighted)

Variables	SE[a]	Min	Max	Total Percent[b]	Quintile Percent[c]
Households in Poverty	0.836	0.00	1.00	17.40	
by Age Quintiles					
Quintile 1	0.600	0.00	1.00	7.26	25.51
Quintile 2	0.235	0.00	1.00	2.62	14.31
Quintile 3	0.184	0.00	1.00	2.24	14.74
Quintile 4	0.239	0.00	1.00	2.51	13.22
Quintile 5	0.245	0.00	1.00	2.78	14.55
by Income Quintile					

Variables	SE [a]	Min	Max	Total Percent [b]	Quintile Percent [c]
Quintile 1	0.823	0.00	1.00	15.96	77.80
Quintile 2	0.178	0.00	1.00	1.34	6.93
Quintile 3	0.056	0.00	1.00	0.10	0.55
Quintile 4	0.000	0.00	1.00	0.00	0.00
Quintile 5	0.000	0.00	1.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Standard Error of Percent.
[b] Describes the percentage of the total sample that comes from this quintile.
[c] Describes the percentage of a given quintile that is in poverty.

APPENDIX C

Additional Tables for the Research Question 2b

Mean Retirement Income After a 25% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	43,013.00	2,260.803	-40,949.00	1,654,405.00
Age Q2	51,034.00	2,762.483	-4,348.06	1,653,196.00
Age Q3	51,553.00	3,002.924	-40,949.00	737,145.00
Age Q4	61,082.00	3,617.878	-2,324.14	2,311,666.00
Age Q5	80,986.00	4,197.227	-1,017.04	1,849,876.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 25% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-0.72***	0.126	-25.00	0.00
Age Q2	-0.51***	0.051	-25.00	0.00
Age Q3	-0.53***	0.031	-25.00	0.00
Age Q4	-0.56***	0.046	-25.00	0.00
Age Q5	-0.73***	0.054	-25.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 25% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,494.21	170.991	-40,949.00	14,947.00
Income Q2	21,159.00	161.135	14,426.00	27,154.00
Income Q3	33,877.00	196.849	23,389.00	41,918.00
Income Q4	54,836.00	373.132	39,895.00	71,103.00
Income Q5	156,936.00	6,238.139	62,349.00	2,311,666.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 25% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-1.12***	0.196	-25.00	0.00
Income Q2	-0.58***	0.042	-14.47	0.00
Income Q3	-0.57***	0.033	-15.24	0.00
Income Q4	-0.53***	0.043	-17.73	0.00
Income Q5	-0.33***	0.023	-14.43	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 25% Cut in Pensions (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	15.54	0.00	1.00	0.790	
by Age Quintiles					
Quintile 1	6.96	0.00	1.00	0.587	24.42
Quintile 2	2.14	0.00	1.00	0.162	11.68
Quintile 3	2.04	0.00	1.00	0.173	13.45
Quintile 4	2.16	0.00	1.00	0.234	11.39
Quintile 5	2.25	0.00	1.00	0.241	11.77
by Income Quintile					
Quintile 1	14.54	0.00	1.00	0.787	70.85
Quintile 2	0.95	0.00	1.00	0.143	4.92
Quintile 3	0.05	0.00	1.00	0.040	0.27
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Standard Error of Percent.

[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After a 25% Cut in Pensions (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.528	
Percentile of Population		
10		1.24
20		3.44
40		11.00
50		16.50
60		23.30
80		43.60
90		59.90
95		72.60
99		91.80

Mean Retirement Income After a 50% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	42,872.00	2,260.308	-41,571.00	1,654,405.00
Age Q2	50,853.00	2,762.640	-4,348.07	1,654,405.00
Age Q3	51,330.00	2,993.381	-41,571.00	736,223.00
Age Q4	60,834.00	3,611.067	-2,324.14	2,311,666.00
Age Q5	80,635.00	4,190.176	-1,017.04	1,849,876.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 50% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-1.48***	0.267	-50.00	0.00
Age Q2	-1.02***	0.103	-50.00	0.00
Age Q3	-1.07***	0.065	-50.00	0.00
Age Q4	-1.13***	0.091	-50.00	0.00
Age Q5	-1.47***	0.107	-50.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 50% Cut in Pensions by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,427.69	171.845	-41,571.00	14,947.00
Income Q2	21,035.00	162.604	12,928.00	27,154.00
Income Q3	33,684.00	195.557	19,184.00	41,918.00
Income Q4	54,549.00	373.628	31,625.00	71,103.00
Income Q5	156,512.00	6,224.228	51,833.00	2,311,666.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 50% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	-2.29***	0.413	-50.00	0.00
Income Q2	-1.17***	0.084	-28.93	0.00
Income Q3	-1.14***	0.066	-30.48	0.00
Income Q4	-1.06***	0.085	-35.46	0.00
Income Q5	-0.65***	0.046	-28.87	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 50% Cut in Pensions (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	15.68	0.00	1.00	0.806	
by Age Quintiles					
Quintile 1	7.00	0.00	1.00	0.587	24.58
Quintile 2	2.16	0.00	1.00	0.163	11.84
Quintile 3	2.04	0.00	1.00	0.173	13.45
Quintile 4	2.18	0.00	1.00	0.234	11.50
Quintile 5	2.30	0.00	1.00	0.241	12.03
by					

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Income Quintile					
Quintile 1	14.64	0.00	1.00	0.790	71.35
Quintile 2	1.00	0.00	1.00	0.149	5.15
Quintile 3	0.05	0.00	1.00	0.040	0.27
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Standard Error of Percent.

[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After a 50% Cut in Pensions (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.529	
Percentile of Population		
10		1.24
20		3.43
40		11.00
50		16.40
60		23.20

Variables	Value	Percentile of Income
80		43.50
90		59.80
95		72.50
99		91.90

Mean Retirement Income After a 100% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	42,384.00	2,258.986	-42,817.00	1,654,405.00
Age Q2	50,487.00	2,763.261	-4,348.46	1,654,405.00
Age Q3	50,881.00	2,974.951	-42,817.00	734,377.00
Age Q4	59,334.00	3,597.640	-2,324.14	2,311,666.00
Age Q5	79,932.00	4,176.694	-1,017.04	1,849,876.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 100% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-2.99***	0.507	-100.00	0.00
Age Q2	-2.06***	0.205	-100.00	0.00
Age Q3	-2.16***	0.133	-100.00	0.00

Variables	Mean[a]	SE	Min	Max
Age Q4	-2.29***	0.187	-100.00	0.00
Age Q5	-2.94***	0.215	-100.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 100% Cut in Pensions by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,288.76	174.085	-42,817.00	14,947.00
Income Q2	20,779.00	167.427	9,080.48	27,154.00
Income Q3	33,295.00	194.836	10,442.00	41,918.00
Income Q4	53,973.00	378.508	14,376.00	71,103.00
Income Q5	155,663.00	6,197.055	30,800.00	2,311,666.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 100% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-4.64***	0.789	-100.00	0.00
Income Q2	-2.39***	0.173	-57.87	0.00
Income Q3	-2.29***	0.132	-62.16	0.00
Income Q4	-2.12***	0.171	-70.92	0.00

Variables	Mean[a]	SE	Min	Max
Income Q5	-1.30***	0.092	-57.73	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 100% Cut in Pensions (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	16.05	0.00	1.00	0.826	
by Age Quintiles					
Quintile 1	7.13	0.00	1.00	0.605	25.03
Quintile 2	2.26	0.00	1.00	0.177	12.36
Quintile 3	2.07	0.00	1.00	0.176	13.65
Quintile 4	2.20	0.00	1.00	0.236	11.57
Quintile 5	2.39	0.00	1.00	0.242	12.55
by Income Quintile					
Quintile 1	14.82	0.00	1.00	0.799	72.24
Quintile 2	1.18	0.00	1.00	0.186	6.09
Quintile 3	0.05	0.00	1.00	0.040	0.27
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Standard Error of Percent.
[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After a 100% Cut in Pensions (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.531	
Percentile of Population		
10		1.22
20		3.40
40		10.90
50		16.30
60		23.10
80		43.30
90		59.70
95		72.40
99		91.90

APPENDIX D

Additional Tables for the Research Question 2c

Mean Retirement Income After a 20% Decrease in Home Equity by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	41,526.00	2,103.123	-42,351.00	1,476,276.00
Age Q2	49,099.00	2,572.878	-4,348.06	1,476,276.00
Age Q3	49,601.00	2,906,904	-42,351.00	728,514.00
Age Q4	57,940.00	3,200.365	-4,804.41	1,869,509.00
Age Q5	77,672.00	4,008.546	-1,017.04	1,824,002.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 20% Decrease in Home Equity by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-3.84***	0.164	-20.00	0.00
Age Q2	-4.01***	0.155	-20.00	0.00
Age Q3	-4.41***	0.159	-20.00	0.00
Age Q4	-4.84***	0.169	-20.00	0.00
Age Q5	-4.64***	0.203	-20.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 20% Decrease in Home Equity by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,284.22	172.630	-42,351.00	14,947.00
Income Q2	20,271.00	165.617	4,864.37	27,142.00
Income Q3	32,303.00	206.949	14,270.00	41,922.00
Income Q4	52,418.00	391.072	33,755.00	70,783.00
Income Q5	150,732.00	5,748.273	60,053.00	1,869,509.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 20% Decrease in Home Equity by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-2.89***	0.265	-20.00	0.00
Income Q2	-4.55***	0.214	-20.00	0.00
Income Q3	-5.15***	0.213	-20.00	0.00
Income Q4	-4.94***	0.209	-20.00	0.00
Income Q5	-4.05***	0.198	-20.00	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 20% Decrease to the Home Equity (N= 6,314; 22,561,448 weighted)

Variables	SE [a]	Min	Max	Total Percent [b]	Quintile Percent [c]
Households in Poverty	0.818	0.00	1.00	16.19	
by Age Quintiles					
Quintile 1	0.584	0.00	1.00	7.14	25.08
Quintile 2	0.182	0.00	1.00	2.26	12.35
Quintile 3	0.174	0.00	1.00	2.10	13.82
Quintile 4	0.243	0.00	1.00	2.26	11.90
Quintile 5	0.243	0.00	1.00	2.43	12.73
by Income Quintile					
Quintile 1	0.813	0.00	1.00	14.87	72.47
Quintile 2	0.186	0.00	1.00	1.24	6.40
Quintile 3	0.045	0.00	1.00	0.08	0.42
Quintile 4	0.000	0.00	1.00	0.00	0.00
Quintile 5	0.000	0.00	1.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Standard Error of Percent.

[b] Describes the percentage of the total sample that comes from this quintile.

[c] Describes the percentage of a given quintile that is in poverty.

Gini Coefficient After a 20% Decrease in Home Equity (n= 6,586)

Variables	Value	Percentile of Income
GINI Coefficient	0.528	
Percentile of Population		
10		1.27
20		3.50
40		11.00
50		16.50
60		23.30
80		43.50
90		59.90
95		72.50
99		92.00

Mean Retirement Income After a 0% Real Growth in Real Estate by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	42,308.00	2,176.626	-44,306.00	1,570,168.00
Age Q2	49,875.00	2,755.336	-5,077.66	1,651,986.00
Age Q3	50,875.00	2,953.503	-44,306.00	735,241.00
Age Q4	60,308.00	3,509.846	-2,742.95	2,210,583.00
Age Q5	80,509.00	4,175.034	-1,017.04	1,846,381.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 0% Real Growth in Real Estate by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-1.69***	0.077	-6.90	0.00
Age Q2	-1.54***	0.063	-6.90	0.00
Age Q3	-1.44***	0.051	-6.90	0.00
Age Q4	-1.28***	0.042	-6.90	0.00
Age Q5	-0.89***	0.036	-4.74	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 0% Real Growth in Real Estate by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,482.06	168.724	-44,306.00	14,947.00
Income Q2	20,997.00	158.610	14,139.00	27,142.00
Income Q3	33,518.00	195.731	25,332.00	41,922.00
Income Q4	54,250.00	368.766	39,317.00	71,048.00
Income Q5	154,665.00	6,081.549	68,391.00	2,210,583.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 0% Real Growth in Real Estate by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	-0.85***	0.075	-6.90	0.00
Income Q2	-1.30***	0.064	-6.90	0.00
Income Q3	-1.61***	0.068	-6.90	0.00
Income Q4	-1.59***	0.055	-6.90	0.00
Income Q5	-1.62***	0.066	-6.90	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 0% Real Growth of Real Estate (N= 6,314; 22,561,448 weighted)

Variables	SE [a]	Min	Max	Total Percent [b]	Quintile Percent [c]
Households in Poverty	0.788	0.00	1.00	15.57	
by Age Quintiles					
Quintile 1	0.586	0.00	1.00	7.02	24.65
Quintile 2	0.167	0.00	1.00	2.15	11.77
Quintile 3	0.173	0.00	1.00	2.02	13.30
Quintile 4	0.234	0.00	1.00	2.16	11.38
Quintile 5	0.239	0.00	1.00	2.22	11.64
by					
Income Quintile					

Variables	SE [a]	Min	Max	Total Percent [b]	Quintile Percent [c]
Quintile 1	0.832	0.00	1.00	15.51	70.91
Quintile 2	0.168	0.00	1.00	1.21	5.03
Quintile 3	0.040	0.00	1.00	0.05	0.27
Quintile 4	0.000	0.00	1.00	0.00	0.00
Quintile 5	0.000	0.00	1.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Standard Error of Percent.

[b] Describes the percentage of the total sample that comes from this quintile.

[c] Describes the percentage of a given quintile that is in poverty.

Gini Coefficient After a 0% Real Growth of Real Estate (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.526	
Percentile of Population		
10		1.26
20		3.48
40		11.10
50		16.50
60		23.40
80		43.70

Variables	Value	Percentile of Income
90		60.00
95		72.70
99		91.80

Mean Retirement Income After a 20% Decrease in Home Equity and a 0% Real Growth in Real Estate by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	40,829.00	2,037.238	-46,139.00	1,407,243.00
Age Q2	48,225.00	2,484.966	-4,348.06	1,407,243.00
Age Q3	48,830.00	2,854.908	-46,139.00	726,252.00
Age Q4	57,082.00	3,109.082	-5,121.07	1,788,642.00
Age Q5	76,963.00	3,986.348	-1,017.04	1,820,984.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of *Decrease* in Retirement Income After a 20% Decrease in Home Equity and a 0% Real Growth in Real Estate by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-5.29***	0.228	-26.90	0.00
Age Q2	-5.31***	0.205	-26.90	0.00
Age Q3	-5.62***	0.196	-26.90	0.00

Variables	Mean[a]	SE	Min	Max
Age Q4	-5.91***	0.200	-26.90	0.00
Age Q5	-5.41***	0.238	-26.90	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 20% Decrease in Home Equity and a 0% Real Growth in Real Estate by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,226.16	171.971	-46,139.00	14,947.00
Income Q2	20,052.00	166.301	4,864.36	27,142.00
Income Q3	31,863.00	208.201	14,172.00	41,922.00
Income Q4	51,704.00	391.003	33,035.00	70,783.00
Income Q5	148,391.00	5,618.967	58,336.00	1,820,984.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 20% Decrease in Home Equity and a 0% Real Growth in Real Estate by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-3.73***	0.344	-26.90	0.00
Income Q2	-5.60***	0.260	-26.90	0.00
Income Q3	-6.46***	0.254	-26.90	0.00
Income Q4	-6.24***	0.242	-23.46	0.00

Variables	Mean[a]	SE	Min	Max
Income Q5	-5.47***	0.240	-26.90	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 20% Decrease in Home Equity and a 0% Real Growth in Real Estate (N= 6,314; 22,561,448 weighted)

Variables	SE [a]	Min	Max	Total Percent [b]	Quintile Percent [c]
Households in Poverty	0.842	0.00	1.00	16.53	
by Age Quintiles					
Quintile 1	0.603	0.00	1.00	7.40	25.97
Quintile 2	0.182	0.00	1.00	2.27	12.43
Quintile 3	0.174	0.00	1.00	2.14	14.11
Quintile 4	0.241	0.00	1.00	2.27	11.94
Quintile 5	0.243	0.00	1.00	2.45	12.85
by					
Income Quintile					
Quintile 1	0.832	0.00	1.00	15.05	73.36
Quintile 2	0.198	0.00	1.00	1.38	7.14
Quintile 3	0.047	0.00	1.00	0.10	0.51
Quintile 4	0.000	0.00	1.00	0.00	0.00
Quintile 5	0.000	0.00	1.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Standard Error of Percent.
[b] Describes the percentage of the total sample that comes from this quintile.
[c] Describes the percentage of a given quintile that is in poverty.

Gini Coefficient After a 20% Decrease in Home Equity and a 0% Real Growth in Real Estate

(n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.527	
Percentile of Population		
10		1.27
20		3.52
40		11.10
50		16.50
60		23.30
80		43.50
90		60.00
95		72.60
99		91.90

APPENDIX E

Additional Tables for the Research Question 2d

Mean Retirement Income After a 10% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	40.861.00	2,102.256	-43,362.00	1,535,402.00
Age Q2	48,752.00	2,545.697	-4,348.06	1,535,402.00
Age Q3	49,329.00	2,751.498	-43,362.00	633,388.00
Age Q4	58,719.00	3,496.013	-2,324.14	2,307,277.00
Age Q5	77,548.00	3,921.038	-1,017.04	1,665,106.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 10% Decrease in Stocks and a 1.5% decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-3.36***	0.207	-20.82	0.00
Age Q2	-2.78***	0.144	-16.53	0.00
Age Q3	-2.73***	0.147	-14.80	0.00
Age Q4	-2.55***	0.098	-14.90	0.00
Age Q5	-2.44***	0.096	-14.90	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After 10% Decrease in Stocks and 1.5% decrease in Portfolio Returns by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,491.21	168.196	-43,362.00	14,944.00
Income Q2	21,013.00	161.811	14,362.00	27,154.00
Income Q3	32,250.00	198.654	23,716.00	41,884.00
Income Q4	53,048.00	356.764	37,369.00	70,438.00
Income Q5	147,574.00	5,826.741	64,707.00	2,307,277.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 10% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-0.91***	0.100	-14.80	0.00
Income Q2	-1.25***	0.116	-15.12	0.00
Income Q3	-2.37***	0.157	-16.26	0.00
Income Q4	-3.73***	0.133	-16.05	0.00
Income Q5	-5.72***	0.183	-20.82	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 10% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	15.56	0.00	1.00	0.802	
by Age Quintiles					
Quintile 1	7.08	0.00	1.00	0.601	24.85
Quintile 2	2.14	0.00	1.00	0.162	11.68
Quintile 3	2.02	0.00	1.00	0.174	13.35
Quintile 4	2.13	0.00	1.00	0.234	11.21
Quintile 5	2.20	0.00	1.00	0.240	11.52
by Income Quintile					
Quintile 1	14.48	0.00	1.00	0.790	70.59
Quintile 2	1.03	0.00	1.00	0.173	5.32
Quintile 3	0.05	0.00	1.00	0.040	0.27
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile

[b] Standard Error of Percent

[c] Describes the percentage of the quintile that is in poverty

Gini Coefficient After a 10% Decrease in Stocks and a 1.5% Decrease in Portfolio Returns (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.518	
Percentile of Population		
10		1.30
20		3.60
40		11.40
50		17.10
60		24.10
80		44.50
90		60.80
95		72.20
99		92.30

Mean Retirement Income After a 20% Decrease in Stocks and a 3% Decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	38,867.00	1,976.557	-46,398.00	1,431,633.00
Age Q2	46,554.00	2,359.643	-4,348.06	1,431,633.00
Age Q3	47,112.00	2,524.323	-46,398.00	539,642.00
Age Q4	56,318.00	3,386.082	-2,324.14	2,303,071.00

Variables	Mean	SE	Min	Max
Age Q5	73.982.00	3,656.633	-1,017.04	1,488,641.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 20% Decrease in Stocks and a 3% Decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-6.30***	0.387	-38.44	0.00
Age Q2	-5.28***	0.273	-30.94	0.00
Age Q3	-5.21***	0.280	-27.85	0.00
Age Q4	-4.92***	0.188	-28.46	0.00
Age Q5	-4.75***	0.185	-28.46	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 20% Decrease in Stocks and a 3% Decrease in Portfolio Returns by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,429.55	166.513	-46,398.00	14,944.00
Income Q2	20,768.00	165.728	13,620.00	27,154.00
Income Q3	32,507.00	209.579	19,778.00	41,884.00
Income Q4	51,174.00	354.620	32,509.00	70,111.00
Income Q5	138,691.00	5,463.522	55,583.00	2,303,071.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 20% Decrease in Stocks and a 3% Decrease in Portfolio Returns by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-1.73[A]	0.188	-27.76	0.00
Income Q2	-2.39[A]	0.218	-28.13	0.00
Income Q3	-4.52[A]	0.294	-30.16	0.00
Income Q4	-7.09[A]	0.249	-29.69	0.00
Income Q5	-10.90[A]	0.342	-38.44	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 20% Decrease in Stocks and a 3% Decrease in Portfolio Returns (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	15.68	0.00	1.00	0.801	
by Age Quintiles					
Quintile 1	7.08	0.00	1.00	0.601	24.85
Quintile 2	2.14	0.00	1.00	0.162	11.68
Quintile 3	2.06	0.00	1.00	0.176	13.56
Quintile 4	2.16	0.00	1.00	0.234	11.39

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Quintile 5	2.25	0.00	1.00	0.252	11.80
by Income Quintile					
Quintile 1	14.57	0.00	1.00	0.790	71.02
Quintile 2	1.03	0.00	1.00	0.173	5.32
Quintile 3	0.08	0.00	1.00	0.050	0.43
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income Quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Standard Error of Percent.

[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After a 20% Decrease in Stocks and a 3% Decrease in Portfolio Returns (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.509	
Percentile of Population		
10		1.35
20		3.74

Variables	Value	Percentile of Income
40		11.80
50		17.60
60		24.70
80		45.30
90		61.50
95		73.70
99		91.90

Mean Retirement Income After a 30% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	37,152.00	1,879.440	-49,434.00	1,342,329.00
Age Q2	44,610.00	2,202.130	-4,348.06	1,342,329.00
Age Q3	45,112.00	2,329.145	-49,434.00	456,318.00
Age Q4	54,116.00	3,292.908	-2,324.14	2,299,051.00
Age Q5	70,628.00	3,410.704	-1,017.04	1,320,375.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 30% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-8.85[A]	0.540	-53.05	0.00
Age Q2	-7.49[A]	0.382	-43.34	0.00
Age Q3	-7.47[A]	0.399	-39.45	0.00
Age Q4	-7.10[A]	0.269	-40.73	0.00
Age Q5	-6.93[A]	0.268	-40.73	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 30% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	9,373.35	165.348	-49,434.00	14,944.00
Income Q2	20,545.00	170.980	12,038.00	27,154.00
Income Q3	31,837.00	226.319	16,469.00	41,884.00
Income Q4	49,489.00	362.815	27,827.00	69,794.00
Income Q5	130,664.00	5,156.274	47,140.00	2,299,051.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 30% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-2.45***	0.263	-38.32	0.00
Income Q2	-3.43***	0.307	-39.13	0.00
Income Q3	-6.46***	0.413	-41.85	0.00
Income Q4	-10.12***	0.350	-41.10	0.00
Income Q5	-15.55***	0.480	-53.05	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 30% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	16.09	0.00	1.00	0.822	
by Age Quintiles					
Quintile 1	7.37	0.00	1.00	0.644	25.88
Quintile 2	2.18	0.00	1.00	0.165	11.92
Quintile 3	2.06	0.00	1.00	0.176	13.56
Quintile 4	2.16	0.00	1.00	0.234	11.39
Quintile 5	2.32	0.00	1.00	0.249	12.18
by					

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Income Quintile					
Quintile 1	14.67	0.00	1.00	0.788	71.50
Quintile 2	1.34	0.00	1.00	0.134	6.93
Quintile 3	0.08	0.00	1.00	0.083	0.43
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Standard Error of Percent.

[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After a 30% Decrease in Stocks and a 4.5% Decrease in Portfolio Returns (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.501	
Percentile of Population		
10		1.39
20		3.87
40		12.20
50		18.10

Variables	Value	Percentile of Income
60		25.40
80		46.00
90		62.20
95		74.30
99		92.20

APPENDIX F

Additional Tables for the Research Question 2e

Mean Retirement Income After a 50% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	41,058.00	2,269.634	-54,236.00	1,653,638.00
Age Q2	49,244.00	2,728.609	-10,577.00	1,653,638.00
Age Q3	49,703.00	2,973.001	-54,236.00	735,618.00
Age Q4	59,185.00	3,582.303	-5,875.98	2,305,466.00
Age Q5	79,236.00	4,151.530	-4,735.04	1,824,726.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 50% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-9.18***	0.717	-100.00	0.00
Age Q2	-6.02***	0.309	-100.00	0.00
Age Q3	-6.28***	0.375	-100.00	0.00
Age Q4	-6.32***	0.360	-100.00	0.00
Age Q5	-6.19***	0.549	-100.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 50% Increase in Out-of-Pocket Medical Expenses by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	8,387.37	184.081	-54,236.00	14,897.00
Income Q2	19,464.00	176.313	591.64	27,044.00
Income Q3	31,724.00	253.238	3,077.30	41,884.00
Income Q4	52,723.00	367.739	22,743.00	70,533.00
Income Q5	154,700.00	6,204.273	57,672.00	2,305,466.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage Change to Retirement Income After a 50% Increase in Out-of-Pocket Medical Expenses by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-13.28***	0.972	-100.00	0.00
Income Q2	-8.55***	0.470	-100.00	0.00
Income Q3	-7.02***	0.492	-100.42	0.00
Income Q4	-4.38***	0.202	-84.42	0.00
Income Q5	-2.15***	0.106	-28.40	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 50% Increase in Out-of-Pocket Medical Expenses (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	18.01	0.00	1.00	0.860	
by Age Quintiles					
Quintile 1	7.58	0.00	1.00	0.624	26.60
Quintile 2	2.56	0.00	1.00	0.203	14.01
Quintile 3	2.34	0.00	1.00	0.182	15.45
Quintile 4	2.62	0.00	1.00	0.261	13.81
Quintile 5	2.90	0.00	1.00	0.243	15.20
by Income Quintile					
Quintile 1	15.89	0.00	1.00	0.827	77.45
Quintile 2	1.84	0.00	1.00	0.213	9.54
Quintile 3	0.27	0.00	1.00	0.100	1.43
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile

[b] Standard Error of Percent

[c] Describes the percentage of the quintile that is in poverty

GINI Coefficient After a 50% Increase in Out-of-Pocket Medical Expenses (n= 6,586)

Variables	Value	Percentile of Income
GINI Coefficient	0.543	
Percentile of Population		
10		0.99
20		3.05
40		10.20
50		15.50
60		22.20
80		42.40
90		59.00
95		71.80
99		91.70

Mean Retirement Income After a 100% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	38,963.00	2,283.157	-68,146.00	1,652,871.00
Age Q2	47,273.00	2,697.457	-21,162.00	1,652,871.00
Age Q3	47,632.00	2,937.914	-68,146.00	733,168.00
Age Q4	57,041.00	3,543.025	-21,062.00	2,299,266.00
Age Q5	77,135.00	4,102.458	-21,523.00	1,847,576.00

Note. Age Quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 100% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-18.36***	1.434	-200.00	0.00
Age Q2	-12.04***	0.618	-200.00	0.00
Age Q3	-12.56***	0.750	-200.00	0.00
Age Q4	-12.63***	0.720	-200.00	0.00
Age Q5	-12.37***	0.830	-200.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 100% Increase in Out-of-Pocket Medical Expenses by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	7,216.01	229.872	-68,146.00	14,892.00
Income Q2	17,647.00	237.378	-16.158.00	27,041.00
Income Q3	29,379.00	380.458	-21,523.00	41,884.00
Income Q4	50,324.00	391.661	3,542.52	70,114.00
Income Q5	152,041.00	6,159.437	41,292.00	2,299,266.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 100% Increase in Out-of-Pocket Medical Expenses by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-26.56***	1.945	-200.00	0.00
Income Q2	-17.10***	0.941	-193.18	0.00
Income Q3	-14.04***	0.984	-177.76	0.00
Income Q4	-8.75***	0.404	-91.55	0.00
Income Q5	-4.30***	0.212	-44.24	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 100% Increase in Out-of-Pocket Medical Expenses (N= 6,314; 22,561,448 weighted)

Variables	Total Percent[a]	Min	Max	SE[b]	Quintile Percent[c]
Households in Poverty	20.60	0.00	1.00	0.860	
by Age Quintiles					
Quintile 1	8.24	0.00	1.00	0.631	28.92
Quintile 2	3.14	0.00	1.00	0.244	17.19
Quintile 3	2.72	0.00	1.00	0.216	17.95
Quintile 4	3.16	0.00	1.00	0.271	16.66
Quintile 5	3.33	0.00	1.00	0.243	17.48
by					

Variables	Total Percent[a]	Min	Max	SE[b]	Quintile Percent[c]
Income Quintile					
Quintile 1	16.65	0.00	1.00	0.843	81.15
Quintile 2	3.12	0.00	1.00	0.316	16.13
Quintile 3	0.75	0.00	1.00	0.199	3.94
Quintile 4	0.08	0.00	1.00	0.051	0.41
Quintile 5	0.00	0.00	1.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Standard Error of Percent.

[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After a 100% Increase in Out-of-Pocket Medical Expenses (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.563	
Percentile of Population		
10		0.39
20		2.31
40		9.11
50		14.30
60		20.90

Variables	Value	Percentile of Income
80		41.00
90		57.80
95		71.00
99		91.40

Mean Retirement Income After a 150% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	36,868.00	2,301.949	-82,056.00	1,652,104.00
Age Q2	45,302.00	2,669.034	-45,762.00	1,652,104.00
Age Q3	45,560.00	2,907.620	-82,056.00	730,718.00
Age Q4	54,896.00	3,507.348	-45,762.00	2,293,066.00
Age Q5	75,035.00	4,057.581	-46,123.00	1,846,426.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After a 150% Increase in Out-of-Pocket Medical Expenses by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-27.53***	2.1518	-300.00	0.00
Age Q2	-18.06***	0.927	-300.00	0.00
Age Q3	-18.84***	1.125	-300.00	0.00

Variables	Mean[a]	SE	Min	Max
Age Q4	-18.95***	1.080	-300.00	0.00
Age Q5	-18.56***	1.244	-300.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After a 150% Increase in Out-of-Pocket Medical Expenses by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	6,044.66	293.147	-82,05600	14,892.00
Income Q2	15,829.00	318.487	-32,908.00	15,829.00
Income Q3	27,033.00	530.438	-46,123.00	41,884.00
Income Q4	47,925.00	440.939	-15,657.00	70,044.00
Income Q5	148,391.00	5,618.967	58,336.00	1,820,984.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After a 150% Increase in Out-of-Pocket Medical Expenses by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-39.84***	2.917	-300.00	0.00
Income Q2	-25.64***	1.411	-289.77	0.00
Income Q3	-21.07***	1.477	-266.64	0.00
Income Q4	-13.13***	0.606	-137.31	0.00

Variables	Mean[a]	SE	Min	Max
Income Q5	-6.45***	0.318	-66.36	0.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After a 150% Increase in Out-of-Pocket Medical Expenses (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	23.68	0.00	1.00	0.920	
by Age Quintiles					
Quintile 1	9.16	0.00	1.00	0.641	32.15
Quintile 2	3.76	0.00	1.00	0.251	20.59
Quintile 3	3.22	0.00	1.00	0.238	21.20
Quintile 4	3.82	0.00	1.00	0.295	20.13
Quintile 5	3.72	0.00	1.00	0.244	19.50
by Income Quintile					
Quintile 1	17.15	0.00	1.00	0.887	83.60
Quintile 2	4.87	0.00	1.00	0.423	25.17
Quintile 3	1.42	0.00	1.00	0.237	7.44
Quintile 4	0.25	0.00	1.00	0.075	1.23
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Standard Error of Percent.
[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After a 150% Increase in Out-of-Pocket Medical Expenses (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.588	
Percentile of Population		
10		-0.47
20		1.34
40		7.77
50		12.80
60		19.30
80		39.60
90		56.70
95		70.10
99		91.10

APPENDIX G

Additional Tables for the Research Question 2f

Mean Retirement Income After Scenario X Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	27,024.00	1,685.416	-102,050.00	1,089,236.00
Age Q2	33,185.00	1,821.498	-50,370.00	1,089,236.00
Age Q3	33,344.00	2,009.068	-102,050.00	431,199.00
Age Q4	40,743.00	2,596.158	-50,370.00	1,755,023.00
Age Q5	57,054.00	3,003.508	-57,068.00	1,287,169.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After the Scenario X Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-47.72***	2.474	-358.57	0.00
Age Q2	-38.71***	0.915	-358.57	0.00
Age Q3	-39.60***	1.187	-358.57	0.00
Age Q4	-39.60***	1.119	-358.57	0.00
Age Q5	-38.65***	1.385	-358.57	-4.16

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After Scenario X Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	4,551.10	294.790	-102,050.00	14,430.00
Income Q2	12,042.00	322.585	-35,589.00	24,370.00
Income Q3	20,126.00	491.823	-57,068.00	40,621.00
Income Q4	35,895.00	408.058	-26,265.00	63,977.00
Income Q5	110,226.00	4,292.625	3,876.11	2,299,051.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After the Scenario X Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-57.92***	3.519	-358.57	0.00
Income Q2	-43.48***	1.444	-305.22	-0.03
Income Q3	-41.33***	1.386	-306.19	-0.40
Income Q4	-34.98***	0.646	-162.62	-3.20
Income Q5	-30.34***	0.663	-105.23	-2.01

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After Scenario X Simulation by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	31.43	0.00	1.00	1.035	
by Age Quintiles					
Quintile 1	11.80	0.00	1.00	0.754	41.44
Quintile 2	5.31	0.00	1.00	0.328	29.05
Quintile 3	4.38	0.00	1.00	0.254	28.88
Quintile 4	4.98	0.00	1.00	0.314	26.24
Quintile 5	4.94	0.00	1.00	0.283	25.94
by Income Quintile					
Quintile 1	18.98	0.00	1.00	0.970	92.50
Quintile 2	8.26	0.00	1.00	0.842	42.75
Quintile 3	3.39	0.00	1.00	0.687	17.80
Quintile 4	0.71	0.00	1.00	0.776	3.54
Quintile 5	0.08	0.00	1.00	0.948	0.39

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Standard Error of Percent.

[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After Scenario X Simulation (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.597	
Percentile of Population		
10		-1.40
20		0.52
40		7.13
50		12.30
60		18.90
80		39.40
90		56.90
95		70.40
99		91.20

APPENDIX H

Additional Analysis of Simultaneous Occurrences of Events.

Scenario 1 simulates the effect of wealth- and income- events over which households exercise at least partial and can protect their finances from through various risk management and financial planning techniques. This scenario focuses on changes to housing equity and returns, stock market meltdown, and an increase in out-of-pocket medical expenses (Scenario 1). The Scenario 1 simulation accounts for a 20.0% decrease in home equity and 0.0% real returns, a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns, and 150.0% increase in out-of-pocket medical expenses. The outcome of those three effects can be potentially hedged against by retired households. For example, utilization of the Home Equity Conversion Mortgage (HECM) loan by a retired household would lock in the value of their home equity shifting the home equity depreciation risk to the HECM provider (Chen, Cox, & Wang, 2010). Also, a desirable solution for many households might be turning a portion of their financial wealth invested in the stock market into an annuity product that pays a constant sum of money with guaranteed returns for as long as the households' members live (Horneff, Maurer, Mitchell, & Dus, 2008). This solution mitigates a number of potential risk as it protects the annuitized sum of money from negative events to the stock market (Horneff, et al., 2008) and protects households from the risk of outliving their assets (Mitchell, 2010). Lastly, households can exercise some degree of control over their out-of-pocket medical expenses, as having supplemental insurance can lower those expenses in retirement (Frostin, 2006).

Scenario 2 focuses on the effects of wealth- and income-impacting events that can be created or prevented by the policymakers. This scenario analyzes the simultaneous occurrence of changes in SSB, outright default of pension plans, and an increase in out-of-pocket medical expenses (Scenario 2). This Scenario 2 simulation will account for a 12.0% cut in SSB, outright default of pensions, and 150.0% increase in out-of-pocket medical expenses. The state and federal governments have a degree of control over the potential wealth- and income-impacting events. For example, instead of reducing the SSB, the government could increase the payroll tax rate to cover Social Security shortfalls (Office of the Chief Actuary, 2010) or combine the current Social Security system with an investment based personal account (Chaffetz, 2011; Feldstein & Samwick, 2001). Both options have been shown to avoid reductions in SSB (Chaffetz, 2011; Feldstein & Samwick, 2001; Office of the Chief Actuary, 2010). Also, historical data shows that the government can, to certain extent, impact the cost of the health care (Altman & Levitt, 2002). Therefore, policymakers' initiative, or their lack thereof, can influence health care costs and the level of out-of-pocket medical expenses.

Results:

This research estimated the impact of three scenarios that could affect retired U.S. households.

Scenario 1 simulates the effect of events that can potentially be controlled by households. This scenario focuses on changes to housing equity and returns, stock market meltdown, and an increase in out-of-pocket medical expenses. The outcome of those three effects can be potentially hedged against households as they can sell their house and rent a home, annuitize their investment assets, and purchase more extensive health insurance.

Scenario 2 focuses on changes that can be controlled by the U.S. government. This scenario analyzes the simultaneous occurrence of changes in SSB, outright default of pension plans, and an increase in out-of-pocket medical expenses. The goal of this simulation is to estimate the effect of changes, or the lack of the effects, that can be proposed by the policymakers as they have the power to: allocate additional resources to avoid cuts in SSB; can require pensions to increase funding levels; and can control the percent of out-of-pocket medical expenses that households pay.

The results of a 20.0% decrease in home equity and 0.0% real returns, a 30.0% decrease in portfolios' stock assets and a 4.5% decrease in portfolios' annual returns, and a 150.0% increase in out-of-pocket medical expenses (Scenario 1) are provided in the table below, which summarizes the results of those cuts in the mean retirement income and the mean percentage of decrease in the retirement income associated with the Scenario 1 simulation.

Mean Retirement Income and the Mean Percentage of Decrease Before and After Scenario 1 Simulation by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	Scenario 1	
Variables	Mean	Mean	Percent Change[a]
Age Q1	43,153.00	28,543.00	-41.88
Age Q2	51,215.00	35,708.00	-31.00
Age Q3	51,775.00	35,953.00	-32.07
Age Q4	61,329.00	43,438.00	-32.11
Age Q5	81,336.00	59,953.00	-31.22
Income Q1	9,491.21	5,526.734	-46.89

	Baseline	Scenario 1	
Variables	Mean	Mean	Percent Change[a]
Income Q2	21,013.00	13,864.00	-34.76
Income Q3	32,250.00	22,595.00	-34.00
Income Q4	53,048.00	38,872.00	-29.49
Income Q5	147,574.00	113,718.00	-27.47

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The Scenario 1 simulation affected various age quintiles in a somewhat uniform fashion with the exception of age quintile 1, which experienced the greatest mean percentage of decrease. Households in age quintile 1 experienced, on average, a 41.9% decrease in their retirement income. The mean percentage of decrease between age quintiles 2 to 5 was smaller than the mean percentage of decrease for age quintile 1. Households in age quintiles 2 to 5 experienced the mean percentage of deceases that ranged from 31.0% to 32.1%.

The analysis of effects of the Scenario 1 simulation by income quintiles revealed that the severities of these cuts varied by income quintile. The mean percentage of decrease was the greatest for the least affluent households and decreased as households' wealth increased. Households in the highest income quintile had the smallest mean percentage of decrease as a result the Scenario 1 simulation.

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After Scenario 1 Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

Only the mean percentage of decrease in retirement income between age quintiles 1 and all other age quintiles were significantly different from each other. The results were significant at the 0.01 level. The ANOVA results did not indicate any other significant changes between different age quintiles. In conclusion, changes between age quintiles 2 to 5 were not significantly different from each other, which indicate that households in those income categories experienced a similar mean percentage of decrease.

The mean percentage of decrease in the retirement income by income quintiles was significant between most income quintiles. The changes were significant at the 0.01, 0.05, and 0.1 levels. Only the mean percentage of decrease between income quintiles 2 and 3 and between income quintiles 4 and 5 was not significantly different.

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After the Scenario 1 Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***		--		
Income Q4	***	**	*		
Income Q5	***	***	***		--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

The effects of the Scenario 1 simulation were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with an 11.7% increase in the percentage of households in poverty. All age and income quintiles had households below the poverty threshold. The Scenario 1 simulation was severe enough to place some households from the highest income quintile below the poverty threshold.

Poverty Before and After the Scenario 1 Simulation by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		Scenario 1	
Variables	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]
Households in Poverty	15.39		27.01	

	Baseline		Scenario 1	
Variables	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]
by Age Quintiles				
Quintile 1	6.92	24.29	10.78	37.85
Quintile 2	2.13	11.68	4.40	24.08
Quintile 3	2.01	13.23	3.52	23.20
Quintile 4	2.13	11.21	4.29	22.58
Quintile 5	2.20	11.52	4.02	21.08
by Income Quintile				
Quintile 1	14.38	70.11	17.70	86.29
Quintile 2	0.95	4.92	6.26	32.40
Quintile 3	0.05	0.21	2.41	12.65
Quintile 4	0.00	0.00	0.59	2.93
Quintile 5	0.00	0.00	0.04	0.21

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile that is in poverty.

The Scenario 1 simulation was associated with an increase in the Gini coefficient. The coefficient increased by 0.046, which indicates that less wealthy individuals were more severely affected by the Scenario 1 simulations.

Gini Coefficient Before and After the Scenario 1 Simulation Returns (n= 6,586)

	Baseline		Scenario 1	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.573	
Pcnt of Population				
10		1.25		-0.96
20		3.46		1.12
40		11.00		8.24
50		16.50		13.60
60		23.40		20.05
80		43.60		41.30
90		60.00		58.50
95		72.60		71.70
99		91.80		91.70

The results of a 12.0% cut in SSB, outright default of pensions, and a 150.0% increase in out-of-pocket medical expenses (Scenario 2) are provided in the table below, which summarizes the results of those cuts in the mean retirement income and the mean percentage of decrease in the mean retirement income associated with the Scenario 2 simulation.

Mean Retirement Income and the Mean Percentage of Decrease Before and After the Scenario 2 Simulation by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	Scenario 1		Scenario 2	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	43,153.00	28,543.00	-41.88	35.149.00	-35.62
Age Q2	51,215.00	35,708.00	-31.00	42,566.00	-26.53
Age Q3	51,775.00	35,953.00	-32.07	42,727.00	-27.25
Age Q4	61,329.00	43,438.00	-32.11	51,991.00	-27.11
Age Q5	81,336.00	59,953.00	-31.22	71,937.00	-26.83
Income Q1	9,491.21	5,526.734	-46.89	5,008.60	-54.82
Income Q2	21,013.00	13,864.00	-34.76	13,890.00	-34.92
Income Q3	32,250.00	22,595.00	-34.00	24,359.00	-28.99
Income Q4	53,048.00	38,872.00	-29.49	44,659.00	-19.16
Income Q5	147,574.00	113,718.00	-27.47	145,530.00	-9.63

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The Scenario 2 simulation affected various age quintiles in a somewhat uniform fashion with the exception of age quintile 1, which experienced the greatest mean percentage of decrease. Households in age quintile 1 experienced, on average, a 35.6% decrease in their retirement income. The mean percentage of decrease between age quintiles 2 to 5 was smaller than the percentage of decrease for age quintile 1. Households in age quintiles 2 to 5 experienced mean percentage of decease that ranged from 26.5% to 27.3%.

The analysis of the effects of the Scenario 2 simulation by income quintiles revealed that the severities of these cuts varied by income quintile. The mean percentage of decrease was the greatest for the least affluent households and decreased as households' wealth increased. Households in the highest income quintile had the smallest mean percentage of decrease as a result of the Scenario 2 simulation.

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After the Scenario 2 Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***		--		
Age Q4	***			--	
Age Q5	***				--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

Only the mean percentage of decrease in retirement income between age quintiles 1 and all other age quintiles was significantly different from each other. The results were significant at the 0.01 level. The ANOVA results did not indicate any other significant changes between different age quintiles. In conclusion, changes between age quintiles 2 to 5 were not significantly different from each other.

The mean percentage of decrease in the retirement income by income quintiles was significant between all income quintiles. The changes were significant at the 0.01 level for most income quintiles. Only the mean percentage of decrease between income quintiles 2 and 3 was significant at the 0.05 level.

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After the Scenario 2 Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	**	--		
Income Q4	***	***	***	--	
Income Q5	***	***	***	***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
*p < .1. **p < .05. ***p < .01

The effects of the Scenario 2 simulation were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 12.2% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold; however, the analysis by income quintile revealed that only households in the first four income quintiles increased the percentage of households below the poverty threshold. The top income quintile did not have any households below the poverty threshold

Poverty Before and After the Scenarios 1 and 2 Simulations by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		Scenario 1		Scenario 2	
Variables	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]	Total Pcnt [a]	Quint Pcnt [b]
Households in Poverty	15.39		27.01		27.60	
by Age Quintiles						
Quintile 1	6.92	24.29	10.78	37.85	10.34	36.32
Quintile 2	2.13	11.68	4.40	24.08	4.68	25.61
Quintile 3	2.01	13.23	3.52	23.20	3.76	24.81
Quintile 4	2.13	11.21	4.29	22.58	4.48	23.56
Quintile 5	2.20	11.52	4.02	21.08	4.33	22.70
by Income Quintile						
Quintile 1	14.38	70.11	17.70	86.29	18.47	90.04
Quintile 2	0.95	4.92	6.26	32.40	6.75	34.89
Quintile 3	0.05	0.21	2.41	12.65	1.95	10.23
Quintile 4	0.00	0.00	0.59	2.93	0.43	2.13
Quintile 5	0.00	0.00	0.04	0.21	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Describes the percentage of a given quintile that is in poverty.

The Scenario 2 simulation was associated with a 0.081 increase in the Gini coefficient. This indicates that the retirement income of the least wealthy households was affected more greatly than the retirement income of more affluent households. In addition, it is the highest value obtained by this research as a result of any simulations.

Gini Coefficient Before and After the Scenarios 1 and 2 Simulations (n= 6,586)

	Baseline		Scenario 1		Scenario 2	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.573		0.608	
Pcnt of Population						
10		1.25		-0.96		-0.91
20		3.46		1.12		0.87
40		11.00		8.24		6.83
50		16.50		13.60		11.60
60		23.40		20.05		17.90
80		43.60		41.30		37.90
90		60.00		58.50		55.20
95		72.60		71.70		69.00
99		91.80		91.70		90.70

Mean Retirement Income After Scenario 1 Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	28,543.00	1,700.521	-96,977.00	1,092,865.00
Age Q2	35,708.00	1,833.532	-47,910.00	1,092,865.00
Age Q3	35,953.00	2,052.766	-96,977.00	437,152.00
Age Q4	43,438.00	2,626.284	-47,910.00	1,757,426.00
Age Q5	59,953.00	3,033,714	-54,312.00	1,288,033.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After the Scenario 1 Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-41.88***	2.206	-340.91	0.00
Age Q2	-31.00***	0.876	-340.91	0.00
Age Q3	-32.07***	1.188	-340.91	0.00
Age Q4	-32.11***	1.088	-340.91	0.00
Age Q5	-31.22***	1.326	-340.91	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After Scenario 1 Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	5,526.734	295.124	-96,977.00	14,892.00
Income Q2	13,864.00	318.753	-33,756.00	26,715.00
Income Q3	22,595.00	509.662	-54,312.00	40,785.00
Income Q4	38,872.00	413.569	-24,565.00	65,252.00
Income Q5	113,718.00	4,346.63	-3,300.11	1,757,426.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After the Scenario 1 Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-46.89***	3.196	-340.91	0.00
Income Q2	-34.76***	1.428	-294.65	0.00
Income Q3	-34.00***	1.432	-296.23	0.00
Income Q4	-29.49***	0.647	-158.57	-0.83
Income Q5	-27.47***	0.650	-104.46	-2.01

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After Scenario 1 Simulation by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	27.01	0.00	1.00	0.990	
by Age Quintiles					
Quintile 1	10.78	0.00	1.00	0.740	37.85
Quintile 2	4.40	0.00	1.00	0.256	24.08
Quintile 3	3.52	0.00	1.00	0.235	23.20
Quintile 4	4.29	0.00	1.00	0.314	22.58
Quintile 5	4.02	0.00	1.00	0.262	21.08
by					
Income Quintile					
Quintile 1	17.70	0.00	1.00	0.970	86.29
Quintile 2	6.26	0.00	1.00	0.842	32.40
Quintile 3	2.41	0.00	1.00	0.687	12.65
Quintile 4	0.59	0.00	1.00	0.776	2.93
Quintile 5	0.04	0.00	1.00	0.948	0.21

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Standard Error of Percent.

[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After 10 Scenario 1 Simulation (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.573	
Percentile of Population		
10		-0.96
20		1.12
40		8.24
50		13.60
60		20.05
80		41.30
90		58.50
95		71.70
99		91.70

Mean Retirement Income After Scenario 2 Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	35.149.00	2,287.509	-87,129.00	1,648,475.00
Age Q2	42,566.00	2,658.952	-48,253.00	1,648,475.00
Age Q3	42,727.00	2,854.717	-87,129.00	723,895.00
Age Q4	51,991.00	3,471.128	-48,253.00	2,290,663.00
Age Q5	71,937.00	4,023.629	-49,413.00	1,845,562.00

Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Mean Percentage of Decrease in Retirement Income After the Scenario 2 Simulation by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Age Q1	-35.62***	2.742	-396.07	0.00
Age Q2	-26.53***	1.039	-396.07	0.00
Age Q3	-27.25***	1.267	-396.07	0.00
Age Q4	-27.11***	1.182	-396.07	0.00
Age Q5	-26.83***	1.443	-396.07	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Mean Retirement Income After Scenario 2 Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	5,008.60	292.594	-87,129.00	14,430.00
Income Q2	13,890.00	323.948	-34,796.00	25,938.00
Income Q3	24,359.00	521.379	-49,413.00	40,621.00
Income Q4	44,659.00	439.103	-18,560.00	68,358.00
Income Q5	145,530.00	6,052.756	24,336.00	2,290,663.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

Mean Percentage of Decrease in Retirement Income After the Scenario 2 Simulation by Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean[a]	SE	Min	Max
Income Q1	-54.82***	3.740	-396.07	0.00
Income Q2	-34.92***	1.432	-300.65	0.00
Income Q3	-28.99***	1.463	-278.53	0.00
Income Q4	-19.16***	0.620	-143.05	-0.30
Income Q5	-9.63***	0.338	-68.82	-0.12

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.
[a] Results of a paired t-test.
*p < .1. **p < .05. ***p < .01

Poverty After Scenario 2 Simulation (N= 6,314; 22,561,448 weighted)

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Households in Poverty	27.60	0.00	1.00	1.026	
by Age Quintiles					
Quintile 1	10.34	0.00	1.00	0.703	36.32
Quintile 2	4.68	0.00	1.00	0.315	25.61
Quintile 3	3.76	0.00	1.00	0.234	24.81
Quintile 4	4.48	0.00	1.00	0.328	23.56
Quintile 5	4.33	0.00	1.00	0.256	22.70
by Income Quintile					

Variables	Total Percent [a]	Min	Max	SE [b]	Quintile Percent [c]
Quintile 1	18.47	0.00	1.00	0.876	90.04
Quintile 2	6.75	0.00	1.00	0.499	34.89
Quintile 3	1.95	0.00	1.00	0.245	10.23
Quintile 4	0.43	0.00	1.00	0.115	2.13
Quintile 5	0.00	0.00	1.00	0.000	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$14,947; second quintile—$27,173; third quintile—$41,992; fourth quintile—$71,292.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Standard Error of Percent.

[c] Describes the percentage of the quintile that is in poverty.

Gini Coefficient After Scenario 2 Simulation (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.608	
Percentile of Population		
10		-0.91
20		0.87
40		6.83
50		11.60
60		17.90
80		37.90

Variables	Value	Percentile of Income
90		55.20
95		69.00
99		90.70

APPENDIX I

Changes to Research Question 2B and Retirement Income

This section contains changes to the research question 2b. Here, the pension variable was treated as an element of income stream. As such, there is an overall increase in retirement income.

Income Descriptive Statistics (N= 6,314; 22,561,448 weighted)

Variables	Mean (Median)	SE	Min	Max
Earned Income	1,802.68 (0.00)	235.122	0.00	175,000.00
Capital Income	7,979.22 (217.85)	980.417	0.00	3,000,480.00
Pension	11,796.00 (1,917.12)	565.088	0.00	479,020.00
Social Security DI or SSI	1,096.91 (0.00)	93.600	0.00	49,154.00
Social Security Benefits	13,960.00 (13,191.00)	201.091	0.00	86,582.00
Unemployment Benefits	30.46 (0.00)	10.812	0.00	19,170.00
Government Transfers	1,344.60	140.570	0.00	98,400.00

Variables	Mean (Median)	SE	Min	Max
	(0.00)			
Other Income	253.65 (0.00)	43.485	0.00	40,000.00
Sum of Income Elements	38,263.00 (26,875.00)	1,494.516	0.00	3,010,980

Other income variable was modified so it does not include lump-sum payments. As a result, the mean value of this variable has decreased from $1,058 (see Table 11) to $253.

Household Income Variables (N= 6,314; 22,561,448 weighted)

Variables	Mean (Median)	SE	Min	Max
Retirement Income	74,808.00 (45,227.00)	2,867.493	-35,106.00	3,271,907.00
Income Stream	38,263.00 (26,727.00)	1,494.516	0.00	3,010,980.00
Annuitized Income				
Financial Income	20,178.00 (3,399.33)	1,016.118	-106,188.00	1,653,213.00
Estate Income	16,367.00 (6,572.64)	1074.167	-23,632.00	2,210,788.00

Pension income has been moved from the financial income to the income stream section. This adjustment resulted in an increase in the overall retirement income and income stream, and decrease to the financial income.

Mean Retirement Income by Age Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Age Q1	58,701.00	3,017.192	-35,106.00	1,789,405.00
Age Q2	70,949.00	3,654.731	-4,348.06	1,789,405.00
Age Q3	73,034.00	4,993.931	-1,533.43	3,271,907.00
Age Q4	79,379.00	4,536.191	-2,324.14	2,346,737.00
Age Q5	99,410.00	6,920.890	-1,017.04	2,518,164.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.

Overall, households in all age quintiles experienced an increase in their mean retirement income. The same situation is with households in income quintiles.

ANOVA Results of Mean Retirement Income by Retirement Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	*	--			
Age Q3	**		--		
Age Q4	***			--	
Age Q5	***	***	***	***	--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
$^{*}p < .1$. $^{**}p < .05$. $^{***}p < .01$

Mean Retirement Income by Retirement Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Mean	SE	Min	Max
Income Q1	10,827.00	187.645	-35,106.00	17,829.00
Income Q2	26,241.00	197.968	17,829.00	34,849.00
Income Q3	44,842.00	258.766	34,857.00	56,626.00
Income Q4	74,754.00	383.802	56,652.00	97,699.00
Income Q5	209,798.00	8,544.620	97,745.00	3,271,907.00

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.

Poverty by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

Variables	Total Percent[a]	Min	Max	SE[b]	Quintile Percent[c]
Households in Poverty	12.96	0.00	1.00	0.735	
by Age Quintiles					
Quintile 1	5.97	0.00	1.00	0.552	20.97
Quintile 2	1.72	0.00	1.00	0.160	9.40
Quintile 3	1.60	0.00	1.00	0.167	10.54
Quintile 4	1.77	0.00	1.00	0.195	9.31
Quintile 5	1.90	0.00	1.00	0.206	9.96

Variables	Total Percent[a]	Min	Max	SE[b]	Quintile Percent[c]
by					
Income Quintile					
Quintile 1	12.21	0.00	1.00	0.729	59.51
Quintile 2	0.75	0.00	1.00	0.135	3.86
Quintile 3	0.00	0.00	1.00	0.000	0.00
Quintile 4	0.00	0.00	1.00	0.000	0.00
Quintile 5	0.00	0.00	1.00	0.000	0.00

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Standard Error of Percent.
[c] Describes the percentage of the quintile that is in poverty.

After accounting for pension income as an income, the percentage of households that were not able to generate enough income above the poverty threshold decreased. The coefficient of income inequality moved from 0.527 to 0.537.

Gini Coefficient (n= 6,586)

Variables	Value	Percentile of Income
Gini Coefficient	0.537	
Percentile of Population		
10		1.07
20		2.99

Variables	Value	Percentile of Income
40		10.10
50		15.50
60		22.50
80		43.40
90		60.00
95		72.50
99		91.50

Research Question 2b Modified

What are the likely effects of pension benefit reductions and outright defaults on the income of retired U.S. households? This research estimated the impact of a 25.0% decrease in pensions, a 50.0% decrease in pensions, and an outright default of pensions on retirement income, poverty rates, and income inequalities among retired U.S. households.

Mean Retirement Income and Mean Percentage of Decrease Before and After a 25.0% Cut in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	25% Cuts	
Variables	Mean	Mean	Percent Change[a]
Age Q1	58,701.00	55,544.00	-4.81
Age Q2	70,949.00	67,778.00	-4.52

	Baseline	25% Cuts	
Variables	Mean	Mean	Percent Change[a]
Age Q3	73,034.00	69,792.00	-4.30
Age Q4	79,379.00	76,506.00	-3.83
Age Q5	99,410.00	97,142.00	-2.99
Income Q1	10,827.00	10,684.00	-1.14
Income Q2	26,241.00	25,365.00	-3.53
Income Q3	44,842.00	42,689.00	-5.30
Income Q4	74,754.00	70,853.00	-5.83
Income Q5	209,798.00	202,394.00	-4.94

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.
[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The results of a 25.0% cut in pensions by age and income quintiles are provided in the table above, which summarizes the results of those cuts in the mean retirement income and the mean percentage of decrease in the mean retirement income associated with the cuts.

A 25.0% cut in pensions affected various age quintiles in a somewhat uniform fashion. The most significant impact was on age quintiles 1, 2, and 3, whereas age quintiles 3 and 5 experienced the least severe mean percentage changes to their income. These income decreases might be explained by the fact that the youngest households might self-report as retired because they receive pension benefits. Still, this group might not be old enough to claim SSB. Therefore, pensions can provide a much greater share of retirement income of the youngest retired households.

The analysis of cuts in pensions by income quintiles revealed that the severities of these cuts varied by income quintile. Households that belonged to the first income quintile were the least significantly affected by the cuts while households in the fifth income quintile had the largest mean percentage of decrease in their retirement income.

ANOVA Results of Mean Percentage of Decrease in Retirement Income After a 25.0% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2		--			
Age Q3			--		
Age Q4	***	**		--	
Age Q5	***	***	***	***	--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

Only mean percentage of decrease in retirement income between age quintiles 5 and all other age quintiles were significantly different from each other. The results were significant at the 0.05 level. Also, the changes between age quintile 4 and quintiles 1 and 2 were significant. The ANOVA results did not indicate any other significant changes between different age quintiles.

The mean percentage of decrease in the retirement income by income quintiles were only significant between first two income quintiles and remaining three quintiles. In addition, changes between income quintile 4 and 5 were significant. Other comparisons between remaining income quintiles were not statistically significant.

ANOVA Results of Mean Percentage of Decrease in Retirement Income After a 25.0% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	***	--		
Income Q4	***	***		--	
Income Q5	***	***		***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.
*$p < .1$. **$p < .05$. ***$p < .01$

The effects of a 25.0% drop in pensions were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 0.36% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. However, the analysis by income quintile revealed that only households in the first three income quintiles increased the percentage of households below the poverty threshold. The top two income quintiles did not have any households below the poverty threshold.

Poverty Before and After a 25.0% Cut in Pensions by Age and Income Quintiles *(N= 6,314; 22,561,448 weighted)*

	Baseline		25% Cuts	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	12.96		13.32	
by Age Quintiles				
Quintile 1	5.97	20.97	6.08	21.36
Quintile 2	1.72	9.40	1.77	9.67
Quintile 3	1.60	10.54	1.63	10.73
Quintile 4	1.77	9.31	1.87	9.83
Quintile 5	1.90	9.96	1.98	10.39
by Income Quintile				
Quintile 1	12.21	59.51	12.60	62.33
Quintile 2	0.75	3.86	0.71	3.62
Quintile 3	0.00	0.00	0.02	0.13
Quintile 4	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.

[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile.

As shown in the table below, a 25.0% cut in pensions was associated with a very minimal increase in the Gini coefficient.

Gini Coefficient Before and After a 25.0% Cut in Pensions (n= 6,586)

	Baseline		25% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.527		0.528	
Pcnt of Population				
10		1.25		1.24
20		3.46		3.44
40		11.00		11.00
50		16.50		16.50
60		23.40		23.30
80		43.60		43.60
90		60.00		59.90
95		72.60		72.60
99		91.80		91.80

The results of a 50.0% cut in pensions are shown in the table below. As in the case of the 25.0% cuts, the most significant impact was on age quintiles 1, 2, and 3, whereas age quintiles 3 and 5 experienced the least severe mean percentage changes to their income. Analysis by income quintiles also followed the pattern of the 25.0% cuts as income quintile 1 also experienced the lowest mean percentage decrease.

Mean Retirement Income Before and After 25.0% and 50.0% Cuts in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	25% Cuts		50% Cuts	
Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	58,701.00	55,544.00	-4.81	52,386.00	-10.71
Age Q2	70,949.00	67,778.00	-4.52	64,607.00	-10.06
Age Q3	73,034.00	69,792.00	-4.30	51,330.00	-1.07
Age Q4	79,379.00	76,506.00	-3.83	66,550.00	-9.54
Age Q5	99,410.00	97,142.00	-2.99	94,874.00	-6.51
Income Q1	10,827.00	10,684.00	-1.14	10,542.00	-2.44
Income Q2	26,241.00	25,365.00	-3.53	24,490.00	-7.77
Income Q3	44,842.00	42,689.00	-5.30	40,536.00	-11.69
Income Q4	74,754.00	70,853.00	-5.83	66,951.00	-13.05
Income Q5	209,798.00	202,394.00	-4.94	194,990.00	-11.02

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

The mean percentage of decrease in retirement income of households in age quintile 1and 2 were significantly different from changes experienced by households in all other age quintiles. In addition, households in age quintile 4 had different changes from households in age quintile 5.

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 50.0% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2	***	--			
Age Q3	***	***	--		
Age Q4	***	***	*	--	
Age Q5	***	***		***	--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

The ANOVA analysis of the mean percentage of decrease by income quintiles revealed that households in income quintiles 1 and 2 had significantly different changes from households in all other income quintiles. The changes were significant at 0.01 levels.

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 50.0% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			

Income Q3	***	***	--		
Income Q4	***	***	*	--	
Income Q5	***	***		***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.
*p < .1. **p < .05. ***p < .01

The effects of a 50.0% drop in pensions were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 0.8% increase in the percentage of households in poverty. All age quintiles had households below the poverty threshold. However, the analysis by income quintile revealed that only households in the first three income quintiles increased the percentage of households below the poverty threshold as a result of the cuts in pensions. The top two income quintiles did not have any households below the poverty threshold.

Poverty Before and After 25.0% and 50.0% Cuts in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		25% Cuts		50% Cuts	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	12.96		13.32		13.76	
by Age Quintiles						
Quintile 1	5.97	20.97	6.08	21.36	6.28	22.05
Quintile 2	1.72	9.40	1.77	9.67	1.80	9.84
Quintile 3	1.60	10.54	1.63	10.73	1.73	11.39

Quintile 4	1.77	9.31	1.87	9.83	1.93	10.19
Quintile 5	1.90	9.96	1.98	10.39	2.02	10.58
by						
Income Quintile						
Quintile 1	12.21	59.51	12.60	62.33	12.73	62.98
Quintile 2	0.75	3.86	0.71	3.62	1.01	5.14
Quintile 3	0.00	0.00	0.02	0.13	0.02	0.13
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.

[a] Describes the percentage of the total sample that comes from this quintile.

[b] Describes the percentage of a given quintile.

A 50.0% drop in pensions was associated with a minimal increase in the Gini coefficient. The increase of 0.006 was so minute that it might be safe to conclude that the 50.0% drop basically did not affect the income inequality.

Gini Coefficient Before and After 25.0% and 50.0% Cuts in Pensions (N = 6,586)

	Baseline		25% Cuts		50% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.537		0.539		0.543	
Pcnt of						

	Baseline		25% Cuts		50% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Population						
10		1.07		1.11		1.14
20		2.99		3.07		3.12
40		10.10		10.20		10.20
50		15.50		15.60		15.50
60		22.50		22.50		22.30
80		43.40		43.00		42.40
90		60.00		59.40		58.60
95		72.50		72.00		71.30
99		91.50		91.30		91.20

The results for 100.0% cuts in pensions are shown in the table below. As in the case of 25.0% and 50.0% cuts, households in the first three age quintiles had the highest mean percentage of decrease in their retirement income. Analysis by income quintiles also followed the pattern of 25.0% and 50.0% cuts as income quintile 1 also experienced the lowest mean percentage decrease.

Mean Retirement Income Before and After 25.0%, 50.0%, and 100.0% Cuts in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline	25% Cuts	50% Cuts	100% Cuts

Variables	Mean	Mean	Percent Change[a]	Mean	Percent Change[a]	Mean	Percent Change[a]
Age Q1	58,701.00	55,544.00	-4.81	52,386.00	-10.71	46,070.00	-25.42
Age Q2	70,949.00	67,778.00	-4.52	64,607.00	-10.06	58,266.00	-24.44
Age Q3	73,034.00	69,792.00	-4.30	51,330.00	-1.07	60,066.00	-23.21
Age Q4	79,379.00	76,506.00	-3.83	66,550.00	-9.54	67,887.00	-20.19
Age Q5	99,410.00	97,142.00	-2.99	94,874.00	-6.51	90,339.00	-15.11
Income Q1	10,827.00	10,684.00	-1.14	10,542.00	-2.44	10,258.00	-5.51
Income Q2	26,241.00	25,365.00	-3.53	24,490.00	-7.77	22,740.00	-18,43
Income Q3	44,842.00	42,689.00	-5.30	40,536.00	-11.69	36,230.00	-28.21
Income Q4	74,754.00	70,853.00	-5.83	66,951.00	-13.05	59,149.00	-31.44
Income Q5	209,798.00	202,394.00	-4.94	194,990.00	-11.02	180,182.00	-26.17

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.

[a] Results of paired t-tests revealed that the differences between mean retirement incomes before and after wealth- and income-impacting events were significantly different at the 0.01 level for all age and income quintiles.

ANOVA Results of Mean Percentage of Decrease in Retirement Income After a 100.0% Cut in Pensions by Age Quintiles (N= 6,314; 22,561,448 weighted)

	Age Q1	Age Q2	Age Q3	Age Q4	Age Q5
Age Q1	--				
Age Q2		--			
Age Q3			--		
Age Q4	***	**		--	

Age Q5	***	***	***	***	--

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106.
*p < .1. **p < .05. ***p < .01

The mean percentage of decrease in retirement income of households in age quintile 5 was significantly different from changes experienced by households in all other age quintiles. In addition, households in age quintile 4 had different changes from households in age quintiles 1 and 2.

The ANOVA analysis of the mean percentage of decrease by income quintiles revealed that households in income quintiles 1 and 5 had significantly different changes from households in all other income quintiles. The changes were significant at 0.01, 0.05, and 0.1 levels.

ANOVA Results of the Mean Percentage of Decrease in Retirement Income After a 100.0% Cut in Pensions by Income Quintiles (N= 6,314; 22,561,448 weighted)

	Income Q1	Income Q2	Income Q3	Income Q4	Income Q5
Income Q1	--				
Income Q2	***	--			
Income Q3	***	*	--		
Income Q4	***	***	*	--	
Income Q5	***	***		***	--

Note. Income quintile upper limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.
*p < .1. **p < .05. ***p < .01

The effects of a 100.0% drop in pensions were associated with an increase in the percentage of households that were not able to generate enough income above the poverty threshold. This decrease was associated with a 1.68% increase in the percentage of households in poverty. All age and income quintiles had households below the poverty threshold.

Poverty Before and After 25.0%, 50.0%, and 100.0% Cuts in Pensions by Age and Income Quintiles (N= 6,314; 22,561,448 weighted)

	Baseline		25% Cuts		50% Cuts		100% Cuts	
Variables	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]	Total Pcnt[a]	Quint Pcnt[b]
Households in Poverty	12.96		13.32		13.76		15.74	
by Age Quintiles								
Quintile 1	5.97	20.97	6.08	21.36	6.28	22.05	6.96	24.44
Quintile 2	1.72	9.40	1.77	9.67	1.80	9.84	2.21	12.10
Quintile 3	1.60	10.54	1.63	10.73	1.73	11.39	2.00	13.21
Quintile 4	1.77	9.31	1.87	9.83	1.93	10.19	2.17	11.43
Quintile 5	1.90	9.96	1.98	10.39	2.02	10.58	2.39	12.55
by Income Quintile								
Quintile 1	12.21	59.51	12.60	62.33	12.73	62.98	13.18	65.24
Quintile 2	0.75	3.86	0.71	3.62	1.01	5.14	1.65	8.42
Quintile 3	0.00	0.00	0.02	0.13	0.02	0.13	0.58	3.11
Quintile 4	0.00	0.00	0.00	0.00	0.00	0.00	0.30	1.47
Quintile 5	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09

Note. Age quintile lower/upper age limits were: lowest quintile—44/67; second quintile—68/72; third quintile—73/76; fourth quintile—77/82; fifth quintile—83/106. Income quintile upper

limits (in 2008 dollars) were: lowest quintile—$17,829; second quintile—$34,849; third quintile—$56,626; fourth quintile—$97,699.
[a] Describes the percentage of the total sample that comes from this quintile.
[b] Describes the percentage of a given quintile.

A 100.0% drop in pensions was associated with a minimal increase of 0.024 in the Gini coefficient.

Gini Coefficient Before and After 25.0%, 50.0%, and 100.0% Cuts in Pensions (N = 6,586)

	Baseline		25% Cuts		50% Cuts		100% Cuts	
Variables	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income	Value	Pcnt of Income
Gini Coefficient	0.537		0.539		0.543		0.561	
Pcnt of Population								
10		1.07		1.11		1.14		1.10
20		2.99		3.07		3.12		3.06
40		10.10		10.20		10.20		9.82
50		15.50		15.60		15.50		14.70
60		22.50		22.50		22.30		21.10
80		43.40		43.00		42.40		40.03
90		60.00		59.40		58.60		56.40
95		72.50		72.00		71.30		69.60
99		91.50		91.30		91.20		90.20

Before the analysis of changes in the retirement income as a result of changes in pensions, this study hypothesized that the mean percentage of decrease in the income of retired U.S. households after changes in pensions would be different among different income households. The analysis of mean income of retirement income by income quintiles and ANOVA analysis of percentage changes to retirement income by income quintiles revealed that the mean percentage of decrease was income quintile specific, so the study rejects the null hypothesis that the changes in retirement income were the same among different income households. The conclusions were based on consistent ANOVA results that indicated that the least and the most affluent households experienced a significant mean percentage of decrease in their income.