Labor Force Participation of Those Near Retirement Age in the United States

By: Katelyn Klinck

Advisor: Dr. Naples

Abstract

This paper will examine the changing participation rates in the labor force of men and women aged 55-64 and those 65 and older from 1975 to 2009. It will examine how and to what extent real average individual defined benefit and defined contribution assets (retirement assets), real health care expenditure per capita, real housing prices, U6, dual-income households, and (fe)male life expectancy have affected American's decisions to remain in the labor force during near typical retirement age. These variables are examined on a time series basis in order to determine which age and gender were affected the most by the variables, and which variables have had the greatest impact on overall retirement. This is important to understand as the baby-boomer generation begins to retire. While results varied for the various age and gender groups in the study, dual-income households had the greatest impact on labor-force participation of all age and gender groups.

Introduction

Robert Burns wrote that the best laid plans of mice and men often go astray, and in the past decade, this has certainly been true in the retirement planning arena. The impact of the two recessions on the American economy and the corresponding rise in the unemployment rate in the last decade have significantly affected the age at which Americans both expect to, and actually retire. Workers age fifty or over are expecting to work longer, which is correlated with the financial crisis of 2007-2009 (Banerjee 1). Each year the Employee Benefit Research Institute ("EBRI") conducts a retirement confidence survey. The survey conducted in January 2011 found that Americans' confidence in their ability to afford a comfortable retirement has reached a new low for the 21st century. The percentage of workers who lack confidence about having enough money for a comfortable retirement grew from twenty-two percent in 2010 to twenty-seven percent in 2011 (Helman et al 3).

The last decade has brought a multitude of forces that have caused Americans to postpone their expected and actual retirements. This unprecedented large decrease in confidence is due to the lack of savings, stock market losses, lower interest rates, housing losses, increasing health care expenditure costs, and changes in the labor market. The culmination of all these factors and their downward decline over the past decade has greatly impacted the once golden retirement age of sixty-five.

This paper will use a model to examine how American's defined benefit and defined contribution assets, health care expenditures, housing prices, dual-incomes, and life expectancies will influence labor force participation at retirement ages. This paper will examine which variable or variables had the most effect on the labor force

participation rate of men and women near retirement age. The literature on the topic has presented arguments for the importance of all of the variables.

It is important to determine the current labor force participation rate and the weight of each factor in order to determine which are vital in this decision. If some negatives can be prevented, this model can determine which negatives are most important to focus on, for which age and gender group. It is also important to use this model to understand what is a healthy retirement age for Americans today and in the future.

Literature Review

Savings

The loss of savings in Americans' retirement accounts has been a critical factor in Americans' decisions to postpone retirement. EBRI conducted a survey on retirement plans and they found that individual's retirement account assets amounted to $8.979 trillion, and employment-based plan assets were $4.823 trillion of that (Copeland 2). The recession made many Americans fear they would continue to lose more of their savings, causing them to spend less and save more. Although the uptick was brief, more Americans began to save; in 2009, seventy-five percent of Americans were saving for retirement, whereas, it dropped back down to the sixty-eight percent it was in 2007 one year later (Helman et al 2011). Americans began to save more during and slightly after the recession but as things started to improve, some stopped saving. One reason for the decrease in savings could be that interest rates have remained near zero since the latter part of 2008 (Federal Reserve Bank of New York). If interest rates are low, people earn less interest on their money and may choose to do other things with it. Another reason for this increase is because many workers are unaware of how much they need to save for

retirement. Instead of calculating how much money they need for retirement, or seeking help from a financial advisor, a large percentage of workers often guess how much money they will need to save.

Forty-two percent of workers reported that they guessed the amount they needed to save, as a result, their estimates are lower than what they actually should accumulate (Helman et al 22). Since their estimates tend to be lower, many will have to return to work, or continue to work longer in order to save properly. It has been estimated that over forty-one percent of those in the lowest preretirement income quartile are predicted to run short of money within ten years of retirement (VanDerhei 2). This means that many Americans will be forced to return to work or will not be able to live as comfortably as they hoped to when retired.

In the 2011 Retirement Confidence Survey, thirty-six percent of workers indicated that they lack confidence in their financial preparations for retirement (Helman et al 10). This is partly due to faulty planning by an uninformed public not realizing the importance of individual savings. However, for those who do save, some have had to take money from their savings as a result of the recession in order to pay for basic expenses in their daily lives. “Thirty-four percent of workers report they had to dip into their savings to pay for basic expenses within the past twelve months” (Helman et al 21). This premature use of their retirement funds means that they will be expected to work longer in order to earn the money they deem necessary for a comfortable retirement.

Those who saved and did so with defined benefit (DB) and defined contribution (DC) plans were more likely to be prepared for retirement. Hewitt Associates generated a study in 2010 (Hewitt’s Real Deal) that determined that those eligible to participate in a

pension plan that did so consistently were almost twice as likely to be prepared for retirement than those eligible to participate that did not do so. Employee sponsored retirement plans can be the most effective vehicles for individuals to utilize when planning their retirement, since those plans often entail employer-matching contributions. Many, but not all of these retirement savings plans provide matching contributions. In 1996 only fifty-nine percent of workers were offered these plans, but in 2011, seventy-two percent were offered, and of those who were offered, seventy-nine percent made contributions (Helman et al 20). Such plans allow the employee to become proactive in their own retirement planning. They also impose restrictions on withdrawals, preventing people from taking money out for non-retirement purposes unless it is under special circumstances such as hardship.

The rising amounts of assets in the DC plans are offset by the slow growth in the DB plans' assets. Over time, more employers have begun to offer DC plans instead of DB plans, thus we have seen the DC assets increase while the growth in DB plan assets has slowed. Fewer workers are participating in a DB plan, which almost always used to pay benefits in the form of an annuity upon retirement (Copeland par 10). The annuity payment allowed retirees to generate lifetime retirement income, and was sometimes adjusted for inflation as well. Now many of the remaining DB plans offer lump sums, which may lead to retirees running out of money while in retirement. The trend to DC plans, primarily a 401(k) plan, means retirees are less likely to receive an annuity plan (Copeland par 12).

The literature on retirement savings shows that although many Americans have lost money in their retirement savings, the larger problem seems to be that a large amount

are not saving at all, or feel they will not be adequately prepared for retirement. The lack of preparation for retirement has begun to be fixed by the increased availability of retirement savings plans. The magnitude of retirement savings is an important factor in a worker's decision for his or her retirement age; with the increased growth provided by employer offered savings plans, people can feel more comfortable retiring at their projected age. To measure retirement savings in the model, the average real DB and DC assets will be used.

Stock Market Losses:

The 2011 Health and Retirement Study shows that the financial crisis of 2007-2009 has had an affect on working Americans' predicted retirement age. Workers age fifty and over are expecting to work longer. In 2006, eleven percent expected to retire at age seventy, and by 2010 it increased to fifteen percent, while expected retirement at ages sixty-two through sixty-five steadily declined over the four years (Banerjee 1). The change in their expectations is likely to have occurred because of the decrease in consumer confidence due to the downward plunge of the stock market. As the stock market spiraled down, so did many people's retirement savings. Those who do save for retirement often put some of their assets from their retirement portfolios in the stock market, therefore the decrease in stock prices will be reflected in the diminished retirement asset growth. With diminished retirement savings, lower interest rates, and decreasing confidence, expected retirement income has greatly decreased, forcing older workers to stay in the labor force longer.

Between December 2007 and December 2008, the S&P 500 index fell by over one-third (Thomasson 1). As a result, retirement accounts lost about $2.8 trillion, or

thirty-two percent of their value (Soto 1). This drop weighed more heavily on those who were closer to retirement, and those who had a large amount of their assets invested in stocks. The impact this drastic decline in the market had on those who were planning to retire in the near future was substantial.

The Urban Institute conducted a simulation in June of 2009 to determine who would be affected most by the stock market crash given different recovery scenarios. They believe that the retirement outcomes, such as when one will retire and with how much money, will depend significantly on future stock market performance. The study separates individuals who were born between 1941 and 1965 into three groups, and assumes an average retirement age of 67 for all. The Retirement Policy Program found that when the stock market crashed, the middle boomers, those aged 53-57, would, on average, lose 9.9% of their retirement income by the age of 67 if the stock market does not recover, and 3.8% of their retirement income by the age of 67 if the stock market partially recovers and they do not sell their stocks until the market recovers (Butrica and Toder 2). The middle boomers would be most affected because, not only would they lose a large sum of their retirement portfolio but, they are also the closest to retirement, and their losses would weigh more heavily on their decision than those who are already retired or who are more than 10 years away from retirement. In each scenario, the middle boomers in the highest income quartile will have the most stock market gain or loss, in the "no recovery" situation, on average they will lose 13.6% of their income at age 67, compared with only 1.6% for the bottom income quartile. By comparison, under the full recovery scenario, those in the highest income quartile gain the most and have 4.0% higher retirement income (Butrica and Toder 2). Those with higher income have bigger

initial losses, but also bigger gains in this simulation, and those with lower incomes have less of a reaction to the market.

Like lower income workers, the late boomers, those farthest from retirement, also did not experience as much of a reaction to the market. Since they are younger, they typically have less wealth because they have had less time to accumulate wealth. With less wealth they have less to invest and therefore, less available to lose. The simulation shows that the late bloomers will see less than a 2% loss in retirement income at age 67 if there is a full to partial recovery. (Butrica and Toder 2). With regard to the late bloomers, they have more time to make up their losses and can buy stocks at lower prices and profit from the gain if there is a full or partial recovery. Overall, the stock market crash should not have a large effect on retirement, however, the simulation presented by the Urban Institute suggests that it varies depending on how far the workers are from retirement and how much wealth they have accumulated.

Housing Losses:

The S&P Case-Shiller Index, as depicted in picture 1, is a commonly used estimate of both 10 and 20 city composites of housing prices. In the late 1990s and early 2000s, the Case-Shiller home price index shows that home prices fluctuated, but had an overall upward trend. In 2011housing prices dropped almost thirty-five percent from their high in 2006 (S&P Case-Shiller Home Price Indices 2). Since a home is often the largest asset that the average person owns, the decrease in home prices could have a large effect on those looking to retire in or after 2008.

If workers had substantial home equity to begin with, and are willing to draw down this equity during retirement, a substantial increase in home equity could accelerate

retirement while a substantial drop could delay it (Colie and Levine 36). The houses of those with lower income are likely to be one of their largest assets. The decrease in their home price could leave them in debt, especially if they took a loan out against it and are now forced to pay a mortgage on a house worth less than the mortgage. For the elderly, leveraging their home at this point in their lives may leave them without a major resource to finance an adequate retirement, given the recent downturn in the housing market (Debt of Elderly and Near Elderly 2002-2007 Copeland 1). In the early 2000s, the share of income that went to housing debt increased substantially for the elderly. For those aged 55-64 the share of income that went to housing debt payments increased from 6.5% in 2001 to 9.1% in 2007 (Debt of Elderly and Near Elderly 2002-2007 Copeland 6). Taking on this much debt before retirement is dangerous because it substantially decreases your retirement savings and ability to retire at one's projected age. In households where the top income earner was age 55 or older housing debt increased steadily, from 24 percent in 1992 to 40 percent in 2007 (Debt of Elderly and Near Elderly 2002-2007 Copeland 6). Not only did the housing debt increase for workers within a decade of retirement, but their amount of debt also increased. The median housing debt, among those having housing debt, also increased to $79,000 in 2007, up from $65,898 in 2002 (Debt of Elderly and Near Elderly 2002-2007 Copeland 6).

The amount of housing debt that the elderly have taken on, in combination with the drop in housing prices, has had an impact on the retirement age of workers of all incomes. Although those who were wealthier were more likely to take a larger hit in the decline of housing prices, those who were of lower income brackets are likely to be affected by the amount of debt they took on in the years before their retirement. The

decrease in housing prices is likely to make that debt increase which could force them to work longer, or be tied to a home that they are forced to pay off the mortgage on in order to sell it at a loss.

Medicare Inflation:

The changes in health care plans and increasing inflation for post-Medicare health care costs have greatly affected consumers' confidence regarding retirement. With concerns and uncertainty regarding many changes in our current health care system, many Americans fear they may be unable to afford health insurance if they retire before the age of 65. Increasing Medicare premiums also leaves future retirees unsure if their current savings will be enough to pay their healthcare expenses. The percentage of workers who are not confident that they will be able to pay for medical expenses in retirement increased from 14 percent in 2007 to 26 percent in 2011; working-Americans' concern about paying for long-term care during retirement, has also increased, from 14 percent in 2007 to 33 percent in 2011 (Helman 9).

With the recent economic downturn, and mounting costs associated with healthcare, research has shown that fewer employers are offering retiree health benefits than in the past. The declining availability of retiree health benefits may partially explain the rising labor force participation rate among individuals ages 55-64. Between 1996 and 2006, the labor force participation rate increased from 67 percent to 69.6 percent for men and from 49.6 percent to 58.2 percent for women (Fronstin and Salisbury 1). The benefits that are offered today often have higher premiums and higher out-of-pocket costs than those provided historically. With the baby boomers beginning retirement, retirees' will have to pay greater out of pocket costs. An average couple, age 65 in 2010, needed

$376,000 to cover what Medicare did not cover. (Fronstein 5). These retiree health care costs have increased significantly. Fidelity estimates that retiree medical costs for an age 65 couple returns in that year increased from $160,000 in 2002 to $250,000 in 2010. This will only grow over time as employers continue to move away from providing retiree health benefits. More of the retirees who have had subsidized employment-based coverage in the past will have to assume for themselves this additional financial risk during retirement (Fronstein 21). This could possibly lead to more Americans working during retirement to pick up health care benefits.

The uncertainty of the health care costs workers will need to pay once retired increases the value of employer-provided health insurance. A study conducted by French and Joans suggests that about half of the value workers place on employer-provided health insurance comes from its ability to reduce medical expense risk (French and Joans 45). Employees are weighing their future medical risks as heavily as their current medical risks. Discussions regarding delaying Medicare eligibility from 65 to 67 also add to a workers uncertainty. If they are unable to come up with the money to pay their Medicare health premiums or find an employer who will pick up some of the cost once they are retired, then their planned age of retirement could change. The French and Joans paper also found that the labor force participation rate for ages 60-69 would be 5.1 percentage points lower if everyone received some form of retiree health insurance from their employer rather than just pension incentives and health insurance while they work for the company (French and Joans 34). This means that if more employers offered some form of supplement to Medicare, then the retirement age would be lower, and the labor force would consist of younger workers. Giving everyone in French and Joans

simulation retiree health insurance that supplements Medicare would make the average job exit age 62. This means that the average retirement age could be reduced because of medical care.

If health care costs increase faster than projected, or if individuals live beyond their life expectancy, then retirees will need even more money for health care expenditures upon retirement. This is a very likely scenario considering that from 1975-2005, Medicare costs outpaced the growth of the economy by 2.4 percent per annum, and health care inflation for Medicare beneficiaries is estimated to have increased an average of 7.2 percent per annum during 2003-2007 (Fronstein 4). With Medicare covering a little over half of the health care costs for retirees, its increasing cost means that many working Americans fear they will not have the money to fund their health care needs upon retirement. With an increasing amount of employees receiving health care packages only when working for the company and not upon retirement, many Americans may be forced to work later or continue working during retirement.

Labor Markets:

The labor market is different from the aforementioned factors because it can often have the reverse effect. The labor market often forces people to change their retirement plans in ways in which they did not expect. The decrease in the stock market, housing market, inflation in health care and Medicare may make older workers feel they have to work longer to make up for their losses or be able to live comfortably during retirement, but in the end it is the labor market that dictates whether or not employees will be able to keep their jobs or find new ones. Often companies look to lower their workforce or cut their expenses by retiring those workers closest to their retirement age. With

unemployment numbers increasing to as high as 10% in 2009, many older workers were forced to "early retire" or had to resign for other reason (Retirement Intentions Survey 36). Many retirees who retired earlier than planned said they did so because of health problems or disability (63%), changes at their current company, such as downsizing or closure (23%), and having to care for a spouse or another family member (18%) (Banerjee 3). Since many of these things can dictate the direction of a workers' life, they can at times take precedence over comfortable retirement.

Although many workers choose to retire on their own during periods of economic downturn, workers are faced with both unemployment and underemployment because of the difficult labor market conditions. Ten to twelve percent of private-sector workers between the ages of 50 and 64 experienced permanent and involuntary job losses when labor markets were weak in times of economic downturn, while displacement rates of around 8 percent (over a three year period) were observed during the expansions of the mid-to-late 1990s and the middle 2000s (Coile and Levine 16). The number of older workers facing unemployment only grew after the recession because of the need to stay working due to losses, and inadequate savings. According to the Bureau of Labor Statistics (BLS) data, about 2 million adults age 55 or older were unemployed in August 2009. That's more than double the number unemployed in November 2007, just before the recession began. Not only is the number of unemployed elderly workers increasing but so is the number of elderly employees filing for social security. The number of U.S. workers claiming Social Security retirement benefits actually rose substantially from 2008 to 2009 (Coile and Levine). The rates for elderly unemployed have most likely increased because of losses in assets that leave them unable to take their retirement

packages at that point in time. The rates of the unemployed elderly are also proportionately higher for those with lower levels of education who may not have had the opportunity to save as much or may have been more affected by housing debt.
Many older workers are also "underemployed", meaning that they work jobs beneath their skill and education level. They are often forced to go back to work because they did not save enough for retirement, they needed health benefits, or they could not find another job because of a change in the skills needed. According to the Bureau of Labor Statistics, "Underemployment" and Unemployment reached a high of 18% during early 2010. More elderly workers were forced to continue work for various reasons and therefore had to postpone retirement.

Overall, the labor market has a significant affect on all workers retirement plans in ways they did not foresee. Although some workers may plan to work longer into retirement, the recession has forced some to take early retirement or work as an underemployed worker in order to fund their retirement. The recession has not only caused unemployment to increase significantly, but it has also caused a momentous increase in the unemployment of elderly workers.

Dual-Income Households

Over time, work participation rates, average earnings, and pension coverage for women have become increasingly similar to those for men. Women have been entering the labor force at an exponential rate. With growing labor force participation by women, jobs have been taken away from men, and men's labor force participation rate has decreased over the years (Blieszner and Bedford 390).

Greater female participation in the workforce has combined with the new dual-

income family structure to provide families with more income to save, and therefore the opportunity to retire earlier. Dual-income families have also led to earlier retirement for women. Spouses generally seem to prefer joint retirement, which usually results in the woman retiring earlier (Wan and Ferrano 385). The Dual-income household will likely have a greater effect on younger woman than men. The increase in female workers and dual-income families has also lead to early retirement for both parties, since more income is earned and can therefore be saved, and since spouses often retire together.

Life Expectancy

As technology and medical care improve, people are living longer, which means they need to save more for retirement or work until an older age. This has greatly impacted the once golden retirement age of 65. A study performed by EBRI in 2003 found that using a life expectancy of 82 for men and 85 for woman, an average couple would need $295,000 at the age of 65 for out of pocket premiums and expenses; however, if they lived until 95 they would need almost $550,000 (Fronstine 13).

With life expectancy increasing, people will have to save more since the cost of living, due to high medical expenses, increases the longer one lives. Men aged 65 in 2003 have a 25% likelihood of living until the age of 88 and woman have a 25% likelihood of living until 92, almost 7 years longer than life expectancy of both men and women (Fronstine 13). People often do not save enough for their increased longevity. If all individuals saved based on having enough money to meet average life expectancy, half would outlive that and fall short on their savings (Fronstine 13). Individuals need to work longer in order to accrue an appropriate amount of retirement savings due to increased longevity.

Introduction to Model and Data Sources

In order to determine the effects of changing retirement plans, the economic recession, and health measures on the labor force participation of those near retirement, this study tests a time series model that uses labor force participation rates of men and women aged 55-65 and 65 and older as the dependent variables. This measure, collected by the U.S Bureau of Labor Statistics on an annual basis since 1975, shows a trend of increasing labor force participation at older ages and by female workers as time progresses. The dependent variable for the first equation, which represents women aged 55-64, will be denoted as WW55-64LFPR. The second equation represents women aged 65 and older, and the dependent variable will be expressed as W65LFPR. The third equation, which is testing men aged 55-64, will be indicated by M55-64LFPR, and the fourth, which is for men aged 65 and up, will have M65LFPR for its dependent variable title.

The explanatory variables are meant to indicate men and women's participation and assets saved via retirement plans, as well as economic expenses that can be affected by varying trends in the economy; their definitions, sources, and projected signs appear on table 1. The first explanatory variables include the real average individual defined benefit (DB) and contribution (DC) assets (RAIDCBA). This show the average amount of money in men and women's pension plans. These variables are crucial to the model because they show which plans have the most money, and which are most likely to contribute to an early retirement.

It is expected that the DC and DB plan assets will be negatively related to the labor force participation rate of men and women at both these ages: the more savings a person

has, the more likely they are to retire earlier, and therefore not be a participant in the labor force. The retirement assets variable will have a greater effect on the men than the women because the women joined the labor force later and took off more time for things such as child bearing. They will therefore, have less time to accrue retirement assets.

While it might be very helpful to have data split on those that had substantial service in, and benefits from, DB and DC plans for both the age groups, split between both male and female, that data is not available. The grouped nominal data that is available is gathered from the Flow of Funds, which is released by the Federal Reserve and dates back to 1975. The retirement assets portion of the CPI, which was published by the Bureau of Economic Analysis, was used to deflate the assets from nominal to real.

The next explanatory variables show how losses of assets due to the changing economy and increases in medical-care spending have affected employees' plans for retirement plans. Real health-care expenditure per capita (RHCEPC) is included in the model to show the rising price associated with treatments. This variable has become more important as men and women live longer and therefore increase their medical spending. The need to save in order to cover higher health costs may deter active employees from retiring earlier because of increases in health-care expenses, especially before Medicare eligibility at age 65. With rising prices, the Medicare system will not cover as much, making it increasingly important to save for health-care bills that will come due during retirement. It is expected that because of higher health-care costs, people will work longer, and therefore it will have a positive effect on the labor force for men and women. Rising health care costs will have a greater effect on men and women aged 55-65 who do not yet have access to Medicare and may be more likely to be hurt by

future changes if they are not grandfathered in any changes. Furthermore, because of their longer life expectancy, women are more likely to be affected by this than men. The Bureau of Economic Analysis reports health-care expenditure in nominal terms. The CPI, which was provided by the Bureau of Economic Analysis, was used to deflate expenditure from nominal to real.

Similar to real health-care expenditure per capita, real housing prices (RHP) have also had an effect on retirement. In the early 1990's housing prices grew, but then dropped before beginning to spike in the early 2000's. After 2000 they steadily grew higher than they had ever been before, and then dropped significantly between 2006 and 2007. This drop caused people to feel as though they had lost a lot of their wealth. The loss put some homeowners underwater, meaning their mortgage balance exceeds the current value of their home. When the housing market looked like a solid investment (circa 2005 for example), many people put their savings, or a large amount of their wealth, into their homes. Many hoped to sell their home, earn a profit, and use the profit from the housing boom to pay for a significant portion of their retirement. With the prices of homes now significantly lower, people now have less money than expected for retirement, and some are unable to sell their homes as well. It is expected that this will have a positive impact on labor-force participation rate because many will be forced to work longer to make up for the financial losses associated with their homes. This will have a greater effect on those 65 and older who are closer to retirement. Nominal housing prices were gathered from the Census Bureau and date back to 1975. The CPI, which was provided by the Bureau of Economic Analysis, was used to deflate the prices from nominal to real.

The next explanatory variable reflects the current economic times and is the "unemployment and marginally attached" rate (U6). As defined by the Bureau of Labor Statistics, U6 is total unemployed, plus all persons marginally attached to the labor force (e.g., discouraged workers) plus total employed part time for economic reasons as a percent of the civilian labor force plus all persons marginally-attached to the labor force. The rising trend in the U6 data reflects the difficulties of those looking for employment to find a job, and shows that many have opted for marginal employment. This will negatively affect the labor-force participation rate of men and women aged 65 and older because they are on the brink of retiring and can more easily access their retirement assets. It will also affect those aged 55-64 in a more negative way. Once men and women of this age are laid off, they may be forced to retire knowing they will be unable to find a new job for the short amount of time until they had planned to retire.

The next explanatory variable is meant to account for the changes in men and women's labor force participation habits. Women have become significantly more visible in the labor force and have taken jobs from men, who have seen decreasing labor force participation at older ages. Increasingly, the trend has been for both spouses to participate in the labor force during the prime of their lives. Dual-income households (DIHH) will account for this trend and its effects on retirement. Dual-income households are expected to have a negative effect on retirement ages of men and women because it generates more income to be saved. Dual-income is expected to have the strongest effects on women aged 55-64 and men aged 65 and above. Men are expected to be able to retire at 65 because of the additional income, and women, who tend to be slightly younger than their husbands when married, will be expected to retire before age 65 since

women often retire at the same time as their spouses.

The last explanatory variable effecting labor-force participation is life expectancy. As people live longer, they are forced to work longer, both in order to build larger savings for retirement and to shorten the period during which they will pull from their retirement funds. Female life expectancy age (FLEA) is used for the female age groups in the model and male life expectancy age (MLEA) is for the males. The effect on women is likely to be greater than that on men because women began to enter the labor force later and spend more time out of it due to childbearing. The male and female life expectancy data was obtained from the World Bank.

Initially, labor-force participation of each group was regressed on the real average individual defined benefit and contribution assets, the real health-care expenditure per capita, real housing prices, U6, dual-income households, and the average female life expectancy age or the average male life expectancy age from 1981-2009 using the following models:

1) $W55\text{-}64LFPR = \beta_0 + \beta_1*(RAIDCBA) + \beta_2*(RHCEPC) + \beta_3*(RHP) + \beta_4*(U6) + \beta_5*(DIHH) + \beta_6*(FLEA) + \varepsilon$

2) $W65LFPR = \beta_0 + \beta_1*(RAIDCBA) + \beta_2*(RHCEPC) + \beta_3*(RHP) + \beta_4*(U6) + \beta_5*(DIHH) + \beta_6*(FLEA) + \varepsilon$

3) $M55\text{-}64LFPR = \beta_0 + \beta_1*(RAIDCBA) + \beta_2*(RHCEPC) + \beta_3*(RHP) + \beta_4*(U6) + \beta_5*(DIHH) + \beta_6*(MLEA) + \varepsilon$

4) $M65LFPR = \beta_0 + \beta_1*(RAIDCBA) + \beta_2*(RHCEPC) + \beta_3*(RHP) + \beta_4*(U6) + \beta_5*(DIHH) + \beta_6*(MLEA) + \varepsilon$

Results

The original data for the variables listed above is proportionate data that is truncated between 0-100. If a regression is run based on these variables, this will lead to incorrect results and therefore must be corrected before a regression is run. A logit transformation was performed in order to produce accurate results upon running each regression.

Women aged 55-64

The first regression was run for the women aged 55-64 using the logged data; the Dickey Fuller test was run to test for stationarity. Since the test statistic was greater than the critical values in absolute value there was non-stationarity which had to be corrected for by taking the first difference. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data. This will be corrected by running a robust regression if it is not corrected when the first difference is taken. The Durbin Watson statistic of .8712 shows that there is autocorrelation. This will be corrected by using the Prais-Winston method if it is not corrected when the first difference is taken.

Another regression is run, this time taking the first difference of the logged data. Since the test statistic from the dickey fuller test is more negative than the critical values, there is stationarity. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data, which was then corrected for by running a robust regression. The Durbin Watson statistic of 1.544 showed that there was still autocorrelation and this was then corrected using the Prais-Winston method.

All of these corrections were made and a correlation matrix, which is displayed in **Table 2**, was created with the new data. The correlation matrix showed that average real

assets in defined benefit and contribution plans (CLRAIDBCA) are strongly correlated with real health care expenditure per capita (CLRHCEPC). This may be because of people having less money to put in their retirement plans due to rising health care expenditures. Due to this correlation, the variables will be run separately in each equation.

The results of the robust regression including retirement assets with corrections for autocorrelation, heteroskedasticity, and stationarity are displayed in **Table 3**. The Durbin Watson statistic of 1.877 shows that there is little autocorrelation. The results for the Dickey Fuller test for stationarity present a test statistic that is less than the critical values at all levels, meaning that there is stationarity.

The F-statistic of 5.89 is significant at the 1% level, meaning that the equation is viable. Retirement assets (CLRAIDBCA) have a negative coefficient and are statistically significant at the 1% level. This is likely because the more assets that women have at the age of 55-64, the more likely women will be to leave the labor force at that age. With more retirement savings they can afford to leave the workforce earlier. Housing prices (CLRHP) has a positive sign and is statistically significant at the 12% level. With the drop in housing prices, many women in this age group may feel as though they are worse off and cannot yet retire, and therefore stay in the labor force. This is why housing prices are positively correlated with labor force participation.

U6 is negatively correlated to labor force participation of women aged 55-64 and is statistically significant at the 10% level. As more people become unemployed or work jobs where they are marginally attached, fewer women will remain in the labor force. As unemployment increases, companies are more likely to not be able to afford to keep

workers, and they may possibly force some women to “early retire”, leaving the labor force. Dual-income households (CLDIHH) are statistically significant at the 7% level and have a negative coefficient. The negative sign shows that a woman is less likely to remain in the labor force between the ages of 55-64 if she has someone else in her household who is working. This is important because if the woman has a working spouse, then she may not have to work when she gets older because she and her spouse will have had the opportunity to save more money for retirement than if just she or her spouse was working. This is also an important variable because spouses tend to mimic each other in their retirement habits. Often, when one spouse retires, the other will too so that they can spend their retirement time together. It is even more likely that if the man retires, the women will as well. Therefore the trend of duel income households has a negative effect on labor force participation for woman aged 55-65.

Female life expectancy is positively related to labor force participation for woman aged 55-64 and is statistically significant at the 2.5% level. This is likely because as woman live longer they feel the need to remain in the labor force during the age range of 55-64, when they might otherwise look to retire. They recognize that they will have to work longer in order to accumulate more money for retirement since they are living longer, or that they will need to shorten the extended time during which they will be able to draw funds.

Another regression is run including health care expenditure and the logged first difference data. Since the Dickey Fuller test statistic is more negative than the critical values, there is stationarity. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data, which was corrected

by running a robust regression. The Durbin Watson statistic of 1.542 showed that there was still autocorrelation and this was corrected using the Prais-Winston method.

A robust regression with corrections for autocorrelation was run on the logged "change in" data, including health care expenditure; the results are displayed in **Table 4**. The Durbin Watson test statistic is now 1.875, which showed that there was little autocorrelation. The results for the Dickey Fuller test for stationarity present a test statistic that is less than the critical values at all levels, meaning that there is stationarity.

The F-statistic is 5.68 and is statistically significant at the 1% level. Health care expenditure (CLHCEPC) has a positive coefficient and is statistically significant at the 1% level. The coefficient is positive because the more health care expenditure increases, the longer women will have to remain in the labor force to obtain health insurance or to pay health care bills. The statistical significance is likely because without the availability of health insurance, the rising cost of health care makes it more difficult for women to retire. This in turn, forces them to remain in the workforce longer. With rising health care expenditures, having health insurance is especially crucial for single women who rely solely on their health care plan to pay health care related bills. At the ages of 55-64, women will begin to have routine health tests done, and have a greater chance of becoming ill than they did at an earlier age, making health insurance vital.

CLU6 has a negative coefficient and is statistically significant at the 10% level, CLDIHH has a negative coefficient and is statistically significant at the 10% level, and CLFLEA has a positive coefficient and is statistically significant at the 5% level. These are the same signs and statistically significant for the same reasons they were in the

model including retirement assets. Of the two models, the first, containing retirement assets, proved to be a stronger model since it had a higher F-statistic and R-squared.

In these estimations under **part 1 of Table 5,** CLRAIDBCA and CLFLEA appear to be the strongest variables, while CLRHP appears to be the weakest. In **part 2 of Table 5,** a regression is run after removing CLRHP, the weakest variable. Without CLRHP, the explanatory variables CLU6 and CLDIHH are no longer statistically significant below the 10% level. Although CLRHP is only statistically significant at a 10% level in the first part, it plays an important role in maintaining the statistical significance at the 10% level of CLU6 and CLDIHH and the statistical significant of CLFLEA at the 5% level. This could be because at low levels there is a small amount of collinearity between the variables.

In **part 3 of Table 5,** a regression is run without CLU6, which was originally statistically significant at the 10% level. Without CLU6, CLDIHH is no longer statistically significant at the 10% level. Once again, this is likely because of a small amount of multicollinearity between the variables. They could be correlated because spouses tend to marry people of similar status, so if both spouses have the same amount of education, and their type of work is experiencing a high level of unemployment, then there would be a higher probability that they would both be unemployed. The results show that real housing prices and female life expectancy and U6 are all statistically connected. They also confirm the importance of retirement assets and life expectancy on the labor force participation rate for females aged 55-64.

Women 65 +

A regression was run with the logit transformation variables on the labor force participation rate of women aged 65 and older. The Dickey Fuller test shows that there is non-stationarity in the model; the first difference will be taken in order to correct for this. The Durbin Watson statistic of 0.9954 shows that there is autocorrelation. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data, a robust regression will be run to correct for this if it is not corrected by taking the first difference.

In a new regression run with the logged "change in" data including retirement assets, the Dickey Fuller test shows that there is stationarity in the model. However, the autocorrelation was not eliminated when the first difference was taken. The Durbin Watson statistic was only 1.519, so a Prais-Winston method was used in the next regression. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data, a robust regression was then run to correct for this. Given the extremely high inverse correlation between the CLRAIDBCA and CLRHCEPC variables, as shown in **Table** 2, they must be run separately.

The results for the robust regression of the logged "change in" variables corrected for autocorrelation and including retirement assets are displayed in **Table 6**. The Durbin Watson statistic of 1.846 showed that there is now low autocorrelation. The results for the Dickey Fuller test for stationarity present a test statistic that is more negative than the critical values at all levels, meaning that there is stationarity.

The F statistic for the equation is statistically significant at the 2% level and therefore, the equation is a good fit. Retirement assets (CLRAIDBCA) are statistically significant at the 5% level. The amount of retirement assets (CLRAIDBCA) has a

negative sign because the more assets a woman accumulates the less likely she will be to remain in the labor force after the age of 65. This variable is important because without enough money saved for retirement a woman cannot retire. This is especially crucial if the woman is single (and not widowed), since she will only have her retirement assets to live off of.

A second regression with the logged "change in" data, including health care expenditure, was run. The Dickey Fuller test shows that there is stationarity in the model. However, the autocorrelation was not eliminated when the first difference was taken, the Durbin Watson statistic was only 1.518, so a Prais-Winston correction was used. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data, a robust regression was run to correct for this. Given the extremely high inverse correlation between the CLRAIDBCA and CLRHCEPC variables, as shown in **Table** 2, they must be run separately.

A second robust regression was run with the logged "change in" variables that were corrected for autocorrelation and including health care expenditure; the results are displayed in **Table 7**. The F-statistic of 3.76 is statistically significant at the 1% level. The Durbin Watson test statistic of 1.845 showed that there is low autocorrelation. The Dickey Fuller test for stationarity presents a test statistic that is statistically significant at all levels, meaning that there is no stationarity within the model.

Health care expenditure (CLRHCEPC) is statistically significant at the 3% level. The health care expenditure variable has a positive sign, which shows that as health care expenditure increases women are more likely to remain in the labor force longer. This is likely true because an increase in expenses will mean that women have to work longer

(past the age of 65) in order to pay for this increase or subsidize this increase. Since woman statistically live longer than men they are likely to have more health care bills to pay after retirement and therefore must work longer in order to pay these bills or have additional health insurance to pay the bills.

In these estimations under **part 1 of Table 8,** CLHCEPC appears to be the strongest variable, while CLU6 appears to be the weakest. In **part 2 of Table 8,** a regression is run after removing CLU6, the weakest variable. Without CLU6, the explanatory variables CLDIHH is now statistically significant at the 5% level, and CLRHCEPC is statistically significant at the 2% level. This shows that without CLU6, CLDIHH is statistically significant and should therefore be included in the equation.

In **part 3 of Table 8,** a regression is run without CLDIHH for parity. Without CLDIHH, CLU6 becomes more statistically significant, but is still not statistically significant at a 10% level and CLHCEPC becomes statistically significant at the 1% level. This is likely because of a small amount of multicollinearity between the variables, as was seen in the equation for women aged 55-64. The results show that U6, and dual-income households, and health care expenditure per capita are all statistically connected. The results also show that dual-income households are significant alone and should be included in the equation.

Men 55-64

A regression was run with the logged data for the men aged 55-64. The Dickey Fuller test was run to test for stationarity. Since the absolute values of the test statistics were greater than that for the critical values at all levels, there was non-stationarity which had to be corrected for by taking the first difference. The Breusch-Pagan / Cook-

Weisberg test for heteroskedasticity showed that the variance changed with the data and that there are heteroskedasticity problems. If this is not corrected by taking the first difference a robust regression will be run. The Durbin Watson statistic of 1.292 shows that there is autocorrelation. If this is not corrected for by the first difference, then the Prais-Winston correction method will be used.

Another regression is run this time taking the first difference of the logged data. Since the test statistic for the Dickey Watson test is more negative than the critical values, there is stationarity. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data, which was corrected for by running a robust regression. The Durbin Watson statistic of 1.618 showed that there was still autocorrelation and it was corrected using the Prais-Winston method. Again, due to the strong inverse correlation between CLRAIDBCA and CLRHCEPC, each variable was run separately in the regressions.

A robust regression of the logged "change in" data including the retirement assets with the Prais-Watson correction for autocorrelation was performed; the results are displayed in **Table 9**. The equation's F-Statistic, 2.85, is statistically significant at the 3% level. The Durbin Watson test for autocorrelation showed that there was a low level of autocorrelation, and had a test statistic of 1.849.

Real housing prices (CLRHP) was statistically significant at the 5% level and had a positive sign. With the drop in housing prices, many men in this age group may feel as though they are worse off and cannot yet retire, and therefore stay in the labor force. This is why housing prices are positively correlated with labor force participation for men aged 55-64. Dual-income households were also statistically significant just above the 5%

level and had a negative correlation coefficient. With more women working there is more income available and therefore more ability to save, and to save more for retirement. This means that men can leave the labor force and retire earlier, which is why dual-income is negatively related to men aged 55-64's labor force participation.

A robust regression including the health care expenditure data (CLRHCEPC) was run using the first different data in order to correct for heteroskedasticity and stationarity issues, the results are displayed in **Table 10**. The F-Statistic, 2.80, is statistically significant at the 3% level. The Durbin Watson test for autocorrelation showed that there was low autocorrelation with the Prais-Winston correction, and had a test statistic of 1.853. Again, real housing prices (CLRHP), has a positive coefficient, and dual-income households (CLDIHH), has a negative coefficient, and both are statistically significant at the 5%. They are statistically significant have the correct signs for the same reasons they did in the model including retirement assets.

In the estimates under **Table 11 part 1** CLRHP and CLDIHH are the strongest variables and are statistically significant at the 5% level, while CLU6 and CLRHP appears to be the weakest. In **part 2 of Table 5,** a regression is run after removing CLU6, the weakest variable. This regression shows that CLRHP becomes significant at the 2% level as opposed to the 5% level, which shows that there is multicolinearity between the two variables. The equation is stronger without CLU6 and is now statistically significant at the 2% level as opposed to the 5% level. This means that CLU6 does not significantly enhance the explanatory power for this age and gender group. However, theory says that it should remain because of the high amount of males being laid off at the age of 55-64.

In **part 3 of Table 11,** a regression is run without CLRHP, which was originally statistically significant at the 5% level. Without CLRHP, CLDIHH is statistically significant at the 2% level. The equation without CLRHP is also statistically significant at the 2% level. Since CLDIHH becomes more significant when CLRHP is removed, there is collinearity between the two variables. This is possibly because with the decrease in housing prices, many households became dual-income households as the second spouse returned to work to make up for money that was lost. The results show that CLDIHH is significant alone and CLRHP should not be included in the equation since it has multicolinearity with CLDIHH and CLU6.

Men 65+

A regression was run with the logit transformation variables on the labor force participation rate of men aged 65 and older. Since the Dickey Fuller test shows that there is non-stationarity in the model, the first difference was taken in order to correct for the stationarity. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data if the first difference does not correct this then a robust regression will be run. The Durbin Watson statistic of 0.9272 shows that there is autocorrelation. If this is not fixed with the first difference, then the Prais-Watson method will be used.

Another regression is run this time taking the first difference of the logged data. Since the test statistic is more negative than the critical values there is stationarity. The Breusch-Pagan / Cook-Weisberg test for heteroskedasticity showed that the variance changed with the data, which was then corrected by running a robust regression. The Durbin Watson statistic of 1.746 showed that there was a minimal amount of

autocorrelation, and that the first difference corrected for much of the autocorrelation seen previously. Again, due to the strong inverse correlation between CLRAIDBCA and CLRHCEPC, as shown in **Table 2**, each variable was run separately in the regressions.

The results of the robust regression of the logged "change in" variables, including retirement assets, are displayed in **Table 12**. The Durbin Watson statistic of 1.746 showed that there is a minimal amount of autocorrelation. The results for the Dickey Fuller test for stationarity present a test statistic that is less than the critical values at all levels. The low R-squared and non-significant F value show that the equation was not significant. Since the equation was not significant, the regression was re-run using including the health care expenditure variable.

The results for the robust regression of logged "change in" variables including health care expenditure are shown in **Table 13** and again, that equation is not statistically significant as it had an F-statistic of 0.91. It is possible that the original equation was not statistically significant because many of the men in this age group are already retired or were forced to retire for health reasons and therefore could not return to work.

A third regression was run with the variables that are believed to have the most influence on the labor force participation of men aged 65 and above. It is believed that males in this age group are most affected by the rising health care expenditures (CLRHCEPC), which are sending many men who have retired back into the labor force in order to pay for the increased health care expenses. Dual-income is also expected to be a significant variable because of the role that woman in the workforce have played on men's position in the workforce. Women's entrance has taken jobs away from men, possibly forcing them into early retirement. The dual-income also gives men aged 65 and

above the ability to leave the workforce because two incomes gives a family the ability to save more.

A regression with these two variables was run and the results are displayed in **Table 14**. The F-statistic of 2.41 was found to be statistically significant at the 1% level. This regression showed that Dual-income house-holds are statistically significant at the 10% level when run in a regression with health care expenditure. This is because males at the age of 65 are more likely to exit the labor force a second income provides more money to save for retirement, allowing men to retire at the age of 65 instead of continuing work to fund retirement or current needs.

Conclusion

As the baby-boomer generation begins to retire, their choices in savings, the economic recession, increasing health care costs, and changes in the labor force will all weigh on those remaining in the labor force. It is important to understand which effects over the last 30 years have had the largest impact on various age and gender groups. This will help others planning for retirement understand which problems have forced others to remain in the labor force past their expected retirement age. A time series model was created to assess these variables and their combined effects from 1975-2009.

The regressions showed that for women, the amount of retirement assets saved, CLRAIDBCA, and the increase in health care expenditure, CLRHCEPC, were the variables that most affected woman's choices to remain in the labor force. In future research it may be important to split women up into four groups to account for various types of women (such as those married with children, those married without children, those single with children, and those single without children). This split may be

important because having adequate retirement assets is more important to single women than married women, since single women (who are non-widowed) only have their savings to rely on, and married women often mimic the retirement habits of their spouses. Health Care Inflation is important for all women because the rising health care costs will weigh more heavily on those who need to go to the doctors more. It is especially important in the 55-64 age range, since these women do not yet have Medicare.

For Men, Dual-income households (CLDIHH) was the most important variable because of the changing dynamic of the labor market that it creates. As more women enter the workforce and work alongside men, there is more money to be saved and more of "men's jobs" that are replaced by women. With more money being earned for the family, a man may choose to retire earlier because there are more retirement assets, assuming the additional money from the second salary earner is not being spent frivolously or needed on a daily basis.

For those aged 55-64, real housing prices (CLRHP) and dual-income households (DIHH) were the most important variables. As predicted by the literature review, the collapse in the housing market had a greater effect on those below the golden age of retirement, sixty-five, than those past it. This is likely because those who are younger than 65 may have been planning to sell their home in a few years and use the money gained for retirement; with the housing drop they now have less money to do this with. The Dual-income variable is most important for women aged 55-64 because women tend to retire when their spouse does, and many women are younger than their husbands, which would likely put them in the 55-64 age range. It is also important for men because

men may have more money if their wife also worked and be able to retire earlier than if there was only one income for the family to live off of.

Although the full equation for males aged 65 and above was weak, a regression with only two variables showed that dual-income was statistically significant. For women aged 65 and above, retirement assets, CLRAIDBCA, and health care expenditure, HCE, were statistically significant, leaving nothing in common. Perhaps these equations do not have similar significant variables because the equation for men is not viable because many people in this age and gender group have already retired.

The most frequent variable in all the regressions was the dual-income households; this is likely because of the increasing trend of both spouses working during the time of the sample (1975-2009). An increasing trend in the last decade has been the number of people seeking more schooling (pursing a Masters, MBA, PHD, etc.) and its effects on the labor force. With more people pursing advanced degrees, they are starting work later in life, giving them less time to save. In future research this will likely be an important trend to analyze. As mentioned before, it would also be important to analyze the various groups of women in the labor force. Due to the change in the gender and age groups participating in the labor force, changing retirement plans, and economic factors it is important to understand what different groups of individuals need to be aware of so that those in future generations can properly prepare for a comfortable retirement.

Bibliography

Banerjee, Sudipto. "Retirement Age Expectations of Older Americans Between 2006 and 2010." Employee Benefit Research Institute, 8 Dec. 2011. Web. Jan. 2012. <http://www.ebri.org/pdf/notespdf/EBRI_Notes_12_Dec-11.RetAge-HCS.pdf>.

Butrica, Barbra A., and Eric J. Toder. "Are Low-Wage Workers Destined for Low Income at Retirement?" *Older Americans' Economic Security*. The Retirement Policy Program, Sept. 2008. Web. Jan. 2012. <http://www.urban.org/UploadedPDF/411756_low-wage_workers.pdf>.

Coile, Courtney C., and Phillip B. Levine. *The Market Crash and Mass Layoffs: How the Current Economic Crisis May Affect Retirement*. Wellesley College, Sept. 2009. Web. Jan. 2012. <http://149.130.69.71/CMSPortalWeb/ShowProperty/BlueLive/binaries/departments/economics/files/coile-and-levine-ilrr-submission.pdf>.

Copeland, Craig. "Debt of Elderly and Near Elderly." Employee Benefit Research Institute, Oct. 2009. Web. Jan. 2012. <http://www.ebri.org/pdf/notespdf/EBRI_Notes_10-Oct09.DebtEldly.pdf>.

Craig, Copeland. "Labor-Force Participation Rates of the Population Age 55 and Older: What Did the Recession Do to the Trends?" Employee Benefit Research Institute, Feb. 2011. Web. Jan. 2012. <http://www.ebri.org/pdf/notespdf/EBRI_Notes_02_Feb-11.HCS_Part-Rts.pdf>.

French, Eric, and John B. Jones. "The Effects of Health Insurance and Self Insurance on Retirement Behavior." 23 Nov. 2010. Web. Jan. 2012. <http://www.albany.edu/economics/research/workingp/2010/ssretire114.pdf>.

Fronstin, Paul, and Dallas Salisbury. "Retiree Health Benefits: Savings Needed to Fund Health Care in Retriement." Employee Benefit Research Institute, Feb. 2003. Web. Jan. 2012. <http://www.ebri.org/pdf/briefspdf/0203ib.pdf>.

Fronstin, Paul. "Savings Needed to Fund Health Insurance and Health Care Expenses in Retirement." Employee Benefit Research Institute, July 2006. Web. Jan. 2012. <http://www.ebri.org/pdf/briefspdf/EBRI_IB_05-20081.pdf>.

Helman, Ruth, Mathew Greenwald, Craig Copeland, and Jack VanDerhei. "The 2011 Retirement Confidence Survey: Confidence Drops to Record Lows, Reflecting "the New Normal"" Employee Benefit Research Institute, Mar. 2011. Web. Jan. 2012. <http://www.ebri.org/pdf/briefspdf/EBRI_03-2011_No355_RCS-2011.pdf>.

"Median and Average Sales Prices of New Homes Sold in United States." Census Bureau, Jan. 2012. Web. Jan. 2012. <http://www.census.gov/const/uspricemon.pdf>.

"Retirement Intentions Survey." *NSW Premier's Department*. 2006. Web. Jan. 2012. <http://www.premiers.nsw.gov>.

Soto, Mauricio. "How Is the Financial Crisis Affecting Retirement Savings?" Urban Institute, 3 Dec. 2008. Web. Jan. 2012. <http://www.urban.org/publications/901206.html>.

"S&P | S&P/Case-Shiller Home Price Indices | Americas." The McGraw Hill Companies, 27 Dec. 2011. Web. Jan. 2012. <http://www.standardandpoors.com/indices/sp-case-shiller-home-price-indices/en/us/?indexId=spusa-cashpidff--p-us---->.

"S&P500 Historical Prices." *Yahoo! Finance*. Yahoo!, Jan. 2012. Web. Jan. 2012. <http://finance.yahoo.com/q/hp?s=%5EGSPC+Historical+Prices>.

"Table A-15. Alternative Measures of Labor Underutilization." *U.S. Bureau of Labor Statistics*. 6 Jan. 2012. Web. Jan. 2012. <http://www.bls.gov/news.release/empsit.t15.htm>.

Thomasson, Lynn. "Record S&P 500 Return on Equity Over Bond Yields Spurs Bulls." *Bloomberg*. 18 July 2011. Web. Jan. 2012. <http://mobile.bloomberg.com/news/2011-07-17/record-return-on-equity-over-bond-yields-spurring-m-a-bull-credit-suisse>.

United States of America. Federal Reserve of New York. Federal Reserve Bank of New York, Jan. 2012. Web. Jan. 2012. <http://www.newyorkfed.org/creditconditions>.

"U.S. Department of Commerce. Bureau of Economic Analysis." *U.S. Bureau of Economic Analysis (BEA)*. 22 Dec. 2011. Web. Jan. 2012. <http://www.bea.gov/national/nipaweb/Nipa-Frb.asp>.

VanDerhei, Jack. "Retirement Savings Shortfalls for Today's Workers." Employee Benefit Research Institute, Oct. 2010. Web. Jan. 2012. <http://www.ebri.org/pdf/notespdf/EBRI_Notes_10-Oct10.RetShrtfl-Cobra.pdf>.

Picture 1

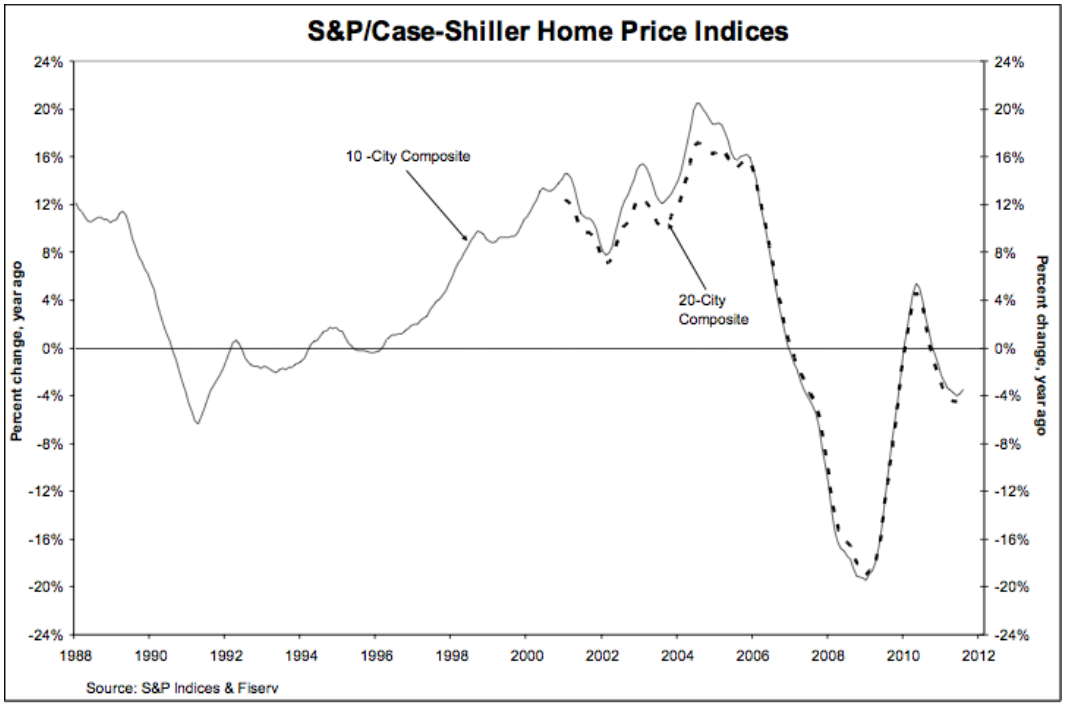
S&P/Case-Shiller Home Price Indices
10 -City Composite
20-City Composite
Percent change, year ago
Percent change, year ago
24%
20%
16%
12%
8%
4%
0%
-4%
-8%
-12%
-16%
-20%
-24%
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Source: S&P Indices & Fiserv

Table 1

Dependent Variables	Definition	Source	Expected Signs
LFPRW1	Labor Force Participation Rate of Women aged 55-65	Bureau of Labor Statistics	N/A
LFPRW2	Labor Force Participation Rate of Women aged 65+	Bureau of Labor Statistics	N/A
LFPRM1	Labor Force Participation Rate of Men aged 55-65	Bureau of Labor Statistics	N/A
LFPRM2	Labor Force Participation Rate of Men aged 65+	Bureau of Labor Statistics	N/A
Explanatory Variables	**Definition**	**Source**	**Expected Signs**
RAIDBCA	This is the real average individual assets in the average defined benefit and contribution plans. The numbers of total assets was divided by the number of plans for each year.	Federal Reserve	Negative
RHCEPC	This measures average national health care expenditures per capita	Bureau of Economic Analysis	Positive
RHP	This shows real single-family home prices annually.	Bureau of Economic Analysis	Positive
U6	Total unemployed, plus all persons marginally attached to the labor force, plus total employed part time for economic reasons, as a percent of the civilian labor force plus all persons marginally attached to the labor force.	Bureau of Labor Statistics	Negative
DIHH	This is a measure of dual income households. It is meant to account for the increase in women's labor force participation.	Census Bereau	Negative
FLEA	This is used as a health measure; it is the average age that women born in that year are expected to live to.	World Bank	Positive
MLEA	This is used as a health measure, is the average age that men born in that year are expected to live to.	World Bank	Postive

Table 2

	Year	*CLW55-64LFPR*	*CLW65+LFPRW2*	*CLM55-64LFPR*	*CLM65+LFPR*	*CLRAIDBCA*	*CLRHCEPC*	*CLRHP*	*CLU6*	*CLDIHH*	*CLFLEA*	*CLMLEA*
Year	1											
CLW55-64LFPR	-0.27256525	1										
CLW65+LFPRW2	-0.380768868	0.41610908	1									
CLM55-64LFPR	-0.57681424	0.323249989	0.082575654	1								
CLM65+LFPR	-0.566281282	0.488428674	0.685285737	0.348694325	1							
CLRAIDBCA	-0.010556308	0.150665716	0.1257474	-0.001101291	0.088412075	1						
CLRHCEPC	0.060568041	-0.158132019	-0.143030272	-0.031622252	-0.126623004	-0.996739811	1					
CLRHP	0.061278288	0.203127349	0.114292476	-0.16877175	0.046655798	0.016264972	-0.003183858	1				
CLU6	-0.21394917	0.140689249	0.168542078	0.03177767	0.145255509	-0.074498041	0.061647921	-0.204772494	1			
CLDIHH	0.707224778	-0.090686676	-0.283485446	-0.301133728	-0.317242145	-0.234417595	0.25213618	-0.020023946	-0.186956625	1		
CLFLEA	0.126198039	0.125167827	0.057312613	0.133876708	0.007650372	-0.22859521	0.224309078	-0.068038388	-0.031666234	0.331338597	1	
CLMLEA	0.153309106	-0.019006398	-0.16723378	0.122121319	-0.033770598	-0.246651443	0.250845343	0.053357102	-0.009392343	0.29991291	0.72384791	1

Table 3
Women 55-64 Labor Force Participation with Retirement Assets[&+^]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clraidbca	-63.1679	-2.92***	0.007	n	34
clrhp	30.14535	1.61*	0.118	F (6, 28)	5.89
clu6	-.0027372	-1.75*	0.091	Prob > F	0.0005
cldihh	-.2491314	-1.92*	0.065	R-squared	0.3604
clflea	2.691016	2.38**	0.025	Root MSE	.00023
_cons	-.0002017	-3.85	0.001		

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 11% level
**Statistically Significant at the 5% level
***Statistically Significant at the 1% level

Table 4
Women 55-64 Labor Force Participation with Health Care Expenditure[&+]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clhrcepc	.449642***	2.86	0.008	n	34
clrhp	30.42006	1.60	0.120	F (6, 28)	5.68
clu6	-.0027559*	-1.74	0.092	Prob > F	0.0006
cldihh	-.2417079*	-1.84	0.076	R-squared	0.3539
clflea	2.647525**	2.29	0.030	Root MSE	.00023
_cons	-.0001243	-1.35	0.187		

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 10% level
**Statistically Significant at the 5% level
***Statistically Significant at the 1% level

Table 5
Women 55-64 Labor Force Participation[&+^]

Explanatory Variables	Coefficients (t-statistics)		
	1	2	3
clradbca	-63.1679	-59.2915	-56.06815
	(-2.92)***	(-2.83)***	(-2.40)**
clrhp	30.14535		28.5621
	(1.61)		(1.78)*
clu6	-.0027372	-.0025092	
	(-1.75)*	(-1.43)	
cldihh	-.2491314	-.2035449	-.2082378
	(-1.92)*	(-1.57)	(-1.48)
clflea	2.691016	0.2.597777	2.691954
	(2.38)**	(1.95)*	(2.52)**
Intercept	-.0002017	-.0001285	-.0001281
	(-3.85)	(-1.46)	(-1.43)
R-squared	0.3604	0.2596	0.1928
F-statistic	5.89***	5.39***	5.51***
N	34	34	34

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 11% level
**Statistically Significant at the 5% level
***Statistically Significant at the 1% level

Table 6
Women 65+ Labor Force Participation with Retirement Assets[&+^]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clraidbca	-524.4913	-2.11	0.044**	n	34
clrhp	390.3259	1.49	0.148	F (6, 28)	3.39
clu6	-.0614315	-1.03	0.310	Prob > F	0.0122
cldihh	-2.093349	-1.25	0.221	R-squared	0.1838
clflea	32.88918	1.45	0.158	Root MSE	.00451
_cons	-.0012041	-0.96	0.344		

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 11% level
**Statistically Significant at the 5% level
***Statistically Significant at the 1% level

Table 7
Women 65+ Labor Force Participation with Health Care Expenditure[&+^]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clhrcepc	4.00117	2.26	0.032**	n	34
clrhp	393.6411	1.50	0.145	F (6, 28)	3.76
clu6	-.0618623	-1.05	0.305	Prob > F	0.0072
cldihh	-2.015332	-1.20	0.240	R-squared	0.1874
clflea	32.81584	1.45	0.159	Root MSE	.0045
_cons	-.0012695	-1.02	0.314		

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 10% level
**Statistically Significant at the 5% level
***Statistically Significant at the 1% level

Table 8
Women 65+ Labor Force Participation[&+^]

Explanatory Variables	Coefficients (t-statistics)		
	1	2	3
clrhcepc	4.00117	2.774612	5.09331
	(2.26)**	(2.63)***	(3.90)**
clrhp	393.6411	320.6878	401.6856
	(1.50)	(1.19)	(1.60)
clu6	.0618623		.0690545
	(1.05)		(1.23)
cldihh	-2.015332	-3.388026	
	(-1.20)	(-2.31)**	
clflea	32.81584	32.67419	28.63353
	(1.45)	(1.52)	(1.28)
Intercept	-.0012695	-.0017051	-.0009045
	(-1.02)	(-1.67)	(-.68)
R-squared	0.1874	0.1147	0.1860
F-statistic	3.76***	8.40***	10.02***
N	34	34	34

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 10% level
**Statistically Significant at the 5% level
***Statistically Significant at the 2% level

Table 9
Men 55-64 Labor Force Participation with Retirement Assets[&+^]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clraidbca	-4.148707	-0.73	0.471	n	34
clrhp	16.48838	2.08**	0.047	F (6, 28)	2.85
clu6	-.0001336	-0.13	0.896	Prob > F	0.0271
cldihh	-.0974989	-2.03**	0.052	R-squared	0.1193
clmlea	.8897044	1.13	0.268	Root MSE	.00014
_cons	.0000437	0.96	0.343		

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 11% level
**Statistically Significant at the 6% level
***Statistically Significant at the 1% level

Table 10
Men 55-64 Labor Force Participation with Health Care Expenditure [&+^]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clhrcepc	.0170575	0.42	0.676	n	34
clrhp	16.52239	2.10**	0.045	F (6, 28)	2.80
clu6	-.0001092	-0.11	0.916	Prob > F	0.0290
cldihh	-.0935002	-1.94**	0.063	R-squared	0.1172
clmlea	.899632	1.15	0.261	Root MSE	.00014
_cons	.0000455	1.01	0.320		

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 11% level
**Statistically Significant at the 5% level
***Statistically Significant at the 1% level

Table 11
Men 55-64 Labor Force Participation[&+^]

Explanatory Variables	Coefficients (t-statistics)		
	1	2	3
clhrcepc	.0170575	.0154381	.018402
	(0.42)	(.40)	(0.47)
clrhp	16.52239	16.38968	
	(2.10)**	(-2.17)*	
clu6	-.0001092		-.0000176
	(-0.11)		(-0.02)
cldihh	-.0935002	-.0898533	-.1043208
	(-1.94)**	(-1.93)**	(-2.59)*
clmlea	899632	.887336	.8457518
	(1.15)	(1.16)	(1.08)
Intercept	.0000437	.0000461	.0000422
	(1.01)	(1.04)	(.96)
R-squared	0.1172	0.1156	0.0761
F-statistic	2.80**	3.31*	3.09*
N	34	34	34

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 10% level
**Statistically Significant at the 5% level
***Statistically Significant at the 2% level

Table 12

Men 65+ Labor Force Participation with Retirement Assets [&]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clraidbca	-57.02731	-0.27	0.786	n	34
clrhp	62.96678	0.43	0.674	F (5, 28)	.96
clu6	-.0093666	-0.37	0.714	Prob > F	0.4589
cldihh	-1.718801	-1.70	0.099	R-squared	0.1164
clmlea	4.101694	0.43	0.672	Root MSE	.00203
_cons	-.00022	-0.42	0.675		

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 11% level
**Statistically Significant at the 5% level
***Statistically Significant at the 1% level

Table 13

Men 65+ Labor Force Participation with Health Care Expenditure [&+]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clrhcepc	.7857738	0.54	0.593	n	34
clrhp	64.00827	0.43	0.668	F (5, 28)	.91
clu6	.0096945	0.38	0.704	Prob > F	0.4891
cldihh	-1.670803*	-1.65	0.110	R-squared	0.1202
clmlea	4.520361	0.48	0.638	Root MSE	.00202
_cons	-.0002072	-0.40	0.690		

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 11% level
**Statistically Significant at the 5% level
***Statistically Significant at the 1% level

Table 14

Men 65+ Labor Force Participation with Important Variables[&+]

Explanatory Variables	Coefficients	t	P>t	Regression Statistics	
clhrcepc	.5153528	0.41	0.682	n	34
cldihh	-1.703695	-2.02**	0.052	F (2, 31)	2.41
_cons	-.0004128	-1.10	0.281	Prob > F	0.0091
				R-squared	0.0907
				Root MSE	.00014

[&] Represents change of logged variables
[+] Represents a robust regression
[^]Prais-Winston Correction was used
*Statistically Significant at the 11% level
**Statistically Significant at the 6% level
***Statistically Significant at the 1% level