

Default Longevity Income Annuities

Executive Summary

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Many defined contribution pension plans pay benefits at retirement as a lump sum, thus imposing on retirees the risk of outliving their assets. Nevertheless, the US Treasury has recently sought to encourage employers to protect their retirees from outliving their assets by converting a portion of their plan balances into longevity income annuities (LIA). These are deferred annuities which initiate payouts not later than age 85 and continue for life, and they provide an effective way to hedge systematic (individual) longevity risk for a relatively low price. Our paper builds a life cycle portfolio framework to evaluate the welfare improvements of including LIAs in the menu of plan payout choices, accounting for mortality heterogeneity by education and sex.

In this setting, we show that introducing a longevity income annuity to the plan menu is attractive for most DC plan participants who will optimally commit 8-15% of their plan balances at age 65 to a LIA that starts paying out at age 85. Optimal annuitization boosts welfare by 5-20% of average retirement plan accruals at age 66 (assuming average mortality rates), compared to not having access to the LIA. We also compare the optimal LIA allocation versus two default options that plan sponsors could implement. We conclude that an approach where a fixed fraction over a dollar threshold is invested in LIAs will be preferred by most to the status quo, while enhancing welfare for the majority of workers. These implications also apply to Individual Retirement Accounts.

This report and summary are drawn from our recent paper Horneff/Maurer/Mitchell (2016) "Putting the Pension Back in 401(k) Plans: Optimal versus Default Longevity Annuities." Pension Research Council Working Paper, September. The authors are grateful for research support from the TIAA Institute, as well as funding provided by the German Investment and Asset Management Association (BVI) and the Pension Research Council/Boettner Center at The Wharton School of the University of Pennsylvania. Helpful insights were provided by Mark Iwry. This research is part of the NBER programs on Aging, Public Economics, and Labor Studies, and the Working Group on Household Finance. Opinions and any errors are solely those of the authors and not of the institutions with which the authors are affiliated, or any individual cited. © 2017 Horneff, Maurer, and Mitchell.

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Key findings:

- We evaluate the impact of “putting the pension back” in 401(k) plans via deferred income annuities.
- Our life cycle model helps us measure how much peoples’ wellbeing is enhanced by including these deferred annuities in the retirement plan menu. The model accounts for stochastic capital market returns, labor income streams, and mortality, and we also realistically model taxes, Social Security benefits, and 401(k) rules.
- We show that both women and men benefit in expectation from these products, as do the less-educated and lower-paid subpopulations.
- Plan sponsors wishing to integrate deferred lifetime annuities as defaults in their plans can do so to a meaningful extent, by converting as little as 10% or 15% of retiree plan assets, particularly if the default is implemented for workers having plan assets over a reasonable threshold.

Only about one-fifth of U.S. 401(k) pension plans offer access to lifelong income payments to cover the decumulation or drawdown phase of the lifecycle (Benartzi, Previtero, and Thaler 2011). To address this issue, the U.S. Department of the Treasury recently launched an initiative to provide firms and employers “more options for putting the pension back” into private sector defined contribution plans (Iwry 2014). This was accompanied by an adjustment in the tax rules governing retirement plans that facilitated lifelong payouts—not only in 401(k) plans, but also in Individual Retirement Accounts (IRAs) and 403(b) tax-sheltered annuities for employees of nonprofit employers, by converting retirement assets into *longevity income annuities* (LIAs).¹ These are deferred life annuities that start payouts at an advanced age (e.g., age 85) and continue for life. Such instruments provide a low-cost way to hedge the risk of outliving one’s assets.

In our new paper,² we have devised a realistic life cycle model to quantify the potential impact of this new policy

on a range of worker types. Additionally, we take account of real-world income tax rules, Social Security contribution and benefit rules, and Required Minimum Distribution (RMD) regulations. We first evaluate how much participants will optimally elect to annuitize given the opportunity to do so, when they face income, spending, and capital market shocks, and where they also are subject to uncertainty about their lifespans. Our goal is to assess how much better off workers would be if their options included LIAs in the payout menu, versus without access to them. We then compare this case with what would happen if the plan sponsor were to default a certain percentage of retiree assets into a deferred annuity. Finally, we compare the retiree’s optimal allocation to LIAs versus a default option, taking into account mortality heterogeneity by education and sex.

Deferred annuities

It is quite inexpensive for retirees to protect themselves against running out of money with a deferred annuity. Even in the current low interest rate environment, a deferred single life annuity purchased at age 65 for a male (female) costing \$10,000 generates an annual benefit flow from age 85 onward of \$4,830 (\$3,866) per year for life.³ This results from the investment returns earned over the 20 years prior to the withdrawal start date, plus the accumulated survival credits resulting from premiums paid by those who die earlier than expected being shared with those who survive.

Yet few people have annuitized in practice, which suggests that institutional factors may be discouraging annuitization, especially in 401(k) plans. For instance, until 2014, U.S. tax rules required retirees to withdraw the so-called “Required Minimum Distribution” (RMD) amount each year from their retirement accounts as of age 70.5 onward. The RMD was computed so that the sum of annual payouts was expected to exhaust the retiree’s 401(k) balance by the end of her life (IRS 2012b). If the retiree purchased an annuity with her plan assets, her RMD was still calculated taking into account the value of her annuity. This had the unappealing consequence that a retiree might find herself needing to

1. This was originally suggested by Gale, et al. (2008).

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3. Quotes available August 2016 on <https://www.immediateannuities.com/>

withdraw an amount in excess of her liquid assets (excluding the annuity value) and be forced to pay a 50% excise tax (Iwry 2014).

In 2014, for the first time, the U.S. Treasury permitted the offering of longevity annuities within the more than \$14 trillion U.S. 401(k) and IRA markets. Approved deferred annuities thus had to begin payouts not later than age 85 and cost less than 25% of the retiree's account balance (up to a limit). Under these conditions, the retiree's annuity would no longer be counted in determining her RMD. As a result of the policy change, RMD requirements that had effectively precluded the offering of longevity annuities in the 401(k) and IRA contexts were relaxed.

Deferred longevity income annuities in a life cycle model: Methodology

We first examine the impact of having access to an LIA purchased at age 66 that begins to payout at age 85. To do so, we build a life cycle model incorporating a realistic formulation of U.S. income tax rules, required minimum distribution rules for 401(k)-plans, payroll taxes for Social Security benefits, and rules for claiming retirement benefits. As described in more detail in the paper, consumers are posited to maximize consumption over the life cycle, and their constraints include labor income profiles, taxes, and the opportunity to invest (to a limit) in a 401(k)-type tax-qualified retirement plan. At retirement (set here at age 66), individuals determine how much of their retirement account they wish to convert to a deferred longevity income annuity, as well as how much they will retain in liquid stocks and bonds. We also take into account the Required Minimum Distribution rules relevant to the U.S. 401(k) setting, as well as a realistic formulation of Social Security benefits. In a subsequent section, we provide additional robustness analysis on different preferences and mortality heterogeneity across educational categories.

We use dynamic stochastic programming to solve this optimization problem. For the base case, we have five state variables: wealth, the total value of the individual's fund accounts, payments from the LIA, permanent income, and time. We also compute the individual's consumption and welfare gains under alternative scenarios using our modeling approach. (Interested readers are referred to the paper for additional details).

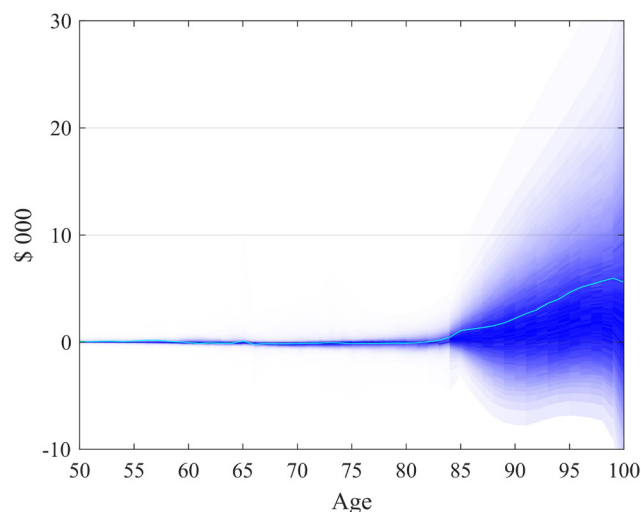
Base case results

When our base case worker lacks access to the LIA, she earns an annual pre-tax income from work, part of which she saves in the tax-qualified 401(k) account. She begins to optimally withdraw from her 401(k) when this is feasible without having to pay the 10%-penalty tax.⁴ After retiring at age 66, she boosts her withdrawals substantially to compensate for the fact that her Social Security income stream is far below her pre-retirement labor income. By contrast, if the same worker had access to a longevity income annuity, she saves somewhat less in the 401(k) plan and uses about 15% of her 401(k) assets to the LIA, at which point no taxes would be payable. She again withdraws gradually from her 401(k) plan, and she exhausts her account by age 85. From that point onward, her LIA pays her an annual amount equal to about 40% of her Social Security benefit, for the rest of her life.

Having the longevity insurance is beneficial, in that, with the LIA, the worker can consume more compared to when she lacks access, particularly after age 85. This is because she is protected against running out of money in old age. Figure 1 displays the difference in consumption between the two cases, with and without access to the LIA. The x-axis represents the individual's age, and the y-axis the consumption difference (in \$000). We depict these in percentiles (99%; 1%) using a fan chart, where differences are measured for each of the 100,000 simulation paths. Darker areas represent higher probability masses, and the solid line represents the expectation. Results show that, prior to age 85, consumption differences are small: the mean is only \$3 at age 50. But by age 85, the retiree with the longevity income annuity is able to consume about \$1,000 more per year on average, and \$6,000 more per year by age 99. There is also heterogeneity in the outcomes, such that at age 25, the average difference is only \$150 for the bottom quarter, while it is \$1,400 for the 75th percentile. At age 99, the difference is \$96 for the 25th percentile, but \$9,680 for the 75th quantile. In other words, the opportunity to purchase a longevity income annuity on average provides individuals with substantially higher consumption levels, particularly at older ages.

4. Before age 59.5, the individual pays 10% penalty for each withdrawal from a 401(k) plan.

Figure 1: Consumption differences over the life cycle with versus without access to the longevity income annuity (LIA)



Note: Distribution (99%; 1%) of consumption differences for 100,000 life-cycles with optimal feedback controls with and without access to longevity income annuities starting benefits at age 85. Darker areas represent higher probability mass. The solid line represents expected consumption differences. For parameter values see Table 1. Source: Authors' calculations.

Sensitivity analysis

Our paper also explores how results might differ for men and women of other educational, and, hence, labor earnings patterns. What we find is that all the sub-groups we examined would, on average, withdraw and consume more from their 401(k) plans post-retirement with LIAs, compared to those lacking access to lifelong benefits. This occurs because people having LIA access use a substantial portion of their retirement assets to purchase longevity annuities that generate a yearly lifelong income.

Since recent studies report widening mortality differentials by education, this could raise questions about whether the least-educated will benefit much from longevity annuities. Our analysis shows that using age/education group mortality tables does not eliminate the demand for LIAs, though it does diminish it. We also examine whether using a unisex instead of a female mortality table to price the LIA changes results, and we conclude that this has little effect on outcomes.

Finally we evaluate how offering a LIA that pays out at age 80 instead of age 85 changes results. When the earlier-

withdrawal LIA payout is permitted, that is, at age 80 instead of age 85, people tend to save less in their 401(k) plans and allocate a bit more to their LIA. In other words, having access to the longevity payout slightly earlier does not alter our conclusions about the appeal of the LIA product.

Welfare analysis

We next compare how much better off people are if they have access to longevity income annuities versus no access. That is, we compare the situation at age 66 for someone who has the opportunity to buy LIAs at age 65 versus someone who does not have this opportunity. Since people are risk averse, it is not surprising that the utility levels of those having access to LIAs at age 66 are generally higher than those without access. We also compute the equivalent increase in the 401(k) wealth needed for those lacking LIAs to be as well off as those with LIAs. The paper reports results for a variety of worker types. The college-educated female with LIA access benefits more than the lesser-educated groups, yet even male high school dropouts with low survival probabilities still benefit a great deal.

What about default longevity annuity solutions? Implications

Finally, we investigate whether a plan sponsor could potentially implement a payout default, wherein a portion of workers' retirement plan assets would be used to automatically purchase a deferred lifetime payout at age 65. In this way, such a default would accomplish the goal of "putting the pension back" into the retirement plan. For instance, an employer could default a fixed fraction—say 10%—of retirees' 401(k) accounts into the LIA when they turned age 65, and overall most retirees would find such a default amount appealing. On the other hand, some very low earners might have so little in their 401(k) accounts that defaulting them into a LIA might not be practical. Accordingly, we also examined results when workers' 401(k) accounts equaled or exceeded some minimum amount, such as \$65,000, in their plans.⁵

We show that the simple default solution based on a 10%-fixed percentage rule is appealing for most workers, though it generates a very small welfare cost for less-educated females with very high mortality. The fixed-percentage rule plus an asset threshold of \$65,000 overcomes this problem, so that, for this group, the welfare gains are again positive. Among other subgroups, introducing an asset threshold produces welfare gains compared to the situation without the asset threshold. In other words, requiring workers to devote a *fixed fraction* of their 401(k) accounts to longevity income annuities starting at age 85, and, additionally, limiting the requirement to savers having at least \$65,000 in their retirement accounts, does not place undue hardships on older men or women across educational groups. Additionally, this approach offers a way for retirees to enhance their lifetime consumption, protect against running out of money in old age, and enjoy greater utility levels than without the LIAs.

This paper shows that longevity income annuities in the 401(k) plan or IRA menu is attractive to most workers. Overall, older individuals would optimally commit 8-15% of their plan balances at age 65 to a LIA which begins payouts at age 85. When participants can select their own optimal annuitization rates, welfare increases by 5-20% of average retirement plan accruals as of age 66 (assuming average mortality rates) compared to not having access to LIAs. If, instead, plan sponsors default participants into deferred annuities using 10% of their retirement age plan assets, this would reduce retiree wellbeing only slightly compared to the optimum. Converting retirement assets into a longevity annuity only for those having over \$65,000 in their retirement accounts eliminates this shortcoming. Accordingly, we conclude that including well-designed LIA defaults in DC plans yields positive consequences for 401(k)-covered workers. Moreover, our findings also apply to Individual Retirement Account payout designs, since the RMD rules for these accounts are nearly the same as those for 401(k) plans.

Financial institutions, insurance companies, and mutual fund companies are increasingly focused on helping Baby Boomers manage their \$18 trillion in assets during retirement. For this reason, our research should interest those seeking to guide this generation as it decides how to manage 401(k) plan assets into retirement. A similar conclusion applies to the management of Individual Retirement Accounts, as these too are subject to the RMD rules and tax considerations described above. Regulators concerned with enhancing retirement security will also find useful the default LIA mechanism described here for helping to protect retirees from running out of money in old age.

5. This appears to be a reasonable threshold in that workers in their 60's with at least five years on the job averaged \$68,800 or more in their 401(k) plans, as of 2014 (Vanderhei et al. 2016). The same source found that workers in their 60s who earned \$40-\$60,000 per year averaged \$96,400 in their 401(k) accounts; those earning \$60-\$80,000 per year averaged \$151,800; and those earning \$80-\$100,000 averaged \$223,640 in these retirement accounts.

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