

# Notes

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### EXECUTIVE SUMMARY

#### **Tracking Health Insurance Coverage by Month: Trends in Employment-Based Coverage Among Workers, and Access to Coverage Among Uninsured Workers, 1995–2009**

**HEALTH COVERAGE ON A MONTHLY BASIS:** This analysis examines employment-based health benefit coverage rates on a monthly basis from December 1995 to December 2009, to allow for more accurate identification of changes in trends, and to more clearly show the effects of recessions and unemployment on changes in coverage.

**RECESSION PERIODS:** The recession officially started in December 2007 and ended in December 2009. Between December 2007–August 2009 the percentage of workers with coverage in their own name fell from 60.4 percent to 55.9 percent. After August 2009, there appeared to be what might be the beginning of a recovery in the percentage of workers with employment-based coverage. By December 2009, 56.6 percent of workers had employment-based coverage.

#### **How Changes in Longevity Annuity Prices and Longevity Risk Affect Retirement Income Adequacy**

**FOLLOW-UP STUDY:** Building on the May 2011 *EBRI Issue Brief*, this article analyzes how changes in longevity annuity prices and longevity risk affect retirement income adequacy of retirees facing three different types of risk—investment income, longevity, and long-term care risk.

**CHANGING PRICES AND RISK:** As the price of a longevity annuity increases, and as longevity risk grows, more initial retirement wealth is needed and the degree of annuitization needs to be especially to achieve a 90 percent chance of adequacy (the inverse is true as well). The of annuitization with a longevity annuity, however, depends on how much an portfolio is invested in equities.

# Tracking Health Insurance Coverage by Month: Trends in Employment-Based Coverage Among Workers, and Access to Coverage Among Uninsured Workers, 1995–2009

By Paul Fronstin, Employee Benefit Research Institute

## Introduction

There is a strong link between health benefits and employment. As a result, employment-based health benefits are the most common form of health insurance for nonpoor and nonelderly individuals in the United States. In 2009, 59 percent of nonelderly individuals were covered by an employment-based health benefits plan, with 68.2 percent of workers covered, 34.6 percent of nonworking adults covered, and 55.8 percent of children covered (Fronstin, 2010a).

Since the 1980s, the percentage of individuals without health insurance coverage has generally been increasing, in large part because rising health benefit costs eroded employment-based coverage. However, for a few years during the late 1990s, the percentage of workers and their families with employment-based coverage increased and the percentage without health insurance declined, in large part due to the strong economy and low unemployment.

While the percentage of workers with coverage has ebbed and flowed with the economy and health care costs, trends in the percentage of workers *offered* coverage and the percentage of workers *taking* coverage when offered have remained steady. Prior research had shown that the percentage of workers offered health benefits had been increasing, but the take-up rate had been declining (Fronstin 2007).

The purpose of this analysis is to examine the state of employment-based health benefits. Coverage rates are examined on a monthly basis from December 1995 to December 2009. This analysis updates prior EBRI research that examined trends in coverage on a monthly basis over this time period (Fronstin, 2010b). Examining these data on a monthly basis allows more accurate identification of changes in trends, and can also more clearly indicate the effects of recessions and unemployment on changes in coverage. Trends in offer rates and reasons for being uninsured among uninsured workers are also examined.

## Trends in Employment-Based Health Coverage

Figure 1 shows the percentage of wage and salary workers ages 18–64 with employment-based health benefits either in their own name or covered as a dependent. There was very little change between December 1995 and December 2007 in the percentage of workers covered both in their own name and as a dependent. The percentage of workers with coverage in their own name increased slightly from just below 60 percent in the second half of 1996 to slightly above 61 percent in 1998. Between February 1998 and September 2002, the percentage of workers with coverage in their own name bounced around between 60.5 percent and 61.8 percent. A gradual decline in coverage started in October 2002, and between January 2004 and December 2007, the percentage of workers with coverage in their own name was mostly below 60 percent.

The recession officially started in December 2007. Between December 2007 and May 2008, the percentage of workers with coverage in their own name fell from 60.4 percent to 56.8 percent, but there are no data in between to determine if this was a gradual trend or a one-time drop. The period between May 2008 and the end of the recession in May 2009 shows a continuing decline in the percentage of workers with employment-

based coverage in their own name. When the recession ended in May 2009, 56.1 percent of workers had employment-based coverage. Between May 2009 and August 2009 there was a continued slight decline in coverage. The percentage of workers with employment-based coverage reached 55.9 percent in August 2009. After August 2009, there appears to be what might be the beginning of a recovery in the percentage of workers with employment-based coverage. By December 2009, 56.6 percent of workers had employment-based coverage in their own name. (While the data from March 2010 show that 55.5 percent of workers had employment-based coverage, this estimate is based on one-quarter of the sample and will likely be revised when data for the full sample are released).

Changes in the percentage of workers with employment-based coverage as a dependent occurred throughout this period as well. Between December 1995 and late 1999, the percentage of workers covered as a dependent increased from 17.4 percent to nearly 20 percent. It then declined during 2000 to about 18 percent. The percentage of workers with coverage as a dependent remained at about 18 percent through Sept. 2003, but then declined to between 16 percent and 17 percent during the October 2003–December 2007 period.

Between December 2007 and May 2009, the percentage of workers with coverage as a dependent increased from 16.6 percent to 17.3 percent, and reached 17.5 percent in July 2010. It appears that the increase in dependent coverage offset the decline in coverage that workers received through their own job. During the post-August 2009 period when coverage through a worker's own job appears to be starting to recover, the percentage of workers with coverage as a dependent declined, dropping to 17 percent by December 2009. Hence, the increase in dependent coverage may have been the result of the decrease in coverage through a worker's job.

## **Workers Without Health Insurance**

It is clear that the likelihood of a worker being uninsured is tied to the strength of the economy and the unemployment rate. Between late 1995 and early 2000, the percentage of workers without health insurance coverage had been falling. During December 1995–October 1996, the uninsured rate for workers was in the low-15 percent range (Figure 2). The uninsured rate was in the mid-14 percent range between November 1996 and September 1997. It fell to the upper-13 percent range during 1998, and was in the low 13-percent range during 1999 and early 2000.

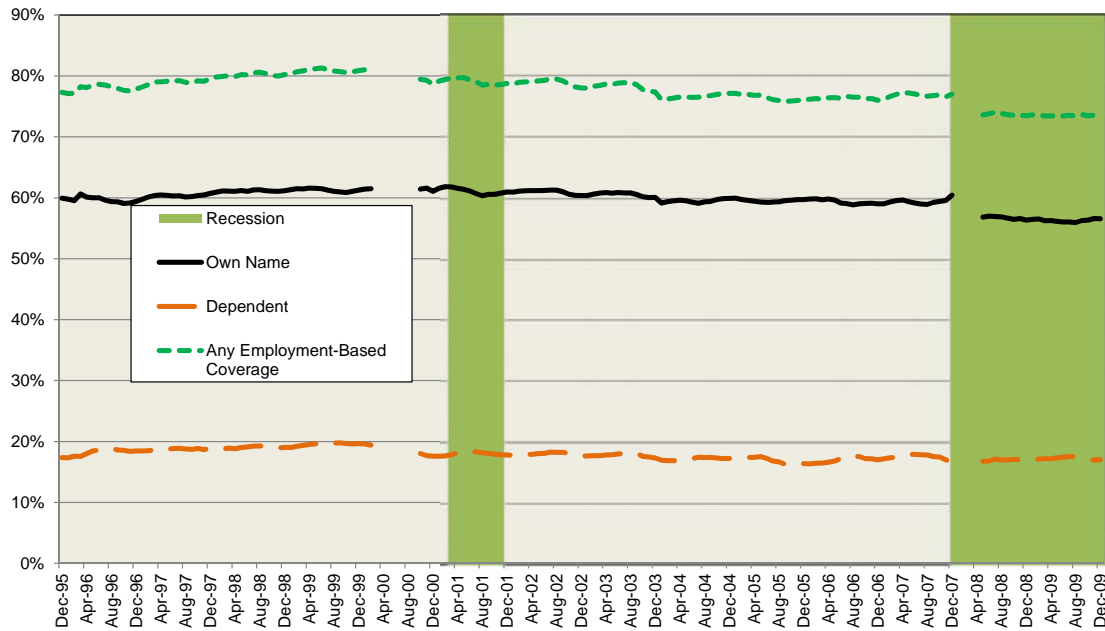
Unemployment bottomed out at 3.9 percent in late 2000, and continued increasing during the recession of 2001. At the same time, the uninsured rate among workers increased to the low- and mid-14 percent range, and did not recover until 2004. From mid-2002 to fall 2003, the uninsured rate for workers was in the upper 14-percent range, and from fall 2003 to summer 2004 it was in the 15–16 percent range. From summer 2004 through February 2007, the uninsured rate ranged from the upper-14 percent to low-15 percent range, and in mid-2007 it was in the low-14 percent range.

The beginnings of the recession in late 2007 put the uninsured rate back in the upper-14 percent range. During May 2008–May 2009 the uninsured rate among workers stayed within a narrow band of just below or just above 18 percent. Since the end of the recession it has remained at about 18 percent.

## **Why Workers Are Uninsured**

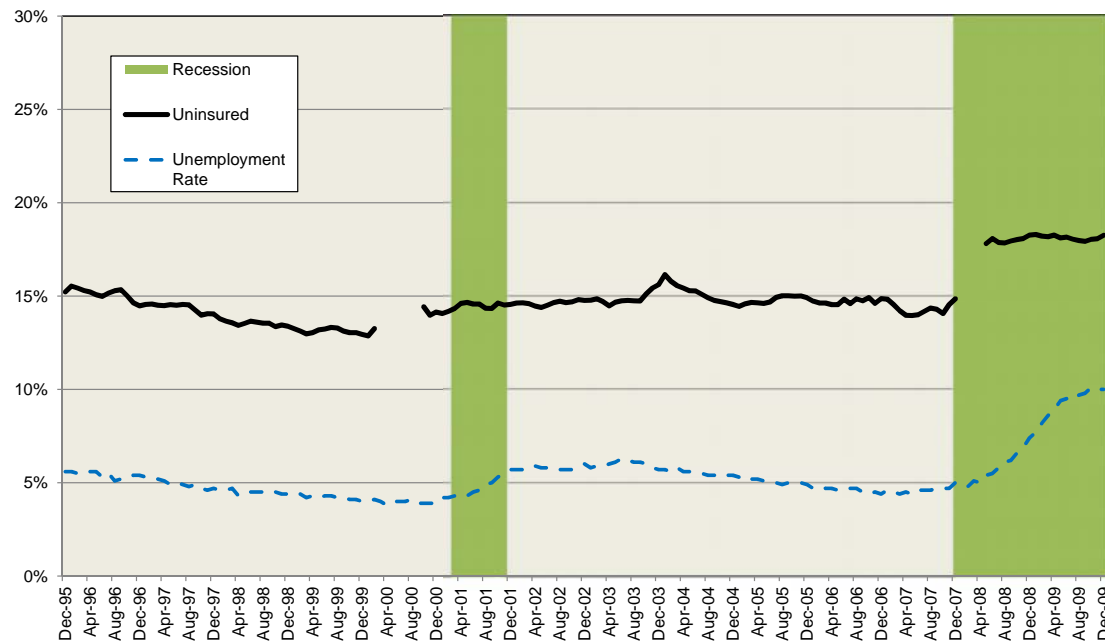
Uninsured workers were asked a series of questions regarding why they were not covered. They were asked about access to employment-based coverage and whether they were ineligible for coverage offered to other workers or declined coverage when it was available. Workers with insurance from other sources such as employment-based coverage as a dependent, those who purchased coverage directly from an insurer, and

Figure 1  
**Percentage of Wage and Salary Workers, Ages 18–64, With Employment-Based Health Benefits, by Source of Coverage, Dec. 1995–Dec. 2009**



Source: Employee Benefit Research Institute estimates from the Survey of Income and Program Participation, 1996, 2001, 2004, and 2008 Panels.

Figure 2  
**Percentage of Wage and Salary Workers, Ages 18–64, That Were Uninsured, Dec. 1995–Dec. 2009**



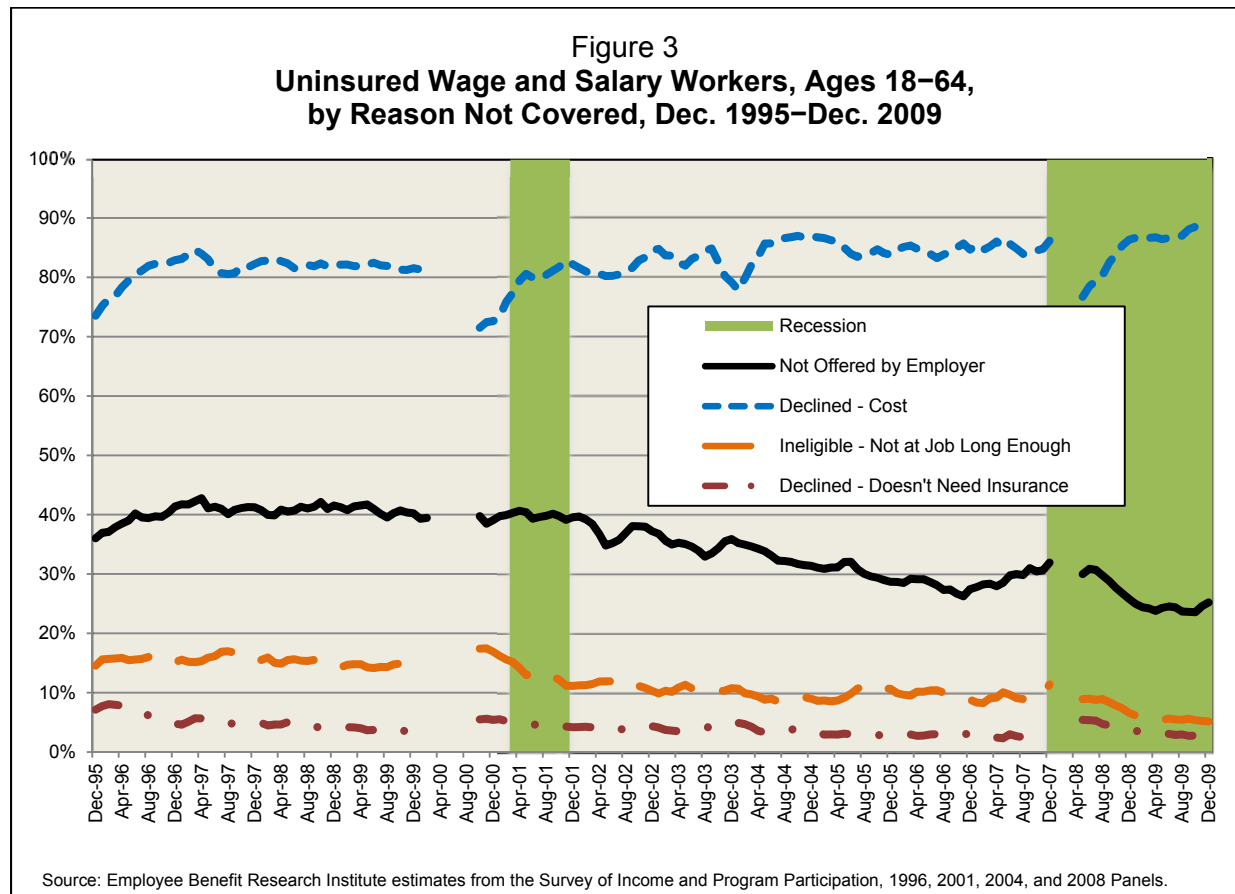
Source: Employee Benefit Research Institute estimates from the Survey of Income and Program Participation, 1996, 2001, 2004, and 2008 Panels.

those covered by public sources of coverage were *not* asked the series of questions on why they did not have coverage. Some of the questions pertain to employment-based coverage specifically, but some can be applied more generally, like those related to cost and declining coverage.

Uninsured workers reported multiple reasons for not having coverage. Most workers reported that they did not have coverage because of cost. These workers may be referring to the cost of employment-based coverage or coverage that they could purchase directly from an insurer. The general trend in the percentage of uninsured workers reporting cost as a reason for not having coverage has been upward.

Between December 1995 and early 1997, uninsured workers citing cost as a reason increased from about 73 percent to 84 percent, and then settled in the low-80 percent range through 1999 (Figure 3). During 2000, an economic expansion year that saw unemployment fall to 3.9 percent, the percentage of workers reporting cost as a reason for not having coverage fell to 71.5 percent. But the percentage reporting cost as a reason for not having coverage started increasing in late 2000, continued to increase during the 2001 recession, stayed in the low-80 percent range through 2003, and then jumped to the mid-80 percent range through 2007. It dropped again to about 77 percent in mid-2008 but then rose sharply during the latest recession reaching 86 percent by May 2009, and continuing to climb to 89 percent by the end of 2009.

The percentage of workers reporting that they were not offered employment-based health benefits was roughly 40 percent through 2003, and has been falling since then, falling below 24 percent in the fall 2009. By December 2009, the percentage of workers reporting that they did not have coverage because their employer does not offer it increased to just above 25 percent.



Currently, less than 10 percent of uninsured workers report that they do not have coverage because they are ineligible for the plan as a result of not working enough hours, have not worked long enough to qualify, or declined coverage because they did not think they need it.

## **Conclusion**

This analysis appears to be the first attempt to examine *sources* of health insurance and uninsured rates among workers on a monthly basis over a long period of time. It would also be the first time that *reasons* for being uninsured were examined on a monthly basis over a long period of time.

Examining these data on a monthly basis allows more accurate identification of changes in trends and can also more clearly indicate the effects of recessions and unemployment on changes in coverage. Although the link between health insurance coverage and employment has long been known, these data underscore the degree to which employment (or, more significantly, unemployment) rates directly affect the levels of the uninsured in the United States.

## **Data and Methods Appendix**

Data for this study come from a series of panels from the Survey of Income and Program Participation (SIPP) conducted by the Census Bureau. SIPP is a nationally representative longitudinal survey of the civilian noninstitutionalized U.S. population. SIPP provides comprehensive information about the income of individuals and households in the United States. It also provides information on participation in public programs. Individuals selected into the SIPP sample are interviewed once every four months over the life of the panel. In addition to a core set of questions asked participants each four months, a rotating set of topical questions supplements the core questions.

The data in this paper come from the 1996, 2001, 2004, and 2008 panels. The 1996 panel covers December 1995–February 2000. The 2001 panel covers October 2000–December 2003. The 2004 panel covers October 2003–December 2007. And the 2008 panel started in May 2008. Data through December 2009 are currently available for the entire sample. Smaller samples are available for early 2010: January 2010 is available for three-quarters of the sample, February 2010 is available for one-half of the sample, and March 2010 is available for one-quarter of the sample. There are two gaps in the time series: March–September 2000 and January–April 2008.

Every four months, panel members were asked about health insurance coverage. Specific questions were asked about coverage from public sources, such as Medicare, Medicaid, the State Children’s Health Insurance Program (SCHIP), and various sources of military-related coverage. Specific questions were also asked about employment-based coverage and insurance purchased directly from an insurer. Uninsured individuals were also asked a series of questions regarding why they did not have coverage. Unfortunately, individuals with public coverage were not asked the series of questions related to why they did not have employment-based coverage; therefore, the analysis in this report related to reasons for not having employment-based coverage is limited to the uninsured.

The data in this report are for wage and salary workers ages 18–64. Self-employed workers are generally not included in the analysis because of issues regarding asking them about employer sponsorship of health benefits.

## References

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# How Changes in Longevity Annuity Prices and Longevity Risk Affect Retirement Income Adequacy

By Youngkyun Park, Employee Benefit Research Institute

## Introduction

Building on the May 2011 *EBRI Issue Brief* (Park, 2011),<sup>1</sup> this article analyzes how different longevity annuity prices and longevity risk affect retirement income adequacy.

Longevity annuities are similar to immediate annuities in that they provide a stream of fixed benefits over time (usually until death). Unlike immediate annuities, which (as the name implies) begins to provide a benefit immediately upon purchase, a longevity annuity starts to distribute its payments only when the retiree reaches an advanced age, such as 80 or 85. The price of a longevity annuity is lower than that of an immediate annuity, because it is mainly determined by conditional survival, which declines with age. In other words, a longevity annuity distributes higher payments per premium dollar compared with an immediate annuity, because the payments are deferred until a commencement age at which the chance of survival declines.

Since retirement income adequacy depends, in part, on different annuity prices (how much the annuity costs) and mortality (how long the individual lives), this article analyzes how those factors would affect the retirement income adequacy of retirees targeting a desired level of adequacy (e.g., a 90 percent probability of adequacy). This sensitivity analysis also provides insight into how an optimal annuitization with a longevity annuity would be changed with different annuity prices and longevity risk.

The next section briefly discusses methodology for the sensitivity analysis. The following sections discuss how changes in longevity annuity price and longevity risk affect retirement income adequacy in terms of a multiple of final earnings.

## Methodology

The previous *Issue Brief* used a specific longevity annuity price quoted as of Sept. 18, 2009, and a mortality table of the 2001 Commissioners Standard Ordinary (CSO) to discuss retirement income adequacy for retirees facing three different types of risk—investment income, longevity, and long-term care risk—with a longevity annuity.

The sensitivity analysis of retirement income adequacy to annuity prices and longevity risk assumes a male who is retiring at age 65. His retirement adequacy is defined in the same way as in the May *Issue Brief*. If there is a non-negative amount at the end of a simulated life-path, this path is regarded as one generating “adequate” retirement income.<sup>2</sup> After the simulation runs, a probability of adequate retirement income is calculated. The probability is expressed as a percentage of simulated life-paths with “adequate” retirement income. This analysis focuses on a 90 percent chance of adequacy.

Simulations for this analysis are conducted with the same assumptions on long-term capital markets, general and long-term care inflation rates, and retirement expenditures (including health care costs) that were used in the May 2011 *Issue Brief*. Also, a retiree is assumed to receive annual retirement income from three sources:<sup>3</sup> first, annuitized income from an immediate or longevity annuity purchased with his initial retirement wealth; second, initial Social Security benefits; and third, investment income from the initial retirement wealth or the remaining wealth after annuitization.<sup>4,5</sup>

This analysis focuses on three types of risk a retiree faces: investment income, longevity, and long-term care risk, as described in “Building Block 3” in the earlier *Issue Brief*. First, investment income risk is related to equity allocation: As a retiree increases his equity allocation, he may benefit from a higher-than-expected investment income, but also faces a larger downside risk from investment losses. Second, longevity risk refers to the risk of a retiree outliving his assets. Third, long-term care risk involves nursing home or home-based health care costs, which can be financially catastrophic.

## Effects of a Change in Longevity Annuity Price

This section discusses how an increased or decreased longevity annuity price would affect retirement income adequacy in terms of a multiple of final earnings.

The analysis adopts as a baseline scenario the prices of immediate and longevity annuities that were used in the earlier *Issue Brief*. Specifically, a male retiring at age 65 is assumed to buy an immediate annuity at a price of about \$13.19 (quoted at the end of 2009 from [www.immediateannuities.com](http://www.immediateannuities.com)) or a longevity annuity commencing payments at age 85 at a price of about \$1.27 (maximum income version quoted as of Sept. 18, 2009, from MetLife’s *Longevity Income Guarantee*<sup>6</sup>). The price of an immediate annuity implies that the lifetime income of \$1.00 per year starting at age 65 could be purchased for \$13.19. Similarly, the price of a longevity annuity indicates that the lifetime income of \$1.00 per year starting at age 85 could be purchased for \$1.27 at age 65.<sup>7</sup>

As an alternative scenario, this analysis assumes that a longevity annuity price is increased or decreased compared with the baseline price used in the previous *Issue Brief*. As an example of a higher price of a longevity annuity, the article uses the longevity price quote (maximum income version) as of Nov. 29, 2010, from MetLife’s *Longevity Income Guarantee*.<sup>8</sup> This price quote was increased by 19.1 percent compared with the baseline price. In contrast, as an example of a lower price, this analysis arbitrarily assumes a price decrease of the same percentage of –19.1 percent.

To discuss how different longevity annuity prices would affect retirement income adequacy, this analysis focuses on the lowest- and highest-income categories. As in the May 2011 *Issue Brief*, a lowest-income retiree is assumed to have final annual earnings of \$16,932, while one in the highest-income category is assumed to have final annual earnings of \$103,584.

### Lowest-Income Category

Figure 1 illustrates the effects of different longevity annuity prices on retirement income adequacy in the lowest-income category. Lines in the figure indicate multiples of final earnings that are needed for a 90 percent of probability of adequacy with different equity allocations and degrees of annuitization. A U-shaped curve represents multiple final earnings with a longevity annuity, and a line with a negative slope does the same for those with an immediate annuity.

An increase in the price of a longevity annuity shifts the U-shaped curves upward (line a’). This means that, all other things being equal, an increase in the price of a longevity annuity requires more initial retirement wealth because of a negative income effect (the more the cost, the lower the income). In addition, the increased longevity annuity price appears to decrease an optimal degree of annuitization, because the longevity annuity becomes relatively more expensive in the retiree’s portfolio. For example, the optimal annuitization is decreased from 22–32 percent to 18–28 percent across different equity allocations of 5–95 percent (see column (2) of Panel A, Figure 3). An exact optimal allocation to the longevity annuity, however, depends on equity allocations of the remaining retirement wealth.

Conversely, a decrease in the price of a longevity annuity shifts the U-shaped curves downward (line a''). A decrease in the price of a longevity annuity requires less initial retirement wealth because of a positive income effect (the less the cost, the more the income). In addition, the decreased annuity price appears to increase an optimal degree of annuitization, because the longevity annuity becomes relatively less expensive in the retiree's portfolio. For example, the optimal annuitization is slightly increased from 22–32 percent to 22–34 percent across different equity allocations of 5–95 percent (see column (3) of Panel A, Figure 3).

### **Highest-Income Category**

Figure 2 shows how different longevity annuity prices affect retirement income adequacy in the highest-income category. The effects of the price changes are very similar to those shown in Figure 1, except for the scale of a multiple of final earnings (values of Y-axis). An increase (or decrease) in the price of longevity annuity shifts the U-shaped curves upward (or downward). In addition, the increased (or decreased) annuity price appears to decrease (or increase) an optimal degree of annuitization. For example, the higher annuity price decreases an optimal annuitization from 23–32 percent to 17–29 percent; conversely, the lower annuity price increases an optimal annuitization from 23–32 percent to 23–35 percent (see column (2) and (3) of Pane B, Figure 3).

### **Effects of a Change in Longevity Risk**

This section discusses how a change in longevity risk, all other things being equal, would affect retirement income adequacy in terms of a multiple of final earnings, by adopting the Annuity 2000 mortality table. As shown in Figure 4, the Annuity 2000 mortality table indicates a longer expected lifetime than the 2001 CSO mortality table used as the baseline scenario. For example, a male at age 65 is expected to live to age 81.8 with a 50 percent probability of survival under the 2001 CSO mortality table, but to age 85.4 under the Annuity 2000 mortality table.

A different mortality table also leads to a change in long-term care costs. For example, greater longevity can bring greater long-term care costs. Building Block 3 in the May 2011 *Issue Brief* simulation model deals with long-term care risk, covering four possible health states: home-based health care, nursing home, not receiving either home care or nursing home care, and death.<sup>9</sup>

Figure 5 (for the retiree in the lowest-income category) and Figure 6 (for the retiree in the highest-income category) illustrate how a longer expected lifetime would affect retirement income adequacy in terms of a multiple of final earnings.

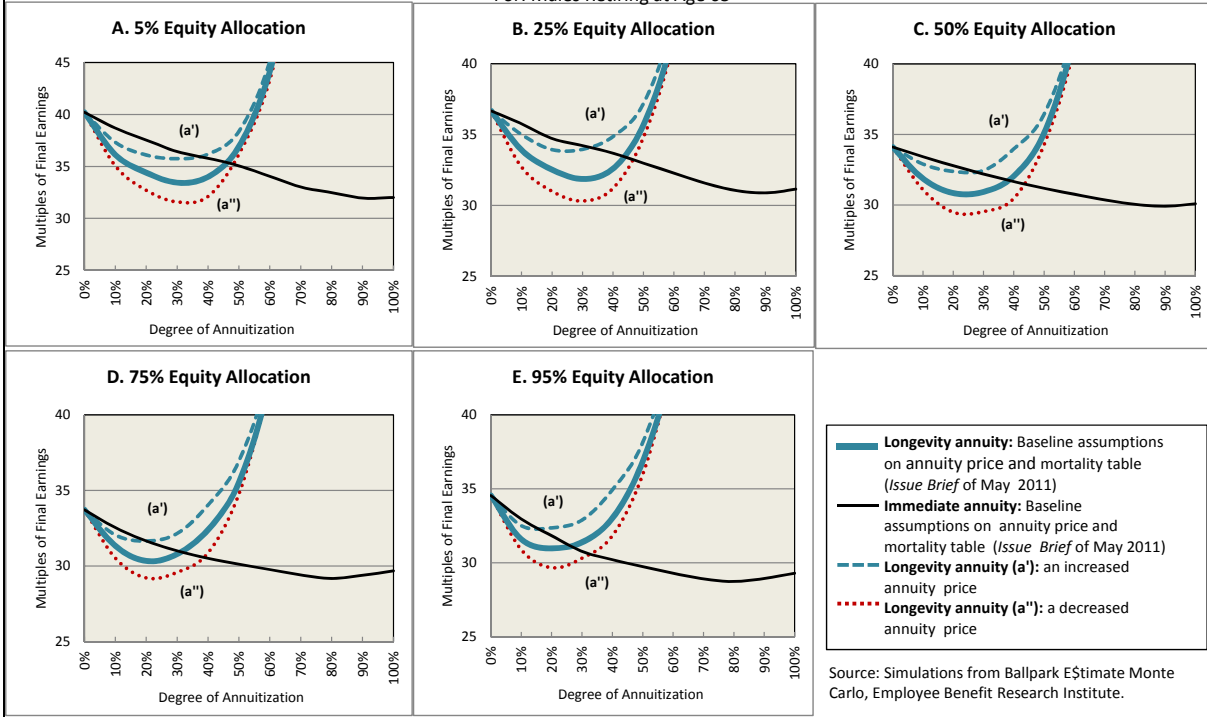
### **Lowest-Income Category**

By adopting the Annuity 2000 mortality table, Figure 5 shows a change of an optimal degree of annuitization with the immediate annuity in two ways. First, the retiree needs more retirement wealth to achieve a 90 percent chance of adequacy with a given degree of annuitization (line b<sub>0</sub> vs. b'). This increase is to cover a greater longevity risk due to a longer expected life span. Second, the adoption of the Annuity 2000 mortality table makes a change in optimal annuitization. While an 80–90 percent annuitization of the initial retirement wealth is needed to optimally achieve a 90 percent chance of adequacy with the 2001 CSO mortality table (line b<sub>0</sub>), a 90–100 percent annuitization is needed with the Annuity 2000 mortality table (line b'), which has a longer expected lifetime.

Similar to the results for an immediate annuity, a longevity annuity with the Annuity 2000 mortality table requires more initial retirement wealth in terms of a multiple of final earnings, compared with the 2001 CSO mortality table (line c<sub>0</sub> vs. c'). In addition (although an exact optimal allocation to the longevity annuity depends on equity allocations of the remaining retirement wealth), an optimal degree of annuitization with

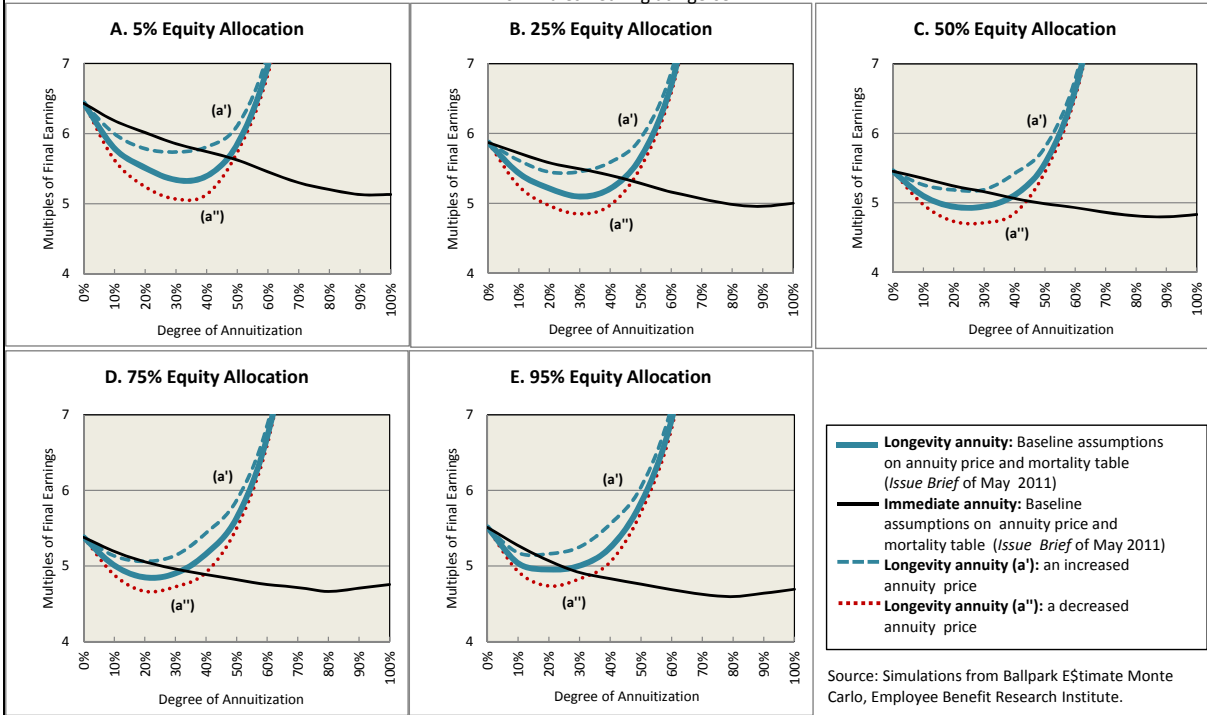
**Figure 1**  
**Impacts of Different Longevity Annuity Prices on Retirement Income Adequacy:**  
**Lowest-Income Category**

Multiple of Final Earnings for a 90% Chance of Adequacy: Building Block 3  
 For: Males Retiring at Age 65



**Figure 2**  
**Impacts of Different Longevity Annuity Prices on Retirement Income Adequacy:**  
**Highest-Income Category**

Multiple of Final Earnings for a 90% Chance of Adequacy: Building Block 3  
 For: Males Retiring at Age 65



**Figure 3**

**Impacts of Different Longevity Annuity Prices on Retirement Income Adequacy:**  
**Optimal Annuitization of Longevity Annuity**

Minimum Multiple of Final Earnings for a 90% Chance of Adequacy by Equity Allocations: Building Block 3  
 For: Males Retiring at Age 65

Equity allocation		Baseline assumption (1)			Price increased by 19.1% (2)			Price decreased by 19.1% (3)		
		Degree of annuitization	Multiple of final earnings	Degree of annuitization	Multiple of final earnings	Degree of annuitization	Multiple of final earnings	Degree of annuitization	Multiple of final earnings	
5%		32%	33.30	28%	35.70	34%	31.35			
25%		31	31.82	26	34.01	28	30.25			
50%		26	30.56	25	32.22	23	29.27			
75%		22	30.31	21	31.63	22	29.11			
95%		23	30.80	18	32.27	22	29.75			
<b>A. Lowest-Income Category: Final Earnings of \$16,932</b>										
Equity allocation		Baseline assumption (1)			Price increased by 19.1% (2)			Price decreased by 19.1% (3)		
		Degree of annuitization	Multiple of final earnings	Degree of annuitization	Multiple of final earnings	Degree of annuitization	Multiple of final earnings	Degree of annuitization	Multiple of final earnings	
5%		32%	5.34	29%	5.72	35%	5.02			
25%		31	5.10	27	5.44	29	4.84			
50%		26	4.89	25	5.17	25	4.70			
75%		23	4.84	21	5.05	23	4.65			
95%		23	4.91	17	5.15	23	4.73			
<b>B. Highest-Income Category: Final Earnings of \$103,584</b>										

Source: Simulations from Ballpark Estimate Monte Carlo, Employee Benefit Research Institute.

the Annuity 2000 mortality table is changed from 22–32 percent to 27–32 percent across different equity allocations of 5–95 percent. In particular, an optimal degree of annuitization for 25–95 percent equity allocations is increased by 1–7 percentage points under the Annuity 2000 mortality table. This increase is also due to the greater longevity risk when adopting the Annuity 2000 mortality table (see Panel A of Figure 7).

Lastly, by adopting the Annuity 2000 mortality table, the slope of the immediate annuity line becomes steeper, and the U-shaped curve of the longevity annuity becomes squeezed tighter prior to an optimal degree of annuitization. This implies that when a longer lifetime is expected, using immediate or longevity annuities appears to be more effective (by saving more initial retirement wealth required for the desired level of retirement income adequacy), compared with *no annuitization*.

Increased effectiveness of annuitization can be seen in the optimal degree of annuitization with an immediate annuity. For example, compared with no annuitization, a retiree in the lowest-income category wanting a 90 percent chance of income adequacy under the 2001 CSO mortality table could save an initial retirement wealth of \$76,900 (or 4.54 *times* final earnings) by allocating 80 percent of the retirement wealth to an immediate annuity, along with a 75 percent equity allocation. A retiree using the Annuity 2000 mortality could save an initial retirement wealth of \$160,000 (or 9.45 *times* final earnings) by allocating 100 percent of the retirement wealth to an immediate annuity, compared with no annuitization (see Panel D of Figure 5).<sup>10</sup> The initial retirement wealth saved under the Annuity 2000 mortality table is more than twice that under the 2001 CSO mortality table.

Increased effectiveness of annuitization can be also found in an optimal degree of annuitization with the longevity annuity. For example, compared with no annuitization, the retiree using the 2001 CSO mortality is able to save an initial retirement wealth of \$57,700 (or 3.41 *times* final earnings) by allocating 22 percent of the initial retirement wealth to a longevity annuity, along with a 75 percent equity allocation. Otherwise, the retiree using the Annuity 2000 mortality is able to save an initial retirement wealth of \$162,400 (or 9.59 *times* final earnings) by allocating 27 percent of the initial retirement wealth to a longevity annuity, compared with no annuitization (see Panel D of Figure 5).<sup>11</sup> The initial retirement wealth saved under the Annuity 2000 mortality table is more than 2.8 times that under the 2001 CSO mortality table.

### **Highest-Income Category**

Figure 6 demonstrates how adopting the Annuity 2000 mortality table affects retirement income adequacy in the highest-income category. An increase in longevity risk has very similar results to those shown in Figure 5, except for the scale of a multiple of final earnings.

With an immediate annuity, a retiree needs a 90–100 percent annuitization to achieve a 90 percent chance of income adequacy under the Annuity 2000 mortality table, compared with an 80–90 percent annuitization under the 2001 CSO mortality table. With a longevity annuity, a retiree also needs to allocate his initial retirement wealth to the longevity annuity by 1-7 percentage points more under the Annuity 2000 mortality table across equity allocations of 25–95 percent.

Similar to the lowest-income category, results for the highest-income category show that, when assuming a longer lifetime, using immediate or longevity annuities appears to be more effective because more initial retirement wealth can be saved to achieve a 90 percent chance of retirement income adequacy.

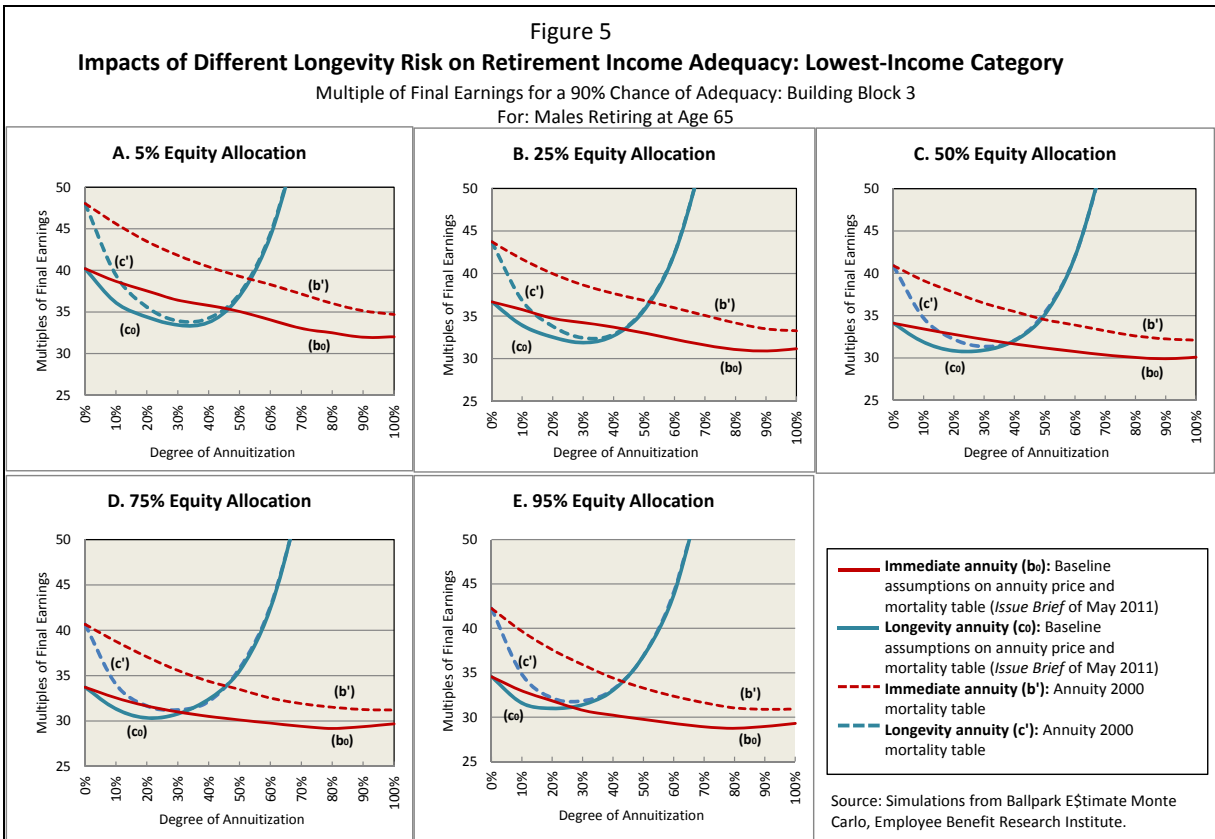
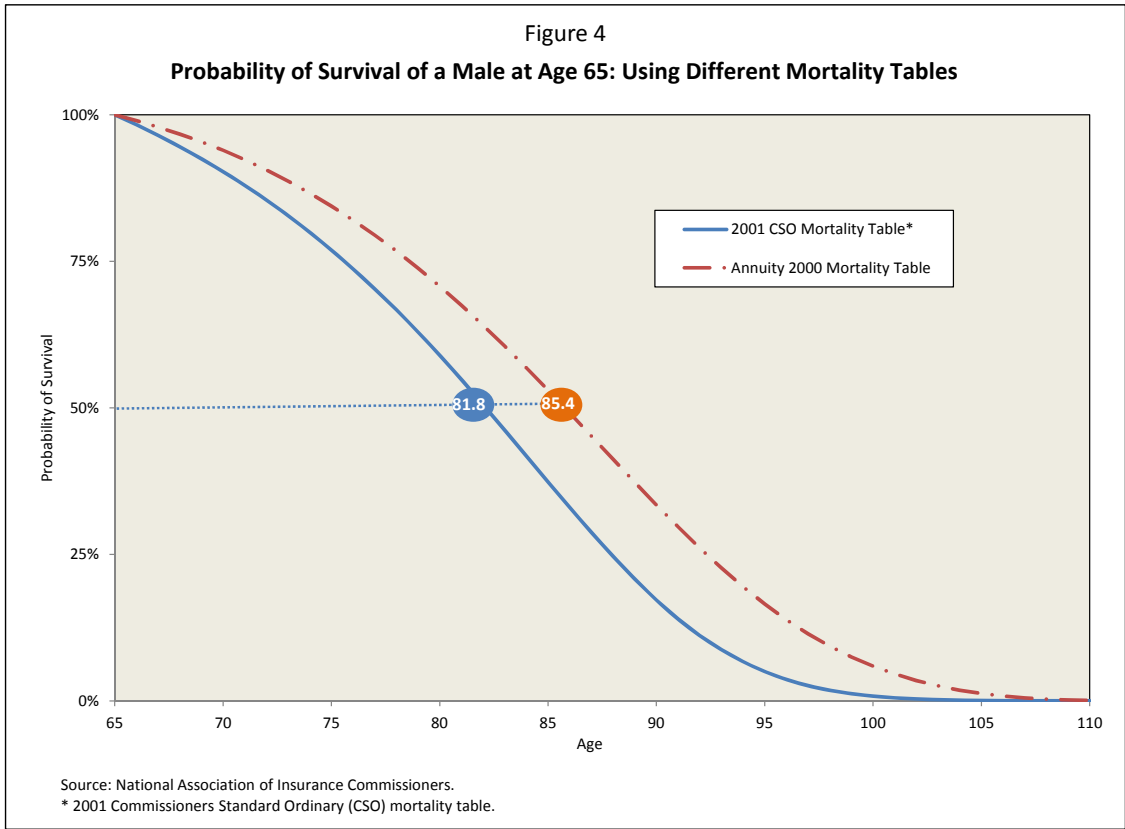
## Conclusion

This analysis shows how a change of longevity annuity prices and longevity risk affects retirement income adequacy, in terms of a multiple of final earnings. It focused on a 90 percent chance of achieving retirement income adequacy under Building Block 3 from the May 2011 *EBRI Issue Brief*, which deals with investment income, longevity, and long-term care risk.

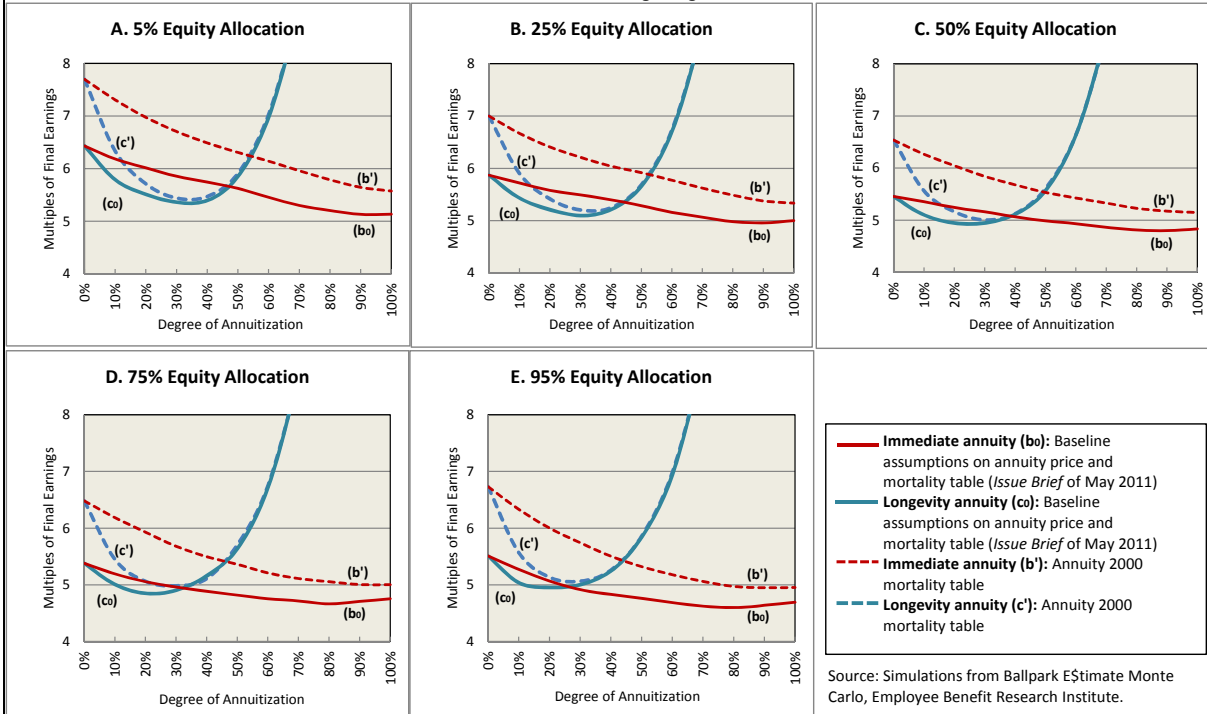
The sensitivity analysis of retirement income adequacy to longevity annuity prices showed that an increase in the price of a longevity annuity requires more initial retirement wealth to achieve a 90 percent chance of income adequacy, because it has a negative income effect; the converse is true if annuity prices fall. In addition, a higher longevity annuity price tends to decrease the optimal degree of annuitization, because the longevity annuity price becomes relatively more expensive in the retiree's portfolio; the converse is also true if annuity prices fall. Furthermore, the results in the lowest-income category are very similar to those in the highest-income category, except for the scale of a multiple of final earnings.

Regarding how greater longevity risk affects retirement income adequacy, the analysis shows that, in order to achieve a 90 percent chance of income adequacy, the retiree needs more initial retirement wealth for a given degree of annuitization, and an optimal degree of annuitization is increased because of the longer expected lifetime. In addition, assuming greater longevity risk, results show that annuitization with immediate or longevity annuities appears to be more effective at saving more initial retirement wealth for a desired level of retirement income adequacy, compared with *no annuitization*. Annuitization results are very similar for both the lowest- and highest-income categories, except for the scale of a multiple of final earnings.

The simulation results presented here have one caveat: They were based on certain assumptions for a male retiring at age 65, with specific long-term capital market and investment expenses, and long-term general and health-care cost inflation rates. Additional research is needed to analyze retirement income adequacy for a female or a household with alternative assumptions.



**Figure 6**  
**Impacts of Different Longevity Risk on Retirement Income Adequacy: Highest-Income Category**  
 Multiple of Final Earnings for a 90% Chance of Adequacy: Building Block 3  
 For: Males Retiring at Age 65



**Figure 7**  
**Impacts of Different Longevity Risk on Retirement Income Adequacy:**  
**Optimal Annuitization of Longevity Annuity**  
 Minimum Multiple of Final Earnings for a 90% Chance  
 of Adequacy, by Equity Allocations: Building Block 3  
 For: Males Retiring at Age 65

<b>A. Lowest-Income Category: Final Earnings of \$16,932</b>				
Equity allocation	Baseline assumption		Annuity 2000 Mortality Table	
	Degree of annuitization	Multiple of final earnings	Degree of annuitization	Multiple of final earnings
5%	32%	33.30	31%	33.73
25%	31	31.82	32	32.30
50%	24	30.56	31	31.30
75%	22	30.31	27	31.07
95%	23	30.80	28	31.69

<b>B. Highest-Income Category: Final Earnings of \$103,584</b>				
Equity allocation	Baseline assumption		Annuity 2000 Mortality Table	
	Degree of annuitization	Multiple of final earnings	Degree of annuitization	Multiple of final earnings
5%	32%	5.34	31%	5.42
25%	31	5.10	32	5.18
50%	24	4.90	31	5.01
75%	22	4.85	28	4.97
95%	23	4.91	27	5.05

Source: Simulations from Ballpark EStimate Monte Carlo, Employee Benefit Research Institute.

## Endnotes

<sup>1</sup> Youngkyun Park. "Retirement Income Adequacy With Immediate and Longevity Annuities," *EBRI Issue Brief*, no. 357 (Employee Benefit Research Institute, May 2011).

<sup>2</sup> For more details on adequate retirement income, see Park (2011).

<sup>3</sup> For simplicity, payments from defined benefit retirement plans are not included in the analysis.

<sup>4</sup> Investment income from the initial retirement wealth or remaining wealth after annuitization is assumed to be generated from a portfolio consisting of three asset classes: U.S. equity, non-U.S. equity, and fixed income. An equity portfolio is constructed with a ratio of 67 percent U.S. equity to 33 percent non-U.S. equity. For details on the expected rate of return and volatility of each asset class, and correlations between the classes, see Park (2011).

<sup>5</sup> If the sum of the simulated investment income, amounts paid from Social Security, and the annuitized portion of the initial retirement wealth (if any), is more than the simulated expenditures for the year, the excess amounts are invested. Even in a case of a 100 percent annuitization, if any excess amounts exist, the amounts are invested with different asset allocation scenarios.

<sup>6</sup> The maximum income version of a longevity annuity means that the longevity annuity contract does not provide a death benefit or any withdrawal option before age 85.

<sup>7</sup> Alternatively, the prices of immediate and longevity annuities can be described as follows: A \$50,000 premium for an immediate annuity could purchase annual payments of \$3,791, while the same premium for a longevity annuity could purchase annual payments of \$39,501 starting at age 85.

<sup>8</sup> The price quote is based on the information that annual payments (maximum income version) of \$31,944 commencing at age 85 could be purchased for a lump-sum payment of \$50,000 as of 11/29/2011.

<sup>9</sup> See Park (2011) for more details on the linkage of long-term care costs to a mortality table under Building Block 3.

<sup>10</sup> Specifically, a retiree using the 2001 CSO mortality table needs 33.72 *times* final earnings with no annuitization, but 29.18 *times* final earnings by allocating 80 percent of the initial retirement wealth to an immediate annuity. Otherwise, a retiree with the Annuity 2000 mortality table needs 40.66 *times* final earnings with no annuitization, but 31.21 *times* final earnings with a full annuitization of initial retirement wealth. Thus, the amount of the initial retirement wealth saved by annuitizing is 4.54 *times* final earnings with the 2001 CSO mortality table, but 9.45 *times* final earnings with the Annuity 2000 mortality table.

<sup>11</sup> Regarding a longevity annuity, a retiree with the 2001 CSO mortality table needs 30.31 *times* final earnings by allocating 22 percent of initial retirement wealth to the longevity annuity. Otherwise, a retiree with the Annuity 2000 mortality table needs 31.07 *times* final earnings by allocating 27 percent of initial retirement wealth. Thus, the amount of the initial retirement wealth saved by annuitizing is 3.41 *times* final earnings with the 2001 CSO mortality table, but 9.59 *times* final earnings with the Annuity 2000 mortality table.

## Quentin I. Smith, Jr., Founding Chairman of EBRI, 1927–2011



Quentin Smith, Jr.

One of the founders of EBRI, Quentin Smith, Jr., died May 20 at age 83.

As then-chairman and CEO of the consulting firm Towers, Perrin, Forster & Crosby, Inc. (now Towers Watson), Smith played a key role in creating the Employee Benefit Research Institute following enactment of the Employee Retirement Income Security Act (ERISA) of 1974, the primary federal law governing private-sector retirement and health benefits.

Smith chaired an organizing group until EBRI was incorporated and legally constituted on Sept. 28, 1978, and served as its chairman and president from 1978 to 1981. He received the EBRI Lillywhite Award in 1998 in recognition of

“extraordinary lifetime contributions to Americans’ economic security.”

Smith’s first hire was Dallas Salisbury as EBRI’s chief operating officer—the position he still holds, 33 years later.

“For me, Quent Smith was an amazing mentor as I began my work at EBRI in my 20s, and his teachings and personal guidance continued to add value right into 2011,” Salisbury said.

“EBRI has substantial reserves today, providing a solid financial foundation, because the fiscal philosophy of ‘bottom-line Quent,’ as he was fondly known at EBRI, Towers, and all other organizations that he touched, has guided every decision I have made at EBRI over the past 33 years. Quent is already missed, but we shall spend every day celebrating his life and his legacy and his teachings.”

A memorial service for Smith was held in New York City in June.

The *New York Times* obituary of Smith is online here at <http://bit.ly/jMQZz8>

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# Notes

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