Social Security Research at the Michigan Retirement Research Center

by Richard Burkhauser, Alan Gustman, John Laitner, Olivia Mitchell, and Amanda Sonnega*

Introduction

Social Security has been a topic of widespread discussion in the last decade. Rising longevity and falling fertility have led to an aging population, which increases solvency challenges for the Social Security system. Public concerns over low national saving have led to an extensive dialog on the merits of reform that might change the U.S. system into one with fully or partially funded personal accounts. Meanwhile, pensions in the private sector have been evolving from predominantly defined benefit (DB) to predominantly defined contribution (DC), raising concerns that workers preparing for retirement have more personal responsibility, with more complex financial challenges, than ever before.

The Office of Retirement and Disability Policy at the Social Security Administration (SSA) created the Retirement Research Consortium (RRC) in 1998 to encourage research on topics related to Social Security and the well-being of older Americans, and to foster communication between the academic and policy communities—in particular, through an annual research conference in Washington, D.C.[1] The Michigan Retirement Research Center (MRRC) has been part of that effort for more than a decade. This article surveys a selection of MRRC output[2] and highlights principal themes in the Center's ongoing research.

From its inception, many MRRC researchers have specialized in quantitative analysis using microeconomic data. The single most important data set for this work is the University of Michigan's Health and Retirement Study (HRS), a panel survey representative of the U.S. population older than age 50, with complementary information on Social Security and pension benefits. (Primary support for the HRS comes from the National Institute of Aging; however, SSA provides important supplementary support. SSA also provides earnings histories of HRS respondents and spouses who consent.) MRRC and the HRS work closely together.

Many analyses of possible Social Security reforms and related policy issues begin with the so-called "life-cycle model" of Nobel laureate Franco Modigliani (1986). It forms the conceptual framework underlying most empirical studies, and much of the research reviewed in this paper employs the life-cycle model. As its name implies, the model follows household members through their life spans. A household starts with a young adult single or couple. Earnings tend to rise as one ages, until abruptly ending at retirement. The premise of the model is that a household's desired lifetime consumption profile is likely to be relatively flat. A household should therefore save during its peak earning years to accumulate assets that will enable it to maintain its standard of living, that is to say its consumption, after retirement. Thus, the model indicates motives for saving. It posits for each household a criterion, or "utility function," which measures the satisfaction derived from lifetime consumption. A household's lifetime consumption aims to maximize this utility function, subject to its budget constraints.

Selected Abbreviations

CAMS	Consumption and Activities Mail Survey
DB	defined benefit
DC	defined contribution
DI	Disability Insurance
HRS	Health and Retirement Study

* *Richard Burkhauser is a professor of policy analysis at Cornell University. Alan Gustman is a professor of economics at Dartmouth College. John Laitner is a professor of economics at the University of Michigan and is also Director of the Michigan Retirement Research Center. Olivia Mitchell is a professor of insurance and risk management at the University of Pennsylvania. Amanda Sonnega is a lecturer in health behavior and health education and movement science at the University of Michigan.*

Selected Abbreviations—*continued*

MRRC	Michigan Retirement Research Center
SSI	Supplemental Security Income

The latter make a household's consumption options conditional on its earnings. Generalizing the criterion to reflect a household's valuation of leisure time, we can use the model to study choices of how much to work and when to retire. The attributes of the utility function will characterize a household's tolerance for risk; hence, one can use the model to explain portfolio choices at different ages. In fact, the model can admit many details and complexities.

Social Security Reform

One of the topics of greatest interest to MRRC researchers in recent years has been possible reform of the Social Security system. There have been numerous proposals from a wide variety of sources. One prominent example is the 2001 Presidential Commission report *Strengthening Social Security and Creating Personal Wealth for All Americans*.[3]

One strand of MRRC research considers basic theoretical differences among public pension systems. A number of reform proposals involve the establishment of personal retirement accounts. Laitner (2002) examines the fundamental theoretical difference between a pay-as-you-go (PAYGO) public pension system and a system with funded private accounts. A PAYGO system pays benefits to current retirees out of tax revenues from current workers. A system with funded private accounts would collect taxes from each current worker and later pay his or her retirement benefits from the balance of the account (that is, from the worker's own cumulative contribution) plus accrued interest. Either system will reduce private incentives to save because both provide retirement benefit payments that substitute for private life-cycle accumulations. In the case of a funded public system, the system's private account balances tend to offset reductions in private saving, and Laitner shows the offset is one-for-one in some cases. With a PAYGO system, however, there are no public-system account balances to offset reduced private saving, inhibiting potential national wealth. To switch from a PAYGO Social Security system to one with funded private accounts requires a funding mechanism. Laitner shows that borrowing money through an increase in the national debt can set up initial private account balances for older workers. Neither efficiency gains or losses, nor changes in general equilibrium prices, will necessarily follow. Nevertheless, such a transition does not improve national saving.

Smetters (2005) employs a more complicated model reflecting household choices about work hours and lifetime consumption, and shows that it is possible to design a changeover from a PAYGO to an account-type Social Security system that leaves no household worse off and leaves some clearly better off (known to economists as a "Pareto improvement"). The study shows that the course of reform can be arranged to elicit larger and more efficient labor supplies during the transition. When Nishiyama and Smetters (2006, 2007) elaborate the model to include earnings uncertainty and mortality risk, however, the efficiency gains tend to disappear. The existing Social Security system has a progressive benefit structure, which provides risk sharing, especially for households with low earnings. In the sophisticated model, switching one-half of Social Security taxes to personal accounts no longer yields overall efficiency gains. Net gains reappear only when benefits to low earners under the residual Social Security system are made considerably more progressive than those of the current system.

A second strand of MRRC research simulates likely effects of specific elements from the Presidential Commission's list of reforms. Gustman and Steinmeier (2002, 2004) use HRS panel data to construct a life-cycle model of household behavior. The model assumes that households choose their lifetime consumption and retirement age, with the latter perhaps preceded by an interval of part-time employment. Interpersonal differences in earning ability, impatience, taste for leisure, and taste for part-time work constitute an important element of the model (see "Labor Supply Behavior" section). Households face constraints on their ability to borrow, in the sense that their net worth must always remain nonnegative.

Gustman and Steinmeier (2003) consider commission proposals to limit future benefit growth to price inflation, boost minimum benefits, reduce benefits for early retirement more rapidly than currently scheduled, increase benefits for surviving spouses in low-wage households, or reduce high-income bracket Social Security benefits. The first and third proposals could have fairly significant effects according to the simulations. Pegging benefit growth to inflation leads to substantial reductions in the purchasing power of benefits over time, causing postponement of retirement. The authors find that full-time work

among individuals aged 62 in 2075 would increase by about 7 percentage points relative to current law, which allows benefits to grow with wages. The third proposal, which directly penalizes early retirement, can increase labor supply 3–4 percentage points at age 65 in 2075. Gustman and Steinmeier (2005a) study a Commission proposal allowing Social Security participants to allocate 4 percentage points of their payroll tax to a personal account, with traditional Social Security benefits being reduced proportionately for those with personal accounts. The new accounts pay market interest rates, assumed in the simulations to equal 4.3 percent above the rate of inflation. Beyond a poverty threshold, retirement funds from the personal account may be withdrawn as either a lump sum or an annuity. In this simulation, the percentage of men retiring at age 62 increases from 33 percent to 42 percent. The high rate of return on the new accounts tends to increase resources available to households, facilitating earlier retirement. Although the new accounts reward households—especially those with higher earnings—with greater benefits for postponing retirement than the existing system, the rate-of-return effect predominates in the simulations.

A third strand of MRRC research investigates possible reforms not explicitly covered in the Presidential Commission report. Gramlich (2006) confronts solvency problems of the current Social Security system, which the Board of Trustees (2007) estimated to be about 3.5 percent of future taxable payroll.[4] Gramlich proposes a package of modest-scale changes. He calculates that eliminating the taxable maximum on the payroll tax, immediately increasing the normal retirement age for benefits by 1 year, and adopting price indexing for approximately a decade would eliminate Social Security's solvency problems in perpetuity. Laitner and Silverman (2006) investigate a policy change affecting Social Security tax requirements and benefit calculations. Earnings beyond a preset age—for example, 54—would not be subject to the payroll tax nor would they be used in calculating the participant's Social Security benefits. The payroll tax earlier in life would be slightly (less than 1 percent) higher, to make the proposed reform revenue neutral. The simulations suggest that men would extend their careers by about 1 year, on average, following the policy change. An individual retires when the after-tax value of wages falls short of the value of retirement leisure. Income and payroll taxes lower a household's perceived reward for work. By eliminating the payroll tax late in life, the proposed reform reduces tax-induced incentives to retire early. In the simulations, most participants value the chance to work longer and keep more of their compensation, and the economy benefits from additional income tax revenues stemming from longer careers.

The research of James and Edwards (2005) on public pension reform in Chile provides interesting evidence corroborating the possibility of labor-supply increases among older men in response to lower tax rates. Although the effects of different aspects of Chilean reform are difficult to separate, "restricted access to early pensions and the exemption of pensioners from the pension payroll tax appear to exert a powerful effect on labor force participation rates."

Social Security Disability Insurance

The onset of disability can pose a significant threat to work and economic welfare. The United States has established a network of public and private programs to mitigate disability's economic consequences. The two most important federal programs are Social Security Disability Insurance (DI) and Supplemental Security Income (SSI). MRRC disability research evaluates features of these programs and studies program interactions.

Unlike most European countries, the United States has no universal short-term disability program, and imposes a 5-month waiting period for DI benefits. This has raised concerns about the potential for substantial loss of income before benefit payments begin. Bound, Burkhauser, and Nichols (2003) trace sources and patterns of household income prior to and following DI application. The average applicant's monthly earnings decline significantly (from $1,575 to $248) in the months before application, but the monthly income of the applicant's household drops much less in the months before and after application (from $3,254 to $2,455) and over the next 3 years—even for those denied benefits. A patchwork of temporary disability benefits such as workers' compensation and employer pension benefits seems to offset declines in their own and their spouse's earnings. In the longer run, most of these temporary sources of income are replaced by DI benefits. Although SSI applicants also experience declines in earnings, their household income holds up much better because, on average, earnings play a less important role for them (the average household income of SSI applicants is $1,530 per month, compared with $3,458 for DI applicants). However, income from Aid to Families with Dependent Children (AFDC) and other welfare programs declined for SSI awardees.

Mitchell and Phillips (2001, 2002) study potential economic consequences of increasing the early Social Security retirement age for workers with health limitations. The 2001 study finds that in the HRS cohort of men and women aged 51–61, the majority is eligible to apply for DI, but some men, and 20 percent of women, are not. The main reason for ineligibility is having insufficient quarters of coverage to qualify for benefits. A disproportionate share of the uncovered population has a health problem and lower income or wealth. The 2002 paper uses the first four waves of the HRS to predict DI application and award patterns longitudinally. Those in poor health and with lower education and income are more likely to apply for DI, compared with those reporting no health problems and more assets. Few factors distinguish those who are awarded benefits from those who are not. Among initial applicants, middle earners are more likely to be awarded DI benefits, while high-earning respondents are less likely to receive initial awards. For reapplications and appeals, higher non–Social Security wealth is positively correlated with a secondary award.

Examining the impact of increasing the early retirement age is important, and merits additional research. For example, Bound, Stinebrickner, and Waidman (2004) run successive simulations using increasingly sophisticated methods, with somewhat different results. They simulate consequences of several policy changes—including increasing the minimum age for Social Security retirement benefits to 65—on employment and DI applications. They find that increasing the early retirement age would reduce exits from the work force at age 62 (currently around 60 percent) by nearly 20 percent, with little change in DI applications.

Bound, Cullen, Nichols, and Schmidt (2004) evaluate the adequacy of the DI program to insure against income losses associated with disability onset. They argue that the empirical literature measures DI efficiency costs in terms of either caseload growth or reduced labor force attachment, without considering how these costs are related to societal gains from redistribution. To address this, they calculate the expected financial benefits and costs of an increase in DI payments. The total cost of providing an additional $1 of income to current DI recipients is $1.50, which the average worker should be willing to "pay." The average implicit price of an additional dollar of insurance is much higher than $1.50 for more highly educated (higher wage) workers, so they would not willingly purchase additional insurance. Although the average implicit price is always such that typical workers would purchase additional insurance, more highly educated workers never gain since they bear a disproportionate share of the costs. This analysis starkly shows the political economy aspects of DI program growth—those who will gain and lose from the policy as well as the tradeoff between program inefficiencies and social gains from its distributional consequences.

Another aspect of MRRC analysis, which is more multidisciplinary in nature, focuses on the relationship between poor health behaviors or specific medical conditions and disability. Richardson and others (2003) show that poor health behaviors at baseline, specifically smoking and a sedentary lifestyle, predict workforce disability (a health-related limitation or inability to perform work tasks) and workforce exits within the 6 years studied. Vijan and Langa (2003) and Vijan, Hayward, and Langa (2004) find strong correlations among diabetes, health-related work limitations, and workforce exit. Wray (2003) finds that poor mental health is also a strong predictor of workforce exit.

Burkhauser and Cawley (2004) examine the impact of obesity, as measured by body mass index (BMI), and find evidence that obesity increases the probability of health-related work limitations. The same authors (2006, 2008) argue that BMI does not distinguish fat from fat-free mass such as muscle and bone. Using data from the National Health and Nutrition Examination Survey III, they show that the identification of individuals as obese, group rates of obesity, and correlations of obesity with social science outcomes are all sensitive to one's measure of fatness. They find that total body fat is negatively correlated with employment for some groups and that fat-free mass is not significantly correlated with employment for any group, a difference obscured in previous research using only BMI. Burkhauser, Cawley, and Schmeiser (2008) apply a similar strategy to predict DI application. They find that, for white men, BMI consistently predicts future DI application. For white women, almost all measures are consistently predictive. For black men, none predict application. For black women, waist circumference and waist-to-hip ratio are the only significant predictors of DI application. This variation across race and gender suggests that social science data sets should include alternative measures of fatness. These findings allow policymakers to better predict program application and enrollment and hence overall Social Security costs.

Labor Supply Behavior

The age at which workers decide to retire will have an important bearing on labor supply and per capita national output in coming years. Certainly, changing trends in women's labor force participation will have a profound impact. This is especially significant in an era of declining birth rates and increasing longevity.

For many years, the most common retirement age for males was 65, and the second most common was 62. Researchers could readily identify probable reasons: Because of inequitable actuarial adjustments embedded in both Social Security and many private DB pensions, the reward for working after becoming eligible for benefits declined. By working full time another year after reaching age 65 (or, in the case of pensions, after qualifying for normal retirement benefits), one would continue to collect wages, but as much as 1 year's worth of benefits could be lost. Because the system failed to adjust future benefits to compensate for any benefits lost while continuing to work, the net wage fell. Furthermore, workers were not allowed to collect private pensions while working on the same job, and many jobs had a mandatory retirement age. Analysts examined the impact of wages, the change in the present value of expected future Social Security and pension benefits, and other factors on retirement age and found that the net gain from continued work typically turned sharply negative at age 65.

However, the institutional backdrop for retirement choices has shifted dramatically in the last three decades. Changes to Social Security enacted in 1983 established incremental increases in the full-benefit retirement age and gradually reduced penalties for earnings after retirement until the penalty was entirely eliminated in 2000. The Age Discrimination in Employment Act of 1986 abolished mandatory retirement in most jobs. Evolution toward DC pension plans in the private sector tended to ensure, and to make transparent, financial advantages for postponing retirement. Recent data show that the "spike" in male retirements at age 65 has indeed greatly diminished as more men work longer. Nevertheless, a bunching of male retirements at age 62 is still quite evident—in fact it is now the most common retirement age—and presents a puzzle, given the incentives to delay retirement.

MRRC research suggests a possible explanation for a continuing effect of institutions and policies on retirement choices. Social Security and pension benefit formulas include a "one-size-fits-all" actuarial adjustment that favors no retirement age over another. Yet, there may be major differences in individual preferences. For instance, some people are very patient while others are not. Economists measure this impatience with the "subjective discount rate." A household with a high subjective discount rate "discounts" the value of a future pleasure relative to that of a present pleasure. Allowing different degrees for impatience for different households, Gustman and Steinmeier (forthcoming) estimate that about 45 percent of married men have subjective discount rates above 5 percent, and one-third have rates above 20 percent. The latter rates indicate very impatient individuals who will eschew delays in benefit receipt under almost all circumstances. For them, the Social Security early retirement age is a great temptation.

As an illustration, although the Social Security penalty for early retirement at age 62 relative to retirement at 65 is now roughly actuarially fair, Gustman and Steinmeier (2005b) find that a policy changing the early retirement age to 64 would induce 5 percent of the older male population to delay retirement from 62 to 64. In a second example, simulations find that changes in Social Security rules legislated in the 1980s and 1990s, and phased in between 1992 and 2004, increased labor force participation among married men aged 65–67 by almost 2 percentage points, raising full-time work for this age group by about 9 percent (Gustman and Steinmeier 2006). According to these calculations, changes from 1992 to 2004 in the Social Security normal retirement age, the earnings test, and the delayed retirement credit account for about one-sixth of the increase in labor force participation of married men aged 65–67 for 1998–2004. Preference heterogeneity within the population seemingly can make even subtle details of pension plan and Social Security rules quite important for private behavior.

Some MRRC research analyzes complex retirement outcomes involving the flows between full-time work, partial retirement, and full retirement, including people who retire, resume working, and subsequently increase the amount they work. Maestas (2004, 2007) examines the extent to which reversals from less to more work are planned, are due to economic hardship, or are due to dissatisfaction with retirement. Using the HRS, Maestas finds that almost half of retirements include periods of part-time work or involve returns to more intensive work. The return to work (or "unretirement") rate is 24 percent within 5 years of the first retirement and 36 percent for those who retired at ages 51–52. For all but 9 percent of those who returned

to work, "unretirement" was expected. Maestas and Li (2007) expand this investigation to discern possible other reasons for postretirement return to work. They use a measure of psychological burnout and recovery to predict retirement and labor force reentry patterns. Among their findings are that burnout is not a factor among those who partially retire, and that burnout combined with health problems makes full retirement more likely.

Another aspect of MRRC research considers implications of changes in women's labor force participation. As married women have chosen to work more outside the home, they have improved the solvency of the Social Security system by contributing payroll taxes (despite being eligible for spousal benefits without contributing)—and they have, of course, greatly augmented the market economy's labor force. Laitner, House, and Stolyarov (2005) and House, Laitner, and Stolyarov (2008) attempt to quantify the "net social" consequences of the changeover. If the value of housework is measured as "home production," then the economy's net gain from married women entering the labor force equals their new earnings minus sacrificed home production. One can divide the net gain into private gain, which equals new after-tax earnings minus lost home production, and public gain, which equals new tax revenues. The authors focus on private gain. Standard national income and product accounts do not measure home production, as direct measures are not available. However, the authors develop an indirect measure based on the life-cycle model. They argue that the financial assets of a retired couple with given lifetime earnings should be lower if both spouses earned wages than if the husband alone accounted for all wages. The asset difference should equal the market expenditures needed in dual-earner households to replace forgone home production of the wife. Calibrating parameters from HRS data, the authors find that the private gain from a married woman's labor force participation is roughly 75 cents per dollar of female earnings. In other words, increases in married women's labor force participation seem to have augmented the well-being of U.S. households quite substantially in recent years.

House, Laitner, and Stolyarov (2006) expand the basic life-cycle model to include household choices about married women's labor force participation at different ages, household saving, and married men's retirement behavior. The aim is to understand the motives for new behavioral patterns rather than just assessing their welfare consequences, so that simulations can more accurately predict policy outcomes. Although the resulting model is complex, the authors provide preliminary calibrations. The paper shows that HRS data with linked lifetime Social Security earnings records for both men and women provide a basis for estimating the model's new coefficients. Because the life-cycle model has long been a basic tool for analyzing prospective Social Security reforms, continuous efforts to update the model are potentially very important.

Financial Investment for Retirement

MRRC research over the last several years has sought to better understand how households build up and draw down their retirement wealth in the face of risks and opportunities. Models tend to distinguish investors' *asset location* decisions (whether to hold wealth directly or to have it managed by money managers, pension funds, or insurers) from *asset allocation* decisions (whether to hold wealth in stocks, bonds, or other forms). Generally, researchers distinguish patterns of behavior during the work-life *accumulation phase* from those in the retirement *payout phase*. These investigations generate insights about life-cycle saving and investment patterns.

One focus of MRRC research is the influence of labor market conditions on preretirement planning. One example is risk of lost earnings. Younger employees are most vulnerable to sharp declines in anticipated earnings, especially job loss. According to McCarthy (2003), this risk induces workers to favor DC pensions early in life so as to diversify their retirement saving. As workers near retirement, they increasingly prefer DB pensions, which provide access to well-priced group annuities and allow diversification of wealth outside financial markets. Horneff, Maurer, and Stamos (2006) also find that asset allocation decisions among the young are strongly shaped by earnings risk. Empirical research by Benitez-Silva (2003b) shows that labor market flexibility shapes investment preferences. He finds that those with more flexible jobs[5] hold 12-14 percent more stock than those whose jobs tightly constrain them, suggesting that job flexibility acts as a kind of insurance that allows greater financial risk-taking. Another way in which earnings and investment decisions are intertwined involves the timing of retirement. Sevak (2002) finds that workers nearing retirement who experience unexpected increases in wealth retire earlier. Specifically, a $50,000 gain in retirement wealth (through successful

investments) leads to a 1.9 percentage point increase in retirement probability among workers aged 55 to 60.

Another set of studies has explored ways in which workers handle DC pension investments. Yamaguchi (2006), Yamaguchi, Mitchell, Mottola, and Utkus (2007), and Mitchell, Mottola, Utkus, and Yamaguchi (2006) have built an extensive database of millions of 401(k) plan participants to assess trading and investment patterns. The research shows that about 80 percent of participants fixed their initial contribution allocation and never revisited the decision over a 2-year period between 2003 and 2004. This is striking because financial market shifts can make pension accumulations diverge dramatically from initial intentions. The analysis also finds that portfolio trading is more frequent if employers put more funds in the plan menu, if participants invest in company stock, and if workers have internet access to their portfolio. One particularly interesting finding is that traders' risk-adjusted returns prove to be the same as those of nontraders overall, though passive rebalancers—who hold only life-cycle or balanced funds—earn the highest risk-adjusted returns. Dominitz and Hung (2006) find that employees who are offered lifestyle and life-cycle funds in their pension menus can wind up better off; although it does tend to be conservative, life-cycle investing may induce some investors to take on more risk than they otherwise would, and to invest more efficiently than if relying on their own strategies. Interestingly, van Soest and Kapteyn (2006) show that people who expect higher Social Security benefits view those benefits as a safe buffer that makes the risk of investing in other retirement resources more acceptable. These findings seem to contradict the notion that high Social Security benefits have a negative effect on private retirement investment. Instead, Social Security benefits exert positive effects on several forms of wealth accumulation.

The possibility of outliving one's assets is perhaps the most prominent risk affecting retirees. Work by Horneff, Maurer, Mitchell, and Dus (2006, 2008), Horneff, Maurer, Mitchell, and Stamos (2007), and Dus, Maurer, and Mitchell (2005) examines older women's decisions of whether (and when) to buy annuities or to hold financial-market assets. The appeal of an annuity is that it provides longevity insurance, so that the retiree will not outlive her wealth. On the other hand, turning funds over to an insurer precludes leaving an estate for one's heirs. The research shows that the optimal strategy involves holding some stock and gradually annuitizing over the retirement period. This gives the retiree access to both the survival insurance of annuities and the equity premium from stocks. The research also shows that the phased withdrawal rule encouraged under U.S. tax law can appeal to a wide range of retirees. Complementing this work, Benitez-Silva (2003a) suggests that Social Security benefits, paid as a lifelong annuity, play an important role in retiree asset location decisions.

Some recent MRRC research on retirement accumulation and decumulation turns to the question of how people actually make financial decisions—whether they are financially literate, whether they carefully plan, and whether they execute their plans successfully. Lillard and Willis (2001) focus on differences in consumer competence at older ages to make complex investment and saving decisions. The authors find that low cognitive capacity[6] is a significant impediment to good financial decisionmaking. Expanding on this topic, Kezdi and Willis (2003) examine how cognitive capacity and other factors shape people's perceptions of investment options, and show strong effects of cognitive capacity and optimistic expectations on the probability of holding stocks. Delavande, Rohwedder, and Willis (2008) propose thinking about financial literacy as a cognitive capacity, a part of human capital in which people can invest. In deciding whether to invest in acquiring financial knowledge, the effort is balanced against the expected return. For older people, the potential reward may not seem worth the effort.

Financial literacy in retirement planning is the focus of a number of MRRC studies (Lusardi 2003, 2006; Lusardi and Beeler 2007; Lusardi and Mitchell 2005, 2007a, 2007c). Lusardi (2003) finds that strikingly few HRS respondents can correctly answer simple questions about inflation, interest compounding, and risk diversification. Women and racial/ethnic minorities display particular deficits of financial knowledge. People who are more financially literate are more likely to plan for retirement and execute their financial plans successfully. The availability of professional financial services does not seem to eliminate the need for individual literacy.

More recent work stresses the accumulation phase of the life cycle. Using data from the RAND American Life Panel, Lusardi and Mitchell (2007b) evaluate financial knowledge during workers' prime earning years (most of the sample is aged 40–60), when important financial decisions are made. With more detailed measures of financial literacy than were available in earlier studies, the authors show that by

every measure, financial literacy proves to be a strong predictor of financial planning for retirement.

Well-being in Retirement

A significant share of MRRC work deals with factors affecting retirement savings and material well-being in retirement. In this context, important questions of how to measure well-being arise. For example, policymakers have long relied on income-based measures of poverty. Hurd and Rohwedder (2006) compare these with a consumption-based measure. They use data from the Consumptions and Activities Mail Survey (CAMS), which they developed. Consumption is arguably a much more accurate measure of material well-being than income, because those in retirement are able to spend out of their savings. Hurd and Rohwedder find that consumption-based poverty rates are considerably lower than income-based rates. The differences are especially dramatic for singles. For example, among 55- to 59-year-old singles, the poverty rate based on after-tax income is around 20 percent, but it is only 10 percent when a consumption-based measure is used.

It is well-documented that household expenditures over the life cycle increase through middle age and decline sharply thereafter. Household consumption tends to rise from ages 25 to 45 and to fall between ages 45 and 70. Some research finds a distinct drop in spending at retirement. This finding is somewhat at odds with the life-cycle model, which posits that households should seek to smooth consumption—to acquire and maintain a given standard of living—over the life cycle. Using the CAMS, Hurd and Rohwedder (2005) examine this so-called "retirement consumption puzzle." They find that declines in spending after retirement often appear to have been anticipated. A closer examination shows that 37 percent of households report no change in spending at retirement, 11 percent report spending increases, 20 percent report declines of 20 percent or less, and 30 percent report declines exceeding 20 percent. A detailed look at the last group reveals that they are more likely to have experienced deteriorating health (see also Rohwedder 2006).

Aguiar and Hurst (2008) use data from the Consumer Expenditure Survey to analyze categories of spending as well as time allocation over the life cycle. They find that the entire decline in nondurable expenditures later in life is attributable to three categories—food, nondurable transportation, and clothing/personal care—which are all positively correlated with gainful employment. Food expenditures are amenable to home production, while transportation and clothing are primarily workers' expenses. The remaining nondurable categories, constituting roughly half of total nondurable expenditures, do not decline at older ages. These categories include entertainment, housing services, charitable giving, and utilities. Moreover, expenditures on several of these categories, most notably entertainment, actually increase over the latter half of the life cycle.

Other MRRC research addresses different factors that influence retirement well-being. Rohwedder and van Soest (2006) use HRS data to examine the impact of misperceptions about Social Security benefits. Comparing expected benefits with those actually received, the authors demonstrate that people who overestimate their Social Security benefits tend to be among the least prepared when they retire. These people tend to reduce consumption at retirement more than those who underestimated or correctly estimated their benefits. Once retired, they have more worries about how to get by with the resources they have. They also more often report that retirement years turned out worse than expected. Such outcomes seem more pronounced for respondents who claimed benefits earlier than anticipated, relative to those who were simply misinformed.

Scholz and Seshadri (2007) examine the effects of children on household net worth. They find that the presence of children is important in explaining why wealth distribution is far more dispersed than earnings distribution. Because children require a portion of household resources, retirees with children may have a lower living standard to maintain than those with no children. Their share of household resources has been less at all ages.

Another set of MRRC papers directly addresses the question of resource adequacy in retirement. Using data from the CAMS, Hurd and Rohwedder (2008) find that a substantial majority of those aged 66–69 are adequately prepared for retirement in that they will be able to follow a path of consumption that begins at their current level and subsequently follows an age pattern similar to the average for current retirees. They do not find inadequate preparation for retirement on average or at the median. However, they also find that many singles lacking a high school education are forced to reduce consumption: Almost half could reduce initial consumption by 15 percent and still face a greater than 5 percent chance of outliving their wealth. The authors find that retirement preparation

among couples is much better. However, a noteworthy subgroup is college graduates: When taxes are taken into account, the proportion that is adequately prepared falls by about 18 percentage points.

Scholz and Seshadri (2008) use HRS data to assess the degree to which individuals born before 1954 have accumulated or are accumulating the wealth necessary to maintain preretirement living standards in retirement. They show that only 3.6 percent of HRS households have net worth below optimal targets, and among those, the shortfall is small. There is some evidence that younger subgroups are less likely to meet targets; but even in the 1948–1953 birth year cohort only 10.2 percent of households are below target, and the median shortfall is $16,306. These findings suggest that households overall are not making large, systematic errors in their financial preparation for retirement.

Dushi and Honig (2007) investigate specific sources of retirement wealth. They report on HRS data comparing 401(k) plan participation rates for cohorts born 1931–1941 with those born 1948–1953. Participation for the younger cohort is nearly 50 percent greater. The substantial growth in participation over a relatively brief period may reflect a growing interest in this particular saving vehicle, changes over this period in the external environment (such as the overall shift from DB to DC plans), or both influences.

With much attention currently focused on the housing market, MRRC is investigating housing equity as a potentially significant resource for older people. Walker (2004) uses the HRS to study how often older individuals draw down their housing equity to finance retirement expenses. She finds that most continue to own their homes until advanced ages. An interesting question is whether this pattern will change in the future.

Distributional Effects

MRRC researchers are keenly interested in distributional aspects of policy and the extent to which public programs may mitigate potentially negative consequences of income and wealth inequality.

In one of the earliest MRRC projects, Gustman and Steinmeier (2000) examine the distributional effects of the Social Security system in practice using the HRS cohort born 1931–1941. The formula for Social Security benefits is progressive, offering proportionately higher returns to lower lifetime earners. At the family level, however, spousal benefits alter this pattern. Generally, a retired couple can claim either the sum of the Social Security benefits for each spouse, or 150 percent of the higher of the two benefits. Upon widowhood, the survivor can claim the higher of the spouses' individual benefits. For HRS families in which the wife had little or no earnings history, the spousal benefit represented a bigger net gain than for families in which the wife had a substantial history of labor force participation. To the extent that wives of high-earning men in the HRS tended to have less labor force participation, their families' gain from the spousal formula was especially large. This tended, in practice, to partially offset the progressivity of the benefit formula for individuals. Indeed, Gustman and Steinmeier find that redistribution from the Social Security system among HRS families is substantially lower than redistribution among individuals.

More recently, Stevens (2008) finds that reduced earnings growth rates over several decades, particularly at the bottom of the earnings distribution, have produced greater wealth inequality for those in and nearing retirement. Stevens' measure of household wealth includes capitalized pensions and Social Security benefits. Changes in the lower half of the male earnings distribution explain a substantial portion of the growing inequality in the distribution of preretirement wealth. Growth in women's earnings does not offset declines associated with male earnings. The declining value of private employer-provided pensions is an important factor. In contrast, Social Security benefits have not been eroding, even for groups that have faced significant deterioration in real earnings. In fact, the role of Social Security for the latter groups is larger than for earlier cohorts.

Another set of papers examines an especially vulnerable population: widowed and divorced women (McGarry and Schoeni 2005; Haider, Jacknowitz, and Schoeni 2003; Weir and Willis 2003; Weir, Willis, and Sevak 2002). For example, the latter two studies show that widowhood is a key risk factor for transition into poverty for women. However, women older than age 65 are less likely to experience severe economic changes than women younger than age 61. Several factors account for age differences: the declining importance of husbands' earnings with age, the rising importance of Social Security benefits, and the occasionally large out-of-pocket medical expenses associated with husbands' death before Medicare eligibility. McGarry and Schoeni examine the importance of medical expenses after Medicare eligibility. They show that, despite the success of Medicare in reducing out-of-pocket medical costs for the elderly, significant

gaps remain. Out-of-pocket spending to assist a dying spouse is a significant determinant of poverty rates for survivors. This circumstance disproportionately affects women and diminishes widows' financial resources.

Conclusion

To summarize, themes of MRRC research include:

1. *Developing a dynamic model of household behavior to estimate and simulate the effects of actual and proposed policy changes.* The HRS, with its rich supply of socioeconomic information including linked Social Security lifetime earnings records, is a premier data resource for the estimation step. MRRC researchers have been pioneers in developing and using these data. The life-cycle model provides a theoretical framework to identify and describe behavioral motives and criteria. It therefore enables analysts to predict effects of policy reforms never previously implemented, make microeconomic calculations of welfare gains from policy and other changes, and understand and anticipate simultaneous household consumption/saving, labor supply, and asset-allocation reactions to external changes.
2. *Studying program policy interactions.* Changes in one public program (for example, increasing the age for full Social Security retirement benefits) may affect utilization and budgets of other public programs such as DI and SSI, and may also influence private behavior.
3. *Promoting household welfare as the ultimate concern of public policy.* Accurate measurement of the well-being of the older population, for example, requires analysis of their time-allocation and consumption possibilities rather than merely their income or wealth. As another example, Social Security and other public programs have important redistributive components—and in studying possible reforms, one should seek to quantify welfare gains and losses, including potential diminution of the power of existing insurance-providing mechanisms, as opposed to merely measuring effects on aggregate saving, income, or labor supply.
4. *Using a research framework that is rich enough, and flexible enough, to encompass large-scale trends.* For example, longevity is increasing, private pensions are switching from DB to DC, and women's labor force participation is rising. A dynamic model of household behavior can help policymakers to understand the consequences of such changes and contribute to the optimal design of public programs.
5. *Mitigating the shortage of financial literacy.* Empirical evidence seems to point to substantial diversity of financial knowledge. Those with less sophistication are increasingly vulnerable as the range and complexity of financial decisions facing Americans is now greater than ever. Policy remedies such as minimum Social Security benefit guarantees, sensible default settings in private pensions, and financial literacy education may be more important in practice than basic economic models predict.

Notes

[1] An article in the October 2006 *MRRC Quarterly Newsletter* covers the history of the RRC, including Steven Sandell's founding role. October *Newsletter* issues also review the most recent RRC Washington conference. See http://www.mrrc.isr.umich.edu/publications/newsletters/.

[2] To date, the MRRC has issued over 200 working papers and policy briefs. See http://www.mrrc.isr.umich.edu/publications/papers/ and http://www.mrrc.isr.umich.edu/publications/policy/, respectively.

[3] See http://govinfo.library.unt.edu/csss/reports/Final_report.pdf

[4] The 3.5 percent figure arises from infinite-horizon Social Security system deficit calculations.

[5] Indicators of flexibility include self-employed status and ability to change hours worked or to work a second job.

[6] As determined by age and education.

References

Aguiar, Mark, and Erik Hurst. 2008. Deconstructing lifecycle expenditure. Working Paper No. WP 2008-173. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp173.pdf.

Benítez-Silva, Hugo A. 2003a. The annuity puzzle revisited. Working Paper No. WP 2003-055. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp055.pdf.

———. 2003b. Labor supply flexibility and portfolio choice: An empirical analysis. Working Paper No. WP 2003-056. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp056.pdf.

[Board of Trustees] Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds. 2007. *2007 Annual Report.*

Washington, DC. Available at http://www.socialsecurity.gov/OACT/TR/TR07/tr07.pdf.

Bound, John, Richard Burkhauser, and Austin Nichols. 2003. Tracking the household income of SSDI and SSI applicants. In *Research in Labor Economics,* ed. Sol W. Polachek, 22: 113–158. Amsterdam: Elsevier Ltd. Initially circulated as Working Paper No. WP 2001-009 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp009.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

Bound, John, Julie Berry Cullen, Austin Nichols, and Lucie Schmidt. 2004. The welfare implications of increasing Disability Insurance benefit generosity. *Journal of Public Economics* 88(12): 2487–2514. Initially circulated as Working Paper No. WP 2002-024 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp024.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

Bound, John, Todd Stinebrickner, and Timothy Waidman. 2004. Using a structural retirement model to simulate the effect of changes to the OASDI and Medicare programs. Working Paper No. WP 2004-091. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp091.pdf.

Burkhauser, Richard V., and John Cawley. 2004. Obesity, disability and movement onto the Disability Insurance rolls. Working Paper No. WP 2004-089. Ann Arbor, MI: Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp089.pdf.

———. 2006. The importance of objective health measures in predicting early receipt of Social Security benefits: The case of fatness. Working Paper No. WP 2006-148. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp148.pdf.

———. 2008. Beyond BMI: The value of more accurate measures of fatness and obesity in social science research. *Journal of Health Economics* 27(2): 519–529.

Burkhauser, Richard V., John Cawley, and Maximilian D. Schmeiser. 2008. The ability of various measures of fatness to predict application for Disability Insurance. Working Paper No. WP 2008-185. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp185.pdf.

Delavande, Adeline, Susann Rohwedder, and Robert Willis. 2008. Preparation for retirement, financial literacy and cognitive resources. Working Paper No. WP 2008-190. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp190.pdf.

Dominitz, Jeff, and Angela A. Hung. 2006. Retirement savings portfolio management. Working Paper No. WP 2006-138. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp138.pdf.

Dus, Ivica, Raimond Maurer, and Olivia S. Mitchell. 2005. Betting on death and capital markets in retirement: A shortfall risk analysis of life annuities versus phased withdrawal plans. *Financial Services Review* 14: 169–196. Initially circulated as Working Paper No. WP 2003-063 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp063.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

Dushi, Irena, and Marjorie Honig. 2007. Are 401(k) saving rates changing? Cohort/period evidence from the Health and Retirement Study. Working Paper No. WP 2007-160. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp160.pdf.

Gramlich, Edward M. 2006. Another attempt at Social Security reform. Policy Brief No. 2. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/policy/pdf/gramlich.pdf.

Gustman, Alan L., and Thomas L. Steinmeier. 2000. How effective is redistribution under the Social Security benefit formula? Working Paper No. WP 2000-005. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp005.pdf.

———. 2003. Retirement effects of proposals by the President's Commission to Strengthen Social Security. Working Paper No. WP 2003-038. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp038.pdf.

———. 2004. How to evaluate the effects of Social Security policies on retirement and saving when firm policies affect the opportunities facing older individuals. Working Paper No. WP 2004-078. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp078.pdf.

———. 2005a. Retirement, saving, benefit claiming and solvency under a partial system of voluntary personal accounts. Working Paper No. WP 2005-105. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp105.pdf.

———. 2005b. The Social Security early entitlement age in a structural model of retirement and wealth. *Journal of Public Economics* 89: 441–463. Initially circulated as Working Paper No. WP 2002-029 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp029.pdf). Ann

Arbor, MI: University of Michigan Retirement Research Center.

———. 2006. How changes in Social Security affect retirement trends. Working Paper No. WP 2006-127. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp127.pdf.

———. Forthcoming. Projecting behavioral responses to the next generation of retirement policies. *Research in Labor Economics.* Initially circulated as Working Paper No. WP 2007-153 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp153.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

Haider, Steven J., Alison Jacknowitz, and Robert F. Schoeni. 2003. The economic status of elderly divorced women. Working Paper No. WP 2003-046. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp046.pdf.

Horneff, Wolfram J., Raimond Maurer, Olivia S. Mitchell, and Ivica Dus. 2006. Optimizing the retirement portfolio: Asset allocation, annuitization, and risk aversion. Working Paper No. WP 2006-124. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp124.pdf.

———. 2008. Following the rules: Integrating asset allocation and annuitization in retirement portfolios. *Insurance: Mathematics and Economics* 42(1): 396–408.

Horneff, Wolfram J., Raimond H. Maurer, Olivia S. Mitchell, and Michael Z. Stamos. 2007. Money in motion: Dynamic portfolio choice in retirement. Working Paper No. WP 2007-152. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp152.pdf.

Horneff, Wolfram J., Raimond Maurer, and Michael Z. Stamos. 2006. Life-cycle asset allocation with annuity markets: Is longevity insurance a good deal? Working Paper No. WP 2006-146. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp146.pdf.

House, Christopher, John Laitner, and Dmitriy Stolyarov. 2006. Home production by dual earner couples and consumption during retirement. Working Paper No. WP 2006-143. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp143.pdf.

———. 2008. Valuing lost home production of dual earner couples. *International Economic Review* 49(2): 701–736.

Hurd, Michael D., and Susann Rohwedder. 2005. Changes in consumption and activities in retirement. Working Paper No. WP 2005-096. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp096.pdf.

———. 2006. Consumption and economic well-being at older ages: Income- and consumption-based poverty measures in the HRS. Working Paper No. WP 2006-110. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp110.pdf.

———. 2008. The adequacy of economic resources in retirement. Working Paper No. WP 2008-184. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp184.pdf.

James, Estelle, and Alejandra Cox Edwards. 2005. Do individual accounts postpone retirement: Evidence from Chile. Working Paper No. WP 2005-098. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp098.pdf.

Kézdi, Gábor, and Robert J. Willis. 2003. Who becomes a stockholder? Expectations, subjective uncertainty, and asset allocation. Working Paper No. WP 2003-039. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp039.pdf.

Laitner, John P. 2002. Transition paths and Social Security reform. Working Paper No. WP 2002-025. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp025.pdf.

Laitner, John P., Christopher House, and Dmitriy Stolyarov. 2005. Valuing lost home production in dual-earner couples. Working Paper No. WP 2005-097. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp097.pdf.

Laitner, John P., and Daniel Silverman. 2006. Consumption, retirement, and Social Security: Evaluating the efficiency of reform with a life-cycle model. Working Paper No. WP 2006-142. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp142.pdf.

Lillard, Lee, and Robert J. Willis. 2001. Cognition and wealth: The importance of probabilistic thinking. Working Paper No. WP 2001-007. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp007.pdf.

Lusardi, Annamaria. 2003. The impact of financial education on savings and asset allocation. Working Paper No. WP 2003-061. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp061.pdf.

———. 2006. Planning and financial literacy: How do women fare? Working Paper No. WP 2006-136. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp136.pdf.

Lusardi, Annamaria, and Jason Beeler. 2007. Saving between cohorts: The role of planning. In *Redefining Retirement: How Will Boomers Fare?,* ed. Brigitte Madrian, Olivia S. Mitchell, and Beth J. Soldo, 271–295. New York, NY: Oxford University Press. Initially circulated as Working Paper No. WP 2006-122 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp122.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

Lusardi, Annamaria, and Olivia S. Mitchell. 2005. Financial literacy and planning: Implications for retirement wellbeing. Working Paper No. WP 2005-108. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp108.pdf.

———. 2007a. Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. *Journal of Monetary Economics* 54(1): 205–224. Initially circulated as Working Paper No. WP 2006-114 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp114.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

———. 2007b. Financial literacy and retirement planning: New evidence from the Rand American life panel. Working Paper No. WP 2007-157. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp157.pdf.

———. 2007c. Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business Economics* 42(1): 35–44. Initially circulated as Working Paper No. WP 2006-144 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp144.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

Maestas, Nicole. 2004. Back to work: Expectations and realizations of work after retirement. Working Paper No. WP 2004-085. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp085.pdf.

———. 2007. Cohort differences in retirement expectations and realizations. In *Redefining Retirement: How Will Boomers Fare?,* ed. Brigitte Madrian, Olivia S. Mitchell, and Beth J. Soldo, 13–35. New York, NY: Oxford University Press.

Maestas, Nicole, and Xiaoyan Li. 2007. Burnout and the retirement decision. Working Paper No. WP 2007-166. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp166.pdf.

McCarthy, David. 2003. A lifecycle analysis of defined benefit pension plans. Working Paper No. WP 2003-053. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp053.pdf.

McGarry, Kathleen, and Robert F. Schoeni. 2005. Medicare gaps and widow poverty. *Social Security Bulletin* 66(1): 58–74. Initially circulated as Working Paper No. WP 2003-065 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp065.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

Mitchell, Olivia S., Gary R. Mottola, Stephen P. Utkus, and Takeshi Yamaguchi. 2006. The inattentive participant: Portfolio trading behavior in 401(k) plans. Working Paper No. WP 2006-115. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp115.pdf.

Mitchell, Olivia S., and John W. R. Phillips. 2001. Eligibility for Social Security Disability Insurance. Working Paper No. WP 2001-011. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp011.pdf.

———. 2002. Applications, denials, and appeals for Social Security Disability Insurance. Working Paper No. WP 2002-032. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp032.pdf.

Modigliani, Franco. 1986. Life cycle, individual thrift, and the wealth of nations. *American Economic Review* 76(3): 297–313.

Nishiyama, Shinichi, and Kent Smetters. 2006. Social Security privatization with income-mortality correlation. Working Paper No. WP 2006-140. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp140.pdf.

———. 2007. Does Social Security privatization produce efficiency gains? *Quarterly Journal of Economics* 122(4): 1677–1719. Initially circulated as Working Paper No. WP 2005-106 (http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp106.pdf). Ann Arbor, MI: University of Michigan Retirement Research Center.

Richardson, Caroline, Jennifer T. Hanlon, Hillary J. Mull, Sandeep Vijan, Rodney Hayward, Linda A. Wray, and Kenneth M. Langa. 2003. The impact of poor health behaviors on workforce disability. Working Paper No. WP 2003-057. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp057.pdf.

Rohwedder, Susann. 2006. Self-assessed retirement outcomes: Determinants and pathways. Working Paper No. WP 2006-141. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp141.pdf.

Rohwedder, Susann, and Arthur van Soest. 2006. The impact of misperceptions about Social Security on saving and well-being. Working Paper No. WP 2006-118. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp118.pdf.

Scholz, John Karl, and Ananth Seshadri. 2007. Children and household wealth. Working Paper No. WP 2007-158. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp158.pdf.

———. 2008. Are all Americans saving 'optimally' for retirement? Working Paper No. WP 2008-189. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp189.pdf.

Sevak, Purvi. 2002. Wealth shocks and retirement timing: Evidence from the nineties. Working Paper No. WP 2002-027. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp027.pdf.

Smetters, Kent. 2005. Social Security privatization with elastic labor supply and second-best taxes. Working Paper No. WP 2005-092. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp092.pdf.

Stevens, Ann Huff. 2008. Retirement wealth across cohorts: The role of earnings inequality and pension changes. Working Paper No. WP 2008-186. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp186.pdf.

van Soest, Arthur, and Arie Kapteyn. 2006. Savings, portfolio choice, and retirement expectations. Working Paper No. WP 2006-119. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp119.pdf.

Vijan, Sandeep, Rodney A. Hayward, and Kenneth M. Langa. 2004. The impact of diabetes on workforce participation: Results from a national household sample. *Health Services Research* 39(6): 1653–1670.

Vijan, Sandeep, and Kenneth M. Langa. 2003. The impact of diabetes on work-force participation: Results from a national household sample. Working Paper No. WP 2003-034. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp034.pdf.

Walker, Lina. 2004. Elderly households and housing wealth: Do they use it or lose it? Working Paper No. WP 2004-070. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp070.pdf.

Weir, David, and Robert Willis. 2003. Widowhood, divorce, and loss of health insurance among near elderly women: Evidence from the Health and Retirement Study. Working Paper No. WP 2003-040. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp040.pdf.

Weir, David R., Robert J. Willis, and Purvi Sevak. 2002. The economic consequences of widowhood. Working Paper No. WP 2002-023. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp023.pdf.

Wray, Linda A. 2003. Mental health and labor force exits in older workers: The mediating or moderating roles of physical health and job factors. Working Paper No. WP 2003-047. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp047.pdf.

Yamaguchi, Takeshi. 2006. Understanding trading behavior in 401(k) plans. Working Paper No. WP 2006-125. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp125.pdf.

Yamaguchi, Takeshi, Olivia S. Mitchell, Gary R. Mottola, and Stephen P. Utkus. 2007. Winners and losers: 401(k) trading and portfolio performance. Working Paper No. WP 2007-154. Ann Arbor, MI: University of Michigan Retirement Research Center. Available at http://www.mrrc.isr.umich.edu/publications/papers/pdf/wp154.pdf.