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SUBSIDIES VS. NUDGES: WHICH POLICIES INCREASE SAVING THE MOST?

By Raj Chetty, John N. Friedman, Soren Leth-Petersen, Torben Heien Nielsen, and Tore Olsen*

Introduction

The federal government provides generous tax subsidies for retirement saving in 401(k)s and IRAs. The subsidies are designed to increase household saving and retirement income security, important national goals. The estimated cost, however, exceeds $100 billion a year in lost revenue to the Treasury.[1] Given the nation's severe budgetary pressures, it is critical to know how effective these subsidies are in raising household saving and whether other approaches would be more cost-effective.

The ability to answer these questions has been limited by inadequate U.S. data on household saving. In particular, it is hard to know whether tax subsidies encourage families to save more, or simply shift money they would otherwise save into tax-advantaged retirement accounts. The same is true for "automatic" saving, such as defaults in 401(k) plans, which increase retirement saving if individuals take no action. While defaults have been shown to increase retirement saving, is this increase offset by reduced saving in taxable accounts or an increase in debt, leaving total household saving unchanged?

This *brief*, based on a recent study, uses high-quality Danish data to address these questions.[2] It assesses the effect of tax subsidies and automatic contributions on retirement saving and total household saving. The Danish retirement system and patterns of retirement saving are similar to those in the United States. The effect of retirement saving policies on total household saving should be similar as well, making the findings relevant to current U.S. policy discussions.

This *brief* proceeds as follows. The first section introduces the problem of evaluating policies designed to increase retirement saving. The second section describes the data and basic methodology used in the analysis. The third section presents findings on the effect of tax subsidies on retirement saving. The fourth section presents findings on the effect of automatic saving. The fifth section offers an explana-

* Raj Chetty is a professor of economics at Harvard University. John N. Friedman is an assistant professor of public policy at Harvard University. Soren Leth-Petersen is a professor of economics at the University of Copenhagen. Torben Heien Nielsen is on the research staff of the Danish National Centre for Social Research. Tore Olsen is a Ph.D. candidate at the University of Copenhagen. This *brief* is adapted from a longer paper (Chetty et al. 2012), which was supported by the Danish Council for Independent Research and the U.S. Social Security Administration (SSA) through a grant to the National Bureau of Economic Research (NBER) as part of the SSA Retirement Research Consortium.

tion of these findings based on how these policies affect two types of individuals – "active" and "passive" savers. The final section concludes that an expansion of automatic saving could produce much larger increases in household saving, at lower fiscal cost, than current tax subsidies for retirement saving.

Evaluating Retirement Saving Policies

Despite numerous studies on tax subsidies for retirement saving, researchers have been unable to obtain conclusive evidence on the effectiveness of these subsidies in raising total household saving.[3] Recent studies on automatic saving policies such as 401(k) defaults have found that they are quite effective at increasing participation in retirement saving programs but, again, it is unclear whether they raise total household saving.[4]

What impedes the ability to answer these questions is a lack of high-quality data on household wealth and saving in the United States.[5] Therefore, this study turns to data on Danish households to address these issues. The Danish retirement income system, which has individual savings accounts, employer-provided pensions, and a government defined benefit plan, is broadly similar to the structure in the United States. Saving behavior *within* retirement accounts – where good U.S. data are available – is also similar. The assumption is that saving behavior outside retirement accounts – where the Danish data are of much higher quality – should be similar as well.

Data and Methodology

Danish tax records allow the creation of a data set that tracks the wealth and saving of over 4 million individuals from 1994-2009, producing 45 million total observations. The data set combines information on income, wealth, and saving from the Danish Income Tax Register; on age, gender, and marital status from the Danish population register; and on education, occupation, and employers from the Danish Integrated Database for Labor Market Research. With this data set, changes in tax subsidies and automatic retirement contributions can be used to analyze the effect of such policies on household saving.

The effect of tax subsidies is assessed using responses to a sharp reduction in Denmark's pension tax subsidy, in 1999, for those in the top income tax bracket. The question is whether those affected reduced their retirement saving and, if so, whether the reduction was *not* offset by increases in other types of saving. This outcome would indicate: 1) that the subsidy had indeed induced households to increase retirement saving; and 2) that the increase was not the result of funds shifted from non-retirement to subsidized retirement accounts, but represented an increase in overall household saving.

The effect of automatic retirement saving is assessed in two ways: 1) the response of workers who switch jobs and receive an increase in automatic retirement contributions made by their employers; and 2) responses to the government's Mandatory Savings Plan, which from 1998-2003 required all Danish citizens to contribute 1 percent of earnings to a retirement savings account. The question is again whether households responded to an increase in automatic retirement contributions by reducing other types of saving, leaving total household saving unchanged. If so, it would show that automatic saving programs simply shift, rather than increase, total household saving.

Automatic contributions increased total saving much more than tax subsidies.

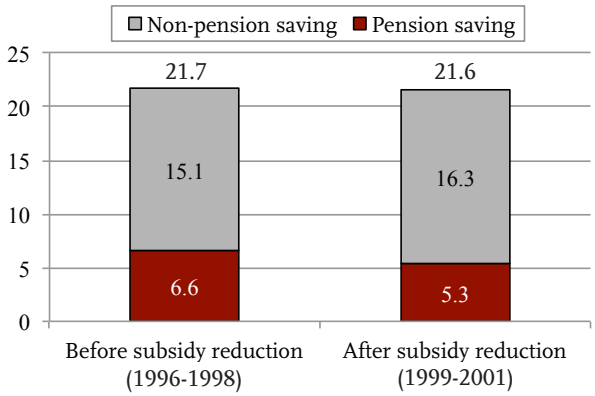
For a more complete description of the methodology used to create the data set and analyze the effects of tax subsidies and automatic saving, see the full working paper on which this *brief* is based.[6]

The Small Effect of Tax Subsidies

The effect of tax subsidies can be analyzed by examining how individuals responded to a reduction in the subsidy for contributions to "capital" pension accounts. Denmark has two types of tax-deferred retirement savings accounts – "capital" pensions, which provide lump-sum payouts at retirement, and "annuity" pensions, which provide lifetime payments. In 1999, the government reduced the subsidy for contributions to capital pension accounts for individuals in the top tax bracket. The tax treatment of contributions to annuity pension accounts, and contributions by individuals in lower tax brackets to either type of account, remained unchanged.[7]

The effect of the subsidy can be assessed by comparing responses by individuals with incomes above and below the income cutoff for the top tax bracket. As one would expect, capital pension contributions remained virtually unchanged for those not affected by the subsidy reduction. Among those who were affected, capital pension contributions fell sharply. Contributions to annuity pensions by members of this group did increase somewhat. Nevertheless, total pension contributions by those in the top tax bracket, to both capital and annuity accounts, declined significantly (see the bottom section of the bars in Figure 1). This finding supports the notion that the higher tax subsidy had indeed induced an increase in *retirement* saving.

Figure 1. Saving for Individuals in Top Income Tax Bracket, Before and After Tax Subsidy Reduction, Thousands of DKr



Notes: Pension saving includes saving in both capital accounts (which were affected by the subsidy reduction) and annuity accounts (which were not affected). Non-pension saving is expressed as a pre-tax amount. Over the period studied, the exchange rate was about DKr 6.5 per US $1. *Source*: Chetty et al. (2012).

However, the decline in *retirement* saving did not produce a similar decline in *total* household saving. Among those affected by the cut in the subsidy, saving in taxable non-pension accounts increased (see the top section of the bars in Figure 1). The increase, in fact, almost entirely offset the decline in their retirement saving, as indicated by the nearly identical height of the total bars in the figure. Each DKr 100 reduction in pension contributions led to only a DKr 2 reduction in overall saving. In other words, nearly the entire increase in retirement saving attributable to the previous level of the subsidy had come from money that would have been saved – and was now being saved – in taxable non-pension accounts.

The government's increased tax revenue due to the lower subsidy can be estimated as the net present value of the additional tax savings provided to taxpayers before the 1999 reform. Using this estimate in the context of the example given above, it would cost the government roughly DKr 200 to raise household saving by DKr 2 (or DKr 1 in tax expenditure for each 1 cent increase in saving).

The subsidy not only had a small effect on total household saving, it also affected very few households. Of those in the top tax bracket, 83 percent essentially made no change in their pension and non-pension saving when the subsidy was cut.

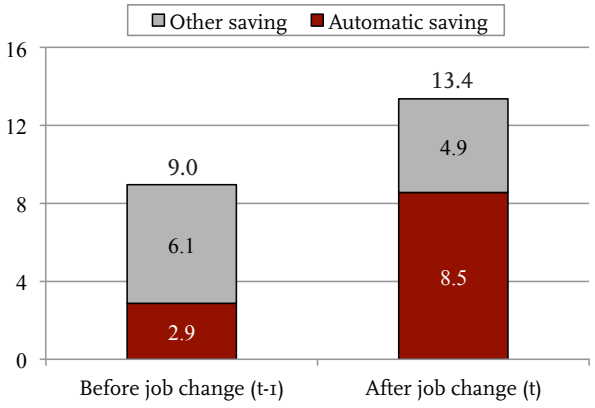
The Large Effect of Automatic Saving

The effect of automatic saving can be assessed by examining how individuals responded to an increase in employer pension contributions when switching jobs and to the introduction of the government's mandatory saving program.

An increase in employer pension contributions is an automatic increase in saving, as it requires no active choices by the worker. In Denmark, employer contributions vary substantially. So, many workers who change jobs see a significant increase in such automatic saving.

Workers who had been making voluntary contributions to an individual pension before changing jobs can simply undo an automatic increase in pension contributions made by a new employer. The two forms of pension saving are perfect substitutes and voluntary individual contributions are easily reduced. Figure 2 (on the next page) shows employer pension contributions and total household saving for such workers who changed jobs and saw employer contributions increase by at least 3 percent of earnings. The bottom section of the bars shows the big jump in employer saving before and after the job change. The top section of the bars shows only a relatively modest reduction in individuals' other saving (their own pension contributions plus non-pension saving) during the same period. Thus, the lion's share of the automatic increase in employer contributions was "passed through" as an increase in total household saving.[8]

Figure 2. Saving Rate Before and After Job Change to Firm with Higher Employer Pension Contribution, Percentage of Salary



Note: Automatic saving consists of employer pension contributions. Other saving consists of individual pension contributions and non-pension saving.
Source: Chetty et al. (2012).

The results are much the same for responses to the government's Mandatory Savings Plan (MSP). This plan, in effect from 1998-2003, required all Danish citizens to contribute 1 percent of earnings to a retirement savings account. Retirement saving increased in those years by about 1 percent of earnings, on average, with little reduction in other types of saving. Saving increased even for individuals who were previously saving more than 1 percent of earnings in voluntary individual pension accounts, a nearly perfect substitute for the MSP.

Under both types of automatic contributions, individual pension contributions and other types of saving for the great majority changed very little. As in the case of tax subsidies, only a small minority – about 15 percent – responded to the increase in automatic pension contributions (either made by their employer or required by the government mandate) by reducing how much they saved on their own.

Active and Passive Savers

Why are automatic contributions so much more effective at raising saving than tax subsidies? The explanation seems to be that most individuals – about 85 percent of the population – are "passive" rather than "active" savers.

Passive savers adjust how much they *spend* in response to changes in disposable income. Money in their pocket gets spent. Money not in their pocket doesn't. Automatic retirement contributions take money out of an individual's pocket. Passive savers respond by reducing how much they spend, not by adjusting how much they save in other accounts to undo the effect of automatic saving.

Active savers, by contrast, make saving and spending decisions based on a life-cycle planning model. They shift assets across savings accounts in response to subsidies or automatic saving, instead of altering their total saving.[9] As a result, active savers tend to thwart the purpose of any type of policy designed to change their saving rate, either subsidies or automatic saving.

Three pieces of evidence support the notion that the distinction between active and passive savers, and the predominance of the latter, is the primary reason why automatic contributions and subsidies have very different effects.

First, the 1999 subsidy reduction had much larger effects on individuals who were starting a new pension that year, compared to those making pension contributions in previous years. These individuals were making active choices and should be more responsive to incentives, consistent with evidence on the importance of inertia in areas of life where individuals are not required to make active choices.[10]

Second, individuals who show themselves to be active savers, by changing pension contributions more frequently in other years, were more responsive to the reduction in the tax subsidy and more likely to offset automatic contributions by changing individual pension contributions.

Third, individuals one could expect to be active savers who plan for retirement and frequently adjust their pension choices – those who have high wealth-to-income ratios, who are older, or who have economics or finance training – were more responsive to price subsidies and more likely to offset automatic contributions.

Conclusion

Retirement saving policies can be distinguished based on whether they change behavior through active or passive choice. Tax subsidies rely on active choice. To be effective, individuals must actively choose to increase how much they save. Automatic saving policies rely on passive acceptance. They are effective unless individuals actively undo an automatic saving increase.

The findings of this study call into question the large tax expenditure currently used to induce individuals to save. The response in terms of increased household saving is quite limited because most individuals are passive savers and the evidence suggests that the small percentage of active savers tend to take advantage of the subsidy without increasing the total amount they save.

Automatic saving, which relies on passive choice, is an attractive alternative. Automatic enrollment or default policies could increase household saving much more, at a much lower cost to the government, because defaults are far more effective at increasing the saving of passive savers.

Endnotes

1 Joint Committee on Taxation (2012).

2 Chetty et al. (2012).

3 See, for example, Engen, Gale and Scholz (1996) and Poterba, Venti and Wise (1996).

4 Madrian and Shea (2001), Thaler and Sunstein (2008).

5 Bernheim (2002).

6 Chetty et al. (2012).

7 Before 1999, contributions to both accounts had been fully tax deductible, with income in the top tax bracket (income above US $38,600 in 1998) taxed at 59 percent and income in the next tax bracket at 45 percent. Starting in 1999, the deduction for capital pension contributions for individuals in the top income tax bracket was reduced from 59 cents to 45 cents per DKr. Other tax treatments remained the same: capital pension payouts are taxed at 40 percent; annuity pension payments are taxed as regular income; capital gains in both are taxed at 15 percent, compared with an average of approximately 29 percent for assets in taxable accounts; withdrawals prior to retirement from either account incur a tax of 60 percent plus administrative fees, making early withdrawals quite rare; and balances in capital pension accounts can be converted to annuity pensions, but the reverse is not allowed.

8 The saving impacts are equally large among individuals who switch employers because of a mass-layoff at their prior employer, confirming that the estimates are not biased by non-random sorting. The changes in saving behavior persist for ten years after the change in employers and result in higher wealth at retirement.

9 This description of the saving behavior of passive and active savers benefits from the description of “spenders” and “savers” in Campbell and Mankiw (1989) and Mankiw (2000).

10 Samuelson and Zeckhauser (1988), Ericson (2012).

References

Bernheim, B. Douglas. 2002. "Taxation and Saving." In *Handbook of Public Economics,* edited by A. J. Auerbach and M. Feldstein. Elsevier: Amsterdam.

Campbell, John Y. and N. Gregory Mankiw. 1989. "Consumption, Income and Interest Rates: Reinterpreting the Time Series Evidence." In *NBER Macroeconomics Annual 1989*, edited by Olivier J. Blanchard and Stanley Fischer. Cambridge, MA: National Bureau of Economic Research.

Chetty, Raj, John N. Friedman, Soren Leth-Petersen, Torben Heien Nielsen, and Tore Olsen. 2012. "Active vs. Passive Decisions and Crowd-Out in Retirement Savings Accounts: Evidence from Denmark." Working Paper 18565. Cambridge, MA: National Bureau of Economic Research.

Engen, Eric M., William G. Gale, and John Karl Scholz. 1996. "The Illusory Effects of Saving Incentives on Saving." *Journal of Economic Perspectives* 10(4): 113-38.

Ericson, Keith M. Marzilli. 2012. "Consumer Inertia and Firm Pricing in the Medicare Part D Prescription Drug Insurance Exchange." Working Paper 18359. Cambridge, MA: National Bureau of Economic Research.

Joint Committee on Taxation. 2012. "Estimates of Federal Tax Expenditures for Fiscal Years 2011-2015." JCS-1-12. Washington, DC.

Madrian, Brigitte C. and Dennis F. Shea. 2001. "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior." *The Quarterly Journal of Economics* 116(4): 1149-1187.

Mankiw, N. Gregory. 2000. "The Savers-Spenders Theory of Fiscal Policy." *American Economic Review* 90(2): 120-125.

Poterba, James M., Steven F. Venti, and David A. Wise. 1996. "How Retirement Saving Programs Increase Saving." *Journal of Economic Perspectives* 10(4): 91-112.

Samuelson, William and Richard Zeckhauser. 1988. "Status Quo Bias in Decision Making." *Journal of Risk and Uncertainty* 1(1): 7-59.

Thaler, Richard H. and Cass R. Sunstein. 2008. *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New Haven: Yale University Press.

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Contact Information

Center for Retirement Research
Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467-3808
Phone: (617) 552-1762
Fax: (617) 552-0191
E-mail: crr@bc.edu
Website: http://crr.bc.edu

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