

# New Evidence Shows Larger Benefits of Disability Insurance Income

By Alexander Gelber, Timothy Moore, and Alexander Strand

The Social Security program — and its component Social Security Disability Insurance program — face funding challenges that policymakers will need to address within the next 15 years.

The Old Age, Survivors, and Disability Insurance (OASDI) Trust Fund that pays for the programs is projected to be exhausted between 2030 (Congressional Budget Office 2017) and 2034 (Social Security Administration (SSA) 2017).

Our research has given that urgency an important perspective: We show that Social Security Disability Insurance (SSDI) payments save lives and impose smaller economic costs

than some had assumed. This policy brief will explain our findings and their implications for policymakers.

## Costs and Benefits of Disability Insurance

SSDI is one of the world's largest social insurance programs, paying benefits and guaranteeing Medicare eligibility to workers and their families when a disability prevents someone from doing substantial work. Payments of roughly \$147 billion covered 11 million disabled American workers and their families in 2016. About 5 percent of 25- to

64-year-olds receive SSDI, and approximately 7 percent of the federal budget is spent on SSDI and related Medicare expenses.

Since 1979, SSDI has greatly expanded (Autor and Duggan 2006): The fraction of the population on SSDI has increased by more than two percentage points, and real expenditures on SSDI and associated Medicare expenditures have more than tripled (U.S. Treasury 2017, SSA 2017).

As lawmakers consider SSDI reforms — including changing the size of cash payments — optimal policy should aim to balance the costs and benefits of those possible changes. Prior research has focused primarily on how SSDI affects work decisions, concluding that SSDI substantially reduces employment and earnings (Bound 1989, Autor and Duggan 2003, Autor and Duggan 2007, von Wachter, Song, and Manchester 2011, Maestas, Mullen, and Strand 2013, French and Song 2014, Kostøl and Mogstad 2014, and Moore 2015).<sup>1</sup>

Much more limited attention has been given to the potential benefits of SSDI (Chetty and Finkelstein 2013), with much of this literature focusing on the gains from reducing recipients' volatility of income and therefore consumption (e.g., Bound et al. 2004, Chandra and Samwick 2005, Ball and Low 2014, Meyer and Mok 2013, Low and Pistaferri 2015, Autor et al. 2017).

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<sup>1</sup> For a review of earlier work, see Bound and Burkhauser (1999).

However, there is a surprising lack of evidence on how SSDI income affects health in particular. To the best of our knowledge, none of the existing literature has studied the causal effects of SSDI payments on health outcomes in the U.S. or considered the valuation of such potential benefits.

In a pair of recent papers, we have found both new sources of benefits, and evidence of lower economic costs, of SSDI payments. We find that SSDI payments reduce mortality, particularly among lower-income beneficiaries (Gelber, Moore, and Strand 2018). The gains in life expectancy we document represent an important benefit of SSDI not taken into account in previous analyses.

And our results confirm previous findings that SSDI payments reduce earnings, but with the twist that these reductions are less distortionary than had been assumed in much previous literature (Gelber, Moore, and Strand 2017).

## Disability Insurance Income Saves Lives

SSDI beneficiaries are in poor health. Approximately 14 percent of those who entered SSDI between 2006 and 2010 died within four years, a mortality rate that is roughly 10 times the rate for working-age adults in the general population (Arias 2014, Zayatz 2015). Given these characteristics, a fundamental policy question is whether SSDI income improves the health of those who receive it.

In a new SIEPR working paper titled “Disability Insurance Income Saves Lives” (Gelber, Moore, and Strand

2018), we examine how disability insurance income may affect beneficiaries’ mortality. We use SSA restricted-access administrative data on each new SSDI beneficiary from 1997 to 2009, covering more than 3.6 million people.

We estimate the causal effect of income on mortality by taking advantage of the formula determining SSDI payments. A beneficiary’s disability insurance payment depends upon average lifetime earnings in the highest-earning years before becoming disabled, which is known as Average Indexed Monthly Earnings (AIME). An additional dollar of AIME raises benefits by 90 cents, up to AIME of roughly \$895 a month (known as the “lower bend point”); by 32 cents from \$895 to \$5,397; and by 15 cents above \$5,397 (the “upper bend point”). In addition to these two bend points, family payment rules create a third “family maximum” bend point. Below this bend point, a dollar of extra AIME leads to an 85-cent increase in the family’s combined benefits, while the increase is 48 cents above this bend point. The lower, family maximum and upper bend points occur, respectively, at the 4th, 30th, and 84th percentiles of lifetime earnings.

We assess whether the relationship of mortality to AIME changes sharply at the bend points. If higher SSDI payments reduce mortality, then AIME should be more positively associated with mortality above each bend point than below, as the lower SSDI replacement rates above the bend point lead to increasing mortality. The “replacement rate” refers to SSDI benefits as a fraction of AIME.

The data confirm these patterns: We find that SSDI payments reduce

mortality, particularly among lower-income beneficiaries. Among the lowest-income group we study, where mean annual SSDI income is \$8,543, we estimate that an increase of \$1,000 in annual SSDI payments decreases beneficiaries’ annual mortality rate by 0.26 percentage points, or 7.3 percent, during the initial four years of receiving disability insurance. Over the 16 years following initial receipt of the benefit, the \$1,000 annual increase in payments would extend recipients’ lives by an average of three months.

Among the second-lowest income group we study, where mean annual SSDI income for the primary beneficiary is \$12,648, we estimate that an increase of \$1,000 in annual SSDI payments decreases beneficiaries’ annual mortality rate by 0.09 percentage points, or 3.2 percent, over these four years. Over 16 years, the increased SSDI payments would increase their life spans by almost one month on average. In the highest-income group we study, where the primary beneficiary receives mean annual SSDI income of \$20,777 per year, we find no robust evidence of an effect, though we cannot rule out substantial effects.

Previous literature has found that in the raw relationship between life span and income in the general population, life span rises with income much more steeply at low incomes than at high incomes (Preston 1975, Chetty et al. 2016). Our estimates mirror this finding — with larger absolute effects at lower lifetime income levels — demonstrating that the causal relationship (beyond the raw correlation) follows this pattern in our setting.

Our baseline point estimates imply that it costs around \$59,000 to save an additional life year at the lower bend point and about \$237,000 at the family maximum bend point. The latest major expert panel recommended that years of life should be valued by economists and policymakers at \$50,000 if not more (Neumann, Cohen, and Weinstein 2014, Neumann et al. 2017). Therefore, our results suggest that the gains in life expectancy we document represent an important benefit of SSDI not recognized in previous estimates of optimal disability insurance benefit levels. These benefits of SSDI add to those from smoothing other consumption through transferring to individuals who become disabled.

Our estimates imply that in the range we investigate near the lower and family maximum bend points, a \$1,000 annual increase in SSDI payments would save 9,713 life-years per SSDI cohort in the years we investigate. This is presumably at least as large as the number of life-years saved in the full SSDI sample in these years, implying large aggregate health effects of SSDI payments.

By identifying a group of Americans for whom income strongly affects life expectancy, our findings also inform the literature on the economic determinants of health in general. Our estimates are generally larger than other estimates of the effect of income on mortality in the general population in developed countries (Cutler, Deaton, and Lleras-Muney 2006). However, our estimates of the mortality effects are within the range found in previous studies of other high-mortality, low-income groups in other contexts in less developed

economies (Jensen and Richter 2004, Salm 2011, Barham and Rowberry 2013).

## Disability Insurance Payments Reduce Earnings

At the same time as SSDI has these significant and previously unrecognized benefits, it is equally important to measure SSDI's costs. Tax revenue pays for SSDI. Raising this revenue distorts behavior through reducing the incentives for work and investment. Tax economists have measured these costs.

Further costs can occur because SSDI payments themselves reduce work of SSDI beneficiaries. Some beneficiaries could reduce their earnings either due to program rules that require their income to remain below a given level, known as Substantial Gainful Activity (SGA), or because the income they receive from disability insurance reduces their need for earned income to reach any given level of total income. The former is an example of what economists call a “substitution effect,” while the latter is called an “income effect” because an increase in SSDI income reduces the need for earnings. In basic economic models, only substitution effects cause welfare losses: Income effects are a transfer whose cost to the government equals its benefit to recipients, while substitution effects lead to reductions in earnings and associated reductions in revenue that are not counterbalanced by commensurate benefits. Across the literature on the employment losses from SSDI, decreases in work have often been interpreted as reflecting distortionary substitution effects (e.g., Gruber 2013).

SSDI reform proposals have often been focused on improving incentives to work, including House Speaker Paul Ryan's recent proposal to improve work incentives within the Ticket to Work program by replacing the benefit “cliff” at the SGA limit with a slower phaseout of benefits. However, such a proposal would not increase earnings or employment to the extent that income effects operate.

On the other hand, proposals to slow the growth rate of Social Security and SSDI benefits by tying cost-of-living adjustments to a slower-increasing measure of inflation — known as the “Chain Weighted Consumer Price Index” — would affect work decisions through an income effect (Office of Management and Budget 2013). To predict the work impacts of such a policy, it is necessary to estimate the income effect of SSDI.

Despite the importance of estimating the income effect of SSDI, it has been considered difficult to do so. For example, Autor and Duggan (2007) write, “The SSDI program has provided benefits exclusively on a work-contingent basis, so income and substitution effects cannot readily be separated” (p. 120).

In our paper “The Effect of Disability Insurance Payments on Beneficiaries' Earnings” (Gelber, Moore, and Strand 2017), we estimate the income effect of SSDI using a similar strategy as in our study of the mortality effects of SSDI, examining how earnings and employment change with AIME around the bend points.

If higher SSDI payments reduce earnings, then earnings should be more positively associated with AIME above each bend point than below,

because the lower SSDI replacement rates above the bend point would lead to higher earnings.

The data confirm this pattern, indicating that SSDI payments reduce earnings substantially. In the case of the earnings outcome, we find the strongest and most robust effects at the upper bend point. We again use the SSA restricted-access administrative data on all new SSDI beneficiaries between 2001 and 2007, with 610,271 beneficiaries in the region of the upper bend point. A clear increase in the slope of mean earnings at the upper bend point arises for the first time in the year after individuals go on SSDI and persists in subsequent years. In a baseline specification, the estimates imply that if SSDI payments are increased by \$1, beneficiaries decrease their earnings by 20 cents.

Our results clearly demonstrate that earnings reductions from SSDI do not only reflect substitution effects. The typical level of earnings among these beneficiaries is far from where it would be constrained by the possibility of losing benefit eligibility by earning more than the level of SGA. In fact, our estimates are similar to those in previous literature encompassing both income and substitution effects, further suggesting that much of the impact of SSDI on earnings around the upper bend point could relate to income effects. This would reflect SSDI recipients being substantially motivated to reach a sufficient level of income to meet their needs.

If this income effect is 20 cents on the dollar more broadly, this would have implications for both the earnings and fiscal consequences of a change in SSDI benefits, such as the

chain-weighting proposal to slow the growth of benefits.

The chain-weighting proposal would cut SSDI cash benefits by around 3 percent for someone who had been on the program for 10 years; for an average beneficiary near the upper bend point in our sample, this would mean an annual benefit cut of \$638. Our estimates suggest this would cause an increase in mean annual earnings of around \$128.

In an illustrative case, a \$1 cut in SSDI benefits would increase total federal government revenue by 5 cents; the Old Age, Survivors, and Disability Insurance (OASDI) Trust Fund alone would gain 2.48 cents in revenue, while the SSDI Trust Fund would gain 0.36 cents. If chain-weighting decreases annual benefits by \$638, this would lead to an annual increase in federal government revenues around \$32, an increase in OASDI revenues around \$16, and an increase in SSDI revenues of over \$2.

At the same time as these revenue changes are substantial, large income effects would have two important implications indicating that SSDI's benefits are larger relative to its costs than had been understood. First, large income effects (and small substitution effects) indicate that individuals value income highly, implying that SSDI should have large benefits in smoothing consumption (Chetty 2006). Second, as noted above, income effects are not associated with direct economic welfare losses in a basic economic model.

Our paper complements a small set of papers that examine income effects in other disability contexts (Autor and Duggan 2007, Marie and Vall Castello 2012, Bruich 2014, Low

and Pistaferri 2015, Autor, Duggan, Greenberg, and Lyle 2016, Deshpande 2016). Our paper is the first to estimate an income effect specifically in the context of SSDI in the U.S., which is the largest U.S. federal expenditure on the disabled.

Overall, if income effects are important as we find, then the welfare losses from SSDI may be substantially smaller, and SSDI's benefits substantially larger, than previously thought. At the same time, we can use these income effects to calculate the revenue, earnings, and employment losses from increases in SSDI benefits, which are substantial.

## Conclusion

As policymakers contemplate changes to SSDI, particularly as the Trust Fund approaches exhaustion in the coming years, many will look to economists to provide guidance for the reform process. Much attention has focused on the important issue of the employment and earnings losses from SSDI. Our work complements this literature.

SSDI payments save lives. They also lead to lower earnings, but through income effects that are associated with smaller economic welfare losses than some had previously assumed. Overall, our work suggests that SSDI has lower costs, and additional benefits, relative to previous literature.

On their own, these findings do not necessarily imply that SSDI benefits should be larger than they currently are; that would additionally depend on how current benefits compare with the optimal level. Our current research focuses on putting our findings together to derive new

quantitative implications for optimal SSDI replacement rates. Research of this sort could help inform policymakers undertaking possible reforms to SSDI.

## References

- Arias, Elizabeth.** “United States Life Tables, 2010.” *National Vital Statistics Reports* 63.7: Hyattsville MD: National Center for Health Statistics (2014).
- Autor, David, and Mark Duggan.** 2003. “The Rise in the Disability Rolls and the Decline in Unemployment.” *Quarterly Journal of Economics* 118 (1): 157-206.
- Autor, David, and Mark Duggan.** 2006. “The Growth in the Social Security Disability Rolls: A Fiscal Crisis Unfolding.” *Journal of Economic Perspectives* 20 (3): 71-96.
- Autor, David, and Mark Duggan.** 2007. “Distinguishing Income from Substitution Effects in Disability Insurance.” *American Economic Review P&P* 97 (2): 119-124.
- Autor, David, Mark Duggan, Kyle Greenberg, and David Lyle.** 2016. “The Impact of Disability Benefits on Labor Supply: Evidence from the VA’s Disability Compensation Program.” *American Economic Journal: Applied Economics* 8 (3): 1-39.
- Autor, David, Andreas Kostøl, Magne Mogstad, and Bradley Setzler.** “Disability Benefits, Consumption Insurance, and Household Labor Supply.” NBER Working Paper No. 23466 (2017).
- Ball, Steffan, and Hamish Low.** “Do Self-insurance and Disability Insurance Prevent Consumption Loss on Disability?” *Economica* 81.323 (2014): 468-490.
- Barham, Tania, and Jacob Rowberry.** “Living Longer: The Effect of the Mexican Conditional Cash Transfer Program on Elderly Mortality,” *Journal of Development Economics*, 105 (2013): 226-236.
- Bound, John.** 1989. “The Health and Earnings of Rejected Disability Insurance Applicants.” *American Economic Review* 79: 482-503.
- Bound, John, and Richard V. Burkhauser.** “Economic Analysis of Transfer Programs Targeted on People with Disabilities.” In Orley Ashenfelter and David Card (eds.) *Handbook of Labor Economics* 3 (1999): 3417-3528.
- Bound, John, Julie Berry Cullen, Austin Nichols, and Lucie Schmidt.** “The Welfare Implications of Increasing Disability Insurance Benefit Generosity.” *Journal of Public Economics*, 88.12 (2004): 2487-2514.
- Bruich, Gregory.** 2014. “How Do Disability Insurance Beneficiaries Respond to Cash-on-Hand? New Evidence and Policy Implications.” Harvard University Working Paper.
- Chandra, Amitabh, and Andrew A. Samwick.** “Disability Risk and the Value of Disability Insurance.” NBER Working Paper No. 11605 (2005).
- Chetty, Raj.** 2006. “A New Method of Estimating Risk Aversion.” *American Economic Review* 96 (5): 1821-1834.
- Chetty, Raj, and Amy Finkelstein.** “Social Insurance: Connecting Theory to Data.” In Alan Auerbach, Raj Chetty, Martin Feldstein, and Emmanuel Saez (eds.), *Handbook of Public Economics* 5 (2013): 111-193.
- Chetty, Raj, Michael Stepner, Sarah Abraham, Shelby Lin, Benjamin Scuderi, Nicholas Turner, Augustin Bergeron, and David Cutler.** “The Association Between Income and Life Expectancy in the United States, 2001-2014.” *Journal of the American Medical Association* 315.16 (2016): 1750-1766.
- Congressional Budget Office.** “The 2017 Long-Term Budget Outlook.” Washington, D.C.: US Government Printing Office (2017).
- Cutler, David M., Angus S. Deaton, and Adriana Lleras-Muney.** “The Determinants of Mortality.” *Journal of Economic Perspectives* 20.3 (2006): 97-120.
- Deshpande, Manasi.** “The Effect of Disability Payments on Household Earnings and Income: Evidence from the SSI Children’s Program.” *Review of Economics and Statistics* 98.4 (2016): 638-54.
- French, Eric, and Jae Song.** 2014. “The Effect of Disability Insurance Receipt on Labor Supply.” *American Economic Journal: Economic Policy* 6 (2): 291-337.
- Gelber, Alexander, Timothy Moore, and Alexander Strand.** 2017. “The Effect of Disability Insurance Payments on Beneficiaries’ Earnings.” *American Economic Journal: Economic Policy*. 2017, 9 (3), 229-261.
- Gelber, Alexander, Timothy Moore, and Alexander Strand.** 2018. “Disability Insurance Benefits Save Lives.” SIEPR working paper.
- Gruber, Jonathan.** 2013. *Public Finance and Public Policy*, 4th edition. New York: Worth Publishers.

Jensen, Robert T., and Kaspar Richter. "The Health Implications of Social Security Failure: Evidence from the Russian Pension Crisis." *Journal of Public Economics* 88.1 (2004): 209-236.

Low, Hamish, and Luigi Pistaferri. "Disability Insurance and the Dynamics of the Incentive Insurance Trade-Off." *American Economic Review* 105.10 (2015): 2986-3029.

Kostøl, Andreas Ravndal, and Magne Mogstad. 2014. "How Financial Incentives Induce Disability Insurance Recipients to Return to Work." *American Economic Review* 104 (2): 624-655.

Maestas, Nicole, Kathleen J. Mullen, and Alexander Strand. 2013. "Does Disability Insurance Receipt Discourage Work? Using Examiner Assignment to Estimate Causal Effects of SSDI Receipt." *American Economic Review* 103 (5): 1797-1829.

Marie, Olivier, and Judit Vall Castello. 2012. "Measuring the (Income) Effect of Disability Insurance Generosity on Labour Market Participation." *Journal of Public Economics* 96 (1-2): 198-210.

Meyer, Bruce, and Wallace Mok. "Disability, Earnings, Income, and Consumption." NBER Working Paper 18869 (2013).

Moore, Timothy. 2015. "The Employment Effects of Terminating Disability Benefits." *Journal of Public Economics* 124 (C): 30-43.

Neumann, Peter J., Joshua T. Cohen, and Milton Weinstein. "Updating Cost-Effectiveness – The Curious Resilience of the \$50,000-per-QALY Threshold." *New England Journal of Medicine* 371 (2014): 796-797.

Neumann, Peter J., Theodore Ganiats, Louise Russell, Gillian Sanders, and Joanna Siegel. *Cost-Effectiveness in Health and Medicine*, 2nd Edition (2017). Oxford: Oxford University Press.

Preston, Samuel H. "The Changing Relation between Mortality and Level of Economic Development." *Population Studies* 29.2 (1975): 231-248.

Salm, Martin. "The Effect of Pensions on Longevity: Evidence from Union Army Veterans." *Economic Journal* 121.552 (2011): 595-619.

Social Security Administration. 2017. *The 2017 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*. Washington, D.C.: Social Security Administration Office of the Chief Actuary.

U.S. Department of the Treasury. 2017. *Combined Statement of Receipts, Outlays, and Balances*. Washington, D.C.: Government Printing Office.

U.S. Office of Management and Budget. 2013. "Budget of the U.S. Government, Fiscal Year 2014." Washington, D.C.: Government Printing Office.

von Wachter, Till, Jae Song, and Joyce Manchester. 2011. "Trends in Employment and Earnings of Allowed and Rejected Applicants to the Social Security Disability Insurance Program." *American Economic Review* 101 (7): 3308-3329.

Zayatz, Tim. "Social Security Disability Insurance Program Worker Experience." *Actuarial Study No. 123, SSA Pub. No. 11-11543*. Washington, D.C.: Social Security Administration Office of the Chief Actuary (2015).

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