

- The Value of Medicaid to Older Households
  - Who Uses the Roth 401(k)?
- Do Financial Incentives Induce Disability Insurance Recipients to Return to Work?

ALSO: Short Abstracts of Recent NBER Working Papers — see page 4

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## BULLETIN ON AGING AND HEALTH

### The Value of Medicaid to Older Households

Medicaid is an important source of funding for long-term care for the elderly. While Medicaid is the payer of last resort, contributing only after Medicare and private insurance pay their share and individuals spend their assets down to a relatively low “disregard” amount, the very high cost of nursing home care — on the order of \$60,000 to \$75,000 per year — means that Medicaid ends up financing care for seventy percent of nursing home residents. While most individuals on Medicaid qualify based on their low income and assets (the “categorically needy”), some states also offer eligibility for those with higher income who face high medical expenses (the “medically needy”). Thus, the reach of the Medicaid program extends beyond the poorest elderly to include many middle-income and some higher-income families as well.

Despite the rising importance of Medicaid to an aging population and the program’s rising costs, relatively little is known about how Medicaid benefits are distributed among the elderly and about their value to older households. In “**Medicaid Insurance in Old Age**” (NBER Working Paper 19151), researchers **Mariacristina De Nardi**, **Eric French**, and **John Bailey Jones** aim to help fill this void. Specifically, they explore issues such as which elderly households receive Medicaid, what the insurance value of those benefits is, and how much people would lose if benefits were cut.

The authors begin by document-

ing Medicaid use using the Assets and Health Dynamics of the Oldest Old (AHEAD) data. Among respondents in the lowest quintile of lifetime income, nearly seventy percent are receiving Medicaid at age 74, a fraction that remains roughly constant as the group ages. In the two highest quintiles, eligibility at age 74 is negligible, but grows to twenty percent by age 96. As the authors note, “even high income people become Medicaid recipients if they live long enough and are hit by expensive conditions.”

Next, the authors use the AHEAD data to estimate a rich model of individual saving and medical expenses, where medical expenses depend on both the individual’s resources and his or her changing health status. In estimating the model, they choose parameters so as to enhance their model’s ability to match aggregate outcomes in the data such as out-of-pocket medical expenses and the fraction of people on Medicaid or in nursing homes.

The model generates some interesting findings regarding medical spending. In the top income quintile, out-of-pocket spending rises rapidly from around \$4,000 per year at age 74 to \$20,000 at age 100; for the lower two income quintiles, out-of-pocket spending remains below \$2,000 per year as an individual ages. Once Medicaid spending is added, however, all income quintiles experience rapidly rising medical spending with age, and the gaps in spending across income quintiles narrow dramatically, with the

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highest income quintile never spending more than twice as much as the lower two quintiles. While the bottom two quintiles are more likely to qualify for Medicaid and thus receive higher average Medicaid transfers than the top quintile, both groups receive substantial benefits at very old ages, with mean Medicaid spending of \$10,000 per year in the top income group by age 100 and nearly twice that amount in the low income group.

Finally, the authors conduct several simulations in which they change the Medicaid program rules and compute the wealth transfers that would make each individual as well off as he or she had been prior to the change. One such change is to reduce the consumption floors (allowable consumption for those that are categorically or medically needy) by 25 percent. This

drops the value of Medicaid payments to individuals in all income groups, but it is the top income group that most values the lost insurance — at five times its cost, compared to just slightly above cost for the lower two income groups. The insurance value is greater for higher income people because they have more consumption to lose if they begin to incur large medical expenses and are at greater risk of living a long time and

facing very high medical needs. When the authors simulate making Medicaid more generous by raising the consumption floors, all income groups except the highest value the expanded benefit at less than its cost.

In concluding, the authors note, “although the lifetime discounted present value of Medicaid payments does decrease with permanent income, even higher income people can receive

sizeable Medicaid payments, as they tend to live longer and face higher medical needs in old age. Furthermore, our compensating differential calculations show that many higher income retirees value Medicaid insurance as much or more than lower-income ones.”

*Jones acknowledges support from the Social Security Administration through the Michigan Retirement Research Center (MRRC grants UM10-16 and UM12-12).*

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## Who Uses the Roth 401(k)?

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Since 2006, plan sponsors have had the opportunity to add a Roth 401(k) option to defined contribution pension plans. Takeup among plans has been fairly rapid, with half of 401(k) plans offering a Roth option by 2011. Yet usage of the Roth 401(k) option by participants has lagged behind, with fewer than one in five 401(k) plan participants making Roth contributions in that year.

In “**Who Uses the Roth 401(k) and How Do They Use It?**” (NBER Working Paper 19193), researchers **John Beshears, James Choi, David Laibson, and Brigitte Madrian** explore the usage of the Roth 401(k).

Pension plan participants may have the option of making three different types of 401(k) contributions: Roth, before-tax, and after-tax. Before-tax contributions are deductible from current-year income, but the principal, interest, and capital gains are taxed at the ordinary income tax rate upon withdrawal. By contrast, Roth contributions are not deductible, but the principal, interest, and capital gains may be withdrawn tax-free if the withdrawal is “qualified” (occurs after age 59½ and the account has been held for five years). After-tax contributions are also not deductible; at withdrawal, interest and capital gains (but not principal) are taxed at ordinary rates.

Due to these differing tax treatments, making contributions to a Roth 401(k) is a better financial deal than making before-tax contributions for workers who expect to face a higher

tax rate in the future (after age 59½) than at the current time. This might be the case for a worker who is young and expects future earnings growth, has temporarily low income this year (for example, due to a spell of unemployment), or has large deductions that reduce current tax liability (for example, a large mortgage or many children under age 18). If tax rates were to rise over time, additional groups of workers might also experience higher tax rates in retirement than at the current time.

As the authors note, other factors can affect the relative appeal of the Roth. The Roth is more attractive if workers anticipate a possible withdrawal before age 59½, since Roth principal is exempt from the 10 percent early withdrawal penalty that applies to before-tax contributions. Moreover, workers who are constrained by the limits on total 401(k) contributions may find it advantageous to make Roth contributions because a dollar of Roth balances buys more retirement consumption than a dollar of before-tax balances. However, if the employer offers a match, the employee can earn more match dollars by making a before-tax contribution.

For their empirical analysis, the authors use administrative data for twelve large companies that introduced a Roth option to their 401(k) plans between 2006 and 2010.

The authors first report that 8.6 percent of participants in their sample use the Roth in the first year after this option was introduced. This figure

rises to 11.5 percent excluding companies that automatically enroll employees with default contributions that allocate nothing to the Roth. While the fraction of employee balances held in the Roth is unsurprisingly low after only one year of contributions, contribution flows into the Roth are also modest one year after the Roth’s introduction, at 5.4 percent of flows for the full sample and 8.5 percent of flows for workers without auto enrollment.

However, conditional on being used, Roth contributions average nearly two-thirds of the employee’s contribution. A majority of Roth users are actively engaging in tax diversification by simultaneously making contributions to both the Roth and another 401(k) account. Among this group, very few follow a naïve “50-50” rule of putting half of their contributions in each type of 401(k).

Since many past studies have shown that workers are passive in their retirement savings decisions, the low usage of the Roth may reflect a slow response to its introduction rather than an active preference for making before-tax contributions. To explore this, the authors examine how Roth participation differs between 401(k) participants who were hired before and after the Roth introduction at their firm. Workers hired after the Roth became a plan option are likely to be more aware of it and are able to choose the Roth at the time they are making their initial pension plan decision, so the cost of enrolling in the Roth is lower.

Indeed, the authors find that for workers hired after the Roth's introduction, 19.0 percent have positive Roth balances and 14.3 percent of employee contributions are flowing to the Roth, versus 7.9 percent with a positive balance and 4.7 percent of employee contribution flows for workers hired prior to the Roth's introduction.

Finally, the authors explore the demographic covariates of Roth usage within the 401(k) participant population. They find that Roth contributors are younger and more likely to be male. Salary has a negative relationship with Roth contributions for workers hired after the Roth's intro-

duction, as expected, but a positive relationship for those hired beforehand. The authors note that this unexpected finding may be due to higher-income workers being less financially passive in general, making them more likely to update their 401(k) contribution elections when the Roth is introduced. In addition, higher-income workers have greater financial literacy and thus are more likely to be familiar with the Roth.

The authors conclude by noting that Roth 401(k) usage is relatively uncommon among workers in their sample of firms, although participation is more than twice as high among

workers who were hired after the Roth introduction. As they write, "because of passivity or inattention, 401(k) participants do not react quickly to the Roth option when it is introduced after they have already joined the 401(k) plan."

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## Do Financial Incentives Induce Disability Insurance Recipients to Return to Work?

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Disability Insurance (DI) programs in the U.S. and elsewhere have historically provided little incentive for recipients to experiment with returning to work, since recipients typically lose eligibility for benefits if they earn more than a modest amount. In recent years, however, some countries have adopted return-to-work policies that allow recipients to keep some of their benefits if they return to work. Under a proposed change to the U.S. DI system known as the "\$1 for \$2 offset," benefits would be reduced by \$1 for each \$2 of earnings above an allowed amount rather than revoked.

Advocates of these policies suggest that they may encourage DI recipients to return to work and ultimately lead some recipients to exit the DI program, increasing the income of DI recipients and reducing program costs. Opponents counter that by making the program more generous such policies may induce DI recipients to work less and may encourage more people to apply for DI. The effects of these policies in practice are not well understood, due to a lack of empirical evidence.

In "**How Financial Incentives Induce Disability Insurance Recipients to Return to Work**" (NBER Working Paper 19016), researchers **Andreas Kostol** and

**Magne Mogstad** explore the effectiveness of programs that incentivize the return to work by DI recipients.

To do so, the authors make use of a natural experiment resulting from a change in DI policy in Norway. There are many similarities between the DI systems of the U.S. and Norway, not only in program design but in trends—in both countries, the DI rolls have expanded in recent years, due in large part to a liberalization of the screening process, resulting in a rapid increase in the share of DI recipients suffering from difficult-to-verify disorders such as mental illness and musculoskeletal disease. However, the U.S. DI program is smaller, offers less generous benefits, and has younger, lower-income beneficiaries.

In 2005, the Norwegian government introduced a return-to-work program. Prior to the program's introduction, beneficiaries faced a discontinuous drop in benefits if they earned a dollar above the substantial gainful activity (SGA) threshold. Under the new program, the discontinuous drop was eliminated and DI benefits were reduced gradually, by \$0.60 for every \$1 in earnings above the SGA, so that the level of earnings permissible before DI benefits were completely eliminated was increased. Importantly, only

recipients who were awarded DI before January 2004 were eligible for the new program, allowing the researchers to compare the labor market outcomes of DI recipients facing the new scheme to those facing the status quo.

Turning to the results, the authors find that the return-to-work program increased labor force participation by three percentage points in the year of its introduction, with the effect rising to five to nine percentage points by the program's third year. The effect may strengthen with time due to the time it takes DI recipients to find jobs. The authors estimate that a ten percent reduction in the tax rate on labor force participation reduced labor force non-participation by one to three percent. The program also doubled participants' average earnings, with the largest effect on earnings near the SGA threshold, where the implicit tax on earnings decreased the most.

Next, the authors explore the effect of the program on DI benefits received, taxes paid, and program costs. They estimate that the program reduced costs by 3.5 to 5 percent, reflecting a significant decrease in benefits and a small increase in taxes paid by DI recipients.

The analysis is not informative about the level of induced entry that might occur if all new DI applicants

were made eligible for the return-to-work program, since the program applied only to DI recipients who had been awarded benefits prior to its introduction. However, the authors calculate the amount of induced entry that would be necessary in order for the return-to-work program to lead to an increase in DI program costs, and find that the response to DI benefits would need to be much higher than what the existing literature suggests.

Finally, the authors explore the response to the program among different groups of beneficiaries. They find that increases in labor force participation are concentrated among younger DI recipients, who may experience

greater gains from returning to the labor force or lower costs from working. The response is greater among DI recipients living in areas with low unemployment rates, suggesting an important role for demand side factors. The response is also greater among those with more education or labor market experience, and greater for males than females.

As the authors point out, the liberalization of the screening process and the shift away from physically demanding work have blurred the line between the totally and permanently disabled and those who are disabled but retain some work capacity. Their results suggest “that many DI recipients have considerable capacity to work that can

be effectively induced by providing financial work incentives” and that providing such incentives both raises the income of DI recipients and reduces DI program costs. Although they encourage readers to exercise caution in applying their findings to other countries, their work suggests “that the work capacity and labor supply elasticity of DI recipients in Norway are comparable to those of DI recipients in the U.S., which lends some support to the external validity of our analysis of the return-to-work program.”

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## NBER Profile: *Michael Baker*

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Michael Baker is a Research Associate in the NBER's Programs on Aging and Labor Studies and a member of the NBER's International Social Security Working Group. He is a Professor of Economics and Canada Research Chair at the University of Toronto.

Professor Baker is the Academic Director of the Toronto Region Statistics Canada Research Data Centre. He co-edits the *Canadian Journal of Economics* and is past coeditor of the B.E. Press Journal in *Economic Analysis and Policy*. He is also a winner of the Doug Purvis Memorial Prize, awarded annually for a work of excellence relating to Canadian economic policy.

Professor Baker received a Bachelor of Commerce degree from the University of Toronto, a M.A. in Economics from York University,

and a Ph.D. in Economics from the University of Michigan.

Dr. Baker has written extensively on a wide variety of Canadian public policy issues, including childcare and maternity leave policies as well as disability insurance and social security programs. Some of his recent research projects have explored the health and cognitive benefits of maternity leave, the effects of social security benefits on retiree well-being, and the different human capital trajectories of girls and boys.

He is married to Gillian Hamilton, also of the Department of Economics at Toronto, and they have a daughter and a son. While he enjoys cooking and music, he currently spends most of his free time sitting in very cold arenas watching his son play hockey or his daughter skate.



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## Abstracts of Selected Recent NBER Working Papers

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WP 18977

**Janet Currie, W. Bentley MacLeod**  
**Diagnosis and Unnecessary Procedure**  
**Use: Evidence from C-Sections**

This paper develops and applies a model in which doctors have two dimensions of skill:

diagnostic skill and skill performing procedures. Higher procedural skill increases the use of intensive procedures across the board, while better diagnostic skill results in fewer intensive procedures for the low risk, but more for the high risk. Deriving empirical analogues to our

theoretical measures for the case of C-section, we show that improving diagnostic skill would reduce C-section rates by 15.8% among the lowest risk, and increase them by 4.7% among the high risk while improving outcomes among all women.

**WP 19032**

**Jingjing Chai, Raimond Maurer, Olivia S. Mitchell, Ralph Rogalla**  
**Exchanging Delayed Social Security Benefits for Lump Sums: Could This Incentivize Longer Work Careers?**

Social Security benefits are currently provided as a lifelong benefit stream, though some workers would be willing to trade a portion of their annuity streams in exchange for a lump sum amount. This paper explores whether allowing people to receive a lump sum as a payment for delayed retirement rather than as an addition to their lifetime Social Security benefits might induce them to work longer. We model the factors that influence how people trade off a Social Security stream for a lump sum, and we also examine the consequences of such tradeoffs for work, retirement, and life cycle wellbeing. Our base case indicates that workers given the chance to receive their delayed retirement credit as a lump sum payment would boost their average retirement age by 1.5–2 years. This will interest policymakers seeking to reform the Social Security system without raising costs or cutting benefits, while enhancing the incentives to delay retirement.

**WP 19063**

**Jeffrey R. Brown, Jeffrey R. Kling, Sendhil Mullainathan, Marian V. Wrobel**  
**Framing Lifetime Income**

We provide evidence that individuals optimize imperfectly when making annuity decisions, and this result is not driven by loss aversion. Life annuities are more attractive when presented in a consumption frame than in an investment frame. Highlighting the purchase price in the consumption frame does not alter this result. The level of habitual spending has little interaction with preferences for annuities in the consumption frame. In an investment frame, consumers prefer annuities with principal guarantees; this result is similar for guarantee amounts below, at, and above the purchase price. We discuss implications for the retirement services industry and its regulators.

**WP 19088**

**Neeraj Kaushal**  
**How Public Pension Affects Elderly Labor Supply and Well-Being: Evidence from India**

We study the effect of a recent expansion in India's National Old Age Pension Scheme on elderly well-being. Estimates suggest that public pension has a modestly negative effect on the employment of elderly/near elderly men

with a primary or lower education but no effect of the employment of similar women. Pension raised family expenditures, lowering poverty, and the effect was smaller on families headed by illiterate persons suggesting lower pension coverage of this most disadvantaged group. Further, households spent most of the pension income on medical care and education. We find some weak evidence that pension raised longevity.

**WP 19103**

**Robin L. Lumsdaine, Rogier J.D. Potter van Loon**  
**Wall Street vs. Main Street: An Evaluation of Probabilities**

This paper challenges recent conventional wisdom of a divide between Main Street (the average American consumer) and Wall Street (financial market participants). The views of survey respondents regarding the likelihood of stock index returns exceeding specific thresholds are compared to market views indicated by index options with strikes at analogous thresholds. The econometric specification explicitly addresses some important impediments to using elicited probabilities from survey data. We confirm that Main Street views track Wall Street views, although the association is not one-for one. We find a closer association for those demonstrating a better understanding of the laws of probability.

**WP 19105**

**Janet Currie, Mark Stabile, Lauren E. Jones**  
**Do Stimulant Medications Improve Educational and Behavioral Outcomes for Children with ADHD?**

We examine the effects of a policy change in the province of Quebec, Canada which greatly expanded insurance coverage for prescription medications. We show that the change was associated with a sharp increase in the use of Ritalin, a medication commonly prescribed for ADHD, relative to the rest of Canada. We ask whether this increase in medication use was associated with improvements in emotional functioning and short- and long-run academic outcomes among children with ADHD. We find evidence of increases in emotional problems among girls, and reductions in educational attainment among boys. Our results are silent on the effects on optimal use of medication for ADHD, but suggest that expanding medication use can have negative consequences given the average way these drugs are used in the community.

**WP 19137**

**Alan Auerbach, Lorenz Kueng, Ronald Lee**  
**Propagation and Smoothing of Shocks in Alternative Social Security Systems**

Even with well-developed capital markets, there is no private market mechanism for trading between current and future generations, so a potential role for public old-age pension systems is to spread economic and demographic shocks among different generations. This paper evaluates the smoothing and propagation of shocks of three pay-as-you-go public pension schemes, based on the actual U.S. and German systems, which vary in the extent to which they rely on tax adjustments versus benefit adjustments to provide annual cash-flow budget balance. Modifying the Auerbach-Kotlikoff (1987) dynamic general-equilibrium overlapping generations model to incorporate realistic patterns of fertility and mortality and shocks to productivity, fertility and mortality, we evaluate the effectiveness of the three public pension systems at spreading the effects of such shocks. We find that the systems, particularly those that rely to some extent on tax adjustments, are effective at spreading fertility and mortality shocks, but that this is not the case for productivity shocks, for which the pension systems actually tend to concentrate the economic impact. These results suggest that both system design and the source of shocks are important factors in determining the potential of public pension arrangements to spread the burden of shocks.

**WP 19142**

**Young Kyung Do, Edward C. Norton, Sallay Stearns, Courtney H. Van Houtven**  
**Informal Care and Caregiver's Health**

This study aims to measure the causal effect of informal caregiving on the health and health care use of women who are caregivers, using instrumental variables. We use data from South Korea, where daughters and daughters-in-law are the prevalent source of caregivers for frail elderly parents and parents-in-law. A key insight of our instrumental variable approach is that having a parent-in-law with functional limitations increases the probability of providing informal care to that parent-in-law, but a parent-in-law's functional limitation does not directly affect the daughter-in-law's health. We compare results for the daughter-in-law and daughter samples to check the assumption of the excludability of the instruments for the daughter sample. Our results show that providing informal care has significant adverse effects along multiple dimensions of health for daughter-in-law and daughter caregivers in South Korea.

WP 19149

Martin B. Hackmann, Jonathan T. Kols-  
tad, Amanda E. Kowalski

### Adverse Selection and an Individual Man- date: When Theory Meets Practice

We develop a model of selection that incor-  
porates a key element of recent health reforms:  
an individual mandate. We identify a set of key  
parameters for welfare analysis, allowing us to  
model the welfare impact of the actual policy  
as well as to estimate the socially optimal pen-  
alty level. Using data from Massachusetts, we  
estimate the key parameters of the model. We  
compare health insurance coverage, premi-  
ums, and insurer average health claim expendi-  
tures between Massachusetts and other states  
in the periods before and after the passage of  
Massachusetts health reform. In the individual  
market for health insurance, we find that pre-  
miums and average costs decreased signifi-  
cantly in response to the individual mandate;  
consistent with an initially adversely selected  
insurance market. We are also able to recover  
an estimated willingness-to-pay for health  
insurance. Combining demand and cost esti-  
mates as sufficient statistics for welfare analysis,  
we find an annual welfare gain of \$335 dollars  
per person or \$71 million annually in Massa-  
chusetts as a result of the reduction in adverse  
selection. We also find evidence for smaller  
post-reform markups in the individual mar-  
ket, which increased welfare by another \$107  
dollars per person per year and about \$23 mil-

lion per year overall. To put this in perspective,  
the total welfare gains were 8.4% of medical  
expenditures paid by insurers. Our model  
and empirical estimates suggest an optimal  
mandate penalty of \$2,190. A penalty of this  
magnitude would increase health insurance to  
near universal levels. Our estimated optimal  
penalty is higher than the individual mandate  
penalty adopted in Massachusetts but close to  
the penalty implemented under the ACA.

WP 19163

Jason Abaluck, Jonathan Gruber

### Evolving Choice Inconsistencies in Choice of Prescription Drug Insurance

We explore choice inconsistency over time  
within the Medicare Part D Prescription Drug  
Program. Using the full universe of Part D  
claims data, we revisit our earlier work on par-  
tial data to replicate our results showing large  
“foregone savings” among Part D enrollees.  
We also document that this foregone savings  
increases over time during the first four years  
of the Part D program. We then develop a rich  
dynamic structural framework that allows us  
to mathematically decompose the “foregone  
welfare” from inconsistent plan choices into  
components due to demand side factors, sup-  
ply side factors, and changes in preferences  
over time. We find that the welfare cost of  
choice inconsistencies increases over time.  
Most importantly, we find that there is little  
improvement in the ability of consumers to

choose plans over time; we identify and esti-  
mate little learning at either the individual or  
cohort level over the years of our analysis. In-  
ertia does reduce welfare, but even in a world  
with no inertia we estimate that substantial  
welfare losses would remain. We conclude that  
the increased choice inconsistencies over time  
are driven by changes on the supply side that  
are not offset both because of inertia and be-  
cause non-inertial consumers still make incon-  
sistent choices.

WP 19168

Jeffrey R. Brown, Arie Kapteyn, Erzo F.P.

Luttmer, Olivia S. Mitchell

### Decision Complexity as a Barrier to An- nuityization

We show that people have difficulty valuing  
annuities, and this, instead of a preference for  
lumpsums, helps explain observed low annuity  
demand. Although the median price at which  
people are willing to sell an annuity stream is  
close to the actuarial value, many responses  
diverge greatly from optimizing behavior.  
Moreover, people will pay substantially less to  
buy than to sell annuities. We conclude that  
boundedly rational consumers adopt “buy  
low, sell high” heuristics when confronting a  
complex trade-off. This suggests that many  
consumers do not make optimizing decisions,  
underscoring the difficulty of explaining cross-  
sectional annuity valuation differences using  
standard models.

## Additional NBER Working Papers on Health and Aging

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