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Better Financial Security in Retirement? Realizing the Promise of Longevity Annuities*

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Abstract

The shift in the U.S. retirement system away from company pensions and towards individual retirement accounts has placed greater responsibility on workers for ensuring the adequacy of their saving and managing those savings. Absent ready availability of or familiarity with suitable financial instruments, retirees increasingly are self-insuring against a variety of retirement risks, especially the risk of outliving their assets. One alternative to self-insuring against extended longevity is an insurance product known as a “longevity annuity.” The essence of a longevity annuity is a fixed stream of payments that begins with a substantial delay from the time the contract is purchased—a longevity annuity purchased at age 60 or 65, for example, might begin payments at age 75, 80 or 85. The current market for longevity annuities faces many barriers, ranging from consumer decision making that does not account adequately for longevity risk to the fiduciary concerns of employers to incomplete markets for the hedging of risk by insurance companies. In this paper, we highlight how recent trends have precipitated a need for products that offer protection against longevity risk, consider whether longevity annuities can improve retirement security, highlight barriers to more widespread take-up of longevity annuities, and offer a menu of potential reforms to bolster this fledgling market.

I. Introduction

The U.S. private retirement saving system has undergone a major transformation over the past 25 years. The rate of worker participation in defined benefit pension plans is now less than half what it was in 1990 and the share of workers covered solely by a defined contribution plan has doubled over the same period. This shift has given workers more flexibility in how they save for retirement but also greater responsibility for ensuring the adequacy of that saving. In addition, for those at the point of retirement, it has shifted the risks associated with transforming wealth into retirement security from retirement plan sponsors to retirees themselves. Absent ready availability of or familiarity with suitable financial instruments, retirees increasingly are self-insuring against a variety of retirement risks, especially the risk of outliving their assets.

One option for addressing the risk of extended longevity is to purchase an insurance product known as a “longevity annuity.” The essence of a longevity annuity is that it provides a fixed stream of payments that begin with a substantial delay from the time the contract is purchased. A longevity annuity purchased at age 60 or 65, for example, might begin payments at age 75, 80 or 85. While the market for deferred-income annuities (DIAs) has blossomed in recent years, available data suggest that many DIAs are sold to individuals in their 50s and almost all are sold with deferral periods of less than 15 years, with payments scheduled to begin well before late old age. The current market for true longevity annuities remains very thin.

Although sometimes discussed as financial products, longevity annuities more accurately are characterized as insurance products. A 60-year-old male who purchases a longevity annuity with a 20 year deferral period has only about a 50 percent chance of receiving any payment and the premiums of those in the risk pool who die before reaching the age of first payment support the payments to those who live to older ages. This design means that longevity annuities may be better structured to address

longevity risk than other financial products. Indeed, theoretical models show that longevity annuities hold the potential to increase retirees’ welfare by offering protection against longevity risk at a much lower cost than strategies predicated on purchase of immediate annuities or gradual decumulation of retirement assets invested in bonds and equities.

There is a wide gulf, however, between the theoretical benefits offered by longevity annuities and real-world markets. Today’s retirees rarely are offered annuities of any sort, let alone longevity annuities, in their workplace retirement plans, and few Americans choose to purchase annuities either within or outside their employer-sponsored accounts. The barriers to a more robust market for longevity annuities are diverse, ranging from consumer decision making that does not account adequately for longevity risk to the fiduciary concerns of employers to incomplete markets for the hedging of risk by insurance companies.

In this paper, we begin by highlighting how recent trends in the retirement security landscape have precipitated a need among middle- to upper-middle-income Americans for products that offer protection against longevity risk. Next we examine the market for longevity annuities, drawing comparisons to the market for immediate annuities and considering whether expanded use of longevity annuities might be a more appealing route to improved retirement security. The paper then addresses current impediments to the development of a more robust market for longevity annuities and offers a menu of potential reforms to bolster this fledgling market.

II. The Retirement Security Landscape

The leading edge of the Baby Boomers is now well into its 60s. According to the most recent Census Bureau projections for the United States, the share of the population age 65 and older, which had been just 12.4 percent in 2000, is expected to rise to 14.8 percent in 2015 and 20.3 percent in 2030, increasing the size of the

65-and-older population from 35.0 million in 2000 to 47.7 million in 2015 and 72.8 million in 2030 (Hobbs and Stoops 2002; U.S. Census Bureau 2014). These anticipated increases in the number of retirement-age adults in the population raise the stakes on ensuring the financial security of this population.

Once people stop working, their incomes in retirement will derive from multiple sources—in most cases, some combination of Social Security, the private employment-based retirement system, and personal savings. Social Security will continue to be an important source of income for retirees, especially those whose incomes during their working years placed them in the middle to lower part of the distribution of earnings. Whereas in the past it was relatively common for individuals to receive an employer pension in addition to collecting Social Security, the shift from defined benefit to defined contribution retirement plans means that even those with an employment-related retirement plan now typically will bear the burden of allocating the resources in that plan, along with other personal savings, to cover expenses during the remainder of their lifetimes.

As the ongoing shift from defined benefit to defined contribution retirement plans has proceeded, policy makers have sought to ensure that workers are accumulating adequate retirement savings. We briefly describe these efforts and document that there has been significant growth in the balances in workers' retirement savings accounts. Further, we argue that there is reason to expect future retirees to have accumulated greater retirement savings than those who are retiring today. All of this means that the question of how best to decumulate retirement wealth to address the major financial risks that individuals face in retirement is of growing relevance. Understanding how the retirement security landscape has changed—and in particular how changes in this landscape have shaped the trends in worker savings behavior—thus provides an essential backdrop to our discussion of the need for mechanisms that allow retirees to transform their financial assets into retirement security.

The Defined-Contribution Revolution

In the decades following the end of WWII, many workers had access to defined benefit pension plans that were designed to provide a stream of income in retirement based on the individual's earnings and years of service with an employer. Although structuring the private retirement system in this way created risks for workers, who could receive a smaller-than-expected pension or even no pension at all if they lost or left their job prior to the age at which they planned to retire, it benefited those who reached retirement age after an extended period of employment with a defined-benefit employer.

Data on the share of full-time workers in the private sector covered by different types of retirement plans are available from the Bureau of Labor Statistics beginning in 1989-90. As can be seen in Table 1, the share of full-time private-sector workers who have any employment-related retirement plan has held approximately steady at about 60 percent over the past two-and-a-half decades, but there have been major changes in the composition of these plans. The prevalence of defined benefit plans among full-time private-sector workers fell from 42 percent in 1989-90 to 19 percent in 2013. Defined contribution plans, which typically do not offer an annuity option, became more common over the same period. When first introduced, defined contribution plans often were supplementary to an existing defined benefit plan, but this has become less common. The share of full-time private-sector workers with only a defined contribution plan has risen from 20 percent in 1989-90 to 40 percent in 2013. In addition, a growing share of full-time private-sector workers with defined benefit plans are covered by so-called cash balance plans that are structured to provide a defined dollar account value at retirement rather than a defined monthly pension payment. Cash balance plans are required under Internal Revenue Service regulations to offer annuities as the default payout option, but perhaps because of how they are presented to workers, many retirees in these plans choose instead to take a lump sum distribution. Cash balance plans were unusual in 1989-90 but

Table 1. Retirement Plan Participation Rates, Full-Time Private-Sector Workers, Selected Years, 1989-90 to 2013

Year	Total	Defined Benefit			Defined Contribution	Defined Contribution Only
		Total	Cash Balance	Traditional		
1989-90	62	42			40	20
1990-91	60	39			39	21
1991-92	61	39			40	22
1993-94	58	33			40	25
1994-95	60	33			44	27
1995-96	61	32			46	29
1996-97	62	32			47	30
1999	56	25			42	31
2000	55	22			42	33
2003	58	24	5	18	48	34
2005	60	25	6	19	50	35
2006	60	23			51	37
2007	60	23			50	37
2008	60	24			51	36
2009	61	24	6	18	51	37
2010	59	22	7	14	50	37
2011	59	22			50	37
2012	59	20	6	14	51	39
2013	59	19	6	13	51	40

Source: Wiatrowski (2011) and National Compensation Survey data

covered 31 percent of full-time private-sector workers with defined benefit plans in 2013, accounting for 6 percent of all full-time private-sector workers as of that date. By 2013, the share of full-time private-sector workers covered by a traditional defined benefit plan had fallen to just 13 percent.¹

With fewer workers able to count on an employer pension and a correspondingly larger number relying on retirement account wealth and other savings, the low level of assets that many households have accumulated at retirement has been a source of significant angst. Poterba (2014), for example, notes that households aged 65–69 in 2008 had a median of just \$5,000 in retirement savings and \$15,000 in non-retirement savings, respectively, despite the fact that the median household had no

defined-benefit wealth to draw upon.² It is true that a lack of accumulated wealth does not necessarily imply that a household should have saved more. Because Social Security replacement rates for low-wage earners are relatively generous, it may be rational for those with low lifetime wages to save relatively little and plan to rely primarily on Social Security in retirement. Indeed, asking the question of how households should allocate their lifetime income to support consumption over the lifecycle, a number of studies have concluded that most Americans are adequate savers or better.³ Still, the low level of retirement savings accumulated by many households and concern about what this implies for their well-being in retirement have prompted a number of policy responses and proposals.

Measures to Encourage Retirement Savings

Tax exclusions for contributions to employer-sponsored defined contribution retirement accounts have been a long-standing feature of the retirement landscape. With respect to encouraging participation in retirement savings plans, newer research suggests that how employees are presented with the option to contribute is also enormously important. Defaulting employees to some positive percentage contribution, so that those who do not wish to contribute are required to make that decision affirmatively rather than the other way around, has been shown to lead to substantial increases in plan participation (Madrian and Shea 2001; Choi *et al.* 2004). Similarly, adopting a default under which percentage contributions rise over time unless the employee opts out has been shown to be effective in raising contribution rates (Thaler and Benartzi 2004). The Pension Protection Act of 2006 (PPA 06) contained provisions intended to encourage such default features by offering “safe harbors” to employers who adopt them and default their employees into investments meeting certain criteria.

Driven in part by PPA 06 provisions, the share of employer plans with automatic enrollment has grown substantially. Data from the Bureau of Labor Statistics show that by 2013, among full-time private-sector workers covered by savings and thrift plans (the most common type of defined contribution plan, accounting for about three-quarters of defined contribution enrollment), 33 percent were in plans with an automatic enrollment provision. Of these, 44 percent were subject to default provisions under which the share of earnings contributed escalates over time, often referred to as “auto escalation”.⁴

Historically, an important source of leakage from defined contribution account balances has been lump-sum distributions taken when a worker leaves a job. According to a 2006 survey conducted by the Census Bureau, among workers who had received a lump-sum distribution between 1980 and 2006 before reaching age 60, 29.8 percent of those receiving

a distribution of \$20,000 or more (in 2006 dollars) spent some of it and 5.2 percent spent all of it. The share choosing to spend some or all of their distribution was greater for those receiving smaller distributions. Among those receiving balances of less than \$5,000, only 26.1 percent rolled the entire distribution over into a qualified retirement account and 21.0 percent spent the entire distribution (Purcell 2009).

Policies have been put in place to reduce leakage through lump-sum distributions. Tax penalties on retirement plan balances cashed out by anyone below the age of 59 ½ and not transferred to a qualified account were introduced as part of the Tax Reform Act of 1986. In 2001, the Economic Growth and Tax Relief Reconciliation Act (EGTRRA) added a requirement that balances between \$1,000 and \$5,000 not retained in the employer plan be rolled over by the employer into an IRA, with exceptions only for employees who are nearing retirement age or affirmatively opt out; prior to 2001, employers had been permitted to return balances up to \$5,000 to departing employees.

There also have been changes in the tax law designed to make tax-favored retirement savings more readily available to individuals who do not have access to an employer-sponsored 401(k) or similar plan. These changes include relaxed eligibility criteria for deductible IRAs and the creation of Roth IRAs in the late 1990s, as well as the higher IRA contribution limits established as part of EGTRRA in 2001.

Trends in Retirement Savings

Reflecting the growth in the prevalence of defined contribution retirement plans, together with a variety of measures to increase worker participation in these and other retirement savings vehicles, retirement savings account balances have grown substantially over the last two decades. While it is still the case that the bottom 50 percent of households typically have either very small or zero balances, in each of the three age groups shown in the table, real balances in the top half of the distribution are significantly higher than in the past. Much of this growth occurred between the mid-1990s and the

mid-2000s. The impact of the Great Recession can be seen in balance declines at both the median and the 75th percentile between 2007 and 2010. The ratio of balances at the 75th percentile in 2013 to balances at the same percentile in 1989 stands at 3.0 for those age 35-44, 3.0 for those age 45-54 and 4.0 for those age 55-64. Over the same period, balances at the 90th percentile increased by a factor of 2.9 for those age 35-44, 2.6 for those age 45-54 and 3.7 for those age 55-64.

Both because new retirees increasingly will have spent their entire careers under a defined contribution regime and because the effects of efforts already undertaken to raise the level of retirement savings should be more fully realized over time, we anticipate that retirement savings balances will continue to grow. This trend could be amplified by proposed policies aimed at further increasing employee contributions to retirement accounts. Building on the demonstrated effectiveness of automatic enrollment plans, federal and state policymakers are actively exploring ways to expand the retirement saving universe to include those not covered by employer-based plans. Recent Administration and Congressional proposals envision that such workers would be

automatically enrolled in a retirement saving account, potentially bringing an estimated 23 to 43 million additional workers into the retirement saving fold (Harris and Fischer 2012). State legislatures also are looking at how to raise saving among workers who do not have access to an employer-sponsored plan. Under a law passed in 2012, employers in California with five or more employees who do not offer a retirement plan eventually could be required to enroll employees who do not opt out into a publicly operated retirement savings plan. Several additional states have passed legislation calling for study of similar automatic enrollment programs and, in a number of others, bills that would establish saving vehicles for uncovered workers have been introduced (Pension Rights Center undated).

Financial Risks in Retirement

A person who has accumulated a retirement plan balance and now is thinking about how best to use those assets in retirement faces a variety of risks. A partial list of these risks includes the risk of living longer than expected and exhausting his or her assets (longevity risk); the risk of needing long-term care or incurring high out-of-pocket medical costs (health care cost

Table 2. Defined-Contribution Balances Among Households by Age of Head, 2013 dollars

Financial Assets in Defined-Contribution	1989	1992	1995	1998	2001	2004	2007	2010	2013
<i>Ages 35-44</i>									
10th Percentile	0	0	0	0	0	0	0	0	0
25th Percentile	0	0	0	0	0	0	0	0	0
50th Percentile	0	2	1,821	6,003	6,237	2,836	4,491	1,500	3,000
75th Percentile	16,991	14,785	25,803	42,885	52,528	43,159	51,648	36,437	50,500
90th Percentile	63,265	61,107	74,376	128,656	147,080	140,578	157,191	138,677	185,000
<i>Ages 45-54</i>									
10th Percentile	0	0	0	0	0	0	0	0	0
25th Percentile	0	0	0	0	0	0	0	0	0
50th Percentile	1,446	1,169	6,071	6,432	13,788	9,741	22,455	10,824	6,000
75th Percentile	34,343	47,118	53,125	64,328	94,551	92,115	112,279	91,094	103,200
90th Percentile	121,107	157,602	179,109	212,998	284,967	321,850	291,926	314,006	310,000
<i>Ages 55-64</i>									
10th Percentile	0	0	0	0	0	0	0	0	0
25th Percentile	0	0	0	0	0	0	0	0	0
50th Percentile	0	4,874	2,428	9,291	8,141	21,579	21,333	12,860	14,500
75th Percentile	36,151	51,992	51,607	78,623	103,744	155,375	157,191	146,286	143,000
90th Percentile	126,529	151,103	177,592	250,166	387,845	450,096	469,328	475,832	463,000

Source: Authors' calculations using Survey of Consumer Finances data.

Note: Defined-contribution balances include both IRA and employer plan balances.

risk); the risk of low financial returns that reduce the value of the accumulated retirement savings (financial risk); the risk of changes in housing market conditions that reduce the value of the home that a retiree may own (housing market risk); and the risk that higher-than-expected inflation undermines the value of retirement income paid in nominal dollars (inflation risk), among other factors that complicate the process of planning for the retirement years.⁵ While some of these risks are partially mitigated by Social Security and Medicare, which provide benefits that are indexed to inflation and are not subject to fluctuations due to variation in economic conditions, the diversity and magnitude of the risks faced by an individual at retirement are nonetheless substantial.

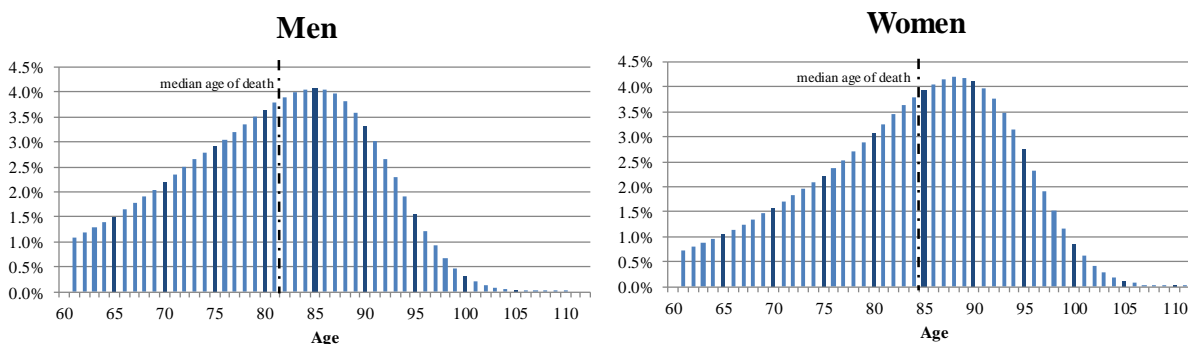
Uncertainty about how long a person will live is perhaps the most daunting of these risks. In 2010, assuming no future mortality improvements, the median 60-year-old man would have been expected to live to age 81 and the median 60-year-old women to live to age 84. As can be seen in Figure 1, however, there is substantial variation around these medians in projected actual age of death. Given the mortality patterns that prevailed in 2010, about 30 percent of men age 60 would have been expected to live to age 86 (an extra five years) and about 10 percent to age 92 (an extra eleven years). Among 60-year-old women, about 30 percent would have been expected to live to age 89 (again, an extra five years) and about 10 percent to age 95 (an extra eleven years).⁶ Individuals with higher earnings have significantly longer life expectancies than those

with lower earnings (Bosworth and Burke 2014).⁷ With continuing improvements in longevity, the actual shares of men and women living to advanced ages are expected to be even larger than implied by these figures.

The fact that there is a significant chance of experiencing a lifespan substantially greater than the median presents a formidable challenge to a retiree seeking to allocate financial assets across his or her retirement years. A spending plan that ensures one's assets will last to the end of a greatly extended lifespan implies significantly lower consumption each year than would be supportable if a person could plan with certainty on needing to cover expenses only through the median remaining lifespan for someone of their age and sex. This implies that many individuals may sacrifice substantial well-being in early old age in order to be more confident of not running out of money in late old age.

Uncertainty about future out-of-pocket health care spending is a similarly critical risk. A particular concern is the small, but growing, risk of especially high health expenditures relative to income. Skinner (2007) estimated that between 1993 and 2004, the share of households aged 75–84 spending more than half their income on health-related costs rose from 2 percent to 6 percent, and projected it would rise to 9 percent by 2019. While the introduction of the Medicare Part D prescription drug benefit in 2006 and subsequent strengthening of prescription drug coverage under the Affordable Care Act may ameliorate these concerns, the risk of very high

Figure 1. Distribution of Projected Age of Death for Men and Women Age 60 as of 2010



Source: Social Security Administration Period Life Tables 2010, authors' calculations.

health care spending remains real.

Macroeconomic factors also create risks that can threaten well-being in retirement. Many of the individuals who had planned to retire in the period immediately following the onset of the Great Recession, for example, found that the value of the assets they had accumulated was substantially smaller at their planned retirement date than they reasonably might have expected. Similarly, a fair number of people experienced a decline in the value of their housing equity—a larger component of wealth than financial wealth for most households (Poterba, Venti, and Wise 2011). Inflation risk is particularly insidious. While financial markets and the housing market may tend to rebound over time, a person who plans for retirement assuming a particular rate of inflation can end up with real resources far below planned levels if inflation turns out to be even modestly higher than anticipated (and real rates of return correspondingly lower).

Managing Retirement Assets for a Risky Future

The ongoing transition from a defined-benefit system to a defined-contribution system certainly offers advantages for workers, most importantly that workers who change jobs do not suffer losses in the value of their pension assets as typically would be the case under a defined benefit plan. It also, however, has transferred considerable risk from plan sponsors to retirement age households. In part, this increase in the risk borne by households reflects the fact that the defined-contribution revolution has not been accompanied by corresponding developments in insurance markets. Many of today's retirees have considerably more liquid wealth than those in previous cohorts, but have limited mechanisms for transforming that wealth into retirement security.

One possible path to greater retirement security would be to use wealth at retirement to purchase a lifetime annuity. Although standard models of the sort first laid out by Yaari (1965) suggest that annuitization should be an attractive option for many retirees, in practice few retirees choose to buy an income annuity. As will be discussed

more fully in the next section of the paper, a great deal of scholarly research has focused on understanding the “annuity puzzle”—the wide disparity between the rate of annuity take-up predicted by simple rational choice models and what is observed in practice. Explanations include adverse selection that causes the price of an annuity to be unattractive to the average individual; the desire to leave a bequest for heirs; the need to maintain liquidity to cover unanticipated health expenses; and behavioral factors related to the way in which annuities are presented to potential purchasers.

The markets for long-term care insurance and reverse mortgages are similarly underdeveloped. Pricing in the market for private long-term care insurance reflects severe adverse selection and private payments under long-term care plans accounted for just 6 percent of the total expenditures for long-term care in 2011 (Congressional Budget Office 2013; Harris, Yin, and Eng 2014). Despite their potential as a vehicle for converting housing wealth into retirement security, reverse mortgages also remain relatively rare. In 2010, of 24 million U.S. home-owning households with a household head aged 62 or over, just 2 to 3 percent had taken out a reverse mortgage (Consumer Financial Protection Bureau 2012).

III. The Market for Longevity Annuities

Longevity annuities—deferred income annuities that begin to pay out at a relatively advanced age—are an intriguing new vehicle for helping retirees deal with some of the most important sources of risk they face in retirement. A conventional annuity provides the purchaser a stream of monthly payments that start immediately. With a longevity annuity, payments do not begin until 10, 15, 20 or even 25 or more years in the future. A longevity annuity is fundamentally an insurance product that offers individuals protection against outliving their assets at a substantially lower cost than a conventional annuity offering the same annual payment. With a deferred annuity established to provide income late in life, people can more

easily allocate their remaining resources over the fixed period of time until the benefits from the deferred annuity begin to be paid out.

Comparing Longevity Annuities and Conventional Annuities

There are several reasons for the lower cost of a longevity annuity compared to a conventional annuity offering the same annual payment amount. First, the deferred start date for the longevity annuity allows the insurance company more years of earnings on the principal supplied by the purchaser. Second, benefits are paid for fewer years. Finally, more of the payments to those who collect them are financed by the contributions of those who do not. Holders of conventional annuities who live to an old age also are subsidized by those who die at younger ages, but the subsidy associated with a longevity annuity is much larger because there are more people who receive no annuity payment or payments only for a few years.⁸ Paying for the benefits received by those who experience long lifespans in part with payments from those who die at a younger age has obvious parallels with how other insurance products are structured; insurance against having one's house burn down, for example, can be purchased relatively cheaply because the cost of rebuilding in the event there is a fire is paid for in large part by the premiums of the many people who have insured their homes but do not suffer a loss.⁹

Table 3 displays the size of the monthly single

life annuity that a male or female currently could purchase at age 60 with an expenditure of \$100,000. As shown in the table, the longer the deferral period, the larger the size of the annual annuity payment this expenditure can buy. For example, for a payment of \$100,000, a 60-year-old male could buy an immediate income annuity paying \$534.50 per month (or \$6,414 per year), but an income annuity that would begin paying at age 80 of \$2,538.70 per month (or \$30,464 per year, more than 4 ½ times the immediate payout amount) or an income annuity that would begin paying at age 85 of \$4,501.86 per month (or \$54,022 per year, nearly 8 ½ times the immediate payout amount).

In the utility framework often favored by economists, longevity annuities are especially valuable because of their ability to ensure that individuals continue to have a reliable source of income even in very old age. Employing a standard inter-temporal utility maximization model, Gong and Webb (2010) show that, under reasonable assumptions about the degree of actuarial unfairness associated with annuity purchases, a typical worker can maximize well-being by using a share of wealth at retirement to buy a longevity annuity rather than by financing consumption in retirement entirely through wealth decumulation or by fully annuitizing their wealth. For many retirees, the lower cost of purchasing a longevity annuity rather than an immediate annuity is likely to be a major attraction, as the lower cost means that the retiree retains a substantial share of retirement assets. For example, as shown in Table 4,

Table 3. Quotes for \$100,000 Non-Qualified Annuity Purchase at Age 60, Selected Deferral Periods, 2014

Deferral period	60 year old male	60 year old female
0	\$534.50	\$510.79
5	\$747.90	\$708.72
10	\$1,052.08	\$988.02
15	\$1,574.75	\$1,469.68
20	\$2,538.70	\$2,318.05
25	\$4,501.86	\$3,933.03

Source: Authors' communication with Hueler Associates.

Note: Reported monthly annuity amounts are for a single life annuity with no inflation adjustment and no return of premium.

Table 4. Insurance Value and Optimal Share of Wealth Devoted to Longevity Annuity Purchase

	Age of commencement	Risk Aversion			
		Low	Medium-low	Medium-high	High
<u>Longevity annuity purchased at age 60</u>					
Insurance value of longevity annuity relative to value for immediate annuity	70	95.4%	95.7%	96.6%	100.0%
	75	88.3%	89.0%	89.8%	92.4%
	80	77.3%	78.6%	79.4%	80.6%
	85	61.9%	64.2%	65.0%	65.2%
	90	43.0%	46.1%	47.3%	47.5%
Proportion of initial wealth spent on ALDA	70	0.522	0.527	0.531	0.538
	75	0.343	0.348	0.351	0.354
	80	0.204	0.207	0.209	0.210
	85	0.103	0.105	0.106	0.107
	90	0.042	0.042	0.043	0.043
<u>Longevity annuity purchased at age 65</u>					
Insurance value of longevity annuity relative to value for immediate annuity	70	98.5%	98.8%	98.5%	98.6%
	75	92.7%	93.3%	94.6%	93.3%
	80	82.0%	82.8%	83.4%	88.3%
	85	66.0%	68.1%	69.6%	69.2%
	90	45.4%	48.5%	49.8%	50.5%
Proportion of initial wealth spent on ALDA	70	0.703	0.707	0.709	0.711
	75	0.459	0.465	0.468	0.468
	80	0.270	0.273	0.276	0.280
	85	0.135	0.137	0.138	0.138
	90	0.053	0.054	0.054	0.054

Source: Gong and Webb (2010).

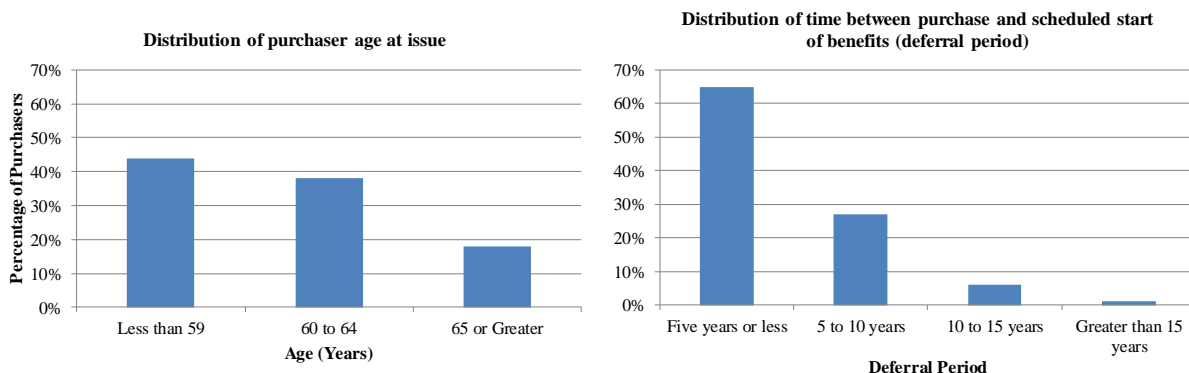
Note: ALDA is Advanced Life Deferred Annuity. The figures reported assume a real interest rate of 2.35 percent that is equal to the rate of time preference and a moderate degree of complementarity in household consumption. Estimates refer to purchases of actuarially fair inflation-adjusted annuities at age 60 (65) by married members of the 1947 (1942) birth cohort with a spouse of the same age and a 2/3 survivor benefit.

assuming for the sake of illustration products that are actuarially fair and written in real terms, Gong and Webb (2010) find that a 60-year-old retiree with medium-low risk aversion who seeks to receive benefits beginning at age 70 optimally would devote just 52.7 percent of their assets to purchase of a longevity annuity, but would receive more than 95 percent of the insurance value of the immediate annuity that could be purchased using all available assets; if that same retiree were to decide not to begin to receive benefits until age 80 (85), they optimally would devote just 20.7 (10.5) percent of their assets to purchase of a longevity annuity, but still would receive 78.6 (64.2) percent of the insurance value of an immediate

annuity. The conclusion that purchasers of a longevity annuity can obtain a large share of the insurance value of full annuitization at a fraction of the cost is robust to alternative assumptions about the money's worth of the products that are offered.

The results reported by Gong and Webb (2010) assume that retirees are purchasing inflation-indexed annuities and thus sidestep the issue of inflation risk. While we are not aware of any currently offered longevity annuity product that includes an inflation protection option, this feature certainly could be added, as has been done for some products in the immediate annuity market.

Figure 2. Characteristics of Deferred Annuities Purchased from One Major Provider, July 2012 to August 2014



Source: Authors' communication with Fidelity Investments.

Indexing longevity annuity benefits to inflation would help protect retirees against inflation risk, but also would raise the cost of the product. Given that retirees are protected against inflation explicitly through indexed Social Security benefits and implicitly through Medicare benefits, it is an open question whether additional inflation protection is worth the higher price of a longevity annuity contract that includes it.

Market for Longevity Annuities Still Small

Despite the potential value of longevity annuities as one piece of many retirees' portfolios, the market for such products to date has been quite small. The growing interest in the broader category of deferred annuities—income annuities with a delay between purchase and the beginning of payments—suggests this could change. From very low levels as recently as 2011, sales of deferred income annuities reached \$1 billion in 2012 and more than \$2 billion in 2013 (LIMRA 2013). While annuity sales remain dominated by variable annuities that function more as investment vehicles than as lifetime income products, deferred income annuity sales are a growing share of fixed income annuity sales. This increase was described by a recent *New York Times* article, which stated that “many investors have become enamored lately with versions called deferred-income annuities, which seem to ease the concerns about cost and interest rates” (Hawthorne 2013)

On closer examination, however, this growth may not be quite what it appears.

Characteristics of the sales of deferred annuities shared with us by one significant player in the market are displayed in Figure 2. A large share of those purchasing deferred annuities from this provider were relatively young—44 percent were age 59 or younger. More important, approximately two-thirds of the annuities sold had deferral periods of five years or less, with only one percent having deferral periods in excess of 15 years. The young purchasing age, coupled with the short deferral period, suggests that few annuitants are using deferred-income annuities to protect against longevity risk. This leads us to the question of why the market for longevity annuities is not larger and what the impediments to its growth might be.

How Well Do Retirees Understand Longevity Risk?

An important barrier to the demand for longevity annuities—and indeed, the market for annuities more generally—may be simply that individuals do not fully understand the longevity risk they face. Using the data from the Health and Retirement Study (HRS), it is possible to track individuals who were first interviewed in 1992 to determine how predictions of own mortality compared to actual outcomes for the same group of people. The HRS cohort included people aged 51–61 at the time of the first interviews in 1992. Each of the individuals interviewed in the first wave of the HRS was asked to state the probability that they would survive to age 75, with permitted responses ranging from zero percent to 100 percent in 10-percentage-point increments. The older members of this cohort—those born in 1931 through 1934—had been followed for long

by 2010 to determine whether they in fact survived to age 75. The actual shares of people in these birth years reporting each subjective expectation of living to age 75 who actually did live to age 75 are tabulated in Table 5. The distribution of subjective expectations is rather lumpy, with a large share of people reporting round-number probabilities of 50 percent or 100 percent. Still, as has been noted by others (see, for example, Hurd and McGarry 2002; Smith, Taylor, and Sloan 2001; and Elder 2013), subjective expectations appear to be related to actual longevity. On the other hand, at all levels of subjective expectation up to an 80 percent chance of surviving to age 75, actual survival rates exceed the anticipated probability of survival, sometimes by a wide margin. At the extreme, roughly half of those who predicted that they had no chance of living to 75 actually did. Even among the groups who thought they had a 40 percent or 50 percent chance of living to age 75, the share actually surviving to that age was considerably larger (69 percent and 75 percent, respectively). For longevity annuities, as with all insurance markets, under-predicting risk may lead to diminished demand.¹⁰

Consumer Decision-Making and the Annuity Puzzle

The lack of demand for longevity annuities can be related to the more general puzzle about why more people do not annuitize at least a portion of their wealth at retirement. There is an extensive literature on this broader question. Dushi and Webb (2004) suggest that many households may choose not to buy annuities because they already have a significant amount of their wealth annuitized in Social Security or employer provided pensions. Mitchell, Poterba, Warshawsky and Brown (1999) cite adverse selection as a possible barrier, calculating that, for the average 65 year old, the expected present discounted value of payouts for annuities offered in 1995 was just 80 to 85 cents on the dollar. The desire to leave a bequest also could play a role in deciding whether to annuitize. Lockwood (2012) shows that retirees who attach even a modest value to leaving a bequest might chose to purchase an actuarially fair annuity, but not to purchase the actuarially unfair annuities actually available in the market.

Table 5. Weighted Tabulation of Actual Survival to Age 75 by Response to Question About Subjective Mortality Expectation Asked in 1992 of Persons Aged 58-61 Years

Subjective Probability of Living to Age 75	Actual Probability of Living to Age 75	Unweighted Sample Size
0	49.2	218
10	59.9	65
20	64.6	107
30	71.2	130
40	68.9	110
50	75.1	702
60	78.4	168
70	80.9	284
80	80.1	434
90	82.5	222
100	78.2	664

Source: Authors' calculations using Health and Retirement Study data.

The intuition for this finding is that the insurance value of an actuarially unfair annuity may not be sufficient to outweigh the value of the potential bequest the same funds could provide. As discussed by Ameriks *et al.* (2011), Turra and Mitchell (2008), and Sinclair and Smetters (2004), households' desire for greater liquidity in the face of uncertain health expenditures also could help to explain low rates of annuitization.

More recently, scholars have turned to ideas from behavioral economics to help with solving the annuity puzzle. For example, as discussed by Brown (2009), potential annuity purchasers may view annuities as a gamble that depends on whether or not they will live long enough to make the annuity worthwhile and view them as unattractive for that reason. Similarly, households' fear that they may come to regret making such a large financial commitment could contribute to low demand for annuities. Benartzi, Previtro, and Thaler (2011) also suggest that people's tendency to choose whatever default option they are offered could explain the lack of demand for annuities. According to the most recent data from the Bureau of Labor Statistics, in 2012 only about 17 percent of private-sector workers in savings and thrift plans (the most common type of defined contribution plan) even had an annuity option; this is actually a decline from 2000, when about 32 percent of those covered by savings and thrift plans (and 33 percent of those with any defined contribution plan) had an annuity option. Moreover, so far as we are aware, *no* U.S. employer currently offers a longevity annuity option as part of their defined contribution retirement plan.¹¹ This implies that none (or virtually none) of the \$5.9 trillion accumulated in employer-sponsored defined-contribution accounts as of the end of 2013 (Investment Company Institute 2014) currently can be used directly to purchase a longevity annuity. We will return shortly to the reasons why so few employers offer annuities—and especially why they do not offer longevity annuities—as an option in their retirement plans, but the consequence is that most retirees who would like to annuitize the balances in their employer plans must actively search for a suitable product outside of the plan in the private marketplace.

Beyond the lack of ready access to annuities as the default option or even an available option within most employer plans, Brown *et al.* (2008) argue that the framing of annuities as investments may be an important factor in their low popularity. They show that presenting annuities in a consumption frame (i.e., as a product that will yield \$X per month in income) results in significantly higher take up than presenting annuities in an investment frame (i.e., as an investment that will yield a return of \$X dollars per month).¹²

Consumers who rely on advice from financial counselors may be especially unlikely to purchase such products. One recent study found that financial advisers systematically deviate from optimal portfolio theory by reinforcing client biases, namely by chasing fund returns and overinvesting in own-company stock, and overwhelmingly recommend actively managed funds over index funds (Mullainathan, Noeth and Schoar 2012). Another study found that clients of fund managers with opaque compensation (for example, commission bundling, where costs are blended with broker fees and not explicitly shown as an expense) experience lower net returns than clients of fund managers with transparent costs (for example, expensed costs) (Edelen, Evans and Kadlec 2012). With respect to longevity annuities, the concern is that advisors who are compensated as an annual percentage of managed wealth will be reluctant to recommend the purchase of lifetime income products that diminish the base on which their compensation is determined.

It is worth adding that, until very recently, even individuals who wished to buy a longevity annuity would have faced regulatory barriers to doing so with the balances in their 401(k), IRA and other retirement accounts. Specifically, distributions from such accounts were subject to minimum distribution requirements beginning at age 70 ½ that posed a potential problem for longevity annuities designed not to begin to pay out until an older age. Treasury regulations released in July 2014 implement a partial exemption from the usual rules regarding minimum plan distributions for purchasers of longevity annuities. These regulations exempt

the lesser of \$125,000 (indexed to inflation) or 25 percent of an account balance from the minimum distribution rules if the distribution is used to purchase a longevity annuity. The new Treasury regulations may have two beneficial effects—they can be expected not only to increase demand for longevity annuities but also to permit annuity purchasers to elect a longer deferral period.

While the new Treasury regulations have removed an important barrier to their purchase, longevity annuities remain a product that relatively few consumers know about. There is some evidence that informing individuals about the longevity annuity option may lead more of them to consider making a purchase. One recent study found that, among a group subject to a lump-sum distribution in an experimental setting, 60 percent elected to use part of their lump sum to purchase a longevity annuity when presented with the option to do so (Gazzale, Mackenzie and Walker 2012).¹³

Concern about the long-run viability of life insurance companies is another factor that often is cited as an impediment to demand for a product whose benefits are not realized for many years. Especially in the wake of the financial crisis, consumers may be influenced by fear that an insurance company will fail to fulfill its obligations to purchasers of annuities contracts. Even though insurance companies, apart from AIG, were largely unaffected by the crisis and, due to higher capital reserve requirements, are better insulated from financial shocks today than in the past, the aftermath of the Great Recession has left many American consumers skeptical of large financial institutions. One post-recession survey found that 73 percent of workers and 56 percent of retirees cited concerns over financial stability of insurance companies as a reason to avoid annuities (Figueiredo and Mackenzie 2012).¹⁴

Related to concerns about the ability of insurance companies to meet their commitments, state laws that prevent life insurance companies from using the existence of state guaranty funds in marketing their products also may be a factor in consumer perceptions of the riskiness of purchasing an

annuity and especially a longevity annuity. Each state has a guaranty association whose members are the insurance companies operating in the state. The members agree that, if an insurer operating in the state should fail, each of the other members will contribute funds up to a defined ceiling to pay covered benefits to customers in that state. The guaranty covers promised benefits up to a threshold amount per policy, for annuities most commonly \$250,000 (National Organization of Life and Health Insurance Guaranty Associations 2014). For the life and health guaranty systems combined, claims against the guaranty associations totaled only about \$5.3 billion from 1988 through 2009, relative to a current assessment capacity of more than \$10.0 billion per year (National Organization of Life and Health Insurance Guaranty Associations 2011). Under the laws of 48 states and the District of Columbia, however, insurers are prohibited from advertising the guaranty fund in marketing their products (the two states that do not have a no-advertising rule are Alabama and Michigan). While there is an obvious rationale for such a rule—namely, concern that being able to reference the guaranty fund could undermine companies' incentive to ensure their own financial soundness—consumers who are not aware of the existence of the guaranty fund may believe the purchase of a longevity annuity to be riskier than is in fact the case.

It is worth noting that consumer fears about life insurer insolvency are not well-supported by historical experience. Since the introduction of regulatory reforms following some highly publicized insolvencies in the early 1990s, most notably the failure of Executive Life, the industry has experienced few disruptions. Life insurance companies performed well relative to other financial companies during the financial crisis, with just eight small companies—possessing total liabilities to policyholders well under \$1 billion—entering into liquidation from January 2008 through November 2011 (National Organization of Life and Health Insurance Guaranty Associations 2011; see also Government Accountability Office 2013). Further, at the point when companies are liquidated, they typically still have assets sufficient to cover the majority of the payments

due to their policyholders. State guaranty funds have covered much of the rest. On average over the period from 1991 through 2009—a period that includes years in the early 1990s when regulations were weaker and the number of insurance company failures correspondingly somewhat higher—holders of annuity policies written by companies that failed received more than 94 percent on the value of their claims, including claims from policyholders who held high-value policies not fully covered by the guaranty (National Organization of Life and Health Insurance Guaranty Associations 2011).

Employer Concerns about Fiduciary Responsibility

The reasons why employers do not offer annuities in their defined contribution accounts are diverse and difficult to quantify, but an important factor appears to be concern about the fiduciary responsibility associated with offering financial products purchased from life insurance companies. Regulations concerning employers' responsibilities in this regard arose in the aftermath of the failure of Executive Life, when defined benefit plans that had purchased annuity contracts with the failed company were put at risk. In response, policymakers put in place strict fiduciary standards designed to protect the benefits promised to participants in defined benefit plans. Although aimed at employers offering defined benefit plans, these regulations also applied to defined contribution plan sponsors seeking to offer annuities (Perun 2004). In 2007, at the direction of the Pension Protection Act of 2006, the Department of Labor (DOL) clarified that the portion of these fiduciary standards directing the selection of the "safest available annuity" were in fact aimed at defined benefit plans and not at defined contribution plans, but the core of the new rules remained intact.

In 2008, the DOL sought to clarify for employers offering annuities under a defined contribution plan exactly what steps must be taken when selecting an annuity provider to satisfy their responsibilities as fiduciaries. The current regulations, in the form of a DOL safe harbor, protect employers from charges that they violated their fiduciary responsibility if they take

each of a series of five analytical steps. We would argue, however, that the "safe harbor" requires employers to make decisions and assessments that are beyond their reasonable capacity. For example, to qualify for safe harbor protection, employers must conclude "at the time of selection that the annuity provider is financially able to make all future payments under the annuity contract" and thereafter continually ensure that the company meets this standard. It is widely believed that the analytical burden associated with making this determination, together with the threat of legal action in the event a selected carrier later fails to make promised payments, deters many employers from offering an annuity option.

Insurance Company Concerns about Mortality Risk

Finally, a concern for insurers who are contemplating entrance to this market is uncertainty about mortality rates twenty or more years in the future. A company that guesses wrong and finds that people are living longer than it had expected could face a significant unplanned liability. As an extreme example, Friedberg and Webb (2007) estimate that a medical breakthrough that eradicated cancer, circulatory disease, and diabetes would increase the present value of payments on joint life and survivor annuities by roughly half. Even under less drastic scenarios, life insurers face a host of potential shocks to life expectancy that could erode or eliminate their profit margin. Absent suitable reinsurance mechanisms, life insurers have limited ability to hedge against aggregate mortality risk.

IV. Removing the Obstacles to a Robust Market for Longevity Annuities

As just described, there are several barriers to the development of a robust market for longevity annuities that affect all of the parties to this potential market—consumers, employers and insurance companies. At present, only a handful of companies offer a longevity annuity

product and the relative lack of competition likely means that the products currently on offer carry a higher price tag than would be expected in a more robust market. From a policy perspective, the natural next question is whether steps could be taken to remove or lower the barriers to the development of the market we have described, helping to make the purchase of a longevity annuity a more attractive and readily available option for retirees who could benefit from that choice.

Addressing Obstacles to Consumer Participation

While we have been able to locate no quantitative evidence on the factors behind weak consumer demand for longevity annuities, plausible explanations include incomplete understanding of longevity risk, lack of awareness that such products exist, and the framing of longevity annuities as financial products rather than as insurance. Lack of confidence in the insurance companies that offer these products is another potentially important factor.

If nothing else, these factors suggest a role for public policy to help bridge the information gap and better inform consumers about the potential benefits of longevity annuities as part of a more comprehensive financial plan. One constructive step could be a set of government guidelines aimed at helping older Americans make sound financial decisions. This could be accomplished by the issuance of a financial security graphic, similar to the MyPlate graphic for nutrition (formerly the food pyramid). This new graphic would aim to serve as a guide to financial decision-making and a portal to additional information from public sources (Gale and Harris 2013).

No financial product is for everyone, but an effective graphic could point individuals towards potentially useful financial and insurance products, including longevity annuities as well as reverse mortgages, supplemental health insurance, and long-term care insurance. The graphic also could provide information on the population for whom each product might be best suited and, importantly, could direct consumers

to additional information about each of the products as appropriate.

In the interest of credibility, the graphic should be created and disseminated by a reputable, unbiased government agency with notable expertise in financial matters. One candidate for this task would be the Office for Older Americans within the recently created Consumer Financial Protection Bureau, an agency charged with overseeing consumer financial markets and facilitating Americans' participation in those markets. Another candidate would be the Social Security Administration (SSA). SSA routinely mails Social Security statements to covered workers age 25 and older. The current policy is to send statements each year to covered workers turning 25, 30, 35, 40, 45, 50 or 55 or age 60 plus who have not begun receiving benefits or established a MySocialSecurity online account. These statements provide a natural platform for disseminating information about retirement security more generally.

A related strategy would be to find a way to certify financial products—including longevity annuities—that meet established standards for reliability, cost, and quality. While there are some obvious issues around determining who would do this and what procedures they would follow, product certification would have the great benefit of simplifying consumers' efforts to evaluate the quality of financial products they are considering for purchase. For example, longevity annuities could be certified based on the financial stability of the issuing institution and expected benefits to purchasers relative to the premiums. Moreover, consumers aiming to achieve the recommendations offered by the financial graphic could look to certification as a straightforward guide for purchasing those products deemed to be in compliance. Going further, the federal government could strengthen the power of certification by extending preferential tax treatment only to those products that meet certification guidelines (Hackethal and Inderst 2013).

Revisiting state-level restrictions on what insurance companies are permitted to say in their advertising to prospective customers about the coverage provided by state guaranty

associations also could be helpful. Consumer fears about life insurance insolvencies in the wake of the financial crisis are not justified by actual experience. In fact, due in part to the actions of state and federal regulators, life insurance companies generally weathered the financial crisis without substantial disruption (Government Accountability Office 2013). The disconnect between consumer perception and observed experience could be partially reversed by allowing insurance companies to advertise state guaranty association coverage of their products under suitable guidelines. For example, state-level regulations could be amended to allow insurance companies to cite the guaranty association coverage in their marketing materials so long as the limitations of that coverage also are described.

An additional step that could help to jump-start the market for longevity annuities would be to offer them within the federal Thrift Savings Plan (TSP). TSP is an enormous defined contribution plan for federal workers that, as of 2012, covered 4.6 million participants and contained over \$300 billion in assets spread across five major investment funds. Current TSP participants can take their distributions as a lump-sum, as an immediate annuity (provided by Metlife), as periodic withdrawals from the account, or as a combination lump-sum payment and annuity or gradual withdrawal (Isaacs 2013). To encourage take-up of longevity annuities, TSP participants could be offered a longevity annuity as a distribution option, either alone or combined with a lump-sum distribution and/or periodic withdrawals. As with the immediate annuity option, the longevity annuity would be provided by a private insurance company.

Private 401(k) plans also could encourage take-up of longevity annuities by directing workers into default investments that include a longevity annuity component. Plan sponsors' ability to default workers into annuities, including longevity annuities, was substantially aided by recent Treasury and IRS guidance explicitly authorizing annuities as a qualified default investment alternative. Following this guidance, employers now are permitted to offer life-cycle funds that include a longevity annuity component or provide workers default

investment options that gradually purchase longevity annuities on behalf of the worker (Gale *et al.* 2008)

Addressing Obstacles to Employer Participation

Employer concern over fiduciary responsibility is seen by many annuities industry players as a major impediment to the inclusion of annuities generally and longevity annuities specifically as an option in employer-sponsored defined contribution retirement plans (U.S. Department of Labor 2012). The Department of Labor attempted to address this concern in 2008 when, at the directive of the Pension Protection Act of 2006, it issued an interpretative bulletin establishing a five-prong safe harbor for employers. While the new safe-harbor guidelines improved clarity for employers, ambiguities remained. In particular, plan sponsors still were charged with evaluating the long-term health of the company providing annuities offered through the plan. This prong of the safe harbor test has been identified by the American Council of Life Insurers (ACLI), among others, as its central problematic aspect.

Ultimately, it seems unreasonable to ask plan sponsors, especially small employers, to independently verify the financial soundness of a life insurance company. Clearly, the role of fiduciary is important and worth safeguarding, but a safe harbor that effectively prevents most retirement plan participants from having an annuity option goes too far. One sensible option would be to revise the problematic prong of the DOL safe harbor by offering a more transparent, easily verifiable test.

The ACLI has advanced a policy proposal that would retain the spirit of the DOL safe harbor while easing the fiduciary burden on plan sponsors. The essence of the ACLI proposal is to allow employers to rely on the evaluations of state regulators in determining whether an insurance company is financially secure. The key proposed requirement is that the company be licensed to offer guaranteed income products in at least 26 states. The insurer also would be required to provide written representation that it has a clean certificate of authority from the insurance commissioner in its home state; that it

has filed appropriate audited financial statements in its home state; that it maintains legally required reserves; and that it is not operating under an order of supervision, rehabilitation or liquidation. Further, the insurer would be required to undergo a financial examination in its home state at least once every five years (Barry 2013). This proposal appears to have little downside risk. Critics of state regulatory agencies might argue that the regulatory scheme is imperfect and in some cases may fail to adequately assess the riskiness of insurance companies. While there are limitations to any regulatory scheme, state insurance commissioners—with substantial expertise in this area—are surely far better prepared than individual plan sponsors to assess these risks.

If the specific criteria proposed by the ACLI for employers to use in determining whether an insurance company has adequate financial capability is not appealing, there are other options. One might be to use a company's attainment of a specified threshold on the Insurance Financial Strength Rating employed by ratings agencies. This rating, which is based in part on assessments of risk-based capital, is uniquely designed to measure the ability of insurance companies to meet their financial obligations.

Addressing Obstacles to Insurance Company Participation

The risk that life expectancies will rise, so that annuity purchasers live longer than expected, is one of the largest risks faced by an insurance company that offers a longevity annuity product. While other types of risk typically can be mitigated through various hedging strategies—for example, inflation risk can be hedged through purchase of inflation-indexed government securities—there exists no practical mechanism for hedging effectively against aggregate mortality risk. Given the widespread aggregate mortality risk faced by a variety of institutions, including every firm with defined-benefit liabilities and every life insurer offering annuities, the absence of any way to hedge against the aggregate mortality risk associated with these products is glaring.

It might seem that life insurers could effectively hedge against aggregate mortality risk by issuing offsetting annuity and life insurance contracts. Such a strategy is not particularly effective, however, because gains in aggregate mortality are likely to be realized mainly by those at the oldest ages, while life insurance risk is spread throughout the adult age distribution (Blake and Burrows 2001). Other options, such as spreading risk across countries or generations, can partially mitigate the mortality risk that insurance companies face, but no private strategy can entirely address it (Brown and Orszag 2006). Public-sector entities are in a unique position to provide hedges against aggregate mortality risk.

One option would be for the U.S. Treasury to issue bonds indexed to aggregate mortality trends. As with inflation-indexed bonds, access to such bonds for hedging purposes would allow insurers to focus on pooling idiosyncratic risk, rather than taking on risk related to macroeconomic and demographic trends. The basic premise of this bond would be that the coupon payment would be tied to aggregate mortality trends for a specific group of individuals, such as individuals of a particular age or cohort. Insurers then could purchase these bonds in conjunction with their age-based liabilities. If lower aggregate mortality for the group (i.e., an increase in life span) were realized, the coupon payments from the longevity bond would rise to offset the higher payments due to annuitants in the group. This additional hedging option could lower the price of annuities, although the magnitude of any price effect is subject to debate. In effect, a mortality-indexed bond would transfer risk from life insurance companies onto the future taxpayers who would be liable for the payments on the bonds.

A complementary reform would be for a government agency to produce an official mortality index on which private-sector longevity bonds could be based. For example, an agency such as the Social Security Administration could calculate and publish longevity indices for given age groups. Antolin and Blommestein (2007) suggest that the indices capture, for a series of cohorts, the probability that life expectancy will

deviate from official forecasts by one year. Such indices could be a useful tool in pricing and benchmarking longevity bonds, whether or not those bonds were issued by a public-sector entity.

V. Conclusion

As employers have replaced defined benefit pensions with account-based plans, defined-contribution wealth has soared into the trillions of dollars. This build-up in liquid retirement wealth, however, has not been accompanied by development of the capacity and access to appropriate financial tools that would best enable American households to use those assets to achieve their desired degree of retirement security. In this paper, we have explored the economic potential of longevity annuities to play a useful role in a retirement landscape increasingly dominated by defined contribution accounts.

There are good reasons why consumers do not fully annuitize their assets at retirement. Longevity annuities can mitigate many of the barriers that have been identified to annuitization more generally while offering much of the advantage of a conventional annuity product. First, in contrast to purchase of a conventional annuity, partial annuitization in the form of a relatively low-cost longevity annuity allows retirees who have a bequest motive or who seek to self-insure against negative financial shocks—especially out-of-pocket health spending and long-term care costs—to retain substantial liquidity. Second, again reflecting their lower cost, longevity annuities can more easily be recast as insurance against the risk of outliving one's assets than can conventional annuities. Lastly, insofar as it is more difficult for people to predict events far in the future, the substantial lag between contract purchase and benefit receipt could mean that there would be less adverse selection for longevity annuities than for conventional annuities. If so, this could lead to a lower load for longevity annuity products. Despite their conceptual appeal, however, a robust market for longevity annuities has yet to develop.

Some have argued that longevity annuities hold little potential for improving the retirement security landscape. Critiques of longevity annuities have included the lack of popularity for these products among consumers to date, assertions that longevity annuities are more subject to adverse selection than immediate annuities (Warshawsky 2014), and the alleged inferiority of longevity annuities for achieving retirement security in comparison with other financial products (Blanchett 2014). In the financial press, one common concern associated with longevity annuities is that the premium is “wasted” if the annuitant dies before the onset of benefits; another related claim is that many retirees would be better-off investing in equities than purchasing a longevity annuity contract.

We find these critiques largely unpersuasive. The observed lack of popularity for longevity annuities surely is due, in substantial part, to their near-complete absence from employer-sponsored accounts—a circumstance that has been driven at least in part by regulatory barriers. Moreover, the recent spike in the popularity of deferred annuities as a product class is cause for optimism about the prospects for the longevity annuity market, even if the products sold in today's market typically have more limited deferral periods. We have seen little empirical support for the claim that longevity annuities are more susceptible to adverse selection concerns—indeed, intuition suggests the opposite may be true—and document in this paper the frequent disconnect between expected and realized mortality. On the issue of retirement security, several studies have shown that longevity annuities either can markedly improve well-being in retirement or have the promise to do so if the market becomes slightly more competitive (Blanchett 2014, Gong and Webb 2010). Lastly, we note that financial sector criticism of longevity annuity premiums being “wasted” reflects an improper framing of longevity annuities as a financial product rather than an insurance product.

In sum, there is good reason to think that longevity annuities can significantly increase

expected lifetime well-being for middle- and upper-income retirees who have substantial financial assets at the time of retirement. As we have discussed, policy reforms aimed at consumers, employers and insurers could provide better support for this nascent market. In

particular, the combination of improved consumer awareness, reduced barriers to employer-based accounts, and better risk management strategies for insurers could go a long way toward turning longevity annuities into a mainstream product for retirees.

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¹ Bureau of Labor Statistics data on plan participation for all workers are available only beginning in 1999; since few part-time workers are covered by employer-sponsored retirement plans, overall participation rates are lower than the rates for full-time workers, but the general trend is similar. A small share of workers participate in defined benefit plans that are non-traditional but not cash balance plans.

² Note that the values cited reflect the distributions for each category, not the values for the median household based on total wealth.

³ Scholz, Seshadri and Khitatrakun (2006) concluded that in 1992, 84.4 percent of households in the Health and Retirement Study (HRS) in 1992 had accumulated at least the optimal amount of savings given their lifetime circumstances and that, among those the authors viewed as having saved too little, the mean saving deficit was just \$5,260. Hurd and Rohwedder (2008) reached a similar conclusion, finding that 83.1 percent of married individuals and 64.2 percent of single individuals in a sample drawn from the HRS had at least a 95 percent chance of dying with positive wealth if they began retirement with their current consumption levels and the followed a consumption profile similar to that of current retirees..

⁴ The corresponding percentages for all workers with a savings and thrift plan are very similar.

⁵ This list of risks is by no means exhaustive. Additional risks include household-level risks such as the disability or death of a spouse or the loss of a spouse's job and the risk that tax rates in retirement will be higher than expected, reducing the after-tax value of retirement income.

⁶ The life expectancy figures cited are derived from the Social Security Administration's 2010 period life tables. Median life expectancies based on the 1950 cohort life table, which allow for continuing mortality declines, are about a year longer than those based on the 2010 period life table, as are the anticipated lifespans for the longest-lived 30 percent and longest-lived 10 percent of the 1950 cohort.

⁷ Bosworth and Burke (2014) also document that income-related differentials in life expectancy are increasing. Between the 1920 and 1940 birth cohorts, life expectancy at age 55 increased by six years for men in the top income decile but just two years for men in the bottom income decile. For women, the top income decile saw an increase of two to three years, while the bottom decile saw declining life expectancy.

⁸ The intuition behind this statement can be illustrated with a simple hypothetical. Imagine a world in which half of retirees live for one period and half for two periods. Consider two scenarios, one in which all retirees purchase a conventional annuity and another in which all purchase a longevity annuity. In either case, longer-lived retirees will account for half of the premium payments, but ignoring issues related to the timing of benefit receipt, they will receive 2/3 of the payout from the conventional annuity versus 100 percent of the payout from a longevity annuity. This implies a markedly larger subsidy for the benefits paid to the longer-lived individuals in the longevity annuity case.

⁹ One factor that may lead longevity annuities to be perceived somewhat differently than other types of insurance is that insurance payouts generally are received by people who experience a bad outcome (a house fire), whereas longevity annuities payments are received by people who experience a good outcome (living a long time). The basic principle, however, is the same, insofar as the policy provides compensation in the state of the world in which it is required.

¹⁰ Elder (2013), in an analysis of subjective expectations and actual survival to specified target ages in data from the original HRS cohort and the older Asset and Health Dynamics among the Oldest Old (AHEAD) cohort, finds that individuals age 60 to 65 tend to understate the probability of surviving to age 75, but those age 80 and over tend to overstate the probability of surviving to age 95 or 100. Only the former, however, is directly relevant to thinking about the market for longevity annuities, as by age 80 the decision about whether to purchase such a product already has been made.

¹¹ We have spoken with a number of insurance industry representatives, none of whom knew of any company that as of the time of our conversation had sold a longevity annuity product to an employer plan.

¹² Given the relatively small population of people who actually purchase annuities, empirical research on the factors that affect demand for annuities is somewhat limited. Chalmers and Reuter (2012), using data from the Oregon Public Employees Retirement System from 1990 to 2002, find that retirees in worse health (i.e., with a lower life expectancy), with less risk aversion, and with higher levels of already-annuitized wealth were less likely to take the full annuitization option offered by their retirement plan. They also find, however, that people do not respond to changes in the relative prices of annuities in the way predicted by rational choice

theory. Inkman, Lopes, and Michaelides (2011) and Pashchenko (2013) highlight the effects of pre-annuitized wealth and bequest motives. In addition, Inkman, Lopes, and Michaelides (2011) find evidence that life expectancy and education levels affect annuity take up while Pashchenko (2013) suggests that illiquid housing wealth and minimum annuity purchase requirements may be important factors.

¹³ The experiment involved subjects age 22 to 70 who were working full- or part-time. Subjects earned tokens by completing computer-based tasks during the experiment's initial phase, then were offered different default options for redeeming the tokens during a "retirement" period lasting up to eight weeks. Those offered the default option of full annuitization had the opportunity to trade their endowment for a lump-sum payment, while those who were endowed with a lump-sum were offered either the option to trade their whole lump-sum for an immediate annuity or the option to trade part of their endowment for a longevity annuity.

¹⁴ A related concern, which has received limited attention to date, is the employment of captive reinsurance, in which insurers effectively reduce their capital reserves by shifting liabilities to offshore entities that are not subject to domestic regulations. Kojen and Yogo (2013) estimate that liabilities in captive reinsurance entities increased from \$11 billion to \$364 billion between 2002 and 2012, lowering risk-based capital by roughly half. A 2013 report released by New York's Superintendent of Financial Services highlighted this threat, comparing the practice of captive reinsurance to financial products such as credit-default swaps on subprime mortgages that precipitated the financial crisis (Lawksy 2013). However, reduced capital reserves also can be expected to lower the price for annuities. The impact of captive reinsurance on the demand for annuities thus is ambiguous.