# The Effects of Health and Wealth Shocks on Retirement Decisions

Dalton Conley
Jason Thompson

Retirement decisions both affect and are affected by health status. Health status, in turn, has been linked to net worth. And, of course, according to the lifecycle model of savings, retirement has an important effect on net worth, drawing down assets to maintain consumption once earners leave the labor force. Given the multi-directionality of all of these influences at this three-factor nexus, it has been difficult to tease out the direct impacts of health and wealth on retirement from the reciprocal effect of retirement on health and wealth. This is the goal of the present paper.

Many studies have found that health shocks predict retirement decisions (see, e.g., Hagan et al. 2009). For example, using fixed effects estimators and by instrumenting subjective health by "health stock," Disney, Emmerson and Wakefield (2006) find that among respondents over the age of 50 in the British Household Panel, ill-health strongly predicts early retirement. Health limitations have also been shown to have a similar impact on early retirement decisions. However, the evidence is not all in line with the claim that health shocks lead to exit from the labor force. For example, French (2005) finds that health is not among the more important determinants of job exit at older ages.

Adding to this ambiguity, is that fact that we also know, however, that retirement may adversely affect health. In the U.K., panel data has been marshaled to show that labor force participation has a gender-specific effect on health. Namely, ongoing labor force participation is detrimental to male health but positive

for female health (Cai 2010). However, in the U.S., the evidence is more consistent: Thanks to the natural experiment of the social security notch—whereby individuals born just before January 1, 1918 received lower Social Security pension payments as compared to their counterparts who were born on the First or just after—we do know that retirement is not good for the health of septuagenarians. Those who received the higher payments thanks to a change in cost-of-living indexing during the 1970s left the labor force earlier on average than those who received the lower payments. However, despite their greater transfer income, Evans and Schneider (2006) found that those who retired earlier suffered from lower life expectancy.

Meanwhile, just as health shocks can affect an individual's decision to keep working or not, so can financial shocks. Besides losing a job, one may experience a shock to one's net worth thanks to the performance of investments, unexpected costs, family transitions (such as divorce) or other dynamics such as changes to tax laws. Economic theory tells us that in order to smooth consumption over the life course, when a negative shock occurs to a stock of savings meant to finance retirement, one should delay retirement, just as a positive shock would enable an early exit from the labor market.[1]

---

[1] This prediction is very straightforward in contrast to, say, the effect of a change in earnings. If wages rise then savings do, indirectly, leading to a positive income effect on the consumption of leisure (in the form of retirement). However, the substitution effect works in the opposite direction, with higher wages making exits from the labor market more expensive in terms of opportunity cost. Of course if

Indeed, empirical research has consistently found a positive wealth effect on retirement exits from the labor market. Higher annuity rates and/or stock prices both lead to greater probability of retirement (Ratcliffe and Smith 2010). Using data from the Health and Retirement Study (HRS), Coronado and Perozek (2003) found that "respondents who held corporate equity immediately prior to the bull market of the 1990s retired, on average, 7 months earlier than other respondents." House prices also seem to affect the exit decision in the same direction (Ratcliffe and Smith 2010; Goldstein 2008). Using changing stock or housing prices or interest rates (which, in turn, affect annuity payouts) is useful but may be confounding other effects. That is, when the entire stock market goes up or down, this affects perceptions of future wealth. The positive effect of higher wealth may be partially offset by rising expectations for the trend to continue, thus causing individuals to remain in the labor force in order to "grow" their nest egg more before they begin to draw it down or convert it into an income stream. Second, when markets are rising or falling, they are doing so for everyone, changing individuals' calculations about their potential relative standard of living in retirement. That is, they may feel richer, but not as rich as they might have felt if their own stocks rose while the rest of the market was stable or falling. Relative comparisons may be at work in the retirement decision arena and affect decision making.

---

potential pension income rises thanks to government policy or a change in the annuity rate, then this is more akin to a wealth shock than an earnings change.

To address these concerns, another approach uses inheritance receipt to instrument retirement decisions. One in five households with older workers in the Health and Retirement Study receive an inheritance over an eight year period. The median value of such a bequest is $30,000. Brown et al (2010) find that receipt of an inheritance increases the probability of retirement by 12 percent and that the effect is even larger when the inheritance is "unexpected." This paper provides a nice confirmation to the wealth effects identified using stock markets (also see Goldstein 2008). However, it too suffers from some limitations. Namely, the receipt of an inheritance may have other retirement-inducing effects that may be biasing the estimate of the wealth effect. The death of the close relative or friend who provided the bequest, for example, may induce an individual to reconsider life priorities or confront the finiteness of the lifespan. This may instigate an exit from the labor force to enjoy "the good life." Likewise, the inheritance-related death may mean that family responsibilities need to be rearranged and individuals shift from paid labor to unpaid caring work.

In the present study we build on this existing work by bringing together the two strands of research discussed above. Namely, we examine the interaction between health shocks and wealth shocks on retirement decisions. There is ample reason to suspect that wealth shocks may be heterogeneous based on an individual's health characteristics: If an individual is ailing and experiences a rise in wealth, this may lift a budget constraint and allow for him/her to exit the labor market. However, the effect of positive wealth shocks may be lessened for those with good health who can keep working without depleting their health capital in a

significant way (Grossman 1975). Thus, we use data from the Panel Study of Income Dynamics (PSID) to estimate a first-difference model of health and wealth shocks on retirement over the course of the 2000s in the United States. For the reasons discussed above, we do not instrument wealth shocks from inheritance (though we do estimate the impact of inheritance receipt in the model directly) nor do we distinguish between wealth shocks that are idiosyncratic and those that are related to the markets as a whole.

To preview our findings, our models show that negative health shocks do lead to greater probability of retirement; as do positive shocks to net worth. Both these effects are strongest for men and insignificant for women, who show weaker labor elasticities. Further, the Great Recession lead to a wave of retirements—net of other factors—but this effect was not moderated by asset levels or health. Meanwhile, wealth is affected by health shocks, but this works differently for blacks and whites.

*Data and Methods*

Originating in 1968 with a nationally representative sample of 5,000 American families, the Panel Study of Income Dynamics (PSID) has followed economic and health histories of individuals. As the longest-running longitudinal study on family and individual dynamics, the study design is much too complex to detail in full here (Please see Hill (1992) or Duncan and Hill (1989) for fuller descriptions). To examine the role of health in retirement decisions and subsequent changes in wealth, we construct an unbalanced panel of data collected biennially

from 1999-2009.[2] We truncate this sample to black and white[3] adult respondents ages 40 to 70 in 1999 who were head, wife, or cohabitating partner of their household in any years between 1999 and 2009. Due to wealth being measured on the family level, all respondents must be a head, wife, or cohabitating partner for all years in which they are in the sample. If a respondent were to be included in the sample, but no longer a head of the family, the wealth measure would be that of the new household to which the individual moved. This might incorrectly assign resources to the individual that are not, in actuality, under the individual's management.

The random selection of one adult head in the family was a careful decision on the part of the authors. Given the propensity for the male adult in a family to be labeled the head, selecting only heads for analysis would potentially bias results. Illness for either head is likely to relate with changes in labor force participation (Bound et al. 1999; Charles 1999; Wu 2003) and changes in wealth. Therefore, we run analyses on the full sample and separated by gender.

---

[2] Additionally, we ran regressions on all years that included data on family wealth (1984, 1989, 1994, 1999, 2001, 2003, 2005, 2007, and 2009) with similarly constructed variables. Results did not significantly change. We chose to present the results for the analysis over the period of the PSID where health and wealth were measured consistently at two year intervals in order to avoid the complication of differing time intervals between waves.

[3] Sample numbers were too small for further comparisons across racial groups.

We detail some of our key variables below.

Retirement: Our primary dependent variable is a measure coded "1" if the individual is currently retired. Just over six percent of person-waves represent transitions into retirement. However, in 2.73 percent of person-waves, individuals move in the opposite direction, out of retirement and back into the labor force. For this reason, we model this using an ordered logistic regression when retirement is our left hand side variable.

Total Family Wealth[4]: This variable is taken from the 1999, 2001, 2003, 2005, 2007, and 2009 waves of the PSID. The PSID codes family wealth by summing the total assets, minus debts, a family owns. Wealth is calculated by adding the values of family business or farm, checking and savings, real estate other than main home, stocks and mutual funds, vehicles, bonds and life insurance policies, Individual Retirement Accounts and annuities, and home equity, minus any debts.

As is common with monetary variables, the distribution of wealth is highly skewed in the sample. To correct for this skew we perform an inverse hyperbolic

---

[4] The PSID offers many measurements of wealth, including the aggregated values of total family wealth with home equity and total family wealth without home equity. Given the potential for measurement error in individuals estimating the value of their home, we ran all analyses with and without home equity included to determine if results were sensitive to the inclusion of home equity. Results were not significantly altered.

sine transformation. A log transformation of the wealth variable would also address the issue of non-normality of the dependent variable. However, log transformations do not permit zero or negative values, which are common in data concerning wealth. The inverse hyperbolic sine transformation (IHS) addresses the issue of extreme values, while permitting positive, zero, and negative values for our wealth variable (for more, see, Burbidge et al. 1988, MacKinnon and Magee 1990, and Pence 2006).[5] Outlined in detail by Burbidge et al. (1988), the inverse hyperbolic sine transformation has been used in data pertaining to wealth and health expenditures (Pence 2006, Zhang et al. 2000)[6], specifically when variables take both extreme positive and negative values and many cases take the value of zero. Given the potential for negative income coded in the PSID, we also transform the family income variable[7].

The key right hand side variables for our regressions include dummy variables for marital status ("1" for married); unemployment ("1" for currently

[5]Additionally, we conducted regressions using log transformed wealth variables with no significant change in results.

[6] For details on the inverse hyperbolic sine transformation and analyses supporting its use versus other transformations, reference Burbidge et al. 1988.

[7] We also conducted all analyses using log transformed family income without significant change in our regression results.

unemployed); onset of acute illness or chronic illness; and total family income. The intergenerational sample adds the variables included in the intra-generational models, along with dummy variables for whether the adult child has offered any financial support to his/her parent(s), all living parents' medical insurance status, and onset of chronic or acute illnesses for parents of adult children in the sample.

Family Income: We smooth income by using a five-year average leading up to each wave to account for potential idiosyncratic fluctuations. Since income may have zero or negative values, with IHS-transform this variable

Acute Health Shock and Chronic Health Condition: In the last six published waves of data (1999-2009) the PSID codes for the incidence of thirteen health conditions for the head and wife. We construct two variables to distinguish between severe health shocks from the onset of chronic conditions. We classify the occurrence of a stroke, heart attack, heart disease, lung disease, or cancer[8] as acute health shocks. We include asthma, arthritis, diabetes, high blood pressure, learning disabilities, memory loss, psychiatric disorders and "other" chronic illnesses in the indicator (a PSID-created miscellaneous category) for chronic health conditions.

---

[8] Our definition of "acute" health shocks largely mirrors definitions of "severe" illnesses in other studies (Smith 2007). The inclusion of cancer in the acute category is potentially misleading, as some forms of cancer may not come as a "shock" to health given certain individual behaviors. However, our findings are robust to alternative definitions of acute illness which do not include the onset of cancer.

Each of these indicator variables are coded "1" if the individual suffered from an occurrence of an acute or chronic illness over the course of each wave. Unfortunately, the PSID does not permit us to determine precise dates in which chronic illnesses onset and relieve for each individual. Given that the PSID does not code the precise date in which an individual was relieved of a particular illness, we code each year as "1" following the initial onset of a chronic illness under the rationale that such conditions have lingering effects across many waves.

With our difference-in-differences methodology, indicators for gender and race are de-facto factored out and age drops from equations as each respondent ages two years across waves. We chose to omit education from the models as most individuals have completed their formal education by age 40. Table 1 presents descriptive statistics.

*Statistical Approach*

All regression models implement a difference-in-difference identification strategy. We implement first difference-in-difference to factor out all unobserved, time-constant variables which may relate to retirement decisions. Our first analysis, the influence of the onset of acute and chronic illnesses on retirement decisions, implements ordered logistic regression of retirement on changes in health, marriage, and IHS-transformed family wealth. To analyze the relationship between health, retirement decisions, and subsequent changes in wealth, we regress change in family wealth on lagged change in family income, marriage, unemployment,

retirement, health shocks, and an interaction between acute health shocks and retirement.

*Results*

Table 2 presents results of difference-in-difference ordered logistic regression of changes in retirement status on acute health shocks, the onset of chronic health conditions, marriage status, and IHS-transformed total family wealth. Without separating the model by gender, it appears that acute health shocks hold little significance in predicting retirement. Significant for only black individuals, the experience of an acute shock relates to approximately a 56% increase in likelihood of retirement within the same wave. Meanwhile, while family wealth itself is not significant in predicting labor market entries, the 2009 indicator variable is significant and positive, suggesting that—*ceteris paribus*—the Great Recession led a great number of older Americans to leave the labor force for good.

When we split the sample by gender, however, the relationship between acute health shocks and retirement becomes much clearer. In Table 3, we run the same analyses for only males. Controlling for changes in wealth, marital status, and the onset of chronic conditions, acute health shocks significantly predict retirement for both black and white males. With all controls in the model, black males suffering from an acute health shock are 2.73 times more likely to retire while white males are 1.59 times more likely to retire following the onset of an acute illness. Family wealth increases are also associated with labor market exits, though not for whites

and blacks separately when we split the sample by race. Finally, 2009 is again associated with increased exits net of other factors.

The high significance of acute illness in predicting retirement for males mostly disappears for females. Table 4 presents results of regressing change in retirement status on health for females in our sample. Counter to intuition, the experience of an acute health shock is negatively associated with white females' decisions to retire in the same wave. With controls, the experience of an acute health shock relates to a 27% decrease in the likelihood of retirement for white females. Further, family wealth has no effect. Finally, women, too, exited the labor force in greater numbers between 2007 and 2009, holding other factors constant.

When we tested interaction effects—for example, between acute illness onset and wealth levels or between survey wave 2009 and either health or wealth—we were surprised to find that they were not significant.

With findings suggesting that acute health shocks play a significant role in retirement decisions, we move on to analyze whether health shocks for retired individuals hold a differential impact on wealth than those still in the workforce. We run two analyses, one on concurrent changes in wealth and one for changes in wealth in the subsequent wave as acute health shocks and retirement may relate to short-term changes within the wave or over the next wave as retirees begin to spend down accumulated wealth. Table 5 presents difference-in-difference OLS regression of changes in IHS-total family wealth on key independent variables. Model 8 presents the interaction term between an acute health shock and retirement for black individuals. The significant coefficient suggests that the onset

of an acute illness for retired black individuals drains total family wealth more than for the non-retired. We present only the results for the full sample (males and females combined), as separating by gender fails to produce any significant results.

Table 6 presents the same analysis as Table 5, but lags all independent variables one wave to examine how changes in health and retirement associate with changes in wealth over the next wave. Across the all models it appears as though retirement and changes in health fail to associate with changes in wealth over the next wave. Furthermore, the interaction between retirement and an acute health shock proves insignificant. Again, we only present results for the full sample due to insignificant results when the sample is split by gender.

*Discussion*

Results presented here suggest that for older American men (though not for women), acute health shocks are associated with labor market exits. These results obtain particularly strongly for blacks, whose labor force participation seems to be particularly sensitive to health status. This may be due to the different occupations in which blacks and whites find themselves; perhaps, for instance, black men tend to work in industries and occupations that are more physically demanding while white men are disproportionately employed at sedentary jobs that can withstand a health limitation. It could also be other aspects of the job that matter—such as benefits and medical leave policies. Meanwhile, rises family wealth between waves allows for men to retire, but it has no effect on women. This lower female labor market elasticity may be due to the fact that women may be more economically vulnerable

when they are the sole householder and, conversely, they may be less critically responsive to family economic conditions when they are secondary earners.

It is also important to note that net of all these conditions—as well as income and marital status—2009 marked a huge exodus from the labor market for this sample. While this may be no surprise for those familiar with the fall out of the Great Recession, it is interesting to note that this effect obtains net of changes in income, health and wealth—and that it is not moderated by health shocks or wealth. Namely, all individuals left the labor market in greater numbers during the Great Recession, regardless of their asset cushion or their health status. Meanwhile, when we predict family net worth based on retirement status and health shocks, we find no significant effects whether or not we lag our right hand side measures—with two notable exceptions. For whites, it appears that net of labor market status and other factors, acute health shocks lower net worth contemporaneously (but not lagged). But for blacks this effect is conditional on retirement status. Retirement alone does not affect blacks' net worths, nor do health shocks alone. However, African-Americans suffer a wealth hit when they are retire and are struck by an acute medical condition. This may suggest different pathways out of the labor market for blacks and whites hit by health problems thanks to different occupational sectors or other factors.

Work Cited

Behncke, S. (2009). How does retirement affect health?.

Brown, J. R., Coile, C. C., & Weisbenner, S. J. (2010). The effect of inheritance receipt on retirement. *The Review of Economics and Statistics*, *92*(2), 425-434.

Cai, L. (2010). The relationship between health and labour force participation: Evidence from a panel data simultaneous equation model. *Labour Economics*,*17*(1), 77-90.

Coronado, J., & Perozek, M. (2003). Wealth effects and the consumption of leisure: Retirement decisions during the stock market boom of the 1990s.

Disney, R., Emmerson, C., & Wakefield, M. (2006). Ill health and retirement in Britain: A panel data-based analysis. *Journal of Health Economics*, *25*(4), 621-649.

Disney, R., Ratcliffe, A., & Smith, S. (2010). Booms, busts and retirement transitions. *Centre for Market and Public Organisation. University of Bristol. Available at http://www. netspar. nl/events/2010/pw/june/paperratcliffe. pdf*.

French, E. (2005). The effects of health, wealth, and wages on labour supply and retirement behaviour. *The Review of Economic Studies*, *72*(2), 395-427.

Goodstein, R. (2008). The Effect of Wealth on Labor Force Participation of Older Men. *University of North Carolina-Chapel Hill Dissertation*.

Hagan, R., Jones, A. M., & Rice, N. (2009). Health and retirement in Europe. *International Journal of Environmental Research and Public Health*, *6*(10), 2676-2695.

Zucchelli, E., Jones, A. M., Rice, N., & Harris, A. (2010). The Effects of Health Shocks on Labour Market Exits: Evidence from the HILDA Survey. *Australian Journal of Labour Economics*, *13*(2), 191-218.

Table 1: Weighted Descriptive Statistics--Means and (Standard Deviations) by Survey Wave

| | 1999 | | | 2001 | | | 2003 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Full | Black | White | Full | Black | White | Full | Black | White |
| Black | 0.124 | 1.000 | 0.002 | 0.124 | 1.000 | 0.002 | 0.126 | 1.000 | 0.002 |
| | (0.330) | 0.000 | (0.049) | (0.329) | 0.000 | (0.049) | (0.332) | 0.000 | (0.049) |
| Male | 0.425 | 0.318 | 0.439 | 0.426 | 0.320 | 0.440 | 0.428 | 0.330 | 0.441 |
| | (0.494) | (0.466) | (0.496) | (0.495) | (0.467) | (0.497) | (0.495) | (0.471) | (0.497) |
| Age | 51.675 | 49.977 | 51.907 | 53.747 | 52.091 | 53.972 | 55.683 | 53.862 | 55.936 |
| | (8.443) | (7.984) | (8.475) | (8.446) | (7.989) | (8.478) | (8.403) | (8.023) | (8.420) |
| Married | 0.658 | 0.385 | 0.697 | 0.649 | 0.361 | 0.690 | 0.634 | 0.353 | 0.674 |
| | (0.474) | (0.487) | (0.460) | (0.477) | (0.481) | (0.463) | (0.482) | (0.478) | (0.469) |
| Total Family Income | 88,419 | 48,175 | 94,117 | 90,546 | 49,451 | 96,325 | 91,901 | 50,051 | 97,879 |
| | (90,630) | (31,761) | (94,642) | (96,068) | (32,762) | (100,450) | (100,038) | (33,891) | (104,754) |
| Total Family Wealth | 419,654 | 68,670 | 469,203 | 461,773 | 93,799 | 513,499 | 489,663 | 103,516 | 544,682 |
| | (1,470,809) | (323,880) | (1,559,037) | (1,771,370) | (195,510) | (1,883,182) | (1,796,024) | (390,370) | (1,906,739) |
| Median Total Family Wealth | 143,979 | 30,759 | 180,470 | 159,113 | 36,946 | 188,424 | 169,431 | 31,161 | 202,014 |
| Years of Education | 13.363 | 12.466 | 13.488 | 13.395 | 12.532 | 13.514 | 13.392 | 12.584 | 13.506 |
| | (2.629) | (2.501) | (2.621) | (2.568) | (2.446) | (2.561) | (2.623) | (2.474) | (2.623) |
| Retired | 0.125 | 0.096 | 0.128 | 0.157 | 0.161 | 0.157 | 0.177 | 0.155 | 0.179 |
| | (0.331) | (0.295) | (0.335) | (0.364) | (0.368) | (0.364) | (0.381) | (0.362) | (0.384) |
| Acute Health Shock | 0.035 | 0.042 | 0.034 | 0.087 | 0.096 | 0.085 | 0.096 | 0.094 | 0.096 |
| | (0.184) | (0.201) | (0.181) | (0.281) | (0.294) | (0.279) | (0.295) | (0.292) | (0.295) |
| Chronic Health Condition Ons | 0.138 | 0.154 | 0.135 | 0.188 | 0.219 | 0.183 | 0.180 | 0.228 | 0.173 |
| | (0.345) | (0.361) | (0.342) | (0.391) | (0.414) | (0.387) | (0.385) | (0.420) | (0.378) |
| | | | | | | | | | |
| | 2005 | | | 2007 | | | 2009 | | |
| | Full | Black | White | Full | Black | White | Full | Black | White |
| Black | 0.129 | 1.000 | 0.003 | 0.129 | 1.000 | 0.002 | 0.129 | 1.000 | 0.003 |
| | (0.335) | 0.000 | (0.051) | (0.335) | 0.000 | (0.050) | (0.335) | 0.000 | (0.051) |
| Male | 0.425 | 0.332 | 0.439 | 0.433 | 0.337 | 0.446 | 0.431 | 0.333 | 0.444 |
| | (0.495) | (0.471) | (0.496) | (0.496) | (0.473) | (0.497) | (0.495) | (0.472) | (0.497) |
| Age | 57.597 | 55.573 | 57.888 | 59.546 | 57.473 | 59.843 | 61.527 | 59.556 | 61.809 |
| | (8.446) | (8.018) | (8.462) | (8.412) | (7.965) | (8.429) | (8.414) | (7.949) | (8.437) |
| Married | 0.616 | 0.341 | 0.657 | 0.605 | 0.322 | 0.647 | 0.574 | 0.293 | 0.616 |
| | (0.486) | (0.475) | (0.475) | (0.489) | (0.468) | (0.478) | (0.495) | (0.456) | (0.487) |
| Total Family Income | 92,635 | 50,453 | 98,816 | 92,538 | 50,632 | 98,685 | 90,858 | 49,210 | 96,959 |
| | (114,121) | (36,528) | (120,102) | (122,728) | (38,196) | (129,391) | (135,077) | (38,049) | (142,784) |
| Total Family Wealth | 529,782 | 118,689 | 590,725 | 601,431 | 148,669 | 669,778 | 696,538 | 121,235 | 780,637 |
| | (1,604,460) | (283,655) | (1,705,619) | (1,702,961) | (383,965) | (1,808,785) | (4,323,745) | (262,494) | (4,619,354) |
| Median Total Family Wealth | 199,442 | 34,263 | 242,188 | 214,511 | 38,827 | 265,510 | 188,947 | 36,077 | 228,150 |
| Years of Education | 13.405 | 12.532 | 13.531 | 13.402 | 12.536 | 13.526 | 13.381 | 12.666 | 13.484 |
| | (2.646) | (2.678) | (2.616) | (2.655) | (2.676) | (2.627) | (2.714) | (2.515) | (2.725) |
| Retired | 0.194 | 0.190 | 0.196 | 0.219 | 0.218 | 0.219 | 0.308 | 0.304 | 0.309 |
| | (0.396) | (0.393) | (0.397) | (0.414) | (0.413) | (0.413) | (0.462) | (0.460) | (0.462) |
| Acute Health Shock | 0.123 | 0.144 | 0.120 | 0.110 | 0.112 | 0.110 | 0.120 | 0.101 | 0.123 |
| | (0.329) | (0.352) | (0.325) | (0.313) | (0.316) | (0.313) | (0.325) | (0.302) | (0.328) |
| Chronic Health Condition Ons | 0.101 | 0.114 | 0.100 | 0.075 | 0.106 | 0.070 | 0.064 | 0.048 | 0.067 |
| | (0.302) | (0.318) | (0.300) | (0.264) | (0.308) | (0.256) | (0.246) | (0.214) | (0.250) |

Note: Standard deviations in parenthesis. All monetary values reported in 2009 dollars. Sample restricted to ages 40-70 in 1999 and 50-80 in 2009.

Table 2: Difference-in-Difference Ordered Logit Regressions of Retirement on Health

| | Retirement | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model Number | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | |
| | Full | | Black | | White | | Full | | Black | | White | | Full | | Black | | White | |
| Acute Health Shock | 0.118 | | 0.443 | * | -0.018 | | 0.118 | | 0.443 | * | -0.016 | | 0.121 | | 0.443 | * | -0.013 | |
| | (0.096) | | (0.177) | | (0.112) | | (0.096) | | (0.177) | | (0.112) | | (0.096) | | (0.177) | | (0.112) | |
| Onset of Chronic Illnes | 0.039 | | 0.190 | | -0.036 | | 0.030 | | 0.188 | | -0.047 | | 0.032 | | 0.190 | | -0.045 | |
| | (0.089) | | (0.143) | | (0.110) | | (0.089) | | (0.144) | | (0.110) | | (0.089) | | (0.145) | | (0.110) | |
| Married | | | | | | | -0.168 | | -0.023 | | -0.232 | | -0.178 | | -0.036 | | -0.241 | |
| | | | | | | | (0.124) | | (0.218) | | (0.149) | | (0.124) | | (0.217) | | (0.149) | |
| Total Family Wealth^ | | | | | | | | | | | | | 0.009 | | 0.011 | | 0.008 | |
| | | | | | | | | | | | | | (0.005) | | (0.008) | | (0.006) | |
| 2003 | -0.184 | * | -0.377 | * | -0.122 | | -0.185 | * | -0.377 | * | -0.122 | | -0.182 | * | -0.373 | * | -0.120 | |
| | (0.088) | | (0.164) | | (0.105) | | (0.088) | | (0.164) | | (0.105) | | (0.088) | | (0.164) | | (0.105) | |
| 2005 | -0.034 | | -0.026 | | -0.040 | | -0.035 | | -0.026 | | -0.041 | | -0.034 | | -0.019 | | -0.042 | |
| | (0.089) | | (0.169) | | (0.105) | | (0.089) | | (0.169) | | (0.105) | | (0.089) | | (0.169) | | (0.105) | |
| 2007 | -0.085 | | -0.058 | | -0.105 | | -0.087 | | -0.058 | | -0.106 | | -0.083 | | -0.054 | | -0.102 | |
| | (0.095) | | (0.179) | | (0.112) | | (0.095) | | (0.179) | | (0.112) | | (0.095) | | (0.179) | | (0.112) | |
| 2009 | 0.572 | *** | 0.440 | ** | 0.623 | *** | 0.568 | *** | 0.439 | ** | 0.618 | *** | 0.578 | *** | 0.455 | ** | 0.626 | *** |
| | (0.091) | | (0.169) | | (0.108) | | (0.091) | | (0.169) | | (0.108) | | (0.091) | | (0.170) | | (0.108) | |
| | | | | | | | | | | | | | | | | | | |
| Cut 1 Constant | -3.543 | | -3.664 | | -3.508 | | -3.544 | | -3.664 | | -3.509 | | -3.542 | | -3.661 | | -3.507 | |
| | (0.073) | | (0.140) | | (0.085) | | (0.073) | | (0.140) | | (0.085) | | (0.073) | | (0.140) | | (0.085) | |
| Cut 2 Constant | 2.839 | | 2.874 | | 2.823 | | 2.839 | | 2.873 | | 2.824 | | 2.844 | | 2.882 | | 2.827 | |
| | (0.065) | | (0.122) | | (0.077) | | (0.065) | | (0.122) | | (0.077) | | (0.065) | | (0.122) | | (0.077) | |
| | | | | | | | | | | | | | | | | | | |
| Observations | 13,905 | | 4,159 | | 9,804 | | 13,905 | | 4,159 | | 9,804 | | 13,905 | | 4,159 | | 9,804 | |

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

^Transformed using the inverse hyperbolic sine function

Table 3: Difference-in-Difference Ordered Logit Regressions of Retirement on Health for Men

| | Retirement | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model Number | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | |
| | Full | | Black | | White | | Full | | Black | | White | | Full | | Black | | White | |
| Acute Health Shock | 0.621 | *** | 0.996 | *** | 0.460 | ** | 0.622 | *** | 0.999 | *** | 0.461 | ** | 0.626 | *** | 1.003 | *** | 0.465 | ** |
| | (0.146) | | (0.271) | | (0.171) | | (0.146) | | (0.272) | | (0.171) | | (0.146) | | (0.272) | | (0.171) | |
| Onset of Chronic Illnes | -0.123 | | 0.138 | | -0.252 | | -0.121 | | 0.144 | | -0.251 | | -0.113 | | 0.166 | | -0.247 | |
| | (0.145) | | (0.220) | | (0.189) | | (0.146) | | (0.219) | | (0.190) | | (0.146) | | (0.220) | | (0.190) | |
| Married | | | | | | | 0.077 | | 0.112 | | 0.057 | | 0.041 | | 0.052 | | 0.034 | |
| | | | | | | | (0.222) | | (0.408) | | (0.251) | | (0.222) | | (0.410) | | (0.250) | |
| Total Family Wealth^ | | | | | | | | | | | | | 0.019 | * | 0.022 | | 0.016 | |
| | | | | | | | | | | | | | (0.008) | | (0.015) | | (0.008) | |
| 2003 | -0.370 | * | -0.518 | * | -0.308 | | -0.370 | * | -0.515 | | -0.308 | | -0.368 | * | -0.494 | | -0.311 | |
| | (0.144) | | (0.264) | | (0.172) | | (0.144) | | (0.263) | | (0.172) | | (0.144) | | (0.262) | | (0.172) | |
| 2005 | -0.001 | | -0.102 | | 0.034 | | 0.000 | | -0.101 | | 0.034 | | 0.001 | | -0.085 | | 0.032 | |
| | (0.137) | | (0.257) | | (0.162) | | (0.137) | | (0.257) | | (0.162) | | (0.137) | | (0.256) | | (0.162) | |
| 2007 | -0.038 | | -0.237 | | 0.052 | | -0.038 | | -0.236 | | 0.052 | | -0.034 | | -0.225 | | 0.054 | |
| | (0.147) | | (0.295) | | (0.169) | | (0.147) | | (0.294) | | (0.169) | | (0.147) | | (0.294) | | (0.169) | |
| 2009 | 0.501 | *** | 0.199 | | 0.615 | *** | 0.504 | *** | 0.208 | | 0.616 | *** | 0.524 | *** | 0.246 | | 0.630 | *** |
| | (0.147) | | (0.283) | | (0.172) | | (0.147) | | (0.279) | | (0.172) | | (0.147) | | (0.281) | | (0.172) | |
| | | | | | | | | | | | | | | | | | | |
| Cut 1 Constant | -3.866 | | -3.759 | | -3.932 | | -3.866 | | -3.756 | | -3.932 | | -3.865 | | -3.747 | | -3.933 | |
| | (0.119) | | (0.232) | | (0.140) | | (0.119) | | (0.232) | | (0.140) | | (0.119) | | (0.232) | | (0.140) | |
| Cut 2 Constant | 2.855 | | 2.776 | | 2.898 | | 2.856 | | 2.780 | | 2.898 | | 2.866 | | 2.806 | | 2.904 | |
| | (0.102) | | (0.202) | | (0.120) | | (0.102) | | (0.202) | | (0.120) | | (0.102) | | (0.203) | | (0.120) | |
| | | | | | | | | | | | | | | | | | | |
| Observations | 5,970 | | 1,565 | | 4,430 | | 5,970 | | 1,565 | | 4,430 | | 5,970 | | 1,565 | | 4,430 | |

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

^Transformed using the inverse hyperbolic sine function

Table 4: Difference-in-Difference Ordered Logit Regressions of Retirement on Health for Women

| | Retirement | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model Number | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | |
| | Full | | Black | | White | | Full | | Black | | White | | Full | | Black | | White | |
| Acute Health Shock | -0.220 | | 0.051 | | -0.325 | * | -0.217 | | 0.050 | | -0.318 | * | -0.217 | | 0.049 | | -0.317 | * |
| | (0.118) | | (0.219) | | (0.138) | | (0.118) | | (0.219) | | (0.138) | | (0.118) | | (0.219) | | (0.138) | |
| Onset of Chronic Illnes | 0.127 | | 0.233 | | 0.069 | | 0.103 | | 0.223 | | 0.042 | | 0.103 | | 0.222 | | 0.042 | |
| | (0.111) | | (0.187) | | (0.135) | | (0.112) | | (0.192) | | (0.134) | | (0.112) | | (0.192) | | (0.134) | |
| Married | | | | | | | -0.322 | * | -0.137 | | -0.385 | * | -0.324 | * | -0.137 | | -0.386 | * |
| | | | | | | | (0.142) | | (0.213) | | (0.181) | | (0.142) | | (0.213) | | (0.181) | |
| Total Family Wealth^ | | | | | | | | | | | | | 0.003 | | 0.005 | | 0.001 | |
| | | | | | | | | | | | | | (0.006) | | (0.009) | | (0.007) | |
| 2003 | -0.082 | | -0.289 | | -0.027 | | -0.085 | | -0.290 | | -0.031 | | -0.084 | | -0.290 | | -0.030 | |
| | (0.113) | | (0.211) | | (0.134) | | (0.113) | | (0.211) | | (0.134) | | (0.113) | | (0.211) | | (0.135) | |
| 2005 | -0.060 | | 0.017 | | -0.090 | | -0.064 | | 0.014 | | -0.093 | | -0.063 | | 0.018 | | -0.093 | |
| | (0.117) | | (0.224) | | (0.137) | | (0.117) | | (0.225) | | (0.137) | | (0.118) | | (0.225) | | (0.137) | |
| 2007 | -0.136 | | 0.030 | | -0.224 | | -0.141 | | 0.025 | | -0.225 | | -0.139 | | 0.027 | | -0.224 | |
| | (0.124) | | (0.227) | | (0.146) | | (0.124) | | (0.228) | | (0.146) | | (0.124) | | (0.228) | | (0.147) | |
| 2009 | 0.614 | *** | 0.591 | ** | 0.625 | *** | 0.609 | *** | 0.591 | ** | 0.617 | *** | 0.613 | *** | 0.598 | ** | 0.619 | *** |
| | (0.117) | | (0.211) | | (0.140) | | (0.117) | | (0.211) | | (0.140) | | (0.117) | | (0.212) | | (0.140) | |
| | | | | | | | | | | | | | | | | | | |
| Cut 1 Constant | -3.374 | | -3.633 | | -3.285 | | -3.378 | | -3.635 | | -3.289 | | -3.377 | | -3.633 | | -3.288 | |
| | (0.093) | | (0.177) | | (0.110) | | (0.093) | | (0.178) | | (0.110) | | (0.093) | | (0.178) | | (0.110) | |
| Cut 2 Constant | 2.839 | | 2.958 | | 2.777 | | 2.840 | | 2.957 | | 2.779 | | 2.842 | | 2.960 | | 2.780 | |
| | (0.086) | | (0.157) | | (0.102) | | (0.086) | | (0.157) | | (0.102) | | (0.086) | | (0.157) | | (0.102) | |
| | | | | | | | | | | | | | | | | | | |
| Observations | 7,935 | | 2,594 | | 5,374 | | 7,935 | | 2,594 | | 5,374 | | 7,935 | | 2,594 | | 5,374 | |

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

^Transformed using the inverse hyperbolic sine function

Table 5: Difference-in-Difference OLS Regressions of Total Family Wealth on Health and Retirement

| | Total Family Wealth^ | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model Number | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | |
| | Full | | Black | | White | | Full | | Black | | White | | Full | | Black | | White | | |
| Total Family Income^ | 0.392 | * | 0.168 | | 0.879 | ** | 0.387 | * | 0.162 | | 0.882 | ** | 0.383 | * | 0.133 | | 0.883 | ** | |
| | (0.178) | | (0.130) | | (0.305) | | (0.180) | | (0.129) | | (0.305) | | (0.180) | | (0.134) | | (0.305) | | |
| Married | 0.949 | ** | 0.970 | | 0.836 | * | 0.930 | ** | 0.936 | | 0.823 | * | 0.933 | ** | 0.951 | | 0.821 | * | |
| | (0.308) | | (0.572) | | (0.349) | | (0.308) | | (0.574) | | (0.350) | | (0.309) | | (0.574) | | (0.350) | | |
| Unemployed | -0.525 | | -0.664 | | -0.405 | | -0.535 | | -0.679 | | -0.413 | | -0.533 | | -0.670 | | -0.414 | | |
| | (0.280) | | (0.433) | | (0.363) | | (0.280) | | (0.434) | | (0.363) | | (0.281) | | (0.434) | | (0.363) | | |
| Retired | 0.195 | | 0.376 | | 0.125 | | 0.198 | | 0.388 | | 0.120 | | 0.235 | | 0.675 | | 0.092 | | |
| | (0.138) | | (0.381) | | (0.119) | | (0.137) | | (0.381) | | (0.119) | | (0.140) | | (0.392) | | (0.123) | | |
| Acute Health Shock | | | | | | | -0.222 | | -0.072 | | -0.309 | * | -0.167 | | 0.193 | | -0.360 | * | |
| | | | | | | | (0.128) | | (0.292) | | (0.132) | | (0.157) | | (0.334) | | (0.168) | | |
| Onset of Chronic Illnes | | | | | | | -0.197 | | -0.306 | | -0.197 | | -0.196 | | -0.311 | | -0.199 | | |
| | | | | | | | (0.154) | | (0.363) | | (0.151) | | (0.154) | | (0.363) | | (0.151) | | |
| Acute Health Shock * | | | | | | | | | | | | | -0.238 | | -1.445 | * | 0.206 | | |
| Retired | | | | | | | | | | | | | (0.247) | | (0.689) | | (0.226) | | |
| 2003 | -0.390 | ** | -0.495 | | -0.334 | * | -0.404 | ** | -0.512 | | -0.351 | * | -0.403 | ** | -0.524 | | -0.353 | * | |
| | (0.143) | | (0.347) | | (0.142) | | (0.143) | | (0.348) | | (0.141) | | (0.143) | | (0.348) | | (0.142) | | |
| 2005 | -0.163 | | -0.688 | * | 0.074 | | -0.180 | | -0.713 | * | 0.056 | | -0.178 | | -0.708 | * | 0.055 | | |
| | (0.144) | | (0.341) | | (0.144) | | (0.144) | | (0.342) | | (0.145) | | (0.144) | | (0.342) | | (0.145) | | |
| 2007 | -0.435 | ** | -0.530 | | -0.367 | ** | -0.469 | ** | -0.570 | | -0.405 | ** | -0.469 | ** | -0.576 | | -0.406 | ** | |
| | (0.142) | | (0.344) | | (0.140) | | (0.143) | | (0.347) | | (0.142) | | (0.143) | | (0.347) | | (0.142) | | |
| 2009 | -1.138 | *** | -1.590 | *** | -0.955 | *** | -1.169 | *** | -1.633 | *** | -0.986 | *** | -1.167 | *** | -1.644 | *** | -0.988 | *** | |
| | (0.154) | | (0.363) | | (0.156) | | (0.154) | | (0.364) | | (0.157) | | (0.154) | | (0.364) | | (0.157) | | |
| Constant | 0.408 | | 0.590 | | 0.315 | | 0.453 | | 0.652 | | 0.363 | | 0.452 | | 0.653 | | 0.364 | | |
| | (0.102) | | (0.252) | | (0.100) | | (0.106) | | (0.260) | | (0.103) | | (0.106) | | (0.260) | | (0.103) | | |
| | | | | | | | | | | | | | | | | | | | |
| Observations | 13,536 | | 4,043 | | 9,551 | | 13,536 | | 4,043 | | 9,551 | | 13,536 | | 4,043 | | 9,551 | | |
| R-squared | 0.009 | | 0.008 | | 0.011 | | 0.009 | | 0.008 | | 0.012 | | 0.009 | | 0.01 | | 0.012 | | |

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

^Transformed using the inverse hyperbolic sine function

Table 6: Difference-in-Difference OLS Regressions of Total Family Wealth on Lagged Health and Retirement

| | Total Family Wealth^ | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model Number | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | |
| | Full | | Black | | White | | Full | | Black | | White | | Full | | Black | | White | |
| Total Family Income^ | -0.348 | | -0.328 | | -0.405 | | -0.347 | | -0.331 | | -0.405 | | -0.349 | | -0.327 | | -0.407 | |
| | (0.183) | | (0.211) | | (0.294) | | (0.183) | | (0.209) | | (0.294) | | (0.182) | | (0.211) | | (0.294) | |
| Married | -0.356 | | -0.614 | | -0.183 | | -0.358 | | -0.612 | | -0.188 | | -0.355 | | -0.612 | | -0.181 | |
| | (0.338) | | (0.605) | | (0.394) | | (0.337) | | (0.607) | | (0.392) | | (0.337) | | (0.607) | | (0.392) | |
| Unemployed | -0.076 | | -0.396 | | 0.181 | | -0.076 | | -0.392 | | 0.182 | | -0.075 | | -0.392 | | 0.186 | |
| | (0.327) | | (0.474) | | (0.447) | | (0.327) | | (0.475) | | (0.447) | | (0.327) | | (0.475) | | (0.447) | |
| Retired | -0.178 | | -0.575 | | -0.016 | | -0.178 | | -0.571 | | -0.017 | | -0.152 | | -0.615 | | 0.034 | |
| | (0.154) | | (0.418) | | (0.132) | | (0.154) | | (0.418) | | (0.132) | | (0.157) | | (0.441) | | (0.135) | |
| Acute Health Shock | | | | | | | 0.053 | | -0.163 | | 0.170 | | 0.089 | | -0.198 | | 0.255 | |
| | | | | | | | (0.146) | | (0.344) | | (0.147) | | (0.173) | | (0.387) | | (0.176) | |
| Onset of Chronic Illness | | | | | | | -0.018 | | 0.099 | | -0.040 | | -0.017 | | 0.099 | | -0.037 | |
| | | | | | | | (0.158) | | (0.345) | | (0.166) | | (0.158) | | (0.345) | | (0.166) | |
| Acute Health Shock * | | | | | | | | | | | | | -0.169 | | 0.218 | | -0.369 | |
| Retired | | | | | | | | | | | | | (0.292) | | (0.772) | | (0.286) | |
| 2003 | 0.260 | | -0.204 | | 0.445 | ** | 0.261 | | -0.205 | | 0.450 | ** | 0.262 | | -0.203 | | 0.455 | ** |
| | (0.143) | | (0.338) | | (0.146) | | (0.143) | | (0.339) | | (0.145) | | (0.143) | | (0.338) | | (0.145) | |
| 2005 | 0.013 | | 0.010 | | 0.029 | | 0.011 | | 0.019 | | 0.027 | | 0.012 | | 0.018 | | 0.030 | |
| | (0.140) | | (0.333) | | (0.141) | | (0.140) | | (0.333) | | (0.141) | | (0.140) | | (0.333) | | (0.141) | |
| 2007 | -0.734 | *** | -1.086 | ** | -0.616 | *** | -0.733 | *** | -1.083 | ** | -0.610 | *** | -0.733 | *** | -1.083 | ** | -0.610 | *** |
| | (0.153) | | (0.359) | | (0.157) | | (0.153) | | (0.360) | | (0.158) | | (0.153) | | (0.360) | | (0.158) | |
| Constant | -0.028 | | 0.041 | | -0.059 | | -0.027 | | 0.027 | | -0.060 | | -0.028 | | 0.027 | | -0.062 | |
| | (0.100) | | (0.241) | | (0.100) | | (0.103) | | (0.247) | | (0.103) | | (0.103) | | (0.247) | | (0.103) | |
| Observations | 10,666 | | 3,179 | | 7,532 | | 10,666 | | 3,179 | | 7,532 | | 10,666 | | 3,179 | | 7,532 | |
| R-squared | 0.006 | | 0.006 | | 0.007 | | 0.006 | | 0.006 | | 0.008 | | 0.006 | | 0.006 | | 0.008 | |

Robust standard errors in parentheses

*** p<0.001, ** p<0.01, * p<0.05

^Transformed using the inverse hyperbolic sine function