18th Annual Meeting of the Retirement Research Consortium

August 4 & 5, 2016

National Press Club

529 14th Street, NW

Washington, DC 20045

18th Annual Meeting of the Retirement Research Consortium

August 4 & 5, 2016

#2016RRC

Conference Organizers

John Laitner
Director, University of Michigan Retirement Research Center
Senior Research Scientist, Survey Research Center, Institute for Social Research
Professor of Economics, University of Michigan

Alicia H. Munnell
Director, Center for Retirement Research at Boston College
Peter F. Drucker Professor of Management Sciences, Boston College

Jeffrey R. Brown
Director, NBER Retirement Research Center
Josef and Margot Lakonishok Professor of Business and Dean of the College of Business at the University of Illinois at Urbana-Champaign

The University of Michigan Retirement Research Center, the Center for Retirement Research at Boston College, and the National Bureau of Economic Research gratefully acknowledge financial support from the Social Security Administration for this meeting. The findings and conclusions are solely those of the authors and do not represent the views of SSA or any agency of the Federal Government.

SCHEDULE AT A GLANCE

Abbreviated Title	Presenter	Discussant

THURSDAY, AUGUST 4

8:45 – 10:15 PANEL 1: Health, Health Insurance, and Choice of When to Retire

Effect of the Affordable Care Act on Retirement	Kosali Simon	Kathleen McGarry
Affordable Care Act as Retiree Health Insurance	Alan Gustman	Matthew Rutledge
Effects of Health on Employment of Older Workers	Eric French	Richard Johnson

10:30 – 12:00 PANEL 2: Cognitive Health

Role of Cognitive Decline on Retirement Decisions	Amal Harrati	Kathleen Mullen
Long-Term Services, Supports &Economic Security	Melissa Favreault	Paul Van de Water
How Does Cognitive Decline Affect Retirement Policy	Anek Belbase	Jonathan King

12:30 Lunch Speaker: Carolyn W. Colvin, Acting Commissioner, Social Security Admin.

1:15 – 2:45 PANEL 3: New Ways to Insure Adequate Resources for Retirees

Home Equity Extraction and Reverse Mortgages	Stephanie Moulton	Lori Trawinski
Potential Impact of Mandated Employer Pension Programs	Barbara Butrica	David John
Automatic Enrollment's Effect on Savings	James Choi	Jack Van Derhei

3:00 – 4:30 PANEL 4: Government Finances with an Aging Population

Adjusting the Payroll Tax to Promote Longer Careers	John Laitner	Eugene Steuerle
Earnings of Undocumented Immigrants	George Borjas	Sven Sinclair
How Would Equities Have Affected SSA Trust Fund	Gary Burtless	Jeffrey Brown

FRIDAY, AUGUST 5

8:30 – 10:00 PANEL 5: Cohort Changes

Cohort Changes in SS Benefits and Pension Wealth	David Weir	Irena Dushi
Student Debt's Affect on Early-Career Retirement Saving	Matthew Rutledge	Diana Elliott
Marital Histories, Gender, and Financial Security	Amelia Karraker	Leora Friedberg

10:15 – 11:45 PANEL 6: Household Resources in Old Age

Labor Supply and Social Network	Gary Engelhardt	Jason Fichtner
Longitudinal Determinants of End-of-Life Wealth	James Poterba	Alice Henriques
Selection in the Long-Term Care Insurance Market	Ami Ko	John Haaga

12:15 Lunch Speaker: Axel Börsch-Supan, Max Planck Inst for Social Law and Soc. Policy

1:00 – 2:30 PANEL 7: International Comparisons

Working Conditions and Sustainable Work at Older Ages	Jeffrey Wenger	Howard Iams
Behavior Response to Drastic Changes in SS Rules	Ola Vestad	Anthony Webb
Passive Saving over the Life Cycle	Daniel Reck	James Choi

18th Annual Meeting of the Retirement Research Consortium

Schedule

Thursday, August 4, 2016

8-8:30 a.m. Registration and coffee

8:30-8:45 a.m. **Welcome and introduction of center directors:**
John Phillips, Associate Commissioner, SSA Office of Research, Evaluation, and Statistics
- Jeffrey Brown, NBER Retirement Research Center
- John Laitner, Michigan Retirement Research Center
- Alicia Munnell, Center for Retirement Research at Boston College

8:45-10:15 a.m. **Panel 1: Health, Health Insurance, and Choice of When to Retire**

Session chair: John Laitner, Michigan Retirement Research Center

"Effect of the Affordable Care Act on Retirement: Evidence from Tax Data"

Bradley Heim (Indiana University), Ithai Lurie (U.S. Department of Treasury), and Kosali Simon* (Indiana University)

Discussant: Kathleen McGarry, UCLA

"The Affordable Care Act as Retiree Health Insurance: Implications for Retirement and Social Security Claiming"

Alan Gustman* (Dartmouth College), Thomas Steinmeier (Texas Tech University), and Nahid Tabatabai (Dartmouth College)

Discussant: Matthew Rutledge, Boston College

"The Dynamic Effects of Health on the Employment of Older Workers"

Richard Blundell, Jack Britton, Monica Costa Dias, and Eric French* (Institute for Fiscal Studies)

Discussant: Richard Johnson, Urban Institute

10:15-10:30 a.m. Break

10:30 a.m.-noon **Panel 2: Cognitive Health**

Session chair: Jeffrey Brown, NBER Retirement Research Center

"The Role of Cognitive Decline on Retirement Decisions: A Mendelian Randomization Approach"

Mark Cullen and Amal Harrati* (Stanford University)

Discussant: Kathleen Mullen, RAND

"Long-Term Services and Supports and Economic Security in Retirement: Implications for Social Security and SSI Policymaking"

Richard W. Johnson and Melissa Favreault* (Urban Institute)

Discussant: Paul Van de Water, Center on Budget and Policy Priorities

"How Does Cognitive Decline Affect Retirement Policy?"

Geoffrey T. Sanzenbacher and Anek Belbase* (Boston College)

Discussant: Jonathan King, National Institute on Aging

Noon Break — box lunches will be available in the lobby.

12:30 p.m. Lunchtime speaker: Carolyn W. Colvin, Acting Commissioner, Social Securty Administration

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1:15-2:45 p.m. **Panel 3: New Ways to Insure Adequate Resources for Retirees**

"How Home Equity Extraction and Reverse Mortgages Affect the Financial Well-Being of Senior Households"

Stephanie Moulton* and Donald Haurin (The Ohio State University), Maximilian Schmeiser (Amazon), and Samuel Dodini (Cornell University)

Discussant: Lori Trawinski, AARP

"The Potential Impact of Mandated Employer Pension Programs on Retirement Savings"

Barbara A. Butrica* and Karen E. Smith (Urban Institute)

Discussant: David John, AARP and Brookings Institution

"Does Borrowing Undo Automatic Enrollment's Effect on Savings?"

John Beshears (Harvard University and NBER), James Choi* (Yale University and NBER); David Laibson and Brigitte C. Madrian (Harvard University and NBER); and William L. Skimmyhorn (United States Military Academy)

Discussant: Jack Vanderhei, Employee Benefit Research Institute

2:45-3 p.m. Break

3-4:30 p.m. **Panel 4: Government Finances with an Aging Population**

Session chair: Dmitriy Stolyarov, Michigan Retirement Research Center

"Adjusting the Payroll Tax to Promote Longer Careers"

John Laitner* (University of Michigan) and Daniel Silverman (Arizona State University)

Discussant: Eugene Steuerle, Urban Institute

"The Earnings of Undocumented Immigrants: Towards an Assessment of the Impact of Status Regularization"

George Borjas* (Harvard University and NBER)

Discussant: Sven Sinclair, Social Security Administration

"How Would Investing in Equities Have Affected the Social Security Trust Fund?"

Gary Burtless* (Brookings Institution); Alicia H. Munnell, Anqi Chen, and Wenliang Hou (Boston College); and Anthony Webb (The New School for Social Research)

Discussant: Jeffrey Brown, University of Illinois at Urbana-Champaign and NBER

4:30 p.m. Adjourn for the day

Friday, August 5, 2016

8-8:30 a.m. Registration and coffee

8:30-10 a.m. **Panel 5: Cohort Changes**

Session chair: Alicia Munnell, Center for Retirement Research at Boston College

"Cohort Changes in Social Security Benefits and Pension Wealth"

Chichun Fang, Charles Brown, and David Weir* (University of Michigan)

Discussant: Irena Dushi, Social Security Administration

"How Does Student Debt Affect Early-Career Retirement Saving?"

Matthew S. Rutledge,* Geoffrey T. Sanzenbacher, and Francis M. Vitagliano (Boston College)

Discussant: Diana Elliott, Urban Institute

"Marital Histories, Gender, and Financial Security in Late Mid-Life: Evidence from Four Cohorts in the Health and Retirement Study (HRS)"

Amelia Karraker* and Cassandra Dorius (Iowa State University)

Discussant: Leora Friedberg, University of Virginia

10-10:15 a.m. Break

10:15-11:45 a.m. **Panel 6: Household Resources in Old Age**

"Labor Supply and Social Networks"

Gary V. Engelhardt* (Syracuse University)

Discussant: Jason Fichtner, Mercatus Center

"Longitudinal Determinants of End-of-Life Wealth"

James Poterba* (MIT and NBER), Steven Venti (Dartmouth College and NBER), and David Wise (Harvard University and NBER)

Discussant: Alice Henriques, Federal Reserve Board of Governors

"Selection in the Long-Term Care Insurance Market"

Ami Ko* (University of Pennsylvania)

Discussant: John Haaga, National Institute on Aging

11:45 a.m. Break — box lunches will be available in the lobby.

12:15 p.m. Lunchtime speaker: Axel Börsch-Supan, Max Planck Institute for Social Law and Social Policy

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1-2:30 p.m. **Panel 7: International Comparisons**

Session chair: John Laitner, Michigan Retirement Research Center

"Working Conditions and Sustainable Work at Older Ages: An International Perspective"

Nicole Maestas (Harvard University), Kathleen Mullen (RAND), David Powell (RAND), Jeffrey Wenger,* and Till von Wachter (UCLA)

Discussant: Howard Iams, Social Security Administration

"How Does Retirement Behavior Respond to Drastic Changes in Social Security Rules? Lessons from the Norwegian 2011 Pension Reform"

Christian Brinch (Norwegian Business School), Ola Vestad* (University of Chicago and Statistics Norway), and Josef Zweimüller (University of Zurich)

Discussant: Anthony Webb, The New School for Social Research

"Passive Saving over the Life Cycle"

Nick Fabrin Nelson (University of Copenhagen) and Daniel Reck* (University of California, Berkeley)

Discussant: James Choi, Yale University

2:30 p.m. Closing comments

Names of presenters are in bold followed by an asterisk.

Note: Summary papers will be posted to www.mrrc.umich.edu/rrc2016 by August 8, 2016.

Panel 1: Health, Health Insurance, and Choice of When to Retire

"Effect of the Affordable Care Act on Retirement: Evidence from Tax Data"

Bradley Heim (Indiana University), Ithai Lurie (U.S. Department of Treasury), and Kosali Simon (Indiana University)

Discussant: Kathleen McGarry, UCLA

"The Affordable Care Act as Retiree Health Insurance: Implications for Retirement and Social Security Claiming"

Alan Gustman (Dartmouth College), Thomas Steinmeier (Texas Tech University), and Nahid Tabatabai (Dartmouth College)

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"The Dynamic Effects of Health on the Employment of Older Workers"

Richard Blundell, Jack Britton, Monica Costa Dias, and Eric French (Institute for Fiscal Studies)

Discussant: Richard Johnson, Urban Institute

Effect of the Affordable Care Act on Retirement: Evidence from Tax and Survey Data

Bradley Heim
Indiana University

Ithai Lurie
U.S. Department of the Treasury

and

Kosali Simon
Indiana University

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We examine the impact of the Affordable Care Act (ACA)'s insurance expansion on early retirement behavior among low-income adults close to retirement age. We hypothesize that subsidized health insurance may alter labor-leisure choices by lowering out-of-pocket health care expenditure and the need for precautionary savings. We also expect reduced labor force attachment due to eased "job lock" when substitutes for employer provided health insurance are subsidized. The ACA expansion may affect labor force participation along both the extensive and intensive margins as individuals close to retirement age could exit work altogether, or reduce work hours and transition from full-time to part-time work.

We test our hypotheses using variation created by the ACA insurance expansions. First, we exploit a quasi-experimental study design comparing the entry into retirement among those who resided in states that expanded Medicaid to those in states that did not. We do so using a panel data set of U.S. tax records spanning 2008-2014. We supplement our analysis with repeated cross-sectional data from the American Community Survey (ACS) which contains measures of part-time work. Second, we exploit regional variation in the "bite" of ACA's premium tax credits (PTC) and cost sharing subsidies, by examining areas and income groups with high vs. low premium subsidy amounts, because of regional variation in the benchmark premium to which the income-based PTCs are anchored. In this version of the paper, the PTC analysis is conducted with ACS data only; we plan to conduct similar analysis with tax data.

Preliminary results show no effects of the ACA on retirement behavior for the population as a whole, but some detectable evidence of increased retirement due to the availability of Medicaid among females and single individuals with access to employer health insurance while working. We observe this only when the definition of retirement is the receipt of Social Security Administration (SSA) retirement income. We do not find this result when we use a broader definition of retirement that additionally includes receipt of private retirement funds or not earning wages, or when we look at a broader sample that also includes individuals without employer health insurance while working, or when we look at ACS. The effect size among the ESI sample implies that if one were to be under poverty when retired, the probability of retirement increases close to 1 percentage points when Medicaid expands. These results suggest that the effect of ACA

on retirement operates primarily through the job-lock avenue, rather than the income-effect avenue. Individuals whose behavior is affected appear to first draw on SSA retirement before they draw on their private retirements.

The elasticity of retirement with respect to insurance observed here is smaller than some existing estimates. This could be because of the differences in type of coverage. Most estimates have been from the availability of spousal coverage, a source of coverage that has less stigma attached to it than Medicaid, while prior studies of single-state Medicaid expansions have found no effects in Oregon and Wisconsin. Though national level expansions draw more publicity and may be more salient than state-level reforms, as national retirement advisors have written extensively on the ACA and retirement options. The weak results found here could also be due to the atmosphere of uncertainty around the ACA in 2014. As more years of data emerge, it will be important to continue to monitor the way that retirement decisions are affected by the ACA.

The Affordable Care Act as Retiree Health Insurance: Implications for Retirement and Social Security Claiming

Alan Gustman
Dartmouth College

Thomas Steinmeier
Texas Tech University

and

Nahid Tabatabai
Dartmouth College

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The Affordable Care Act (ACA) was passed in 2010. Among its other aims, it increases the availability of health insurance for those who did not have coverage from their employer, and subsidizes that insurance.

There has been concern about potential side effects of ACA, with an important focus on whether ACA reduces employment. The effect of ACA on retirement is one dimension of that question. If ACA accelerates retirement, this side effect might undermine decades of public policies that were designed to increase the retirement age.

The current literature is contradictory concerning the retirement effects of ACA. On the one hand, the literature suggests that firm provided retiree health insurance accelerates retirement before age 65. This finding implies ACA may accelerate retirements since it provides health insurance to those individuals who retire before age 65, who would not otherwise be covered until they became eligible for Medicare. On the other hand, recent research (Levy, Buchmueller, and Nikpay, 2015) has detected only a minimal effect of ACA on retirement.

This paper focuses on the question of whether ACA encourages earlier retirement. Our aim is to bridge the contradictory findings between the retiree health literature and the recent analysis of the retirement effects of ACA.

We focus on three major groups of employed individuals, categorized by their employer provided health insurance coverage before the adoption of ACA. A first group consists of individuals with employer provided health insurance when working, but not in retirement. ACA potentially creates a large change in the incentive to retire for members of this group. Two other groups, those whose employers provide health insurance both on the job and in retirement, and those with no employer provided health insurance either at work or when retired, would not be subject to a large change in their marginal incentive to retire.

There are three parts to our analysis, all of which use data from the Health and Retirement Study (HRS). First, we conduct a difference-in-difference analysis of the actual effects of ACA on retirement in the short term. This analysis uses data from the HRS Mid Boomer cohort (born 1954 to 1959) to calculate the differences in retirement outcomes between 2010 and 2014 for those whose retirement incentives are modified by ACA and those whose marginal incentives are not affected by ACA. These differences are then compared to analogous changes experienced by members of an older cohort

(Early Boomers, born from 1948 to 1953) during a period when ACA did not affect incentives.

In view of the possibility that it is too early to find effects of ACA on actual retirements, our second step is to extend the time period for measuring retirement. We do this by analyzing changes in respondent reports of their expected retirement and Social Security claiming dates.

Third, to look at the potential effects of ACA over an even longer period, we use a structural model of retirement. We modify the model to simulate the full adjustments in retirement that might be observed for those who entered the labor market with ACA already in place, as well for a short and intermediate term period relevant to those who were older when ACA was adopted.

Simulations based on our previously estimated structural model of retirement and saving suggest that the group subject to the largest marginal effect on their retirement incentives from Affordable Care Act — those who initially had health insurance at work but not in retirement — will increase their retirement as a result of passage of ACA. But the reduction in work effort is quite modest, amounting to an increase of half a percentage point in the percent retired. These simulations also suggest that the period of adjustment to a change in the law will be relatively short.

Whatever the longer run effects of ACA on retirement, these effects are not visible in retirement data through 2014. We find no statistically significant evidence in HRS panel data that respondents who initially had health insurance at work, but not in retirement, have begun to retire early as a result of ACA. Nor is there evidence of changes in expected retirement dates and dates of claiming Social Security as a result of adoption of ACA.

Too short a time may have passed to observe the effects of ACA on retirement to date. But our structural model also suggests that even after the adjustment period is completed, any effects of ACA on retirement outcomes will be quite small.

Reference

Levy, Helen, Thomas Buchmueller, and Sayeh Nikpay. 2015. "The Effect of Health Reform on Retirement." Michigan Retirement Research Center, Working Paper 2015-329

The Dynamic Effects of Health on the Employment of Older Workers

Richard Blundell
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Jack Britton
Institute for Fiscal Studies

Monica Costa Dias
Institute for Fiscal Studies

and

Eric French
Institute for Fiscal Studies

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Question and methods

This paper investigates the dynamic effects of health on the employment of older workers. We estimate how transitory and permanent health shocks affect employment over time. Most research on the effect of health on employment does not distinguish between the short and the long run effects. Yet, the short-and the long-term effects of poor health are likely to be very different, and both are important. A transitory health shock such as a broken bone may lead some to drop out of work for a short period of time, but many of these workers will be back into employment as their condition improves. However, poor health may have effects on employment that outlive the health condition for a myriad of reasons. For instance, by keeping individuals out of work, poor health may erode the individual competencies that are valued in the labor market, hence reducing productivity. Furthermore, individuals driven off employment because of a bad health shock may have a difficult time returning to the labor force, even if their health improves. The longer poor health conditions persist, the larger the productivity and long-term employment effects are expected to be.

We develop a dynamic model of health and labor supply that allows for rich interactions between the two variables in order to capture the different paths leading to the long-term effects of health. To do so, our model extends those existing in the literature in several directions. First, we distinguish between transitory and persistent shocks and allow their effects to differ. We believe that separating persistent shocks is crucial for two main reasons: they are a better indicator of the serious health conditions that are likely to limit current working capacity and productivity; their persistency may lead to magnified consequences inflicted by permanent losses in productivity and labor market attachment. Second, we consider that past health may affect current labor supply, even after conditioning on current health. This may happen because health reduces opportunities for human capital investment, for example. As for current shocks, we allow for the effects of past shocks to differ by the nature of the shock, whether persistent or transitory. Third, we allow for the health effects to be reinforced through additional persistency of the employment process. And fourth, we control for person specific heterogeneity in health, allowing for the possibility that health and labor supply are correlated partly because more motivated people tend to be healthier. Put differently, we

relax the assumption that the correlation between health and labor supply is exclusively driven by the effects that health may have on labor supply.

Our estimates are based on two longitudinal datasets: the U.S. Health and Retirement Study (HRS) and the English Longitudinal Survey of Aging (ELSA). The ELSA data was based upon the design of the U.S. Health and Retirement Study (HRS) data. For this reason, the timing of the interviews, their structure and the information collected are all very similar. Both datasets are designed to be a representative sample of non-institutionalized individuals living in each country and aged 50 or older. Interviews are held bi-annually to both the main respondent and, in couples, his/her partner.

A critical issue for our analysis is how to measure health. The literature on the effects of health has raised concerns that estimates of these impacts may be biased due to measurement error in health. One problem is that only limited health measures are generally available, and those available may capture only one dimension of health. Furthermore, people may errantly misreport their health status because they misinterpret a question, or interpret the question differently than others. Most likely, this type of measurement error leads to an understatement of the effect of health on labor supply. Another problem is that estimates of the effect of health status and labor supply potentially suffer from "justification bias," as those who are not working might claim to be unhealthy in order to justify their working status. This would likely lead to an overstatement of the effect of health on labor supply.

We estimate the model using a multi-step procedure. First, we construct our health measure, addressing measurement error in health in a two-step procedure. We start by using principal components analysis to extract the first factor from a set of subjective health measures; this should deal with the first problem above. Second, we instrument this subjective health factor with objective measures of health, which should take care of justification bias as objective measures are less likely to be sensitive to it.

Next, we estimate the dynamic health process using an error components model. We use the full variance covariance matrix of the residual of the regression of health on an age polynomial and initial conditions as estimating moments. The other model parameters are estimated by the Method of Simulated Moments. We use the full variance

covariance matrix of employment and health residuals together with moments of employment by age and initial conditions to estimate all the remaining parameters.

Results

1. The dynamic properties of health are well described by the sum of a highly persistent AR(1) component, plus a transitory component.
2. Transitory health shocks have little impact on employment.
3. Permanent health shocks have much bigger effects on employment.
4. Employment is highly persistent. Lagged employment strongly predicts current employment, even after accounting for the persistence in health.

To give a sense of the importance of the dynamic model, we compare the predicted employment decline from a one standard deviation negative shock to health as predicted by the estimated dynamic model relative to what would be predicted using OLS estimates of the effect of health on employment. Our estimated dynamic model has a predicted employment response that is more than double the OLS estimates, and the employment response is longer lived. The reason why the OLS estimates are biased towards 0 is that they conflate the employment response to transitory health shocks (which we find to be small) and permanent health shocks (which we find to be large).

Figure 1: Employment response to a 1 standard deviation shock to the permanent component of health, predicted using our estimated health model and our estimated dynamic employment model

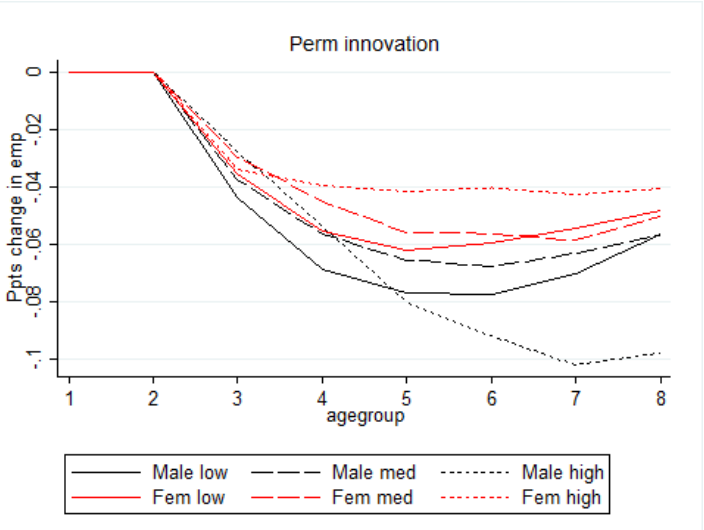
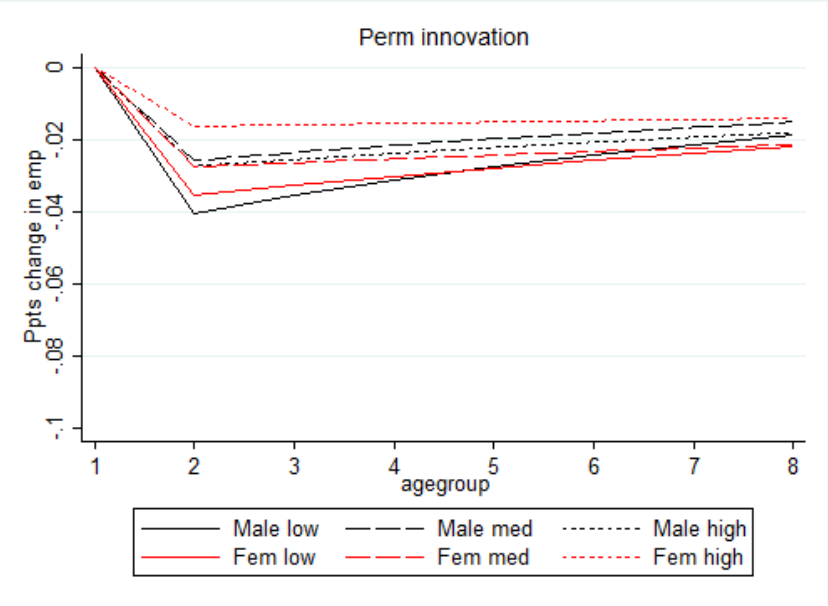


Figure 2: Employment response to a 1 standard deviation shock to the permanent component of health, predicted using our estimated health model and OLS estimates of the effect of health on employment



Panel 2: Cognitive Health

"The Role of Cognitive Decline on Retirement Decisions: A Mendelian Randomization Approach"

Mark Cullen and Amal Harrati (Stanford University)

Discussant: Kathleen Mullen, RAND

"Long-Term Services and Supports and Economic Security in Retirement: Implications for Social Security and SSI Policymaking"

Richard W. Johnson and Melissa Favreault (Urban Institute)

Discussant: Paul Van de Water, Center on Budget and Policy Priorities

"How Does Cognitive Decline Affect Retirement Policy?"

Geoffrey T. Sanzenbacher and Anek Belbase (Boston College)

Discussant: Jonathan King, National Institute on Aging

The Role of Cognitive Decline on Retirement Decisions:A Mendelian Randomization Approach

Amal Harrati
Stanford University
and
Mark R. Cullen
Stanford University

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Introduction and background

There are many reasons to believe that cognitive change is a driver of retirement decisions. As the number of 'white collar' jobs grows in comparison to manual labor, cognitive capacity may become more important determinants of job productivity and job satisfaction. There is already an extensive literature of the effect that this change in occupational structure has on the perceived and real productivity of older workers (see Borsch-Supan, 2008 for a review of this literature) but little work exploring subsequent retirement decisions. Secondly, cognition is closely associated with financial literacy and levels and composition of savings, which have clear implications on the ability and desire to retire. Finally, changes in cognition can impact preferences by changing the relative utility of work and leisure. Changes in cognition may make work less enjoyable; or, continued intellectual challenges from work may work to slow or reverse cognitive declines.

An instrumental variable approach can be used to estimate the causal impact of cognitive declines on retirement decisions. For this study, the instruments are selected based on a growing body of evidence in several scientific and medical fields that have identified specific genetic markers which possess significant associations with specific diseases and health behaviors. While there has long been scientific evidence suggesting that the association between genetic factors and health is substantial (Culter and Glaeser, 2005; Di Chiara and Imperto, 1988), the recent collection of genetic markers in large-scale, respondent-based surveys has made the integration of genetic material into social science research possible.

We will exploit facts from Mendelian randomization that dictates that any given gene is both randomly assigned from one parent to offspring, as well being independent of the assignment of any other gene (known as Mendel's Second Law). While this random allocation is at a the family level (from parent to child), at a population level it has been demonstrated that genetic variants are largely unrelated to the many socioeconomic and behavioral characteristics that are closely linked with each other and that confound conventional observational studies (von Hink Kessler Sholder et al., 2010; see Bhatti et al., 2005; Davey Smith et al.,2008; Kivimäki et al., 2008; Lawlor et al., 2008).

Data

Our data come from the Health and Retirement Study (HRS), a nationally-representative, biennial survey of Americans over the age of 51. The HRS is well-known for its high quality measurement of many key SES and labor market outcomes including wealth, income, and retirement decisions. In addition, HRS includes in some waves several salient dimensions of cognitive skills. Past studies have shown that these measures are highly correlated with a wealth growth and composition (McArdle et al., 2009), retirement savings (Lillard and Willis, 2001), and portfolio composition and financial literacy (Cole and Shastry, 2009).

The HRS also has a genetic sample which included 12,507 participants who provided saliva samples and signed consent forms in 2006 and 2008 with coverage of approximately 2.5 million genetic variants, called single nucleotide polymorphisms (SNPs), per variant.

Genetic instrument

The instrument used is a genetic risk score (GRS) using 19 of the top SNPs from the Lambert et al. (2013) GWAS on Alzheimer's disease. The genetic risk score, which aggregates only the top 19 SNPs from this GWAS weighted by its effect size, was developed and validated in the HRS (Daniel et al., 2013). Given the known associations between APOE and cardiovascular disease and its potential violation of the exclusion restriction, the two imputed SNPs for APOE are removed in the calculation of the genetic risk score. Because this significantly reduced the power of the instrument, we show results for both specifications in both of the results section.

Cognitive decline

Cognitive aging measures were based on data from wave three (1996) through wave ten (2010) using four cognitive functioning assessment measures—delayed recall, immediate recall, serial 7s, and backwards counting. From these four measures, a cognitive age was calculated for each participant at each wave.. Details on the calculation of the cognitive age measure can be found in Harrati, Morgan & Crimmins (in progress) or from the author.

Then, for each participant, individual slopes and intercepts were also calculates as the change in cognitive age as a function of the change in chronological age over the fourteen years (1996-2010). A slope of 1 suggests a participant's cognitive aging is on-

track with his/her chronological age. A value greater than one signifies that a participant has an accelerated rate of cognitive aging, while a value less than one signifies decelerated cognitive aging.

Retirement age

Retirement age was calculated by subtracting year and month of birth from the stated year of retirement Wave 11 (the most recent data year).

Results

Table 1 shows the results for of the two-stage least squared IV approach used. In the first stage, we show results with the unconditioned genetic risk score with and without APOE, as well as controlling for one, two and five principal components, a technique often utilized in population genetics to control for confounding with genetic ancestry. We see that estimates hold very stable, with a beta-coefficient of 0.05 changes in cognitive slope for 1 standard deviation change in genetic risk score, but the instrument does lose power as demarked by a lower F-statistic. On the second stage, there is marginally significant evidence of an effect of instrumented change in cognitive decline in the direction one would expect. A higher slope of cognitive aging, which implies a faster decline in cognition is associated with a lower retirement age (p-value=0.10). These findings point to suggestive evidence, but also a need for a greater sample size for more robust estimates.

Discussion

Using the HRS data, we find marginally significant effect of cognitive decline on retirement age, in the direction one would expect. We provide evidence to support the use of our instrument, a genetic risk score for dementia, and show that we have reasonably met all of the assumptions necessary for proper use of an instrument. The instrument used appears robust to specification and the inclusion and exclusion of different genetic variants. However, the exclusion of APOE does significantly reduce the power of the instrument.

Taken together, this evidence suggests that early signs of cognitive decline that occur when individuals are still of working age, might impact retirement decisions. Still, given the issues with statistical power, next steps for the project include adding to our sample through pooling and meta-analyzing the power of the instrument using additional data, namely the Framingham Heart Study.

Long-Term Services and Supports and Economic Security in Retirement: Implications for Social Security and SSI Policymaking

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Many Americans fear that, as they age, they may experience physical or cognitive decline that could limit their ability to care for themselves. Many people with severe cognitive impairment and limitations with activities of daily living (ADLs) receive assistance from unpaid family members and friends. As disabilities intensify, many older people turn to paid long-term services and supports (LTSS), such as formal home care, residential care, or nursing home care. These paid services and supports are often financially burdensome, because relatively few people have private long-term care insurance, Medicare pays only in special circumstances, and Medicaid covers only people with virtually no assets. Consequently, late-life disability has important implications for retirement security and programs that serve older adults, including Social Security, Supplemental Security Income (SSI), Medicare, and Medicaid.

Our project combines historical household survey data with empirically grounded simulation analyses to examine the prevalence and trajectory of late-life disability and its consequences. We describe how limitations in ADLs, cognitive impairment, and caregiving needs vary by individual characteristics (age, gender, education, race, occupational history, health status, and risk behaviors) and social environment (marital status, living arrangements, and surviving children). We then describe the economic and functional consequences of disability for all US households, with a special focus on those that receive Social Security and SSI benefits. For example, we consider expenditures on formal in-home care as well as expenditures for care in institutional and residential care settings, imputing expenses using price data (such as from Genworth [2016]). We also examine the extent to which families finance these expenses out of income or wealth, and measure the economic costs of informal care. We combine these LTSS estimates with our estimates of out-of-pocket costs for acute health care needs (adapted from Favreault and Johnson 2016 and Hatfield, Favreault, Chernew, and McGuire 2016), including both premiums and point-of-care payments, to provide a holistic estimate of the distribution of health- and disability-related income risk at older ages and how it varies by individual characteristics.

Through this union, we aim to join sources like Spillman and Lubitz (2000) in contributing to multiple strands of the literature. These include studies on the needs and costs for LTSS in late life, such as Kemper, Komisar and Alexcih (2005/2006) and

Stallard (2011); costs of dementia, such as Alzheimer's Association (2015), Hurd et al. (2013), and Yang et al. (2012); and late-life acute needs, such as Alemayehu and Warner (2004), Bhattacharya and Lakdawalla (2006), De Nardi et al. (2015), Fronstin, Salisbury, and VanDerhei (2015), Gaudette, et al. (2015), and Yamamoto (2013).

Our policy goal is to explore questions of benefit adequacy and program interactions as beneficiaries age. Many analysts frequently suggest, for example, changing the indexation of Social Security benefits, such as by shifting to the Experimental Consumer Price Index (CPI-E), or boosting benefits for long-term OASDI beneficiaries to account for increased medical and disability-related expenditures that often accompany old age.

On the other hand, some argue that economic needs associated with disability expenses might be better handled through programs like Medicaid and Medicare, or even more expansive private insurance—like Medigap insurance or private long-term care insurance—rather than through income-support programs like Social Security and SSI.

Our projection analyses help to inform such debates, by illustrating how disability changes are likely to play out for family economic well-being in a dynamic society where other factors also changing, such as family sizes and structures and women's employment histories, that influence the availability of family caregivers.

We find that the financial risks associated with severe disability in later life, including severe cognitive impairment, are quite prevalent. Nearly three-fifths of those surviving to age 65 can expect to experience some form of severe disability, and about half will use formal (paid) LTSS. The risks are also highly skewed. Most old-age spells of severe disability will be fairly short and the associated out-of-pocket costs manageable, in large part because family caregivers provide so much informal care. However, a significant percentage of older adults will experience disability shocks that are lengthy and potentially impoverishing. Women and those in lower income quantiles are at special risk, but even those with moderately high incomes face serious financial risk because of disability-related needs.

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How Does Cognitive Decline Affect Retirement Policy?

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Background

Aging bodies and minds change in predictable ways. Despite the occasional news headlines about 70-year-old marathoners, physical abilities peak in our 20s or 30s and decline steadily thereafter. But changes in mental abilities are less obvious. Research on these mental changes — a field known as cognitive aging — has exploded in the past few decades, documenting effects at the behavioral, neurological, and functional levels. Cognitive aging has important implications for retirement policy, because cognitive decline before retirement can impede the ability to work at older ages, while cognitive decline after retirement can affect the ability to make and carry out financial decisions. This project reviews the literature on cognitive aging to produce three policy briefs: 1) a lay of the landscape on "normal" cognitive aging; 2) the impact of cognitive change on work; and 3) the impact of cognitive ability on ability to manage finances in retirement.

What We Know About Age-Related Cognitive Change

Several themes have emerged from decades of research on age-related cognitive change. Neuroscientists have identified age-related changes in brain structure, chemistry, and activation patterns (See Chapter 1 of Craik and Salthouse, 2008; DeCarli et al., 1995; Pantoni and Garcia, 1997; Sullivan et al., 1995). Physical and chemical changes to the brain are correlated with predictable age-related changes in cognitive ability.[1] In general, changes in ability mirror changes at the neural level – cognitive functions mediated by brain regions that show the most deterioration decline faster than cognitive function mediated by brain regions that are preserved with age. On average, starting in one's 30s or 40s, reaction speed starts to slow down, working memory starts to deteriorate, and other components of "fluid" intelligence (which are typically associated with the brain's frontal lobes) start to weaken, while "crystalized" intelligence (which is based on knowledge stored throughout the brain) such as vocabulary tends to increase or remain steady until the last decade of life.

These changes in cognitive abilities show up in age-related changes in functional abilities. For example, compared to younger adults, older adults have a harder time

[1] Individuals who show greater changes in brain structure and activation also show greater decline in fluid cognitive abilities; brain regions that show the most deterioration correspond to decline in ability mediated by those regions (for a summary, see Salat, 2011).

reading or hearing text when confronted with distractions, are more prone to making errors when performing under time pressure, and have a reduced ability to acquire and transfer new information (Mund et al., 2010). On the other hand, older adults tend to score better than younger adults on tests of general and domain-specific knowledge (Ackerman, 2000). The rate of decline in cognitive ability accelerates towards the end of life, with widespread loss of functional ability common and an exponential increase in risk of dementia (Wilson et al., 2003).

Individual variation in the rate of decline is significant, with four typical profiles (three related to "normal" aging and a fourth associated with dementia): 1) a long period with little to no decline in ability until the decade before death, followed by a compressed period of rapid decline towards the end of life; 2) a moderate decline in fluid abilities starting in mid-life, with little to no change in functional ability until one's 70s; 3) a significant decline in fluid cognitive abilities starting in mid-life, with noticeable changes in functional ability (like ability to make complex decisions) by one's 60s; and 4) a pathological decline, which is a precursor to dementia or other forms of cognitive impairment, marked by widespread functional limitations that typically become severe over 5-10 years (Yaffe, 2009).

How Cognitive Change Interacts with Work

Despite a steep decline in "fluid" cognitive ability by the time workers are in their 60s, studies of worker productivity often fail to find significant differences between older and younger workers (Jeske and Rossnagel, 2015; Ng and Feldman, 2013). This could be explained by accumulated knowledge, which may overcome deficits in fluid cognitive ability for most workers. But, by reducing one's ability to adapt to change, cognitive aging does make older workers more vulnerable to changes, for example in health job demands. And workers who experience faster-than-average decline, as well as workers who are in occupations where fluid cognitive ability is important, could face difficulty remaining productive. Some occupations, where complicated decisions need to be made quickly and errors can result in loss of life, have recognized the risk posed by cognitive aging and have either instituted mandatory retirement ages (e.g. air-traffic controllers), or required frequent testing to work past a certain age (e.g. pilots, and under consideration for physicians) (Angelici et al., 2004; Lee and Lee, 1999; Hardy and Parasuraman, 1997).

On the other hand, work can also affect cognitive ability – workers with mentally stimulating jobs will likely preserve cognitive ability longer than those who retire early (Bosma et al., 2003).

The relationship between cognitive change and work has several implications for changing retirement policy. A higher retirement age will likely affect various types of workers differently based on the extent to which their jobs require fluid intelligence vs. knowledge. Workers in occupations that require fluid intelligence where consequences of errors are high will likely need to develop some ways to limit malpractice resulting from a loss of cognitive ability. And – because age reduces workers' ability to respond to changing demands – a higher retirement age will also put all workers at greater risk of not being able to work up to their full retirement age. For these reasons, increases in the retirement age could be coordinated with a stronger safety net and professional standards for certain occupations.

How Cognitive Change Affects Financial Decision-making

While age-related cognitive change could make financial decisions in one's 60s more difficult to make, the most serious effect of cognitive change on financial capacity typically occurs towards the end of life. The reason is that the biggest threat to financial decision-making capacity is dementia, a condition which makes most unable to make sound decisions or even carry out every day financial activities like paying bills. The risk of dementia rises exponentially with age: 5.3 million Americans had dementia in 2015, with 32 percent of people over 85 experiencing the condition (Alzheimer's Association, 2015). A further 16 to 20 percent have a precursor to dementia (Roberts and Knopman, 2013) – Mild Cognitive Impairment (MCI) – which lessens the capacity to make complex financial decisions. Both groups are more likely to be subject to financial fraud, with caregivers often the culprit (Riggs and Podrazik, 2014).

The risk of cognitive impairment in retirement raises the need to protect the elderly. Workers with significant assets in defined contribution plans are particularly at risk because they must decide how to invest and draw down assets. Workers who rely more on Social Security are better off because these decisions are made for them by the plan, but fraudsters can still direct payments away from beneficiaries who lack financial capacity. Such concerns suggest a policy response may be needed, but any response must

navigate a maze of unresolved ethical, legal, and practical questions. Security comes at the expense of freedom, many legal issues are unresolved, and standards for assessing, communicating, and acting on incapacitation are under development.

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Panel 3: New Ways to Insure Adequate Resources for Retirees

"How Home Equity Extraction and Reverse Mortgages Affect the Financial Well-Being of Senior Households"

Stephanie Moulton and Donald Haurin (The Ohio State University), Maximilian Schmeiser (Amazon), and Samuel Dodini (Cornell University)

Discussant: Lori Trawinski, AARP

"The Potential Impact of Mandated Employer Pension Programs on Retirement Savings"

Barbara A. Butrica and Karen E. Smith (Urban Institute)

Discussant: David John, AARP and Brookings Institution

"Does Borrowing Undo Automatic Enrollment's Effect on Savings?"

John Beshears (Harvard University and NBER), James Choi (Yale University and NBER); David Laibson and Brigitte C. Madrian (Harvard University and NBER); and William L. Skimmyhorn (United States Military Academy)

Discussant: Jack Vanderhei, Employee Benefit Research Institute

How Home Equity Extraction and Reverse Mortgages Affect the Financial Well-Being of Senior Households

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Introduction

More than 80 percent of senior households in the U.S. own their home, and nearly half of the net worth for the median senior is in the form of home equity.[1] Seniors tend to not spend down this asset for a variety of reasons. There is some evidence that seniors view the equity in their homes as precautionary savings to help buffer future shocks such as medical expenses or the death of a spouse, with rates of equity extraction through borrowing or home sale increasing after such life events occur (Benito, 2009; Davidoff, 2010; Nakajima and Telyukova, 2011; Venti and Wise, 1990, 2004; Poterba, Venti, and Wise, 2011). Senior households who desire to consume home equity may be unwilling to sell their homes or may be unable to qualify for or afford a mortgage, particularly after experiencing a financial shock.

The federally insured Home Equity Conversion Mortgage (HECM) is designed to address this tradeoff, with limited underwriting and no required repayment until the borrower no longer lives in the home. The underlying policy assumption is that reverse mortgages can provide seniors with "greater financial security" by providing a vehicle to "supplement social security, meet unexpected medical expenses and make home improvements" without the monthly carrying costs of a forward mortgage (U.S. Department of Housing and Urban Development, 2016). Following the financial crisis, the origination of HECMs spiked from 5 percent of all types of home equity extractions by seniors in 2006 to 12 percent in 2009 (Moulton et al., 2015).

What happens to seniors after they extract home equity through borrowing, particularly through a reverse mortgage? Do they have improved financial security relative to similar seniors extracting equity through other channels or seniors unable or unwilling to borrow? The purpose of this paper is to examine how equity extraction, including but not limited to equity extracted through reverse mortgages, affected the financial well-being of seniors both during and after the Great Recession. We consider a specific aspect of financial well-being—a senior's use and management of credit. Credit is a critical source of liquidity for seniors, with 30 percent of households over the age of 62 holding credit card debt and 26 percent holding non-housing installment debt, such as

[1] Authors' calculations using the 2013 Survey of Consumer Finances.

automobile loans.[2] Further, changes in credit scores, revolving and installment debt balances and payment behaviors can be an indicator of the overall financial security of a household, including the ability to borrow to meet liquidity needs.

Using a panel dataset of credit records, we compare credit outcomes of seniors who extracted home equity using reverse mortgages (the federally insured HECM) to those who extracted home equity using other mortgage channels and those who did not extract any home equity. Other borrowing channels include cash-out refinancing of a first mortgage, revolving home equity lines of credit (HELOCs), closed end home equity loans (HELOANs). Each borrowing channel has different costs and repayment terms that may differentially affect borrower credit outcomes. No prior studies have examined the impact of equity extraction loans generally or HECMs specifically on borrower liquidity or other household credit outcomes. Thus, while our primary expectations are related to HECMs, our paper also informs credit outcomes for seniors extracting equity through other channels.

Data and methodology

This paper uses data from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel (CCP), representing a 5 percent random sample of U.S. households. We identify seniors in the CCP dataset who extracted equity through cash-out refinancing, HELOCs or HELOANs between 2008 and 2011. As reverse mortgages are not reported in consumer credit files, we supplement the CCP dataset with our unique credit panel dataset of HECM borrowers who originated a reverse mortgage between 2008 and 2011. In both datasets, we track consumer credit records at the individual level for two years prior and three years after extraction. Using the CCP dataset, we also follow the credit records for a random sample of seniors not extracting equity during the same period.

We estimate differences in differences by extraction channel using individual fixed effects panel regression. We first compare trajectories for the entire sample, and then estimate regressions separately for households experiencing a financial shock, defined as consumers with a 25 point or greater drop in credit score in the two years prior

[2] Authors' calculations using the 2013 Survey of Consumer Finances.

to origination (or the baseline period for non-extractors). From the credit panel data, we identify five credit outcomes corresponding to different aspects of financial health: credit score, credit card balance, non-mortgage installment loan balance, whether or not the consumer has any tradeline that was 60 days or more past due in the prior 12 months, and whether or not the consumer as any mortgage with a foreclosure on file.[3]

Results and discussion

We find that seniors extracting equity through HECMs have greater reductions in revolving and installment debt and improvements in liquidity three years post origination relative to other extractors and non-extractors. For example, difference in difference estimates indicate that credit card balances for HECM borrowers decline by $3,000 more than non-extractors over the same period. Credit card balances for other equity extractors decline by only about $150 to $850 relative to non-extractors, depending on the channel. In addition to improved liquidity, HECM borrowers are also significantly less likely to become delinquent on debt payments or experience foreclosure post-extraction. On the other hand, the likelihood of delinquency increases for seniors extracting equity through the other three channels of extraction, with the increase the greatest among those extracting equity through cash-out refinancing.

We estimate subsample regressions for households with and without a prior credit shock, and find that much of the reduction in revolving debt and improvement in payment outcomes is concentrated among HECM borrowers who had a prior credit shock. Descriptively, seniors extracting through a HECM were much more likely to have had a credit shock prior to loan origination: nearly 30% of HECM borrowers experienced a shock two years prior to origination, compared to 15% of other extractors. Across all channels of extraction, seniors with a credit shock who extract equity demonstrate an increase in credit card balances prior to extraction that subsequently decline post extraction. This is in line with households turning to credit cards for liquidity in the short term before turning to their home equity. To the extent that HECMs and other types of mortgages have lower interest rates and fees than credit card borrowing, this type of substitution may be associated with improved financial position over the longer term.

[3] Credit scores are the proprietary Equifax credit scores that range from 250 to 850.

In contrast to HECMs, forward channels of equity extraction have stringent credit based underwriting requirements that may have prevented seniors experiencing a financial shock from tapping their equity through borrowing. The predominant form of equity extraction among seniors in our sample is borrowing through a HELOC. Our results indicate that HELOC borrowers tend to have strong credit profiles prior to extraction that remain strong post extraction.[4] The HECM appears to play a unique role in providing seniors with access to equity through borrowing, particularly to help seniors recover from financial shocks.

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[4] The average credit score for HELOC borrowers at origination is 782, compared to an average credit score of 695 for HECM borrowers at origination.

The Potential Impact of Mandated Employer Pension Programs on Retirement Savings

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According to the Bureau of Labor Statistics (2015), about one in three private-sector workers are employed in jobs that don't offer retirement plans. Access to retirement plans is even less common among low-wage workers and those working for small employers—58 percent of workers in the bottom earnings quartile and 48 percent of workers at establishments with fewer than 100 employees were not offered either a defined benefit or defined contribution plan by their employers in 2015. Although these workers could save in Individual Retirement Accounts (IRAs), many of them do not.

According to EBRI's Retirement Confidence Survey, workers with retirement plans (defined benefit, defined contribution, or IRA) save more than those without retirement plans (Helman, Copeland, and VanDerhei, 2016). The survey found that 67 percent of workers without a retirement plan saved less than $1,000, compared with only 9 percent of those with a retirement plan. In contrast, only 5 percent of workers without a retirement plan saved at least $100,000, compared with 35 percent of those with a retirement plan.

Because employer-sponsored pension plans are critical to retirement savings, Mark Iwry and David John conceived the idea for workplace automatic IRAs (Iwry and John, 2009). Their proposal called for employers with more than 10 workers that do not offer retirement plans to set up IRAs for their employees. Employers would automatically deduct a percentage of workers' pay and deposit it into workers' IRAs, but employers would not be required to contribute themselves. Employees could opt out of this retirement savings deduction or change the amount deducted. Automatic IRAs would be provided by the same private financial institutions that currently offer IRAs and be subject to the same contribution limits and regulations as existing IRAs.

Although several bills to create automatic IRAs have been introduced in Congress over the past half dozen years, and the Obama administration strongly advocated for them, momentum for automatic IRAs has stalled at the national level (Dorn, Hadley, and Zinter, 2015). However, proposals for workplace savings programs, including automatic IRAs, have gained traction at the state level. Several states have already enacted such programs and a number of other states are considering following suit (Pew, 2016).

This paper uses the Urban Institute's DYNASIM microsimulation model to analyze the potential impact of state mandated employer pension plans on retirement

savings. It estimates how many workers are likely to participate, describes their characteristics, and shows how future retirement savings would be affected by different program parameters, including firm size, savings vehicle (Roth IRA or 401(k)), default contribution rate, adjusted gross income limits, and investment portfolio.

We find that employer mandates increase participation and retirement savings, but that the size of the increase depends on coverage, contribution limits and tax treatment, default contribution rates, income limits, and how portfolios are invested. The smallest increase in retirement savings occurs when the mandate is restricted to larger firms, uses Roth IRA contribution limits and tax treatment, sets low default contribution rates, has Roth income-eligibility limits, and invests in low risk/low return instruments. The largest increase in retirement savings occurs when the mandate covers all workers, uses 401k contribution limits and tax treatment, sets high default contribution rates with autoescalation, has no income-eligibility limits, and invests in stock and bonds. Middle lifetime earners are expected to benefit the most from employer mandates because they have more ability to save, can make larger contributions, and are less likely to cash out their savings than low lifetime earners. Additionally, with employer mandates, middle lifetime earners are more likely to gain coverage and less likely to be constrained by contribution and income limits than high lifetime earners.

Does Borrowing Undo Automatic Enrollment's Effect on Savings?

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Yale University and NBER

David Laibson
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Automatically enrolling employees in defined contribution retirement savings plans has become increasingly common. In the U.S., adoption of automatic enrollment has been encouraged by the Pension Protection Act of 2006 and by evidence that it increases both the fraction of employees who contribute to the savings plan and the average contribution rate to the plan. The United Kingdom and New Zealand have also enacted automatic enrollment in their national pension schemes. However, there has been no evidence to date on how the asset accumulation effects of automatic enrollment inside a savings plan are offset by increased spending or borrowing outside the plan.

In this paper, we link individual employee payroll records to credit reports to identify the amount of crowding out that occurs on the borrowing margin. The setting we study is a natural experiment created by the introduction of automatic enrollment for civilian employees of the U.S. Army. Prior to August 1, 2010, these employees had to opt into contributing to the Thrift Savings Plan (TSP), the defined contribution plan of the U.S. federal government that is similar to a 401(k) plan. Afterwards, newly hired employees were automatically enrolled in the TSP at a default contribution rate of 3% of their income unless they opted out. Importantly, employees hired prior to August 1, 2010 were never subject to automatic enrollment. We can therefore identify the effect of automatic enrollment by comparing the 33,987 employees hired in the year prior to the regime change (the "pre-AE cohort") to the 26,835 employees hired in the year after (the "post-AE cohort").

Consistent with prior evidence, we find that automatic enrollment at the low default contribution rate chosen by the TSP (which is the most common non-zero default implemented in 401(k) plans) has a modest positive effect on average cumulative contributions to the TSP and a large positive effect at the left tail. Four and a half years after hire, the effect on cumulative contributions as a percent of an employee's first-year salary is 6% at the mean, 17% at the 25th percentile, and 32% at the 10th percentile. There is no effect at the median or above. (See Figure 1.)

To assess the impact on net wealth accumulation, we subtract from these cumulative contributions the change in debt excluding mortgage, student, and auto debt. The reason to exclude these three categories of debt is that they are being used to purchase durable or investment goods, so to a first approximation, increases in these debt

balances do not represent declines in net worth. We find evidence of substantial crowding out. Averaged over tenure months 48-52, automatic enrollment increases net wealth by only 2% of first-year income at the mean and 9% of first-year income at the 10th percentile. However, there is relatively little crowd-out at the 25th percentile, where the net wealth effect at months 48-52 is 15%. (See Figure 2.)

Our results highlight the importance of observing households' entire balance sheet when assessing the effect of savings policies.

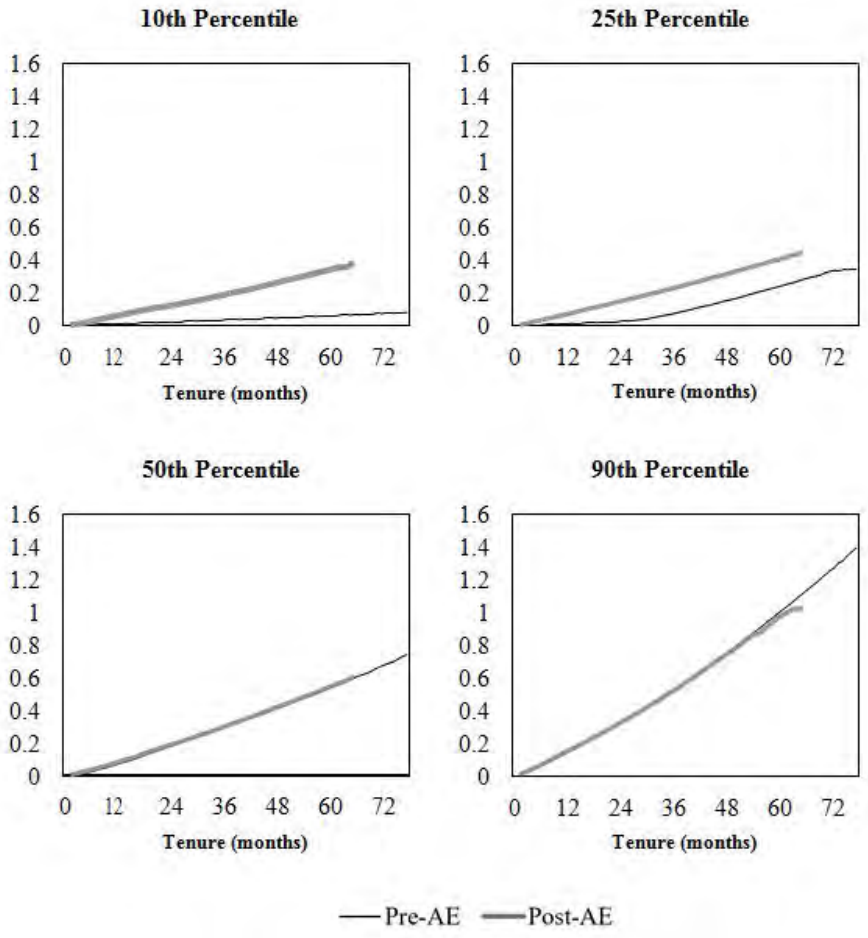

Figure 1. TSP cumulative contributions to annualized first-year pay ratios at 10th, 25th, 50th, and 90th percentiles

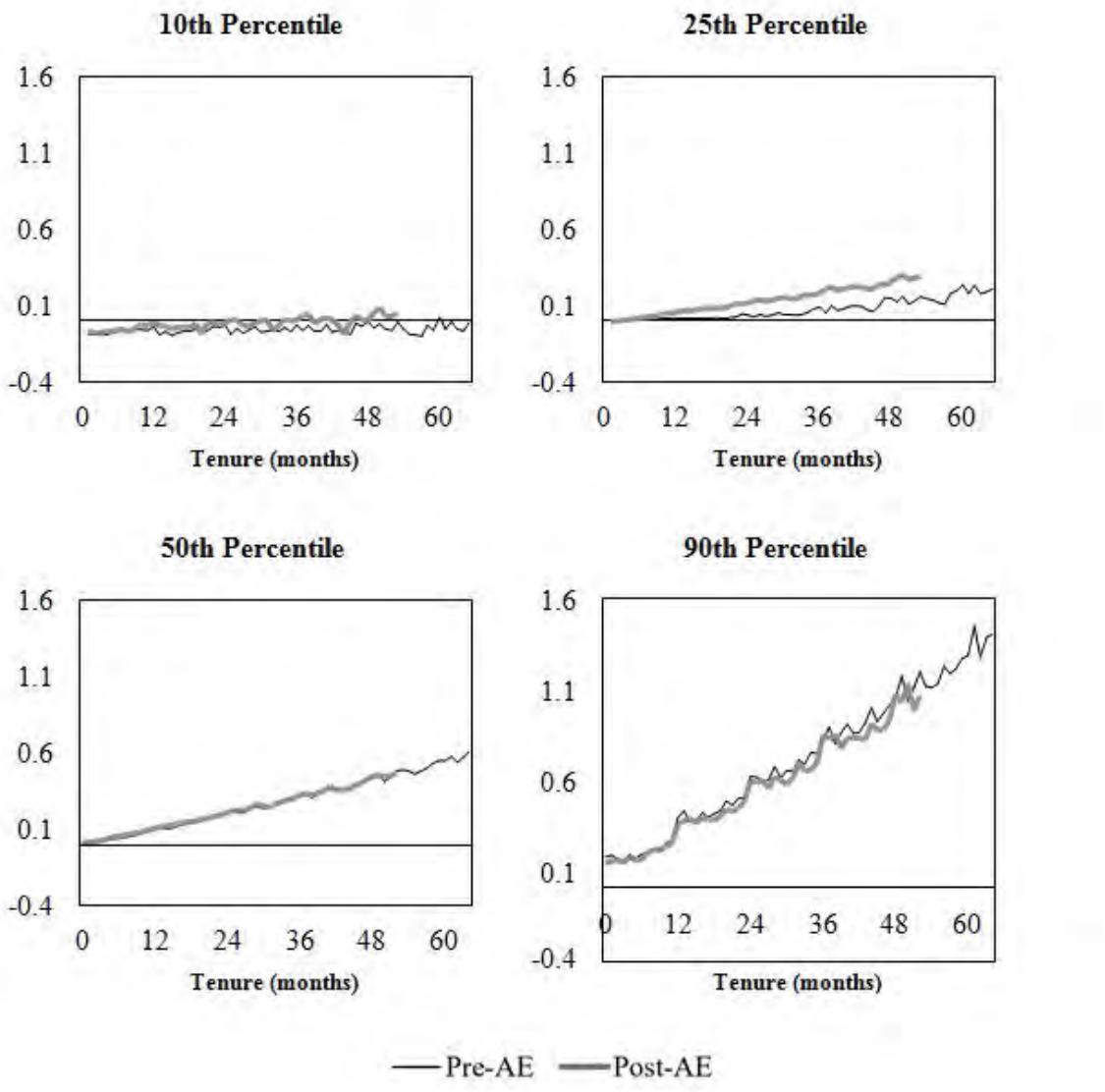

Figure 2. Net wealth change to annualized first-year pay ratio changes at 10th, 25th, 50th, and 90th percentiles. Net wealth change is calculated as cumulative TSP contributions minus change in debt excluding mortgages, student loans, and auto loans.

Panel 4: Government Finances with an Aging Population

"Adjusting the Payroll Tax to Promote Longer Careers"

John Laitner (University of Michigan) and Daniel Silverman (Arizona State University)

Discussant: Eugene Steuerle, Urban Institute

"The Earnings of Undocumented Immigrants: Towards an Assessment of the Impact of Status Regularization"

George Borjas (Harvard University and NBER)

Discussant: Sven Sinclair, Social Security Administration

"How Would Investing in Equities Have Affected the Social Security Trust Fund?"

Gary Burtless (Brookings Institution); Alicia H. Munnell, Anqi Chen, and Wenliang Hou (Boston College); and Anthony Webb (The New School for Social Research)

Discussant: Jeffrey Brown, University of Illinois at Urbana-Champaign and NBER

Adjusting the Payroll Tax to Promote Longer Careers

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and

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If tax and other policies distort household labor supply, reforms directed at changing the payroll tax — in particular, payroll-tax changes targeted to ages that maximize the impact — might be able to deliver significant efficiency gains. For example, we could argue that income and payroll taxes tend to diminish the attractiveness of work relative to leisure, thereby reducing household incentives to supply labor. Lowering the Social Security payroll tax at all ages would be unattractive from the point of view of the System's solvency. However, we might hope that targeting tax reductions to ages at which households reach the margin of deciding whether to continue work or begin retirement could secure efficiency gains from more labor supply, with much more limited sacrifice of tax revenue.

There is a literature on such reforms — e.g., Laitner and Silverman (2012), Goda et al. (2009), Burtless and Quinn (2002), and others. (See also Banks and Diamond, 2010.) Analogously, the private sector has a long history of tailoring DB pension contributions and benefits to age.

The present paper attempts to contribute to the literature. We set up a life-cycle model of household behavior, estimate key parameters with Health and Retirement Study (HRS) and other data, and use the model to simulate possible tax reforms. This is work in progress at this point.

Model

The basic model resembles Laitner and Silverman (LS, 2012). Each household seeks to adjust its lifetime trajectory of consumption expenditure to maximize its lifetime utility, subject to its budget constraint. A household's basic resources consist of the (net-of-tax) labor earnings of its adult male and female. In addition to choosing its trajectory of consumption expenditure, a household picks its retirement age. In the current draft, female earnings are taken to be exogenous and household retirement is retirement of the male adult. Future drafts will, however, model joint male and female retirement as well. Labor supply is all-or-nothing — households have latitude for choice on the extensive margin (i.e., retirement age) but not the intensive margin (i.e., how many hours per day to work during labor-force participation).

We consider couples. Numbers of children and life spans are exogenous. We adjust for household composition changes using "equivalent adult" indices, with

estimated weights. Labor earning profile shapes are exogenous. They depend upon education (itself taken to be exogenous). As we solve the model for the optimal age of retirement and the optimal lifetime trajectory of household consumption, we also determine the age-path of household wealth accumulation.

Analysis is more complicated than one might expect. On the one hand, as a household maximizes its lifetime utility with respect to its trajectory of consumption expenditure, it faces a standard, concave problem. On the other hand, maximization with respect to retirement age may not be nearly as straightforward. Maximization with respect to retirement age depends on the shape of the household's lifetime earnings profile. The profile can depend, for example, on aggregative productivity growth, which may be quite uneven. Our calculations find that multiple local maxima do, in fact, arise in some cases. When they do, we must evaluate all and find the one generating the highest lifetime utility.

Data and estimation

Our analysis depends on two data sources. As in LS 2012, we derive equivalent-adult weights from the Consumer Expenditure Survey (CEX) 1984-2001. Using data cells for individual ages 25-69 and years, we estimate the per capita rate of growth, with age, of consumption expenditure within households; the relative weight for a spouse; the relative weight for a child 18-25 still living with parents (with young children having the same weight multiplied by 0.7); and, the percentage change in consumption at retirement.

Second, we use Health and Retirement Study (HRS) data — including linked Social Security earnings records — to estimate a remaining, key parameter, namely, the intertemporal elasticity of substitution (IES). At this stage, the estimate is conditional upon CEX estimates. Given consistent estimates of the latter, we derive a consistent estimate of the IES. We use the HRS cohort first sampled in 1992.

For each household, the HRS supplies lifetime demographic data, a retirement age, and net worth. Linked Social Security earnings records provide yearly earnings for both spouses. Given the CEX coefficients and a value for IES, we can solve the life-cycle model for each HRS household *h,* deriving an optimal retirement age and the household's optimal net worth for, say, 1992. Thinking of the HRS demographic information and

linked earnings as constituting a matrix X_h, we estimate the IES from the regression equation

$$R_h = \phi(IES, X_h) + \in_h,$$

where R_h is the household's actual age of retirement. As indicated above, we use an algorithm that searches among each household's local maxima year-by-year. Our preliminary estimates use a quantile (median) regression — which does not require strong assumptions about the error term, and can be robust with respect to outliers. Not all respondents retire in-sample (e.g., some households drop out of the sample or fail to meet our selection criteria for some date after 1992). Thus, we use a censored-data quantile regression (Powell, 1984; Koenker, 2005).

The model assumes that disability can cause retirement earlier than planned. Suppose that insurance for disability is available. Retirement due to disability creates censoring beyond that noted above. Our estimation takes account of censoring of both types. We consider 4 specifications of disability.

Finally, we can use of our solution of the life-cycle model to derive a second regression equation for a household's net worth, say, in 1992. This can provide alternative parameter estimates — which can be checked against those derived from retirement age.

Our estimates so far suggest an IES smaller than 1 but larger than 0.5. The definition of disability makes a relatively modest difference. Results based on net worth accumulation are similar to those from retirement age.

Simulations

Our preliminary simulations show that if we eliminate the payroll tax (OASI and DI, both employer and employee shares) at ages 60 and beyond, for example, we could expect an average gain per household in labor-force participation of 0.5 years. Eliminating the tax at earlier (later) ages would make the participation gains larger (smaller). The simulations take disability into account: as we perform the simulations on our HRS sample, a household becoming disabled at a given age in the data is ineligible for working beyond that age regardless of tax reform. The preliminary simulations are not revenue neutral — see below.

Policy

Consider OASI. For the Social Security tax, (i) the income effect presumably increases the optimal retirement age, and (ii) the substitution effect reduces it. For the Social Security benefit, (iii) the income effect presumably decreases the optimal retirement age, and (iv) the substitution effect — though probably weak — increases it. In combination, roughly speaking, (i) and (iii) tend to counterbalance one another but (ii) should dominate (iv); hence, the Social Security system, on balance, may tend to promote earlier-than-otherwise retirement.

For the income tax, our model leaves the role of government spending on goods and services implicit. Assuming the influence of government expenditure on private households is strictly temporal, a simple analysis might then be as follows: (i) the income effect of income taxes raises the optimal retirement age, and the substitution effect lowers it. If, on the other hand, the same public spending were financed from a (non-distorting) lump-sum tax, only the income effect would remain. From an efficiency standpoint, therefore, the optimal retirement age should be higher than what households compute. Put in other words, the need to finance public spending should stimulate more labor supply, but the substitution effect of the actual income-tax system impedes the adjustment.

Thus, there seems to be an opportunity for an efficiency gain if we can devise a policy that can undo, or counterbalance, existing distortions. This paper studies one such policy: we study lowering the Social Security payroll tax late in life to encourage longer careers. The ideal age for a lower tax rate is the moment a household reaches the margin at which continued work and retirement are equally attractive. Conditioning the payroll tax on age seems feasible — using the payroll tax in such a manner seems analogous to the way DB pensions often worked in the private sector, for example. The hope would be that tax reductions focused in a narrow age range could be relatively inexpensive to implement (in terms of lost tax revenue), yet due to timing, potent in affecting household behavior.

Results

The outcomes so far suggest that payroll tax reductions fairly late in life can postpone retirement by 0.5 years or more. On the basis of prior analysis (e.g., LS [2012]), we expect the largest efficiency gains to flow to society as a whole: we expect offering

households the option to work, payroll-tax free, beyond, say, age 60, will yield individual-household utility gains that are small in relation to society's gain from greater income-tax collections.

However, a reform as just described will certainly generate (lump-sum) transfers as well as efficiency gains. Households differ in their demographic and earning profiles; optimal retirement ages, therefore, differ as well. Suppose, for example, that we remove the payroll tax at age 60. Then a household that would otherwise have worked until 62 will, roughly speaking, receive lump-sum rebates of its payroll taxes for ages 60-61. It may want to retire at 63 to take advantage of the reform, but the rebates (for 60-61) are efficiency-neutral "transfers." LS [2012], for instance, devise a way of paying for the transfers efficiently. There could thus be a net gain in welfare for society. Nevertheless, paying for the transfers requires a higher-than-otherwise tax before age 60. And, households with an inherent desire to work longer gain from the transfers, while those inherently desiring an early retirement lose. Although the reform may be worthwhile, it is neither as simple nor as clear-cut as one might have imagined.

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The Earnings of Undocumented Immigrants: Towards an Assessment of the Impact of Status Regularization

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According to the Department of Homeland Security (DHS), over 11 million undocumented persons reside in the United States. In the past few years, Congress considered (but failed to enact) a number of proposals to regularize the status of the undocumented population and provide a "path to citizenship." Similarly, President Obama issued executive orders that would grant some form of amnesty to about half of this population, but the executive amnesty is yet to take place as courts have ruled that the president may not have such authority.

Given the size of the undocumented population, any future change in the immigration status of this group is bound to have significant effects on the labor market, on the number of persons that qualify for many social insurance programs, on the timing of retirement, on the size of the population receiving Social Security benefits, and on the funding of all of these programs.

Obviously, the empirical analysis of these issues is hampered by the fact that no widely available microdata survey reports whether a particular foreign-born person is undocumented or not. In recent years, however, much progress has been made to develop methods that attempt to impute the undocumented status of foreign-born persons in micro data sets, such as the Current Population Surveys or the American Community Surveys. These attempts build on the framework first developed by Passel and Warren (1987) that attempt to estimate the size of the undocumented population. The Passel-Warren methodology, in fact, underlies the "official" estimates of this population reported by DHS.

Jeffrey Passel (now at the Pew Research Center) and various colleagues have continued to improve and extend the initial methodology over the past two decades. This additional work led to the creation of some micro-level CPS files that contain a variable indicating if a foreign-born person is "likely authorized" or "likely unauthorized." I was granted access to the 2012-2013 Annual Socioeconomic and Economic Supplements (ASEC) created by the Pew Research Center that contains the undocumented status identifier. After carefully examining the Pew methodology, I adapted and extended their approach so that I could create an undocumented status identifier in other micro data files, including all the ASEC files where foreign-born status is reported (i.e., all the ASEC files beginning in 1994) and the American Community Surveys (ACS). This

extension of the Pew approach yields a time series of micro data that allows us to document and examine the determinants of key characteristics of the undocumented population.

Borjas (2016) began such an analysis by studying differences in labor supply behavior among undocumented immigrants, legal immigrants, and natives. The differences in work propensities were striking. For example, undocumented men had much larger employment rates than other groups in the population; this gap grew substantially over the past two decades; and the labor supply elasticity of undocumented men was very close to zero, suggesting that their labor supply is almost perfectly inelastic. In contrast, undocumented women had much lower employment rates than other groups in the population.

Building on this earlier work, this paper extends the analysis to an examination of the wage differences that exist among undocumented workers, legal immigrants, and natives. The analysis of both the CPS cross-sections and the ACS yields a number of potentially important findings:

1. The age-earnings profiles of undocumented workers lies far below that of legal immigrants and of native workers. Moreover, the age-earnings profile of undocumented workers is almost perfectly flat during much of the prime working years.

2. Although the unadjusted gap in the log hourly wage between undocumented workers and natives is large (around 40 percent for both men and women), half of the gap disappears once the calculation adjusts for differences in observable socioeconomic characteristics. The wage gap between observationally equivalent undocumented workers and natives (adjusted for age, education, and state of residence) is less than 20 percent for both men and women.

3. The adjusted wage of undocumented workers rose rapidly in the past decade, relative to that of both native workers and legal immigrants.

4. The relative rise in the adjusted wage of undocumented workers implies that the wage penalty to undocumented status fell dramatically in the past few years. This wage penalty, defined as the wage gap between observationally equivalent undocumented and legal immigrants, was about 10 percent in 2005, but had fallen to less than 4 percent by 2014. The small magnitude of the current wage penalty implies that the enactment of a

regularization program is likely to have only modest effects on the wage of undocumented workers.

5. The higher employment rates of undocumented men imply that the total earnings gap (the gap that includes both the difference in the wage rate and differences in employment behavior) is far smaller than suggested by the gap in the hourly wage rate. In contrast, the lower employment rates of undocumented women imply that the total earnings gap is far larger than suggested by the gap in the hourly wage rate.

This diverse set of findings provides a foundation upon which any eventual impact analysis of the various regularization proposals can be based. It is important to acknowledge at the outset, however, that the robustness of the evidence depends on the validity of the procedure used to impute undocumented status at the micro level. Nevertheless, as the analysis reported in this paper suggests, a systematic application of the methods that can be used for identifying undocumented status in micro data sets provides a unique opportunity for such an assessment to begin.

How Would Investing in Equities Have Affected the Social Security Trust Fund?

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This research was supported by a grant from the U.S. Social Security Administration (SSA) as part of the Retirement Research Consortium (RRC). The findings and conclusions are solely those of the authors9 and do not represent the views of SSA, any agency of the federal government, or the Center for Retirement Research at Boston College.

Summary

The financial reserves of Social Security are currently invested solely in U.S. Treasury bonds. The expected investment returns on reserves could be increased if the portfolio were diversified to include riskier financial assets, such as publicly traded equities. By increasing the expected return on asset holdings, investing part of Social Security reserves in riskier assets can strengthen the long-term financial outlook of the program. Some advocates of this policy also believe it would improve intergenerational risk-sharing. By increasing the variance of annual returns on Trust Fund holdings, however, the policy shift would also expose the program to greater financial risk and potentially to greater political risk.

This paper evaluates the implications of investing part of the Trust Fund in U.S. equities. The evaluation is performed using two simulation approaches. First, we use actual historical returns on publicly traded stocks to investigate whether, with the benefit of hindsight, it would have been advantageous to invest a portion of the Trust Fund in equities starting in two past years, 1984 and in 1997. The first year followed the enactment of the 1983 Social Security amendments, which put Social Security on a path toward accumulating large Trust Fund reserves. The latter year was one which saw intense public debate over the wisdom of investing some reserves in equities. Our second evaluation strategy analyzes the current Social Security outlook under the assumption that lawmakers act immediately to restore long-run solvency by increasing the payroll tax. This policy dramatically increases future Trust Fund reserves compared with those predicted under current law. We use Monte Carlo simulation methods to investigate whether investing in equities would strengthen the long-term outlook compared with the current policy of investing all reserves in Treasury securities.

Equities have historically offered investors a higher expected rate of return relative to that on safer assets, such as Treasury bills or bonds. The geometric mean return on the S&P 500 stock index between 1928 and 2015 was 9.5 percent. In comparison, the mean return on 3-month Treasury bills was just 3.5 percent, and that on 10-year U.S. Treasury bonds was 5.0 percent. In exchange for higher returns, equities carry greater risk. The standard deviation of S&P 500 annual returns was 19.8 percent, versus just 3.1 percent for Treasury bills and 7.8 percent for 10-year Treasury bonds. For

many long-term investors, including most pension funds, the sizeable historical premium on equity investment makes the extra risk of equity holdings appear worthwhile.

Our simulations suggest that equity investments would have been helpful historically and can be helpful prospectively. Investing part of Social Security reserves in equities can reduce the need for future payroll tax hikes and benefit cuts. If equity investment had begun in 1984, for example, and if equity holdings had ramped up to 40 percent of the Trust Fund portfolio, reserves at the end of 2015 would have been $3.8 trillion compared with actual holdings of just $2.8 trillion. A more helpful measure of the size of the reserve is the Trust Fund ratio—the amount of assets in the Fund at the beginning of the year divided by expected Social Security outlays during the year. If equity investment had been phased in beginning in 1984, the Trust Fund ratio at year end 2015 would have been 4.1 compared to the actual ratio of 3.1. If equity investment had been phased in beginning in 1997, the ratio would have been 3.7.

To evaluate the potential impact of future investment in U.S. equities, we first assume the combined payroll tax rate is increased 2.62 percentage points in 2016, eliminating the 75-year funding imbalance under the Social Security Trustees' intermediate assumptions in 2015. We then assume equities are phased into the Trust Fund and reach 40 percent of reserve holdings over a 15-year period starting in 2016. The bond portion of the portfolio consists of special issue Treasury securities identical to the ones currently held in the Trust Fund. Like many analysts, we expect future real equity returns will be somewhat lower than they have been in the past. We perform Monte-Carlo analysis with 10,000 simulations to project the range of future outcomes for equity and bond returns. Equity returns are assumed to follow a lognormal distribution based on the distribution Wilshire 5000 index returns, while Treasury bond interest rates are constructed from interest rates on new special issues, which follow an autoregressive model. The covariance between interest rates on new special issues and equity returns is assumed to be zero. For simplicity, equity mean-reversion is not incorporated in the model.

Our key result is that the 50^{th} percentile of outcomes for the 40% stock/60% bond portfolio generates a Trust Fund ratio close to 4.0 at the end of the 75-year period. This is well above the Trust Fund ratio if all reserves are held as special issue Treasuries, which

is 1.0. Even the 25th percentile of the mixed portfolio remains above 1.0 during the projection period and yields a better outcome than an overwhelming majority of the bond-only simulations. The mixed portfolio also does a much better job of avoiding bad outcomes over the 75-year horizon. Only 23 percent of all simulations for the mixed portfolio fall below a Trust Fund ratio of 1.0; only 11 percent of all simulations end in Trust Fund exhaustion. In comparison, in 84 percent of cases the 100-percent bond portfolio produces a Trust Fund ratio that is less than 1.0. In 47 percent of cases the Trust Fund is exhausted before the end of the 75-year planning horizon.

Of course, the issues surrounding equity investment transcend the expected return on the Trust Fund's investment portfolio. Opponents of equity investment fear government interference in the allocation of capital in the broader economy. Many are also concerned that public ownership of equity shares will lead to government interference corporate decision-making. It is also uncertain how the higher expected returns and greater risk of a mixed equity-bond portfolio should be taken into account when assessing the long-run financial outlook of the Social Security program. The paper considers these issues in turn.

Proponents of Trust Fund equity investment typically assume the government will take a passive role in selecting and voting company shares held in the Trust Fund. They believe—as we assume in this paper—that Trust Fund investments will track a broad market index, such as the Wilshire 5000. Legislation to permit equity investment could legally require investment neutrality. We point to actual experience of U.S. government investment in equities, as for example under the Federal Thrift Savings Plan, to show that government neutrality is both feasible and practically attainable.

One issue in the debate over including risky assets in the Trust Fund portfolio is the treatment of the additional risk of the portfolio in evaluating the funding status of Social Security. Some government agencies, including the Congressional Budget Office and the Office of Management and Budget, have ignored the higher expected return and credit equities as yielding the long-term Treasury rate. In effect, these agencies view the cost of the additional risk in stocks as precisely offsetting their higher expected return. Under this view, adopting a policy of equity investment would produce no immediate improvement in Social Security's 75-year funding status. However, if equities continue

to produce superior returns in the future, the investment gains would eventually be reflected in higher Trust Fund ratios. This in turn would imply a smaller need for future payroll tax increases or benefit cuts to keep Social Security solvent.

Panel 5: Cohort Changes

"Cohort Changes in Social Security Benefits and Pension Wealth"

Chichun Fang, Charles Brown, and David Weir (University of Michigan)

Discussant: Irena Dushi, Social Security Administration

"How Does Student Debt Affect Early-Career Retirement Saving?"

Matthew S. Rutledge, Geoffrey T. Sanzenbacher, and Francis M. Vitagliano (Boston College)

Discussant: Diana Elliott, Urban Institute

"Marital Histories, Gender, and Financial Security in Late Mid-Life: Evidence from Four Cohorts in the Health and Retirement Study (HRS)"

Amelia Karraker and Cassandra Dorius (Iowa State University)

Discussant: Leora Friedberg, University of Virginia

Cohort Changes in Social Security Benefits and Pension Wealth

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The Health and Retirement Study (HRS) creates the potential to follow changes in retirement preparation at midlife (ages 51-56) through the introduction of new cohorts every six years. The most recent addition in 2010 included also an expansion of the minority sample of HRS, with financial support from the Social Security Administration (SSA). This new 2010 cohort coincides with the recent availability of private-sector pension plan descriptions provided online by the Department of Labor from Form 5500 filings, improving the linkage over what was available in previous cohorts. Additionally, linked Social Security data have also recently become available for the 2010 new cohort. We use these new data sources, in conjunction with survey data, to measure pension and Social Security wealth, and to conduct sensitivity analyses of cohort changes and racial disparities to key assumptions used in their construction.

Table 1 demonstrates the value of the Department of Labor's posting of Form 5500 records. In both 2004 and 2010 the HRS was able to match most public-sector workers to their plan information because public plans post their own plan information online. In 2004, only about 1 in 3 private sector pension-covered workers was successfully matched through requests made of employers. In 2010, over 90% were matched through the DoL website.

Table 1. Employer Plan Match Rates, by Sector and Self-Report of Plan Type, 2004 and 2010

Sector	Plan Type	2004	2010
Private	All	31.6%	87.9%
	Any DB	33.6%	88.4%
Public	All	88.2%	96.9%
	Any DB	92.1%	98.3%

The very high rate of employer matching allows us for the first time to compare systematically the wealth in plan types reported by respondents with the wealth in plan types offered by employers for which that respondent is eligible. Table 2 shows the estimates of 2010 pension wealth according to whether we rely on respondent reports of plan type, as is done in the public versions of HRS pension wealth back to 1992, or instead rely on plans offered by employers to which the respondent can be matched.

Imputations are used to estimate DB wealth when a respondent reports DB but no DB is matched, and when a respondent did not report a DC but is matched to one. It is comforting that half or more of total pension wealth of all types is in plans for which the respondent and employer match agree on the plan type. Pure plan switches, where the respondent says DB and the employer only offers DC (or vice versa), account for a very small part of the total wealth and the totals are not very different whether we rely on respondents or employers. Cases in which the respondent reports both types of plans but can only be matched to one or the other account for a slightly higher share of pension wealth, and the net change from replacing the respondent's report with employer data is to reduce wealth by about 30 million out of nearly 600 million total, or about 5%. A larger impact is seen in cases where a respondent reported only one type of plan but was found to be eligible for both. If we were to add all the plans for which the respondent seems eligible (but did not herself report) it would add about $100 million in pension wealth in 2010, or about 15%. Slightly more of this comes from DC plans than from DB plans.

Table 2. Pension Wealth on Current Job by Plan Type; Respondent Report Compared to Employer Match , All Workers in HRS 2010 ($000s)

	DB wealth		**DC wealth**		**Total Pension wealth**	
Plan type agreement	**Resp**	**Empl**	**Resp**	**Empl**	**Resp**	**Empl**
Agree	139,964	139,494	201,160	201,160	341,123	340,654
Type switch	13,698	14,579	7,085	20,437	20,783	35,016
Drop plan	40,468	28,624	40,128	22,565	80,596	51,189
Add plan	69,856	116,006	83,706	140,579	153,562	256,585
Total	263,986	298,704	332,079	384,740	596,065	683,443

There is no reliable source to validate which estimates of pension wealth are closer to the truth. One type of administrative data that provides some partial information comes from the W-2 records contained in the linked HRS-SSA administrative records. "Deferred compensation" indicates that some income was exempt from taxation because it was contributed to a qualified defined-contribution plan. The presence of deferred compensation in the W-2 is good evidence of current contribution (participation) in a DC

plan. The converse is not true. That is, someone who is not currently contributing may nevertheless have wealth in a DC plan at their current employer. Linked SSA administrative records also provide no information on DB plans. The other limitation of administrative records is that they are only available for respondents who provide consent. About half of all workers in HRS 2010 had provided consent as of the most recent linkage. The W2 evidence tends to support the employer match estimates for DC wealth. Those estimates added about 57 million in DC wealth to respondent reports (see Table 2). Imputing values to plans implied by the W2 deferred compensation field, and adjusting the total for the rate of Social Security consent would add about 60 million to respondent reports.

We consider these and other assumptions used in the construction of pension and Social Security wealth in the context of cohort change. The primary estimates (weighted) are shown in Table 3 for individuals aged 51-56 at six-year intervals corresponding to the entry of new cohorts into HRS. Total wealth increased from 1992 to 2004 then dropped sharply in 2010 for the cohort having experienced the Great Recession. Despite financial losses, in 2010 for the first time DC wealth exceeded DB wealth, reflecting the long-term trend away from DB plans in the private sector. Social Security wealth rose somewhat after 1998, due mainly to the increasing real value of the maximum taxable earnings. The real value of annuitized retirement wealth (Social Security plus DB) fell from 1998 to 2004 and again to 2010. The real value of non-annuitized tax-advantaged retirement wealth (DC plus IRA) rose steadily but not fast enough to offset the decline in annuitized wealth.

Table 3. Components of Full Wealth for Individuals Aged 51-56, by Year ($2010)

Wealth	**1992**	**1998**	**2004**	**2010**
HH wlth	176,744	177,530	217,082	179,699
IRA	15,147	26,409	30,395	26,238
DC	22,152	38,497	35,711	44,675
DB	109,856	108,086	60,549	35,881
SSW	104,139	104,154	120,166	127,313
Total	428,038	454,676	463,903	413,806

In the full version of the paper we consider these trends across the distribution of lifetime income and for different racial/ethnic groups.

How Does Student Debt Affect Early-Career Retirement Saving?

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Introduction

Workers who attended college increasingly begin their working lives with a financial responsibility not shared by prior generations: paying off substantial student loan debt. As recently as 1993, 47 percent of graduates had student loans, but the debt burden was typically low – borrowers owed less than $10,000 on average (in 2013 dollars). Today, 70 percent of graduates have loans and the average debt burden has tripled to $30,000 (TCAS, 2014).

The rapid rise in student debt has clearly weakened the balance sheet of younger workers. How have they responded? Some students may cut back on consumption. Others might rack up other types of debt; indeed previous research has found that higher student debt burdens are associated with decreased creditworthiness (Gicheva and Thompson, 2013).

Alternatively, student debtors may reduce their retirement saving – essentially, opting to shore up short term needs at the expense of the longer run. Workers who begin saving for retirement while they are young give themselves a leg up – by taking advantage of employer's matching contributions, enjoying the fruits of compounded interest, and establishing good saving habits. Given the rapid rise in student debt and the increasing importance of individual retirement saving, a natural question arises: how does the presence of student debt affect young adults' decisions to save for retirement and how does it alter early career asset accumulation?

Despite concerns in the popular press that rapidly rising student debt could set back efforts to save for retirement, the academic literature on the relationship between student loan debt and retirement saving has thus far been thin. The lack of research likely stems from the recency of the problem – the national total of outstanding student loan debt has nearly quintupled just since 2004 (Federal Reserve Bank of New York, 2016) – and the shortcomings of the data typically used to answer questions about savings and debt. Nearly all of the existing studies reviewed below use the Survey of Consumer Finances (SCF), a nationally representative cross-sectional dataset (e.g., Elliott, Grinstein-Weiss, and Nam, 2013). Because of the rising incidence and amount of student debt, young adults are the workers who are most likely to be impacted by this issue. Yet the SCF includes only a small number of young adults, which may lead to noisy results.

Moreover, the SCF contains little information on the individual's family background, college quality, or underlying intellectual ability, yet all of these factors are likely correlated with the need to take out a student loan and with one's propensity to save for retirement.

To overcome these shortcomings, this project uses the National Longitudinal Survey of Youth 1997 Cohort (NLSY97), which samples a larger cohort of recent college graduates than would be available in standard surveys of household finance, and includes rich information on students' family background, college quality, and intellectual ability. The project has a narrow focus, on retirement plan participation and assets as of the respondent's 30th birthday, rather than on wealth accumulation in general. Importantly, the controls provided by the NLSY97 allow the project to analyze students who differ with respect to the amount of student loan debt held at age 25 but are otherwise similar in all other observable characteristics.

Methodology

The analysis estimates linear regression models where the dependent variable is: 1) an indicator for participating in any employer-sponsored retirement plan by age 30; 2) the same indictor variable, but limiting the sample to individuals ever offered a retirement plan – i.e., the take-up of any retirement plan offer by age 30; or 3) the natural logarithm of the level (in 2013 dollars) of assets in all retirement accounts combined, among individuals with positive assets.

The independent variables of interest relate to student loan borrowing. First, the regression includes an indicator variable equal to one if the individual had a positive outstanding balance on an educational loan at age 25. Second, the model includes the natural logarithm of that loan balance. The basic model also includes standard demographic variables like gender, race, Hispanic ethnicity, marital status, and an indicator for the presence of children in the household; the natural logarithm of the respondent's earnings at age 30; a categorical variable for firm size to account for auto-enrollment; and birth cohort fixed effects.

The full specification of the model adds indicator variables for the degree earned by age 30; indicators for whether the main institution attended was public, private non-profit, or private for-profit; the background of the respondent's parents, including their

education and their income when the respondent was 18; and the respondent's percentile score on the Armed Services Vocational Aptitude Battery prior to entering college, as a measure of innate ability.

Results

Young workers' balance sheets are clearly hurt by student debt – median non-student debt levels among college graduates with student loans are more than double the median debt of college graduates without loans, and non-retirement assets are half as large for graduates with student loans. But the preliminary results indicate that student loans do not substantially reduce retirement saving to compensate. The estimated relationship between retirement plan participation and student debt is small and statistically insignificant, and we can rule out any large negative correlation. The relationship between pension take-up and student debt is negative as expected, but the estimates are small and somewhat noisy. Retirement assets as of age 30 have no statistically significant relationship with the outstanding student loan balance.

Conclusion

The precipitous rise in outstanding student debt – nearly quintupling just in the last decade – has hurt the finances of young workers. Previous studies have documented how educational debt spills over into increased levels in other kinds of debt, and potentially reduces homeownership rates (e.g., Cooper and Wang, 2014). But few studies have examined the question of how student loans affect retirement saving, and those that have used ill-suited data.

This project uses more suitable data with a larger sample from the NLSY 1997 cohort. At least to date, the negative impact of student loans on younger workers has not yet shown itself in the form of lower early-career retirement savings. Instead, younger workers with substantial student loan debt may be at a financial disadvantage that manifests itself in higher credit card debt or lower consumption. Whether the relationship between student debt and retirement saving will continue to be weak as the cohorts with even higher student debt burdens advance into financial and economic maturity will require further study.

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Marital Histories, Gender, and Financial Security in Late Mid-Life: Evidence from Four Cohorts in the Health and Retirement Study (HRS)

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Marital status is strongly linked to aspects of financial security, such as earnings and assets (i.e. wealth). Those who are continuously married fare better economically than those who are divorced, widowed, or never-married.

Over the second half of the twentieth century, individuals' marital histories—which we define as the sequencing of marital status and the duration of current and past relationships—have also become less stable and more complex. Individuals in later-born birth cohorts are more likely to experience divorce and cohabitation and are less likely to ever marry compared to their earlier-born counterparts (Cherlin, 2010).

While there is evidence to suggest that financial security in later life varies by cohort, with more-recent cohorts having more total wealth (Addo and Lichter, 2013), it is not known what potentially changing role marital history plays in inter-cohort differences in financial security. Furthermore, given women's increasing economic parity with men over time, it is unclear how the relationship between marital history and financial security will vary by gender within and between cohorts.

We use data from the Health and Retirement Study (HRS) to examine inter-cohort and gender variation in the relationship between marital history and financial security in late mid-life (ages 51-56), a forerunner of economic security in retirement (Collins, Scholz, and Seshadri, 2013). Our analysis includes four cohorts of HRS respondents, comprised of: members of the original HRS cohort (born 1936-1941), the War Babies (born 1942-1947), the Early Baby Boomers (born 1948-1953), and the Middle Baby Boomers (born 1954-1959).

We examine each cohort at ages 51 to 56, when income and assets are frequently at or near their lifetime peaks (Lee, Lee, and Mason, 2008). This approach enables us to consider the how differences in marital histories may have unique financial benefits and consequences for various cohorts at the same ages. For each cohort we examine three financial measures (negative, zero, and positive wealth; positive wealth levels; earnings) that capture distinct components of financial security as individuals approach retirement. We use multivariate regression models that control for other factors that may be associated with both financial outcomes and marital histories, including race/ethnicity, education, number of children ever born, and physical health.

We find that Middle Baby Boomers born in the mid- to late-1950s differ from older cohorts born in the mid- to late-1930s by both marital history and financial security measures. Middle Baby Boomers are more likely to have negative wealth (i.e. debt) or zero wealth, and those who have positive wealth have lower levels of wealth. On the other hand, Middle Baby Boomers working full-time have higher earnings than earlier cohorts, especially among women. More recent cohorts are less likely to be continuously married than previous cohorts. The relationship between marital history and financial security depends on whether wealth or earnings is examined. Specifically, the economic benefits of continuous marriage are more pronounced for wealth than earnings.

Middle Baby Boomers are the only cohort we examined after the Great Recession. To some extent, the wealth of Middle Baby Boomers may have rebounded since our 2010 measures, resulting in a (temporary) understatement of assets in our data. However, our findings of a higher proportion of Middle Baby Boomers with negative or zero wealth suggests that this cohort is indeed less prepared for retirement than earlier cohorts.

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Panel 6: Household Resources in Old Age

"Labor Supply and Social Networks"

Gary V. Engelhardt (Syracuse University)

Discussant: Jason Fichtner, Mercatus Center

"Longitudinal Determinants of End-of-Life Wealth"

James Poterba (MIT and NBER), Steven Venti (Dartmouth College and NBER), and David Wise (Harvard University and NBER)

Discussant: Alice Henriques, Federal Reserve Board of Governors

"Selection in the Long-Term Care Insurance Market"

Ami Ko (University of Pennsylvania)

Discussant: John Haaga, National Institute on Aging

Labor Supply and Social Networks

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The role of family, friends, and neighbors in providing social support at older ages has been a longstanding topic of interest in public health and the sociology and demography of aging. In contrast, the role of social networks in shaping—and being shaped by—economic decisions has only relatively recently generated substantial attention among economists. One area of emphasis has been on the impact of social networks on education, employment, and labor supply outcomes, particularly for younger individuals. Social connections may aid in finding employment, and there may be peer effects and other social interactions in labor supply and education. However, there has been little work on older individuals, and little work on the reverse channel: the impact of work and employment on social networks and social connectedness. In particular, employment may provide opportunities to expand one's social network, or may crowd out the time necessary to foster social ties. Transitions out of the labor force at older ages may have the potential to induce large changes in social networks.

This paper has a very simple goal: to examine the impact of work and retirement on social networks. It uses novel data on older Americans from the first two waves of the National Social Life, Health, and Aging Project (NSHAP). In particular, the NSHAP gathered egocentric data on the social network of each respondent. These data are used to examine how changes in labor force participation, hours worked, and retirement affect network size, composition, and a variety of metrics of network density for older individuals.

A fundamental empirical challenge in identifying causal effects of labor supply on social networks is that labor force attachment is not assigned randomly across individuals. An important contribution of the empirical analysis is the development of a panel instrumental variable (IV) identification strategy to circumvent these difficulties and isolate causal impacts. The IV approach, detailed below, relies on a large literature in labor and public economics that shows that age-based eligibility rules for claiming Social Security benefits have important effects in reducing labor force participation and hours worked by, and inducing retirement among, older individuals. The first wave of the NSHAP was administered in 2005-6; the second wave five years later, in 2010-11. In the five-year window between waves, individuals from different birth years hit the Social Security eligibility ages at different points, which yields differential exposure to

incentives to reduce labor supply and retire that is non-linear in age. Given widespread knowledge among older individuals of the age-eligibility rules for Social Security, this program-induced variation in labor supply is plausibly exogenous with respect individual choices about social networks.

For individuals in the later stages of their potential working careers, defined in this paper as ages 57-70, there is a strong first-stage relationship between age eligibility for Social Security and labor force participation, hours, and retirement, respectively, in the NSHAP panel. For example, controlling for marital status, age (linearly), and a broad array of health characteristics, attaining the Social Security Early Entitlement Age (EEA) of 62 is associated with an 11 percentage-point reduction in the labor force participation rate and a 19 percentage-point increase in self-reported retirement, respectively. Attainment of age 65—for many cohorts, the Social Security Full Benefit Age (FBA)—is associated with a 5 percentage-point reduction in labor force participation and an 11 percentage-point reduction in retirement, respectively.

Based on the IV approach, there are two primary findings about the link between work, retirement, and social networks at older ages. First, labor supply raises (and retirement lowers) the size and density of one's social network. The estimated elasticity of the social network size to the labor force participation rate is 0.25. The estimated elasticity of network size to hours worked is 0.16. The estimated elasticity of network size to the retirement rate is 0.12. Second, most of these effects occur for women and individuals with a post-secondary education. Work and retirement has little impact on the size of the social network for men and the lesser educated. The paper also explores how work and retirement affect the composition of network members. Unfortunately, these estimates were too imprecise to draw firm conclusions.

Longitudinal Determinants of End-of-Life Wealth

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Many individuals reach the end of life with few assets. Our research focuses on two potential explanations for this outcome: the possibility that an individual reached retirement with very few assets, therefore making it almost inevitable that they would have few assets at death, and the possibility that the individual was well-prepared for retirement but encountered unanticipated post-retirement events, such as the loss of a spouse, a health shock, or a general decline in health, that drained financial resources.

This paper builds on our previous research, which suggested that most low-asset individuals at the time of death had low assets at the traditional age of retirement, by presenting additional evidence on the prevalence of low assets at retirement. We investigate the factors that are associated with low saving before retirement, and examine several forces that affect the evolution of asset balances after retirement. We pay particular attention to the association between the level of education, the prevalence of health conditions, and financial circumstances.

Low levels of accumulated wealth at retirement may result from low lifetime earnings, so that even with a reasonable saving rate the accumulated wealth balance is low, from a low saving rate while working, or from poor returns on investments. To assess the relative importance of these factors, we report the distribution of lifetime earnings in the population, which we view as describing "saving capacity," and compute the ratio of assets at retirement to lifetime earnings. This ratio reflects the propensity to save out of lifetime earnings as well as the rate of return the individual has earned.

We draw data on asset balances at retirement and in the last years of life from the Health and Retirement Study (HRS). We study participants from all cohorts who are known to have died during the survey and who were 65 years of age, or older, in the last survey wave prior to their death. Interviews in the HRS are approximately two years apart, so the date a person is last interviewed may be as much as two years prior to the actual date of death. We consider both financial assets and net worth. Net worth includes home equity and the net value of other real estate, business assets, and financial assets. IRA, 401(k) and Keogh balances, when available, are included in financial assets. We use household balance sheet measures because it is difficult to assign ownership of housing or jointly held financial assets to household members.

Our estimates of the percentage of persons with low financial wealth suggest substantial variation by lifetime earnings decile and by level of education, and also indicate a role for pre-retirement health status. About one third of those in the third decile of the lifetime income distribution are "low wealth" when this is defined as net worth of less than $50,000, compared with only 4.1 percent of those in the highest lifetime income decile. Similarly, 34 percent of those without a high school degree have low wealth, compared with 4.2 percent of those with a college degree. Pre-retirement health is strongly associated with asset balances at retirement: 11.5 percent of persons who never experienced a major health condition had less than $50,000 of total wealth, compared with 17.6 percent of those who experienced a major health condition.

Similar patterns emerge for financial assets. Individuals in the lowest education group are 6.4 times more likely to have financial assets of less than $25,000 at retirement than those in the highest education group. Individuals in the third or fourth lifetime earnings decile are 7.2 times more likely to have low financial assets than those in the highest decile, and those in the lowest education and earnings groups are 17.2 times more likely to have low financial assets than those with high education and earnings. The data suggest considerable variation in assets at retirement by level of education, even controlling for lifetime earnings.

With regard to asset trajectories after retirement, the onset of a major medical condition is associated with an increase of about 1.5 percentage points in the chance that net worth is below $25,000, $50,000, or $100,000. The evidence that the onset of a major health condition raises the likelihood of reporting low net worth is stronger than that for financial assets. The percentage of persons with low net worth increases by between 2.2 and 4.7 percentage points following the death of a spouse, but there is no such evidence for financial assets alone. Some findings even suggest a rise in financial assets following a spousal death. This could reflect life insurance payouts or balance sheet re-arrangements, for example selling a home to cover medical bills and converting some of the residual home equity to financial assets.

Our findings suggest that reaching late life with low assets is not simply the result of low saving before age 65. Elderly households are not fully insured against health care needs, and adverse health shocks can result in the draw-down of assets and increase the

likelihood of reaching the end of life with very limited assets. Wives outlive their husbands more often than not, and there is a non-trivial chance that the wife's assets will fall to low levels after the death of her husband.

Selection in the Long-Term Care Insurance Market

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A decade ago, there were more than one hundred insurance companies writing private long-term care insurance policies. Today, only a dozen remain. During the same period, the average annual premium of a typical policy has tripled from $1,000 to $3,000. The share of policies that are sold to consumers over the age 80 plunged from 70 percent to 10 percent. The share of policies that provide lifetime benefits plunged from 80 percent to 10 percent.

Long-term care insurance policies provide insurance against risky and costly formal long-term care expenditures such as the costs of nursing homes and paid home care. While a public insurance program –Medicaid – exists, one has to be impoverished to be eligible for benefits. With the average monthly cost of $7,000 for nursing homes and $4,000 for paid home care, the seemingly unraveling of the private long-term care insurance market entails substantial welfare implications for elderly Americans.

This paper studies to what extent adverse selection can explain the seemingly death spiral witnessed in the private long-term care insurance market. If insurance companies neglect factors that are highly predictive of an individual's formal care spending, then the market can suffer from adverse selection where the consumer with the highest value for insurance also has the highest expected spending under insurance. In the presence of adverse selection, an unraveling may take place on the extensive and the intensive margins. On the extensive margin, an insurance market can enter a death spiral in which insurance companies keep increasing premiums but consistently make losses as higher premiums attract even riskier consumers. On the intensive margin, insurance companies may stop selling relatively comprehensive plans and reject consumers who are observably risky. As the recent phenomena of the long-term care insurance market strikingly resemble the symptoms of adverse selection, I explore the possibility of adverse selection in the market. I focus on two potential sources of adverse selection; informal care and moral hazard.

As long-term care refers to assistance with basic daily activities, unlike acute medical care, informal care provided by family members – usually adult children - can easily substitute formal care. While the likelihood of family caregiving might depend on unobserved factors such as the degree of altruism, there exist observables that are highly predictive of family caregiving such as the gender of children. However, insurance

companies do not collect any information about children from applicants. Indeed, the actuarial model widely used in the industry only uses an individual's age, gender and health conditions for risk classification.

The other source of adverse selection studied in this paper is moral hazard. Following the literature of health economics, I define moral hazard as the incremental formal care spending due to insurance coverage. All else equal, individuals with greater moral hazard are more likely to select into insurance as they can benefit more from it. The magnitude of an individual's moral hazard is ex-ante unobserved by insurance companies. However, there are again factors that might be highly predictive of moral hazard. First, financial assets might be highly correlated with moral hazard. Impoverished individuals may not show great response to private insurance coverage as they already have the Medicaid. Affluent individuals may not either as they can afford formal care even in the absence of insurance. Second, family caregiving might also be important in determining moral hazard. If adult children reduce care in response to their parents' insurance coverage, then there will be greater needs for formal care which will subsequently result in higher spending. Information about neither financial assets nor children demographics is used by insurance companies for pricing.

I formalize the analysis by writing a model in which elderly parents make private insurance coverage choices and formal care decisions, and adult children make caregiving choices. Adult children make caregiving choices based on their altruism, opportunity costs, and financial benefits they could gain in the form of bequests. Informal care by children determine parents' needs for formal care services. As elderly parents are liquidity constrained and formal care is very costly, formal care choices could vary substantially with the insurance coverage status, potentially resulting in moral hazard. The key feature of the model is that it allows forward-looking elderly parents to make insurance choices based not only on the health risks, but also on the expected informal care from children and the magnitude of moral hazard. I estimate the model using the panel data from the Health and Retirement Study.

With the estimated model, I run counterfactual simulations with healthy 60 years olds to analyze insurance selection. I find that informal care and moral hazard are indeed sources of adverse selection; individuals with less family caregiving or greater moral

hazard are more likely to buy insurance and to use formal care. Quantitatively, informal care has a larger impact on selection than moral hazard. Moving from the median to the ninetieth percentile of the informal care distribution is associated with a 14 percentage point decline in the demand for insurance (the average demand is 20 percent). Moving from the median to the ninetieth percentile of the moral hazard distribution is associated with a 10 percentage point increase in the demand for insurance. For the determinants of informal care, children demographics as well as parents' financial access to formal care are important. For the determinants of moral hazard, wealth is critical; moral hazard shows an inverted U-shape curve in the wealth distribution. This result is driven by the fact that individuals at the bottom and the top of the wealth distribution are less price sensitive and their children reduce care in response to insurance coverage by smaller magnitude. I find that on average, about three quarters of moral hazard are caused by the price elasticity of the demand for formal care and the remaining quarter is caused by reduced family caregiving in response to insurance.

Next, I simulate the model to find the actuarially fair price of standardized policies. The simulation reveals these policies before the big premium hike were indeed underpriced; the actuarially fair premium is almost twice the average empirical premium a decade ago. As the premium increases from the empirical level to the actuarially fair level, the demand falls by more than half. The increased premium attracts even riskier individuals than before; the average spending of the insureds increases by one fifth and family caregiving among the insureds falls by a third.

Finally, I run a set of counterfactual experiments intended to combat adverse selection. I examine counterfactual pricing rules where premiums depend on key observables of informal care and/or moral hazard. The use of these observables result in reduced adverse selection and higher welfare.

Panel 7: International Comparisons

"Working Conditions and Sustainable Work at Older Ages: An International Perspective"

Nicole Maestas (Harvard University), Kathleen Mullen (RAND), David Powell (RAND), Jeffrey Wenger, and Till von Wachter (UCLA)

Discussant: Howard Iams, Social Security Administration

"How Does Retirement Behavior Respond to Drastic Changes in Social Security Rules? Lessons from the Norwegian 2011 Pension Reform"

Christian Brinch (Norwegian Business School), Ola Vestad (University of Chicago and Statistics Norway), and Josef Zweimüller (University of Zurich)

Discussant: Anthony Webb, The New School for Social Research

"Passive Saving over the Life Cycle"

Nick Fabrin Nelson (University of Copenhagen) and Daniel Reck (University of California, Berkeley)

Discussant: James Choi, Yale University

Working Conditions and Sustainable Work at Older Ages: An International Perspective

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In this report we present preliminary findings from both the 2015 American Working Conditions Survey (AWCS), and the European Working Conditions Survey (EWCS). The AWCS is a new, nationally representative survey of U.S. workers ages 18-71, modeled on the EWCS. The American data come from a survey fielded between July 15 and October 15, 2015 to participants in the RAND American Life Panel (ALP). The ALP is a nationally representative (when weighted) sample of individuals residing in the U.S. who have agreed to participate in regular online surveys. Respondents who do not have a computer at home are provided both a computer and Internet access, so that the panel is representative of all individuals in the U.S., not just Internet users. Since its inception in 2006, the ALP has fielded over 400 surveys on a wide variety of topics including health, employment, and retirement. All surveys are publicly available (after an embargo period) and can be linked to one another. For more details about the RAND ALP, see https://alpdata.rand.org.

The EWCS was initially fielded in 1991 and again 1995, continuing every five years thereafter until the most recent survey in 2015. The EWCS has expanded from 12 countries (then the EU member states) in 1991, to 35 countries in 2015. The survey is conducted in face-to-face interviews and contains responses from 35,765 participants between February and September 2015. For more about the EWCS, see http://www.eurofound.europa.eu/european-working-conditions-surveys-ewcs.

Both the AWCS and the EWCS contain questions on employment status, physical and psychosocial risks, time and place of work, work organization, skills use and skills development, social relations at work, as well as health and well-being. The AWCS surveyed 3,878 respondents in the U.S. The EWCS sample sizes differ by country size. For smaller countries samples range from 600 to 1000 respondents, and 1000 to 2000 for larger countries.

Main Findings

Using both data sets we find patterns of working conditions are similar for older and younger workers across the U.S. and Europe with shift work, working at high speed, adverse social behavior, and prospects for career advancement all declining with age.

One of the most interesting differences between Europe and the U.S is the ability of American workers to adjust their starting and finishing times within designated

margins (flextime). Compared to Europeans, Americans are much more likely to be able to adapt starting and finishing times. In the EU, 20 percent of EWCS respondents reported being able to adjust starting and finishing times, while 44 percent of AWCS respondents reported having that option. For those who do not have the option of flextime, similar proportions of workers in the U.S. and Europe report employer-driven changes in work schedules; 31 percent of employees report employer-driven changes to work schedules in both the U.S. and Europe.

With the proliferation of personal computing and smartphones many workers are finding it difficult to draw distinctions between personal time and work time. To address this issue, both the EWCS and AWCS inquired about working in your free time to meet work demands. In the U.S. *half* of all workers worked in their free time to meet work demands, for Europe the proportion was 45 percent.

We also investigated how easy or difficult it would be to take an hour or two off during working hours. Nearly two-thirds of Europeans (65 percent) said it would very easy (25 percent) or fairly easy (40 percent) to take an hour or two off during work hours; a similar proportion of Americans report that it would be not difficult at all (30 percent) or not too difficult (33 percent)

It appears that Americans and Europeans have similarly flexible work arrangements that allow them to take time off, although Americans are more likely to work during their free time, and have more flexibility around their starting and finishing times. While it is interesting to note workers' flexibility around when they work, equally interesting is whether workers have flexibility about how they work. We examined worker autonomy in a series of questions about whether workers were able to change the order of tasks, change their methods of work, or change the speed or rate of work. Overall, a higher proportion of Americans report having work autonomy related to task order, methods of work, and speed of work. In Europe women report consistently higher levels work autonomy than men (although the differences were small for speed of work). The U.S. represents a mixed picture of work autonomy for men and women. More women reported flexibility when it came to the order of tasks while more men reported having control over their methods of work. The proportion reporting control over the speed and rate of work were identical for U.S. men and women. We note that in both the

U.S. and Europe men were much less likely to control their ordering of tasks. This may be due to the higher proportion of men in manufacturing and construction jobs where task order is difficult to change.

In general we find that American workers, as compared to Europeans, are more likely to blur the boundaries between work and home, often by working in their "free time." More Americans than Europeans can adapt the starting and finishing times of work and have more control over the order of tasks, methods of work, and speed or rate of work. Americans appear more likely to work whenever and however they please, but this implies a significant encroachment on American workers' free time. Since hours flexibility is an important determinant of sustainable work and is strongly predictive of continued labor force participation at older ages, the abundance of flexible arrangements in the U.S. may mean that many people remain working at older ages than would in the absence of this flexibility. This may, in some small measure, explain the differences in labor force participation rates we see between the EU and the U.S. Of course, the pendulum may swing too far –making working hours so flexible that workers feel that they can't get away from work unless they retire.

How Does Retirement Behavior Respond to Drastic Changes in Social Security Rules? Lessons from the Norwegian 2011 Pension Reform

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Summary

In the U.S. and in many other OECD countries, a disproportionate fraction of workers retire at the early retirement age (ERA), the age when social security retirement benefits become available. This widely observed phenomenon is commonly referred to as "spikes" in retirement hazard rates. The particular rules of social security systems are a potentially important driver of these spikes, since the rules of existing social security system are often associated with substantially lower net returns to work past the ERA. Two features that tend to reduce the returns to work are (i), earnings testing of pension benefits, resulting in reduced benefits for claimants whose earnings are above a specified amount; and (ii), non-neutral deferral mechanisms, meaning that future benefits are not sufficiently increased for individuals who choose to postpone pension claiming past the ERA. The fact that spikes in retirement hazards are observed even in countries with fairly flexible pension systems, such as the U.S., suggests that the spikes in retirement hazards might also be driven by benefit availability as such. This could be due to liquidity constraints, self-control problems, or norms regarding what is an acceptable retirement age. In this paper, we present empirical evidence on each of these possible explanations of spikes in retirement hazards at the ERA; effects of social security incentives on the one hand, and effects of benefit availability on the other.

We exploit policy variation from a comprehensive reform of the Norwegian pension system to contribute to a better understanding of spikes in retirement at the ERA, and of labor supply and pension claiming behavior at and just after the ERA. The reform was implemented in 2011 and brought major changes both in terms of the earnings test, in terms of actuarial adjustments for early and late claiming of pension benefits, and in terms of the earliest benefit access age, the ERA. Our empirical design relies on the fact that two groups of private sector workers, defined by their contractual pension coverage, were affected by the reform in distinctively different ways.

Workers in firms affiliated with the early retirement scheme AFP[1] ("AFP workers" in the following) had access to pension benefits from age 62 in the pre-reform pension regime, but benefits were subject to a strict earnings test and there were no actuarial adjustments in place. The post-reform system too has an ERA of 62, but with a complete abolishment of the earnings test and the introduction of an actuarially neutral deferral mechanism, the post-reform system goes a long way towards disentangling the decision of when to exit the labor market from the decision of when to start claiming pension benefits. Hence, for AFP workers, the early retirement age has remained fixed at age 62, while there have been dramatic increases in the net returns to work past the early retirement age. Workers in firms not affiliated with AFP ("nonAFP workers"), on the other hand, did not have access to pension benefits prior to age 67 in the prereform regime. After the reform, they could start claiming non-earnings tested pensions from age 62, subject to actuarially neutral adjustments for early or late claiming.

We perform difference-in-differences analyses by age and calendar time to study the impacts of the reform on labor market behavior, separately for AFP and nonAFP workers. For AFP workers, we find large positive effects of increased returns to work past the ERA, both in terms of employment rates and in terms of earnings. While the spike in retirement at the ERA is strongly reduced with the reform, effects on employment are not large enough to remove the spike completely. We argue that the remaining excess retirement at the ERA is most likely related to incentives provided by the AFP scheme to remain in employment until that age. As for nonAFP workers we find no effects of a lower ERA on employment and only minor effects on earnings, suggesting that factors such as self-control problems and liquidity constraints are not likely to be important drivers of the spike in retirement at the ERA that is observed among AFP workers. For both AFP and nonAFP workers we find no robust evidence of benefit substitution, that is, of changes in the inflows into the disability or unemployment insurance systems.

[1] All private and public sector workers are covered by social security, while the "AFP" ("Avtalefestet Pensjon," contractual pension) system is an early retirement scheme based on a collective agreement between trade unions and employer federations, which covers the entire public sector and a majority of workers in the private sector. As the public sector AFP scheme was not changed as part of the 2011 reform of the social security system, due to a breakdown in negotiations, we restrict attention to private sector workers.

In the last part of the paper we return to AFP workers, and investigate whether the spikes in retirement at the ERA that are present both before and after the reform can be reconciled with incentives in the pension system that could potentially generate such behavior. With the guidance of a simple lifetime labor supply model, we implement a bunching estimator that exploits the upward notch in the lifetime budget constraint for AFP workers. We make use of the detailed Norwegian administrative data to calculate incentives measures for each individual in our sample, and find that the behavioral responses to the incentives in the Norwegian pension system are in line with standard economic theory. The estimated labor supply elasticities are rather small.

Passive Saving Over the Life Cycle

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Motivation

Consider the following scenario: a person pays little attention to her savings until she approaches retirement age. Then she realizes that she accidentally saved too little. Recent research[1] suggests that many individuals are inattentive to savings, which implies that these shortfalls, along with surpluses from saving more than intended, should be common. This paper examines how individuals react to shortfalls and surpluses later in life. When people save too little because of inattention, how do they satisfy their lifetime budget constraint? In particular, do they postpone their retirement?

Research on this question has important implications for public policy. In an effort to help more people save adequately for retirement, policymakers have proposed and, in some cases, implemented policies like default contributions to pension plans, which are designed to target inattentive, or passive, savers. If such policies succeed in increasing saving, then they may also have the unintended consequence of causing people to retire earlier. More early retirements would increase the stress on already-strained social security and pension systems, and they would also undo some of the increase in saving by stretching retirement savings over extra years. If, in contrast, increased saving results mostly in higher expenditures, then policymakers can accomplish their goal of increasing the resources available to retired persons without these consequences.

Theory

The paper describes two lines of theoretical reasoning to make the point that changes in saving caused by policies like default contributions must have consequences later in life. The first uses the simple accounting of budget constraints: any saving today must be converted into expenditure (possibly including bequests and transfers) later in life. All else equal, an increase in (passive) saving today must therefore increase expenditures or reduce earnings later in life.

The second line of theoretical reasoning adds more assumptions to obtain a more precise prediction: inattentive individuals should act like they receive wealth shocks when they become attentive to the extra saving (or lack thereof) that accrued while they

[1] For a more thorough review of the empirical evidence and other studies mentioned in this summary, including citations of the relevant work, please refer to the full body of the paper.

were inattentive. Several prior studies look for similar responses to wealth shocks outside the context of passive saving, such as winning the lottery, typically finding small but non-zero effects.

Empirical Analysis

We examine this question empirically using data on earnings, saving, and retirement from the Danish population register. This data covers the entire population of Denmark, and includes much more detailed data on saving than is typically available in the United States.

Our primary research design uses the changes in employer pension contributions accompanying job switches, as in prior work by Chetty et al (2014). These employer pension contributions are rather like U.S. 401(k) contributions with one important exception: the amount of the contribution is determined by collective bargaining agreements, which cover the vast majority of Danish workers. This institutional fact means that 1) variation in employer pension contributions can be thought of like "default" pension contributions where "opting out" of the default would mean making changes in some other type of savings account, and 2) the changes in pension contributions accompanying job switches are plausibly unrelated to individuals' preferences over saving and retirement timing, which implies we can use these changes to answer our research question. Our empirical analysis therefore studies individuals changing jobs in their 50s, tracking the changes in their savings that accrue due to the changes in employer pension contributions, and then observing their likelihood of retiring early at age 60 or 62 (two popular ages for early retirement in Denmark).

We find that early retirement behavior actually responds very little to increases (or decreases) in wealth from passive saving. The point estimates suggest that increasing savings rates by 5 percent over five years would lead to a 0.45 percentage-point increase in the likelihood of retiring by age 60. Considering that 14 percent of individuals in the sample retire by age 60, this is a small effect. We document a slightly larger and statistically significant effect on the likelihood of retiring at age 62 – which is perhaps a more likely response for individuals who had initially planned to retire at 65. Our estimates suggest that the five-year 5 percent increase mentioned above would lead to a 1.3 percentage point increase in the likelihood of retiring at age 62. While statistically

significant, this effect is still small enough that the large majority of the impact of passively accruing wealth on lifetime earnings and expenditures must be on something other than early retirement.

Conclusion

If policymakers or employers utilize policies that increase individuals' saving for retirement because individuals are inattentive, these policies must lead to higher consumption or lower earnings down the line. Our findings suggest that early retirement does respond slightly to such policies, but that the majority of the necessary budgetary adjustments happen through other channels, such as expenditures at various ages, transfers and bequests to heirs, and labor force participation later in life. These findings should assuage concerns that small changes in total saving generated by default contributions will have unintended consequences for early retirement. Future work should 1) explore similar questions in the other contexts, including other countries and, ideally, settings with larger variation in total saving; and 2) marshal additional data to examine some of the other channels for budget adjustment.

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Howard Iams earned an AB at Indiana University and an AM and PhD at the University of Michigan in sociology. Iams has worked 40 years for the Social Security Administration, primarily in the research office as a statistician, a social science research analyst, a senior research advisor, and the acting director of the Office of Policy Evaluation and Modeling. At the Social Security Administration (SSA), Iams has worked on a variety of research and evaluation activities. He worked on evaluation demonstrations in the Aid to Families with Dependent Children program, specializing in the subjects of performance measurement and work demonstrations. In the 1980s, he worked on the 1982 New Beneficiary Survey (NBS) and was responsible for its re-interviews in 1991. Using the NBS, he conducted analyses of mortality and of employment patterns of newly disabled and retired beneficiaries. Since 1986 Iams has conducted policy evaluations on retirement with survey data from the Census Bureau's Survey of Income and Program Participation (SIPP) matched to SSA administrative records of earnings and benefits. In collaboration with Steve Sandell, he designed and developed the Modeling Income in the Near Term (MINT) data system with matched SIPP data. Iams has been responsible for the logic of the MINT process of projecting recent Census data forward to represent retirees of the future and guiding the contractual effort implementing the projection equations of MINT. From 1990 through 2011, SSA has used MINT to estimate the retirement income of the baby boomers and future retirees including the impact of Social Security reform proposals on subpopulations of the retiree population. Iams has co-authored numerous conference papers and published articles using the MINT data to compare the baby boom birth cohort economic status to earlier cohorts.

David C. John is a senior strategic policy advisor at the AARP Public Policy Institute (PPI) focusing on pension and retirement savings issues. PPI is AARP's internal think tank. John also serves as the deputy director of the Retirement Security Project (RSP) at the Brookings Institution. RSP focuses on improving retirement savings and income in the U.S., especially among moderate- and low-income workers. Prior to joining AARP, John was also a senior research fellow at The Heritage Foundation for 14 ½ years. Before joining Heritage, John worked on Capitol Hill for four U.S. Representatives, two Democrats and two Republicans. In the private sector, John was a vice president specializing in public policy development at The Chase Manhattan Bank in New York. In addition, he worked as director of legislative affairs at the National Association of Federal Credit Unions, and worked as a senior legislative consultant for the Washington law firm of Manatt, Phelps & Phillips. John has written and lectured extensively on the importance of reforming the nation's retirement programs. He is also the co-author, along with J. Mark Iwry, of the Automatic IRA, a small business retirement savings program for firms that do not sponsor any other form of retirement savings or pension plan. The Automatic IRA was endorsed by both the 2008 campaigns of John McCain and Barack Obama, and is part of the Obama budget. It has received favorable attention from publications as diverse as The New York Times, National Review, and many others.

Richard W. Johnson is a senior fellow in the Income and Benefits Policy Center at the Urban Institute, where he directs the program on retirement policy. An economist specializing in health and income security at older ages, he is an expert on older Americans' employment and retirement decisions. Recent studies include analyses of the recession's impact on older workers, occupational change at older ages, changes over time in job demands, and work disincentives created by the tax and transfer system. He recently directed a team of researchers evaluating public pension plans in all 50 states and the District of Columbia, and is examining how reforms might affect public-sector employees. He has also written extensively about retirement preparedness, including studies of the financial and health risks people face as they

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Thomas L. Steinmeier is professor of economics at Texas Tech University. He previously taught at Dartmouth College and Oberlin College. He is a Research Economist at the National Bureau of Economic Research and for 15 years was a member of the steering committee, and for most of those years a co-PI, of the Health and Retirement Study. Steinmeier's research has focused on retirement, pensions, Social Security and savings. Together with Alan Gustman, he has built a series of structural models of retirement and saving for individuals and couples. These models have been applied to increase understanding of how retirement is affected by health conditions, the Great Recession, and by current and contemplated Social Security and other retirement policies. Together with Gustman and Nahid Tabatabai, he has examined how retirement is defined and reasons for the wide differences in retirement behavior among individuals; has documented incentives observed in pension plans and sharp trends in these incentives over time; and has investigated the extent of and effects of imperfect knowledge of pensions and Social Security on wealth and retirement.

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Jeffrey Wenger is a senior policy researcher at the RAND Corporation. His current research examines the effects of working conditions on remaining in the labor force, and the transitions of military personnel into the civilian labor force. He is also leading a project on long-term unemployment among late-career workers. From 2003 to 2015, Wenger was an assistant and then associate professor at the University of Georgia where he taught econometrics, statistics, economics, and policy evaluation. From 2013 to 2015 he was also an NIH/NIA Research Fellow in the Study of Aging at RAND in Santa Monica. Wenger's primary expertise is in unemployment insurance; he has published studies in the areas of UI financing, automatic triggers for extending UI benefits, and the role of information on UI application rates. Wenger is also interested in issues of retirement and the role of business cycles on retirement savings. He has published research on the asynchronicity of stock and labor markets and its effects on retirement savings, and research on preference heterogeneity and its role on savings rates and borrowing options in defined contribution plans.

David A. Wise is the John F. Stambaugh Professor of Political Economy, Emeritus, at the John F. Kennedy School of Government at Harvard University. He is also the former director of the Program on the Economics of Aging, and the former director of the Disability Research Center and the Retirement Research Center, at the National Bureau of Economic Research. He has written extensively about the saving effect of personal retirement programs – such as Individual Retirement Accounts and 401(k) plans in the U.S. He is currently engaged in an ongoing analysis of the retirement incentives in public social security programs around the world, and in studying the drawdown of personal retirement account assets. He also has written extensively on the retirement incentives of defined benefit pension programs in the U.S., and on the financial implications of housing wealth for the elderly.

Josef Zweimüller is professor of macroeconomics and labor markets at the University of Zurich. His research interests are in the area of labor economics, income distribution and economic growth. He has worked on the impact of welfare state programs (unemployment insurance, family policy, disability insurance, pension reform) on labor-market outcomes. He has also worked on the effect of income inequality for innovation, growth and the patterns of international trade. His work has been published in American Economic Review, Quarterly Journal of Economics, Review of Economic Studies, Journal of Labor Economics, Journal of Monetary Economics, Journal of Public Economics, American Economic Journal, Journal of the European Economic Association, Economic Journal, Journal of Economic Theory, among others. He has also published the book "Income Distribution and Macroeconomic Models" (Princeton University Press 2006, with G. Bertola and R. Foellmi). From May 2009 until August 2015 he has been director of the Labor Economics Program of CEPR London. He is a member of the IZA network and a researcher in the NBER Disability and Retirement Research Networks, Cambridge, MA.

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