Exploring the "Cost" of Various Lifetime Income Solutions

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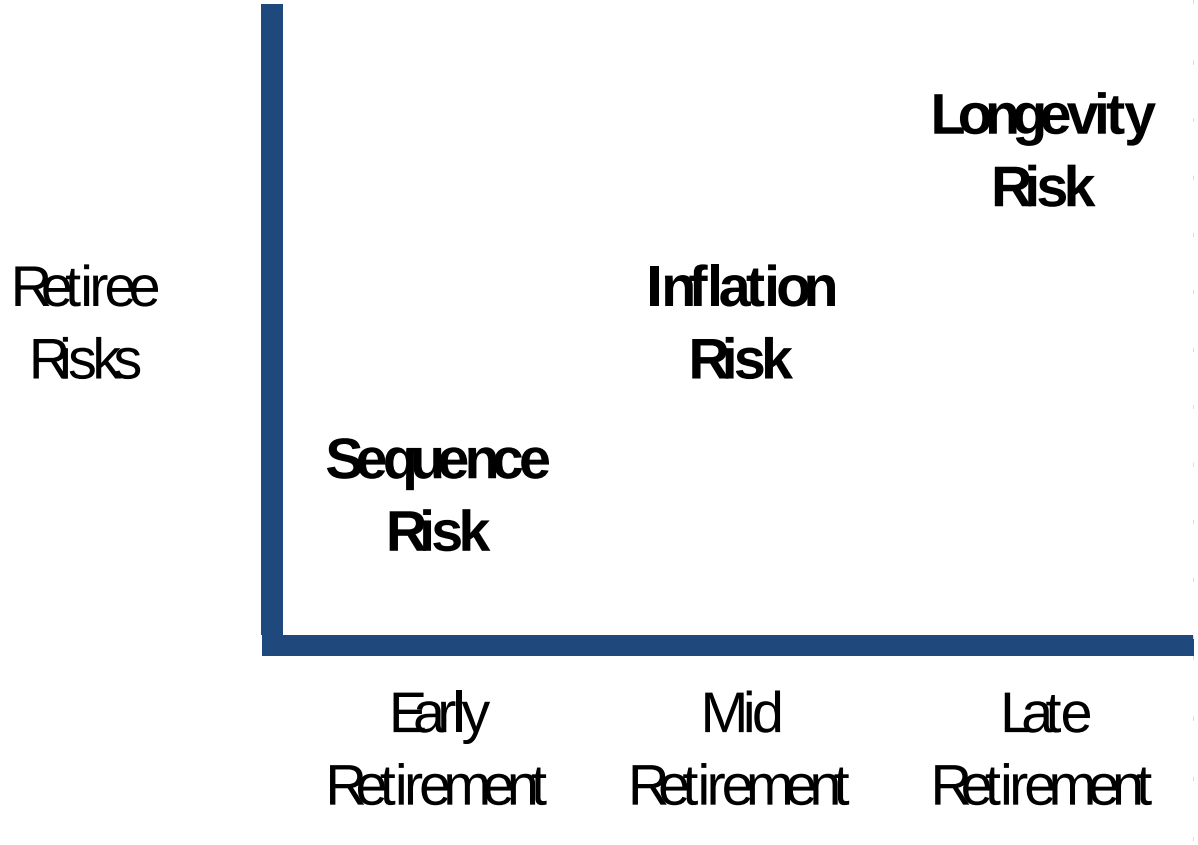
Agenda

- Overview of Retirement Risks
- The Annuity Puzzle
- A Cost Framework
- Three Types of Guaranteed Lifetime Income Products
    - Immediate Fixed Annuities
    - Variable Annuities with a GMWB rider
    - Longevity Insurance
- Conclusions
- Questions

Key Retiree Risks

Retiree Risks



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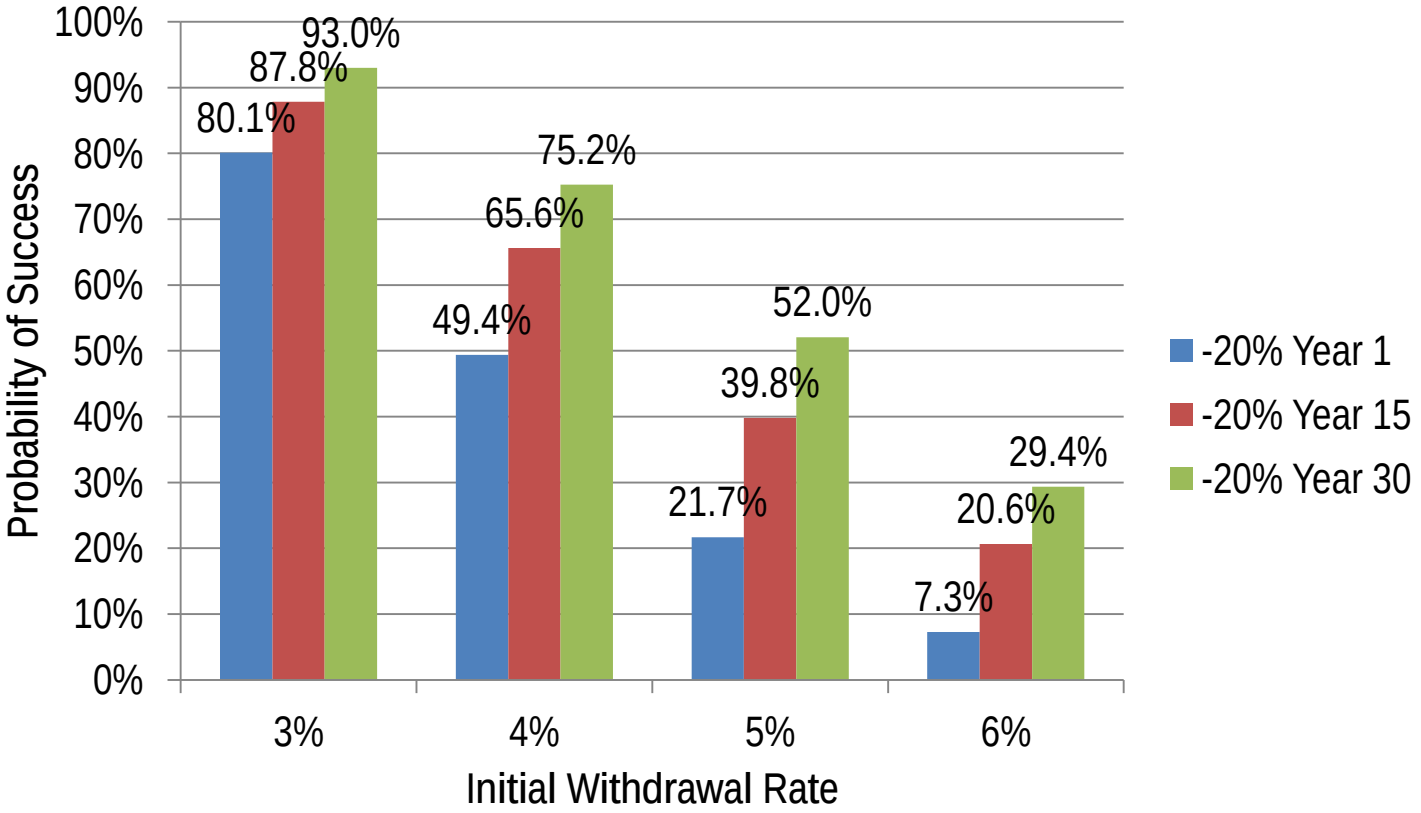
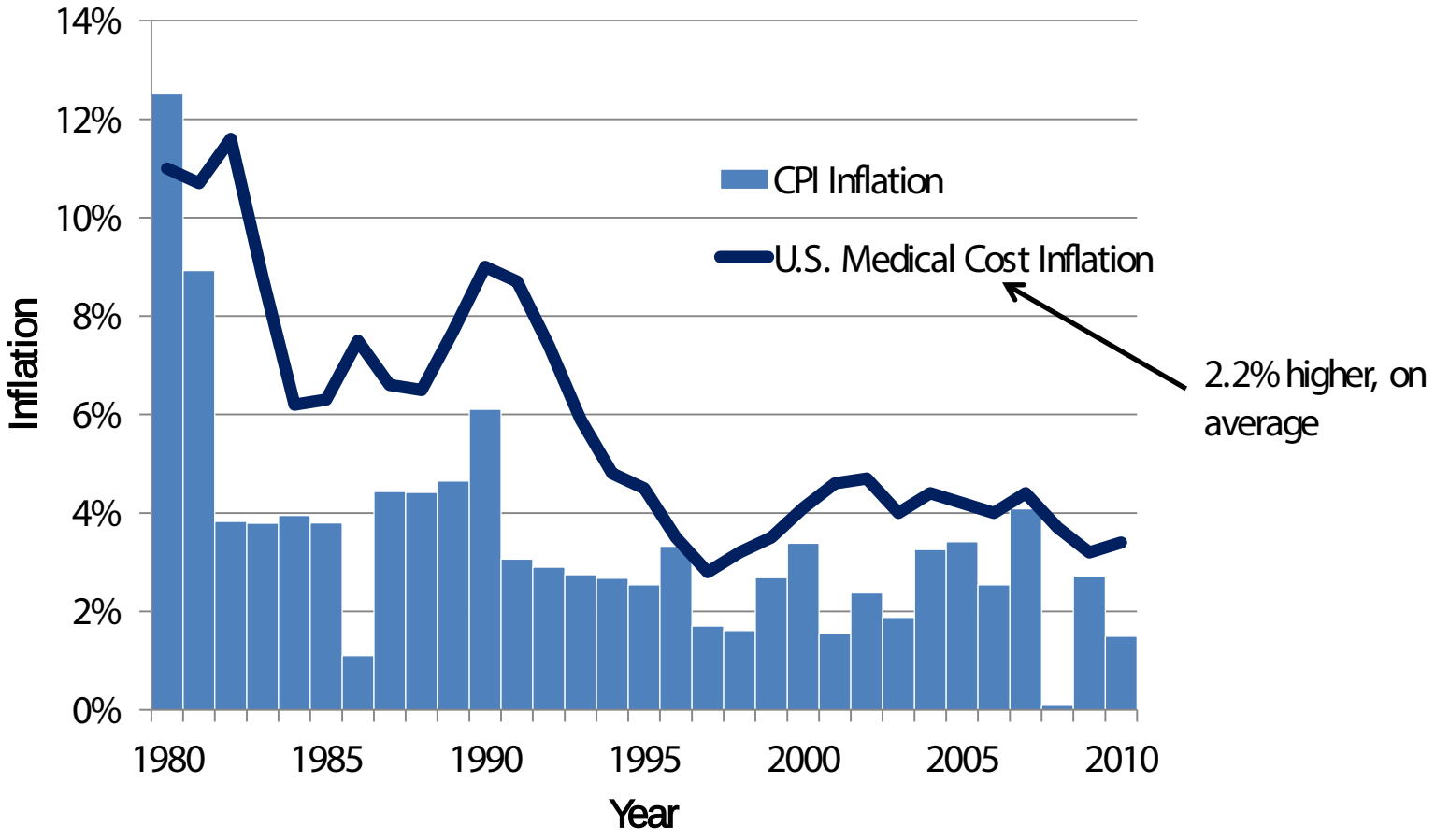
Is Sequence Risk Real?



60% equity, 30% bond, 10% cash portfolio using Ibbotson's 2012 Captial Market Assumptions, assumes a 1% investment management fee

Defining Inflation



Source: Bureau of Labor Statistics. For illustration only.

The Three "Stages" of Retirement

- **Go-Go:** Retirees maintain lifestyle, travel, the group that does not consider themselves "old".

- **Slow-Go:** Between the ages of 70 and 84, brought on by the body saying "Slow Down," 20%-30% budget decline.

- **No-Go:** 85+ , significant changes in retirement lifestyle is generally brought on by health issues.

Source: "The Prosperous Retirement, Guide to the New Reality", Michael Stein

Longevity Risk

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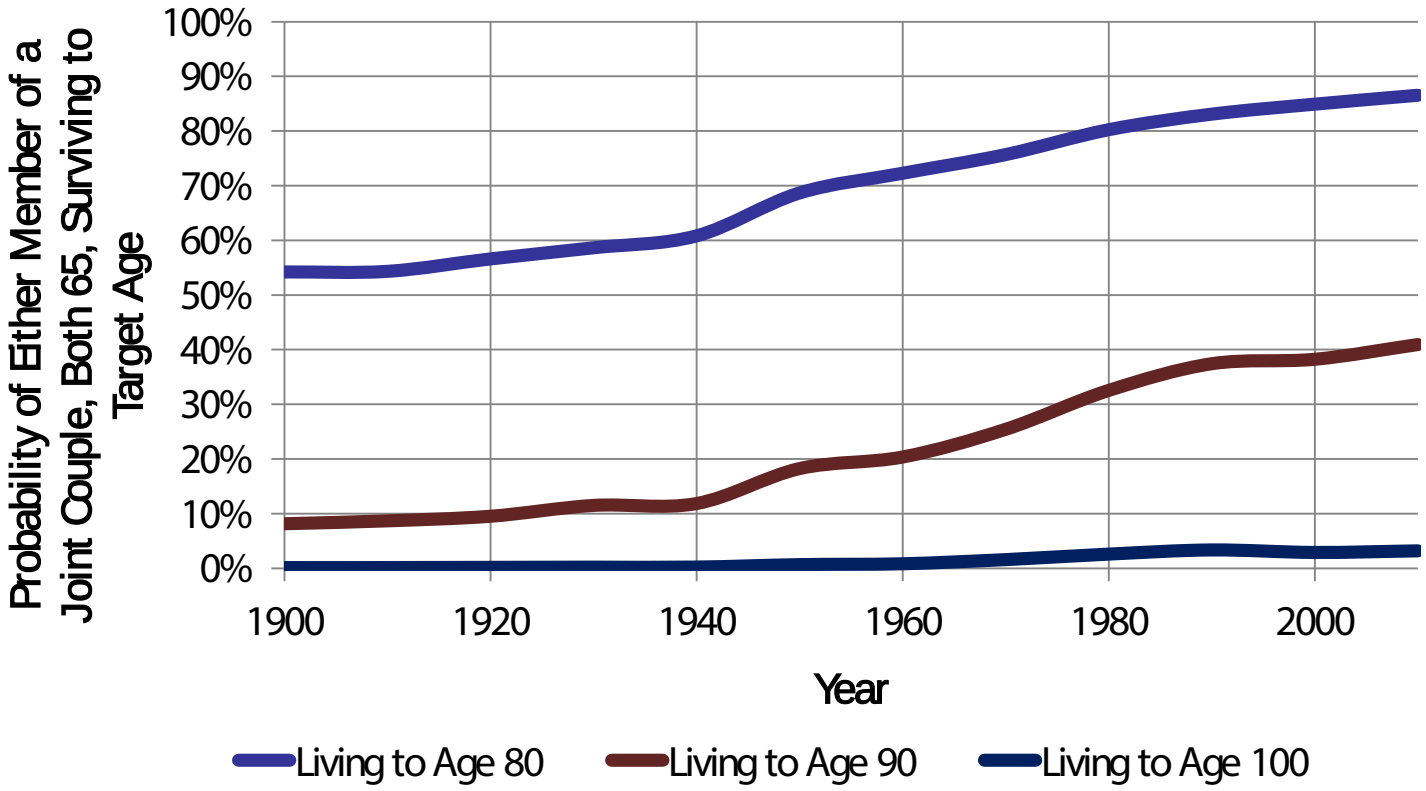
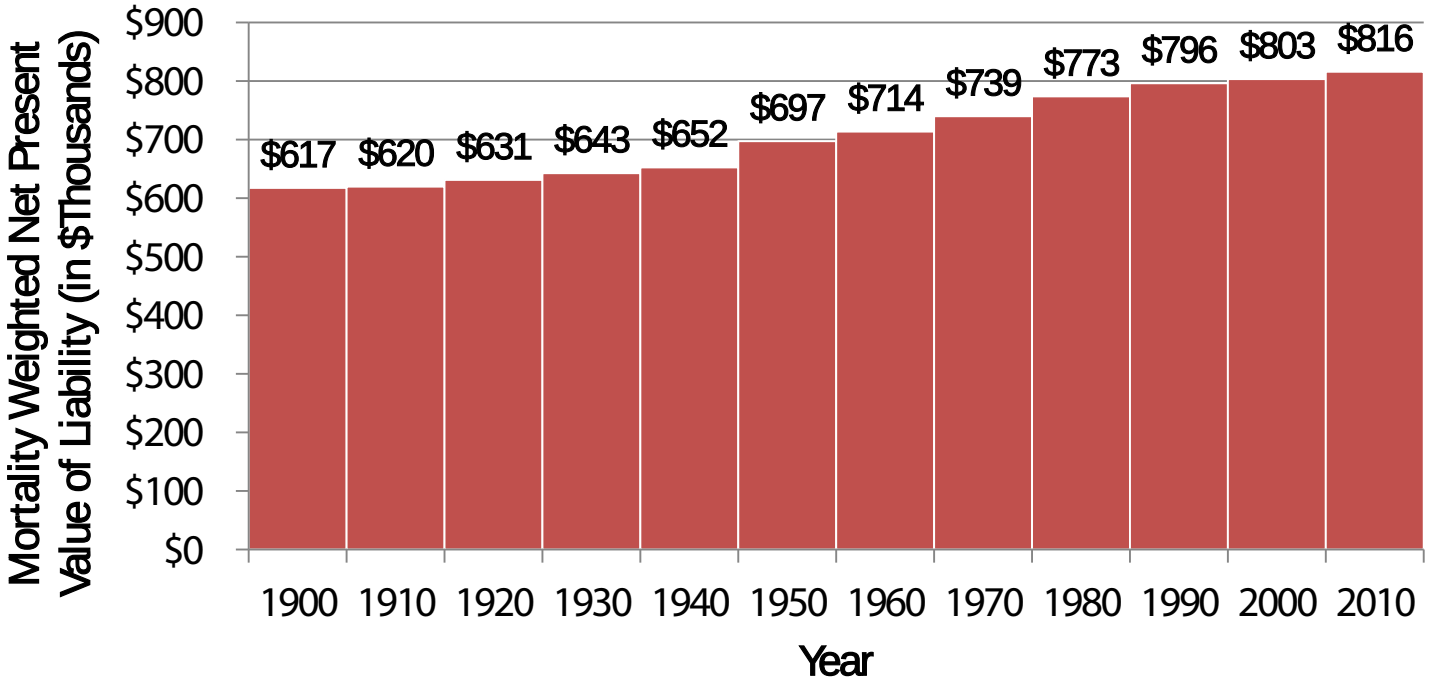
Life Expectancies Keep Increasing



Source: Social Security Administration. For illustration only.

Increasing Cost of Funding Retirement



Source: Social Security Administration, author's calculations. For illustration only.

Defining "Average" Life Expectancy

- Different implications for different people. For example, chain smokers probably don't buy too many annuities…

Annuity 2000 Table

Death Age (Neither Alive)	Current Joint Age 65	70	75	80	85	90
75	98%	99%				
80	94%	96%	98%			
85	84%	86%	90%	95%		
90	63%	65%	69%	76%	88%	
95	36%	37%	40%	45%	55%	76%
100	14%	15%	16%	18%	23%	34%
105	3%	3%	4%	4%	5%	8%
110	0%	0%	0%	0%	0%	1%

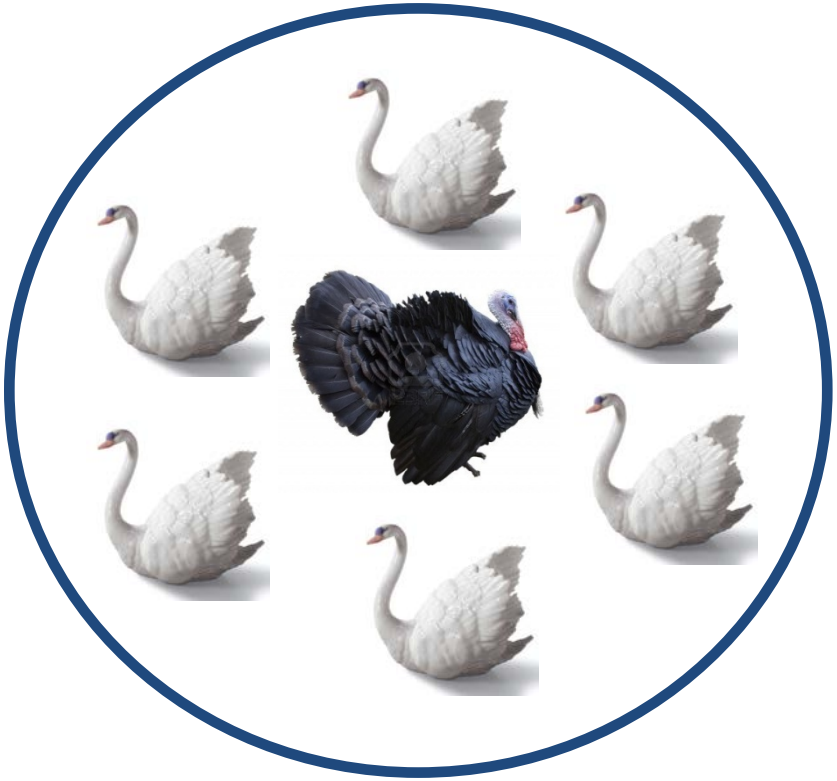
SSA Periodic 2007 Life Table

Death Age (Neither Alive)	Current Joint Age 65	70	75	80	85	90
75	96%	99%				
80	88%	92%	96%			
85	72%	76%	82%	91%		
90	45%	48%	53%	62%	79%	
95	18%	19%	21%	26%	35%	58%
100	4%	4%	4%	5%	7%	13%
105	0%	0%	0%	1%	1%	1%
110	0%	0%	0%	0%	0%	0%

Source: Social Security Administration and Society of Actuaries Annuity 2000 Table. For illustration only.

Inefficient Retirement Planning

Defined Benefit Plans



401(k) Plans

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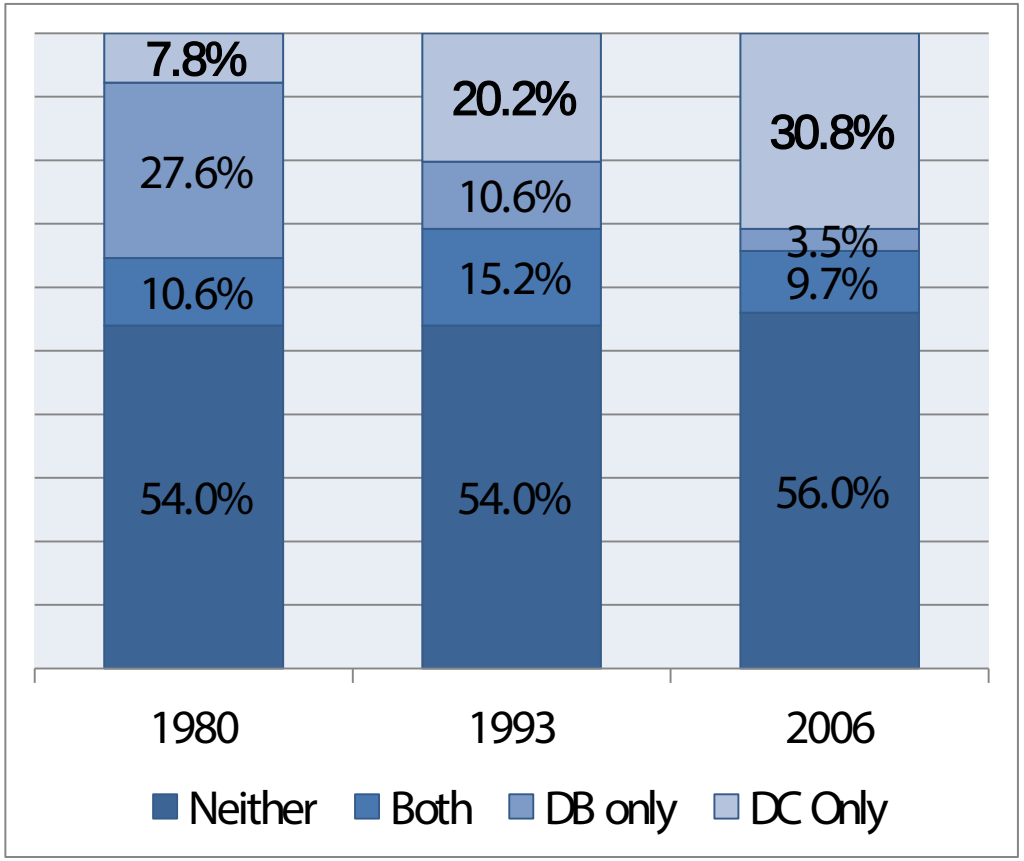
Decline of the DB Plan



Sources: "Notes," February 2009, Vol. 30, No. 2, www. ebri.org and "The Financial Crisis and Private Defined Benefit Plans," Center for Retirement Research at Boston College, November 2008.

The Annuity Puzzle

Who Cares About Lifetime Income?

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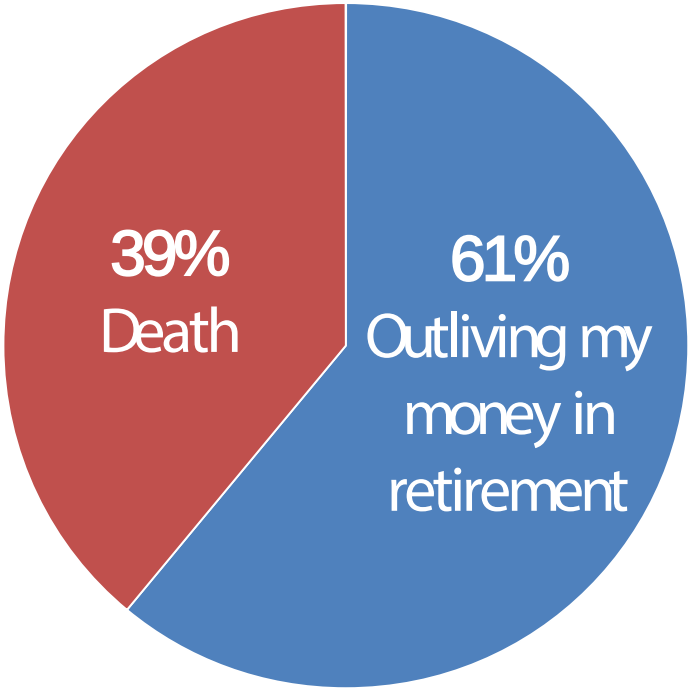
Which Do You Fear the More?



Source: https://www.allianzlife.com/content/public/Literature/Documents/ent-1154.pdf

The Puzzle

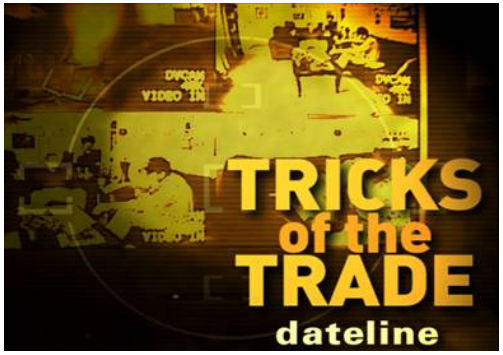
- In his Nobel acceptance speech given in 1985, Franco Modigliani (1986) drew attention to the "annuitization puzzle." He said: "It is a well-known fact that annuity contracts, other than in the form of group insurance through pension systems, are extremely rare. Why this should be so is a subject of considerable current interest. It is still ill-understood."

- Yaari (1965) originally noted that that under some specific assumptions rational individuals with no bequest motive should convert all of their retirement wealth to an annuity at retirement.

Source: Modigliani, Franco. 1986. "Life Cycle, Individual Thrift, and the Wealth of Nations." American Economic Review, 76(3): 297–313.
Yaari, Menachim. 1965. "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer." Review of Economic Studies, 32(2): 137-150.

Why is there a Puzzle?

- A survey conducted by Allianz Life Insurance Company of North America (Allianz Life) noted that more than half (nearly 54%) of Americans aged 44-75 expressed distaste for the word "annuity".
- This is despite the fact 80% of the more than 3,200 surveyed preferred a product with four percent return and a guarantee against losing value over a product with eight percent return and subject to market risk.



Source: https://www.allianzlife.com/content/public/Literature/Documents/ent-1154.pdf

Research Perspectives

Portfolio Withdrawal Strategies

Annuities

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A Cost Framework

Do You Feel Lucky?

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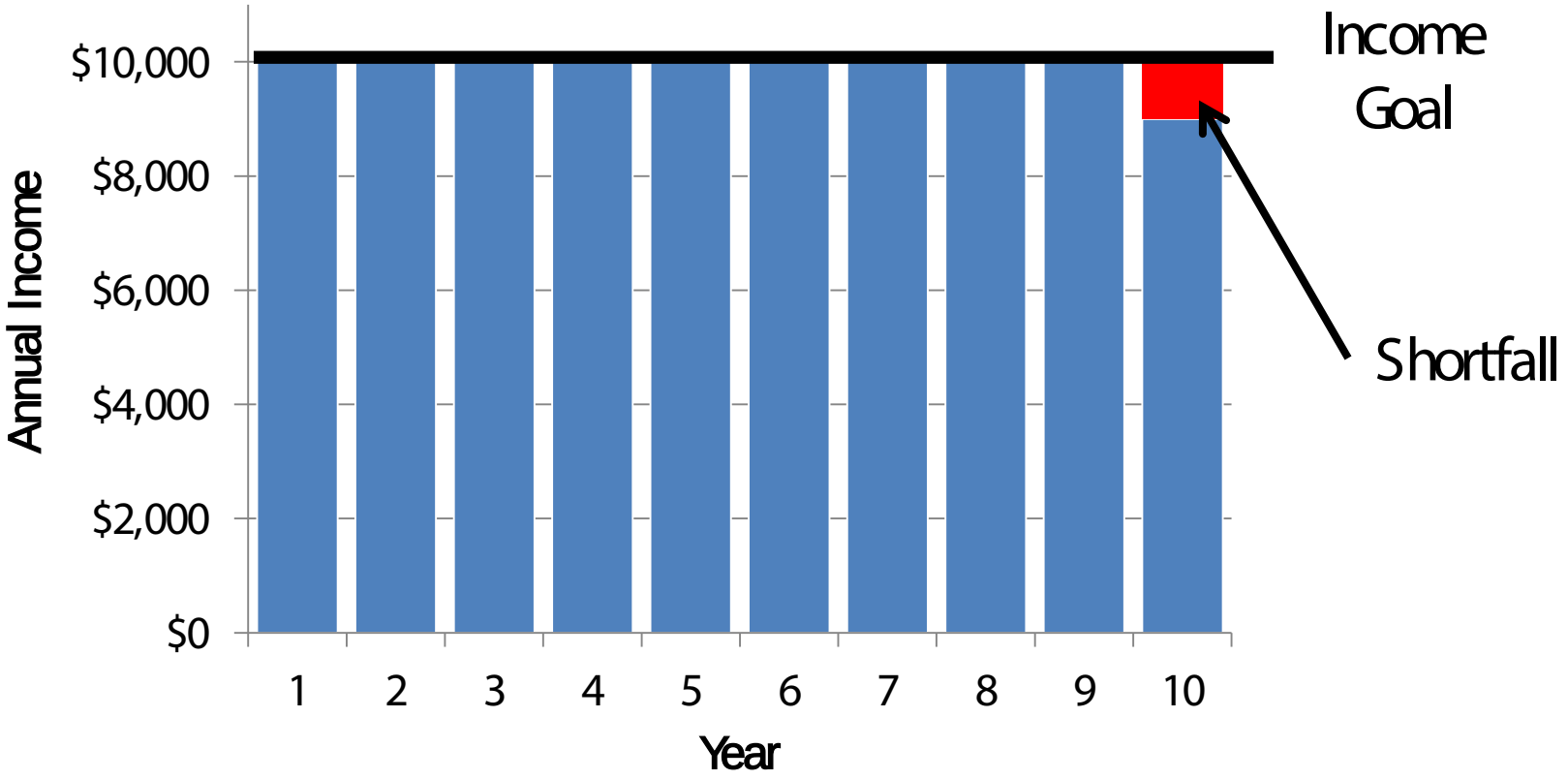
Defining "Failure" for a Retiree

- You can achieve 99% of your goal and still "fail"



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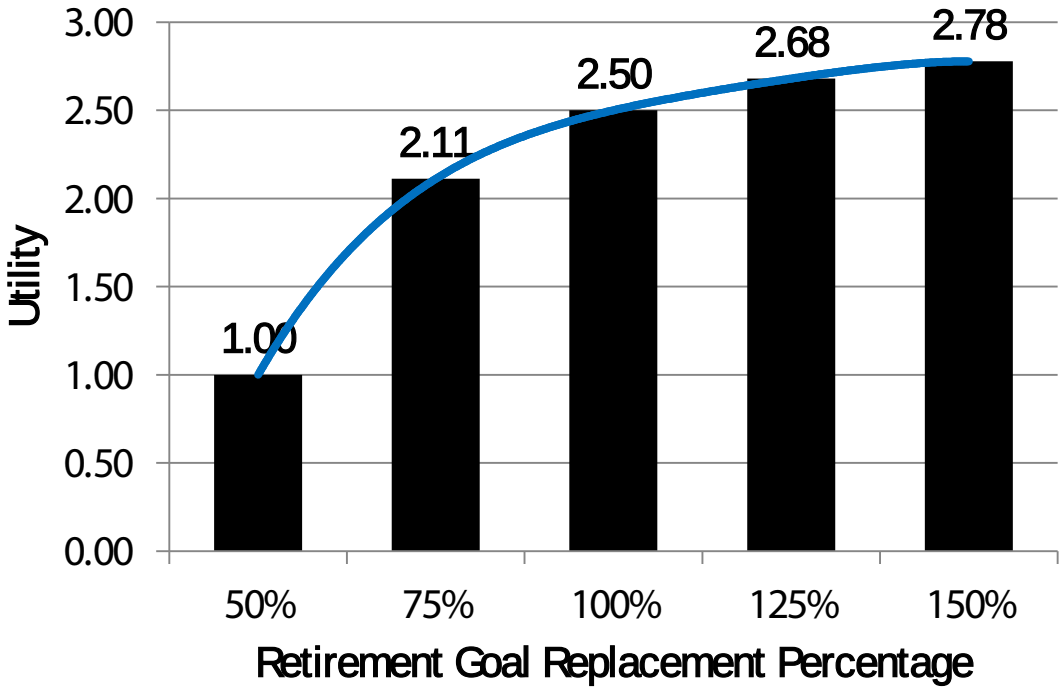
Using Utility to Estimate Retiree Preferences

- Goal is to maximize the total income replaced during retirement.
- Excess income is good, but a shortfall is penalized more:

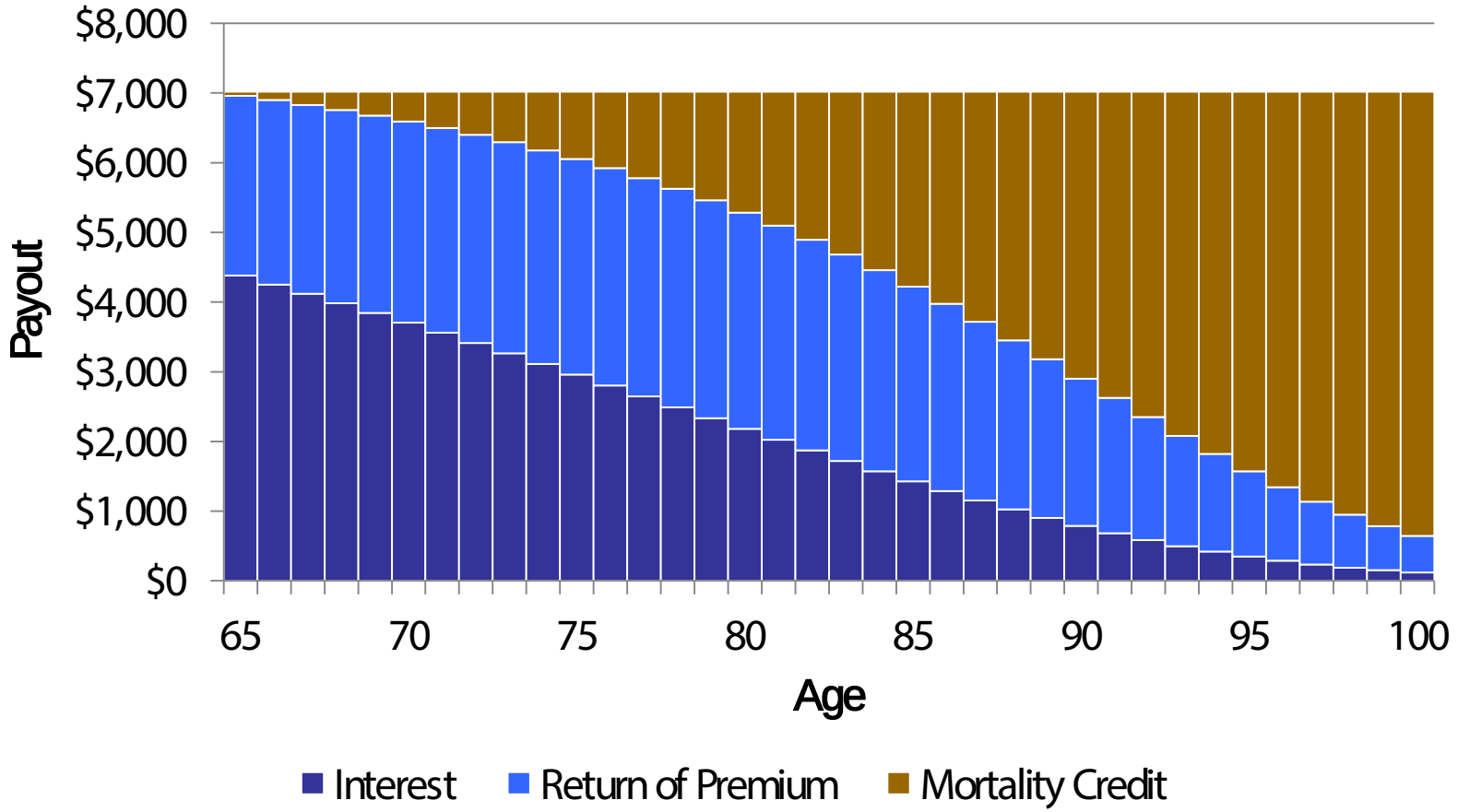


Source: Author's calculations. For illustration only.

Mortality Premium

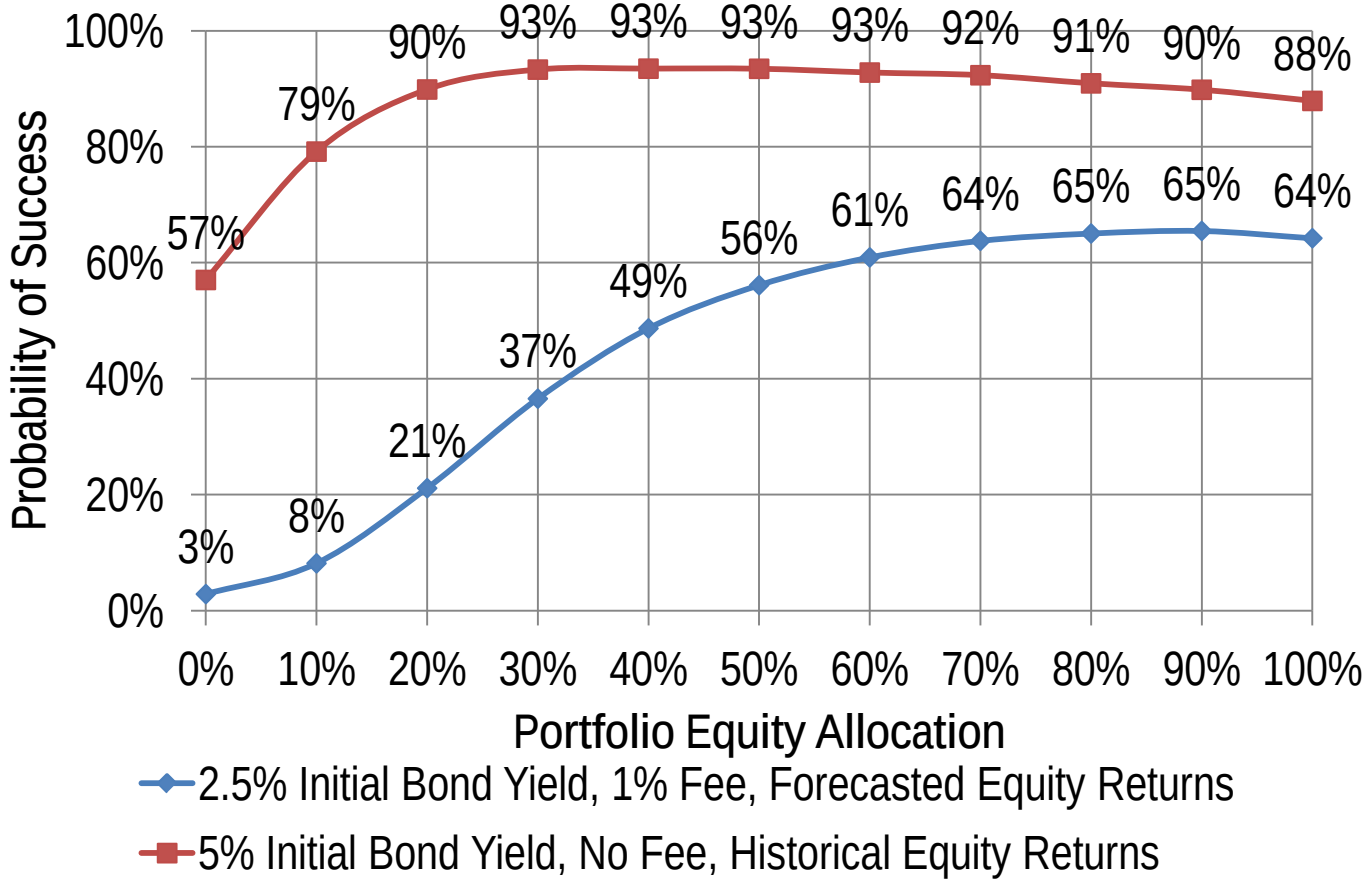
- Suppose you only care about your own utility, and you do not know how long you are going to live. You can either invest your money in a bond or buy an annuity.
- Yaari (1965) shows that by buying an annuity you assure yourself a higher level of consumption in every year that you live, compared to holding the bond. The reason is that those who die early subsidize those who live a long time. In the literature, this is called the "**mortality premium**."

Visualizing the Mortality Premium for an Immediate Fixed Annuity



Source: http://www.immediateannuities.com/information/rates.html and author's calculations

This Time IS Different



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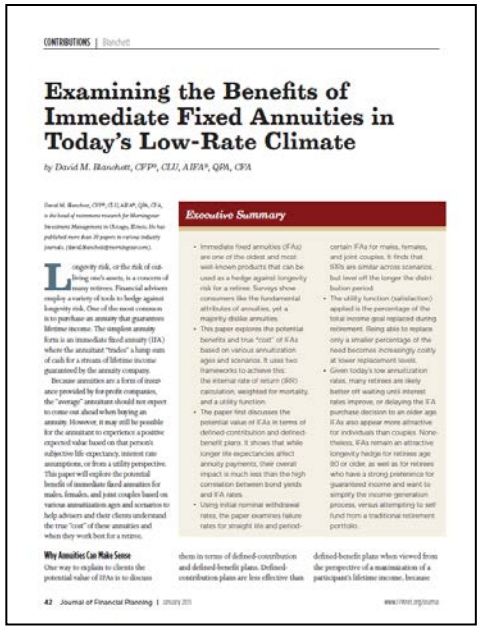
Immediate Fixed Annuities



CONTRIBUTIONS | Blanchett

Examining the Benefits of Immediate Fixed Annuities in Today's Low-Rate Climate

by David M. Blanchett, CFP®, CLU, AIFA®, QPA, CFA

Executive Summary

- Immediate fixed annuities (IFAs) are one of the oldest and most well-known products that can be used as a hedge against longevity risk for a retiree. Surveys show consumers like the fundamental attributes of annuities, yet a majority dislike annuities.
- This paper explores the potential benefits and true "cost" of IFAs based on various annuitization ages and scenarios. It uses two frameworks to achieve this: the internal rate of return (IRR) calculation, weighted for mortality, and a utility function.
- The paper first discusses the potential value of IFAs in terms of defined-contribution and defined-benefit plans. It shows that while longer life expectancies affect annuity payments, their overall impact is much less than the high correlation between bond yields and IFA rates.
- Using initial nominal withdrawal rates, the paper examines failure rates for straight life and period-certain IFAs for males, females, and joint couples. It finds that IRRs are similar across scenarios, but level off the longer the distribution period.
- The utility function (satisfaction) applied is the percentage of the total income goal replaced during retirement. Being able to replace only a smaller percentage of the need becomes increasingly costly at lower replacement levels.
- Given today's low annuitization rates, many retirees are likely better off waiting until interest rates improve, or delaying the IFA purchase decision to an older age. IFAs also appear more attractive for individuals than couples. Nonetheless, IFAs remain an attractive longevity hedge for retirees age 80 or older, as well as for retirees who have a strong preference for guaranteed income and want to simplify the income generation process, versus attempting to self-fund from a traditional retirement portfolio.

Longevity risk, or the risk of outliving one's assets, is a concern of many retirees. Financial advisers employ a variety of tools to hedge against longevity risk. One of the most common is to purchase an annuity that guarantees lifetime income. The simplest annuity form is an immediate fixed annuity (IFA) where the annuitant "trades" a lump sum of cash for a stream of lifetime income guaranteed by the annuity company.

Because annuities are a form of insurance provided by for-profit companies, the "average" annuitant should not expect to come out ahead when buying an annuity. However, it may still be possible for the annuitant to experience a positive expected value based on that person's subjective life expectancy, interest rate assumptions, or from a utility perspective. This paper will explore the potential benefits of immediate fixed annuities for males, females, and joint couples based on various annuitization ages and scenarios to help advisers and their clients understand the true "cost" of these annuities and when they work best for a retiree.

Why Annuities Can Make Sense

One way to explain to clients the potential value of IFAs is to discuss them in terms of defined-contribution and defined-benefit plans. Defined-contribution plans are less effective than defined-benefit plans when viewed from the perspective of a maximization of a participant's lifetime income, because

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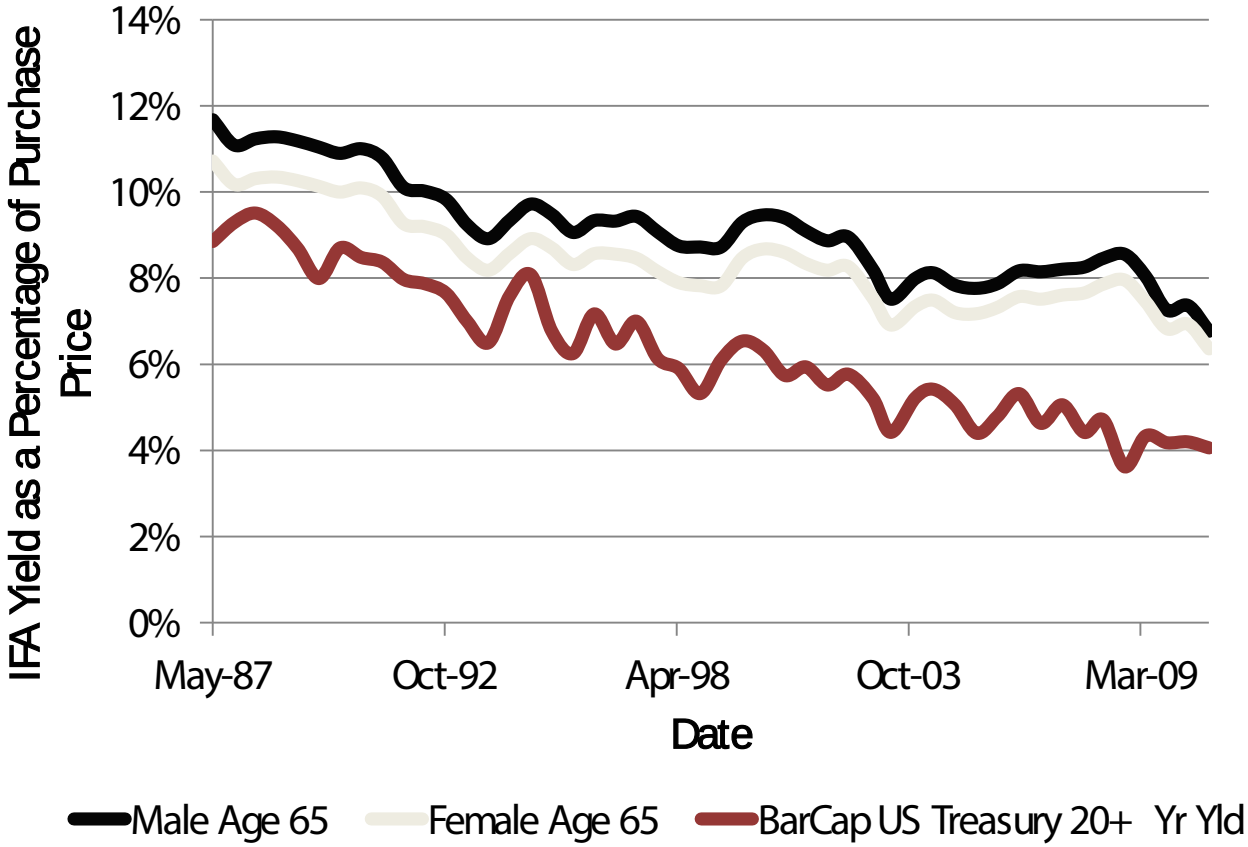
A Brief History of Immediate Fixed Annuities (IFAs)

- Immediate fixed annuities (IFAs) are not a "new" financial innovation
- Romans sold financial instruments called "annual" that returned a fixed yearly payment, either for life or a specified period, in return for a lump sum payment
- The Roman Domitius Ulpianus was one of the first annuity dealers and is credited with creating the first life expectancy table
- In the Middle Ages an annuity called the "tontine" existed, where participants purchased a share of an annuity, and as the participants in the pool passed away the share received by each survivor would increase, with the last survivor receiving the remaining principal

Source: http://www.immediateannuities.com/annuitymuseum/historyofannuities/

Historical IFA Rates



Source: http://www.immediateannuities.com and Morningstar Direct

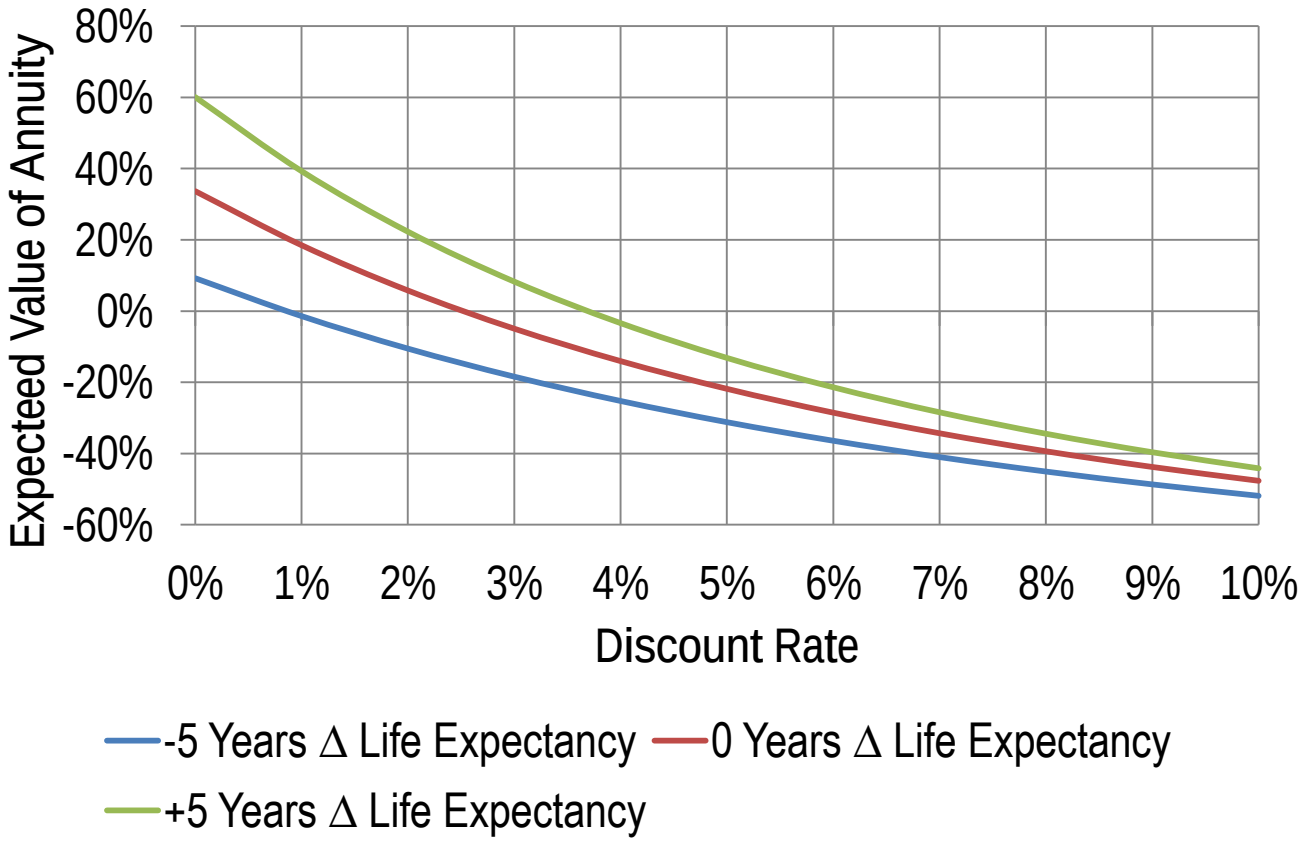
Current IFA Rates

Life Income Payment Percentage, No Payments to Beneficiaries				
		Male	Female	Joint
Age	60	6.28%	5.87%	5.51%
	65	7.02%	6.47%	5.96%
	70	8.04%	7.31%	6.65%
	75	9.53%	8.73%	7.68%
	80	11.90%	10.87%	9.35%
	85	15.17%	14.27%	11.70%
	90	20.10%	19.34%	14.51%

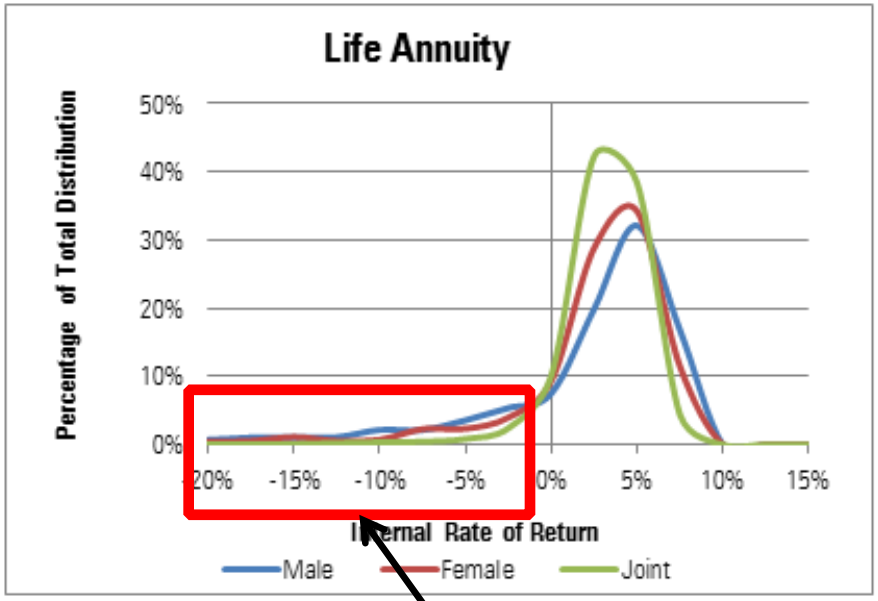
Life Income Payment Percentage, 10 Year Period Certain				
		Male	Female	Joint
Age	60	6.15%	5.86%	5.62%
	65	6.75%	6.32%	5.88%
	70	7.46%	7.01%	6.59%
	75	8.33%	7.93%	7.45%
	80	9.30%	8.96%	8.51%
	85	10.08%	9.95%	9.45%
	90	10.66%	10.49%	9.86%

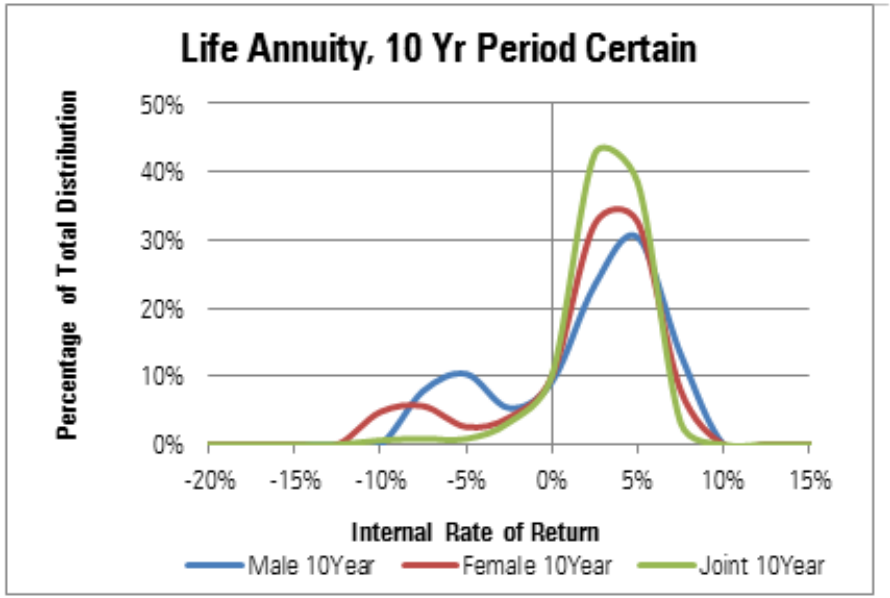
Source: http://www.immediateannuities.com, quotes as of 02/27/2012

Mortality Weighted Net Present Value



Distribution of IRRs





"Cost" of dying early into the contract

Source: Author's calculations based on a 65 year old individual or couple. For illustration only.

Spread Between Median and Geometric Mean Returns

Male Age 65			
IFA Rate	Geo Return	Med Return	Std Dev
6.5%	-5.2%	3.4%	15.6%
7.0%	-4.2%	4.2%	15.4%
7.5%	-3.3%	4.9%	15.3%
8.0%	-2.4%	5.6%	15.2%
8.5%	-1.6%	6.3%	15.1%

Female Age 65			
IFA Rate	Geo Return	Med Return	Std Dev
6.0%	-2.8%	3.1%	12.6%
6.5%	-1.8%	3.9%	12.5%
7.0%	-1.0%	4.6%	12.3%
7.5%	-0.1%	5.3%	12.2%
8.0%	0.7%	6.0%	12.1%

Joint Age 65			
IFA Rate	Geo Return	Med Return	Std Dev
5.5%	2.1%	3.2%	4.0%
6.0%	2.9%	3.9%	3.9%
6.5%	3.7%	4.7%	3.8%
7.0%	4.4%	5.3%	3.7%
7.5%	5.1%	6.0%	3.6%

Current SPIA Rates

"Average" person will achieve a 4.2% return, the "average" compounded return, is -4.2% (don't die young)

Source: Author's calculations. For illustration only.

Optimal Portfolio Allocation: Current Rates

- Very low utilization based on current annuitization/interest rates
- Better for males and females versus couples
- Works for older ages (80)

Optimal Allocation to a Life Only Immediate Fixed Annuity: Current IFA Rates

Initial Fixed Withdrawal%	Male Age 60	65	70	75	80
3%	0%	0%	0%	30%	60%
4%	0%	0%	0%	30%	60%
5%	0%	0%	0%	30%	60%
6%	0%	0%	0%	30%	60%
7%	0%	0%	0%	20%	60%
8%	0%	0%	0%	10%	60%

Initial Fixed Withdrawal%	Female Age 60	65	70	75	80
3%	0%	0%	0%	0%	50%
4%	0%	0%	0%	0%	50%
5%	0%	0%	0%	0%	50%
6%	0%	0%	0%	0%	50%
7%	0%	0%	0%	0%	50%
8%	0%	0%	0%	0%	40%

Initial Fixed Withdrawal%	Joint Age 60	65	70	75	80
3%	0%	0%	0%	0%	20%
4%	0%	0%	0%	0%	20%
5%	0%	0%	0%	0%	20%
6%	0%	0%	0%	0%	10%
7%	0%	0%	0%	0%	0%
8%	0%	0%	0%	0%	0%

Source: Author's calculations. For illustration only.

Optimal Portfolio Allocation: Current Rates + 100 bps

- Considerably more attractive if IFA rates increase by 100 bps
- Same general theme, better for individuals versus couples
- Works now at age 70

Optimal Allocation to a Life Only Immediate Fixed Annuity: Current IFA Rates + 100 bps

Initial Fixed Withdrawal%	Male Age 60	65	70	75	80
3%	10%	30%	50%	60%	70%
4%	0%	30%	50%	60%	70%
5%	0%	20%	50%	60%	70%
6%	0%	10%	40%	60%	70%
7%	0%	0%	40%	60%	80%
8%	0%	0%	30%	60%	80%

Initial Fixed Withdrawal%	Female Age 60	65	70	75	80
3%	0%	10%	30%	50%	70%
4%	0%	0%	30%	50%	70%
5%	0%	0%	20%	60%	70%
6%	0%	0%	10%	50%	70%
7%	0%	0%	10%	50%	70%
8%	0%	0%	0%	40%	70%

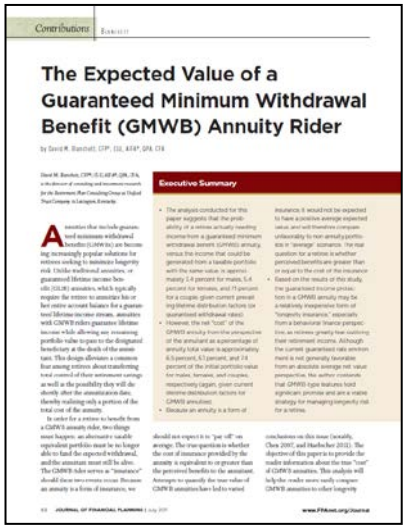
Initial Fixed Withdrawal%	Joint Age 60	65	70	75	80
3%	0%	0%	10%	40%	70%
4%	0%	0%	0%	40%	70%
5%	0%	0%	0%	40%	70%
6%	0%	0%	0%	30%	70%
7%	0%	0%	0%	10%	70%
8%	0%	0%	0%	10%	60%

Source: Author's calculations. For illustration only.

Immediate Fixed Annuities: Parting Thoughts

- These can be excellent solutions when the fit is right
- Given current interest/annuitization rates, the cost of the longevity protection is relatively "expensive"
- Regardless of rates (whether or not they rise), IFAs become increasingly attractive at older ages
- Might be best to wait and see if/when rates increase

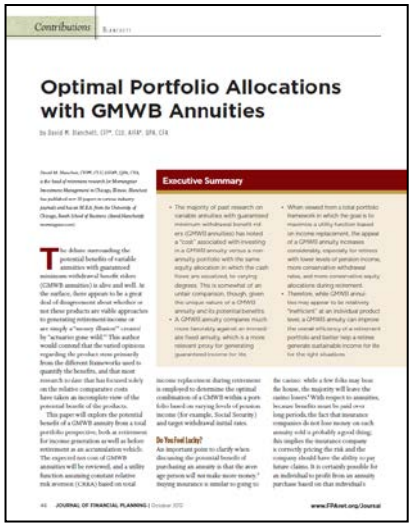
Variable Annuity with a GLWB/GMWB Rider



Contributions

The Expected Value of a Guaranteed Minimum Withdrawal Benefit (GMWB) Annuity Rider

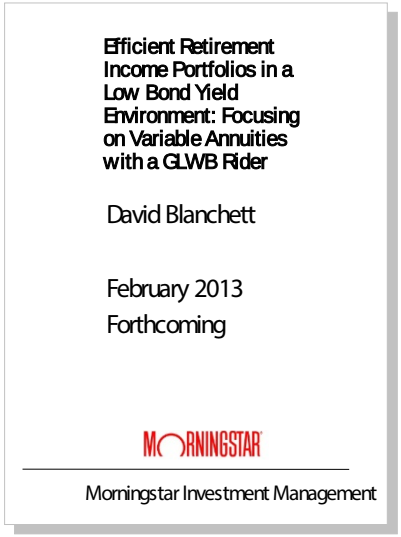
Executive Summary



Contributions

Optimal Portfolio Allocations with GMWB Annuities

Executive Summary



Efficient Retirement Income Portfolios in a Low Bond Yield Environment: Focusing on Variable Annuities with a GLWB Rider

David Blanchett

February 2013

Forthcoming

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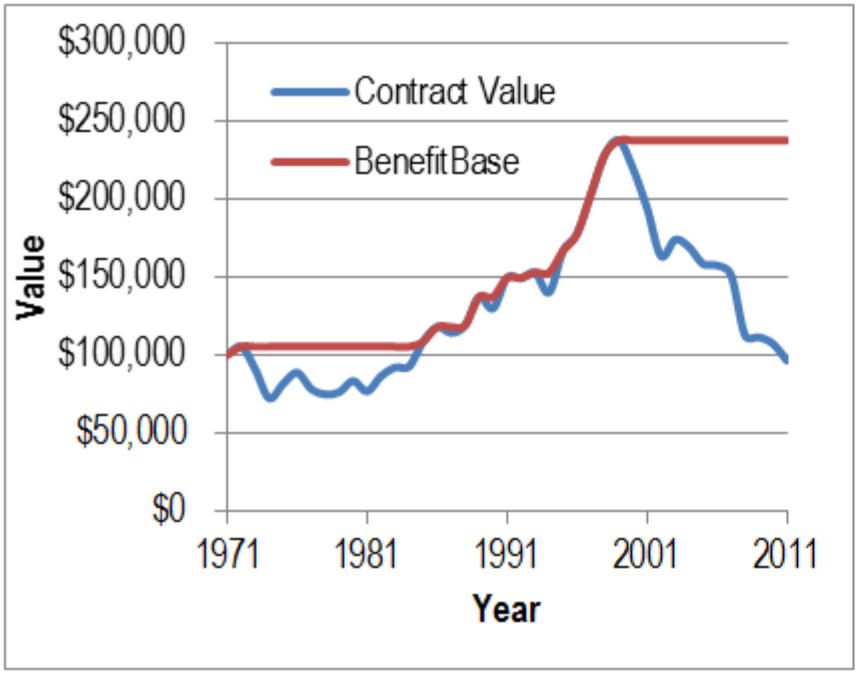
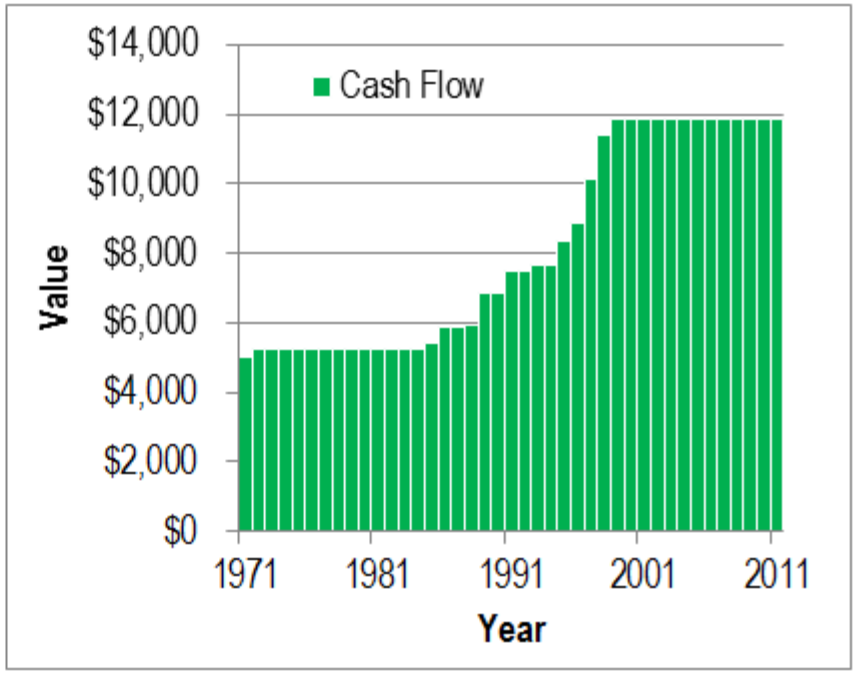
How a GMWB Annuity Works: Example





Quantifying the Payoff

- Potential benefit of GMWB annuity has been called a "money illusion[1]" created by "actuaries gone wild[2]"
- Easiest "casino" analysis is to compare the difference the net present value of the differences in the values of the GMWB annuity an outside portfolio at death, plus the net present value of any additional cash flows generated from the GMWB annuity that could be achieved from the outside portfolio.

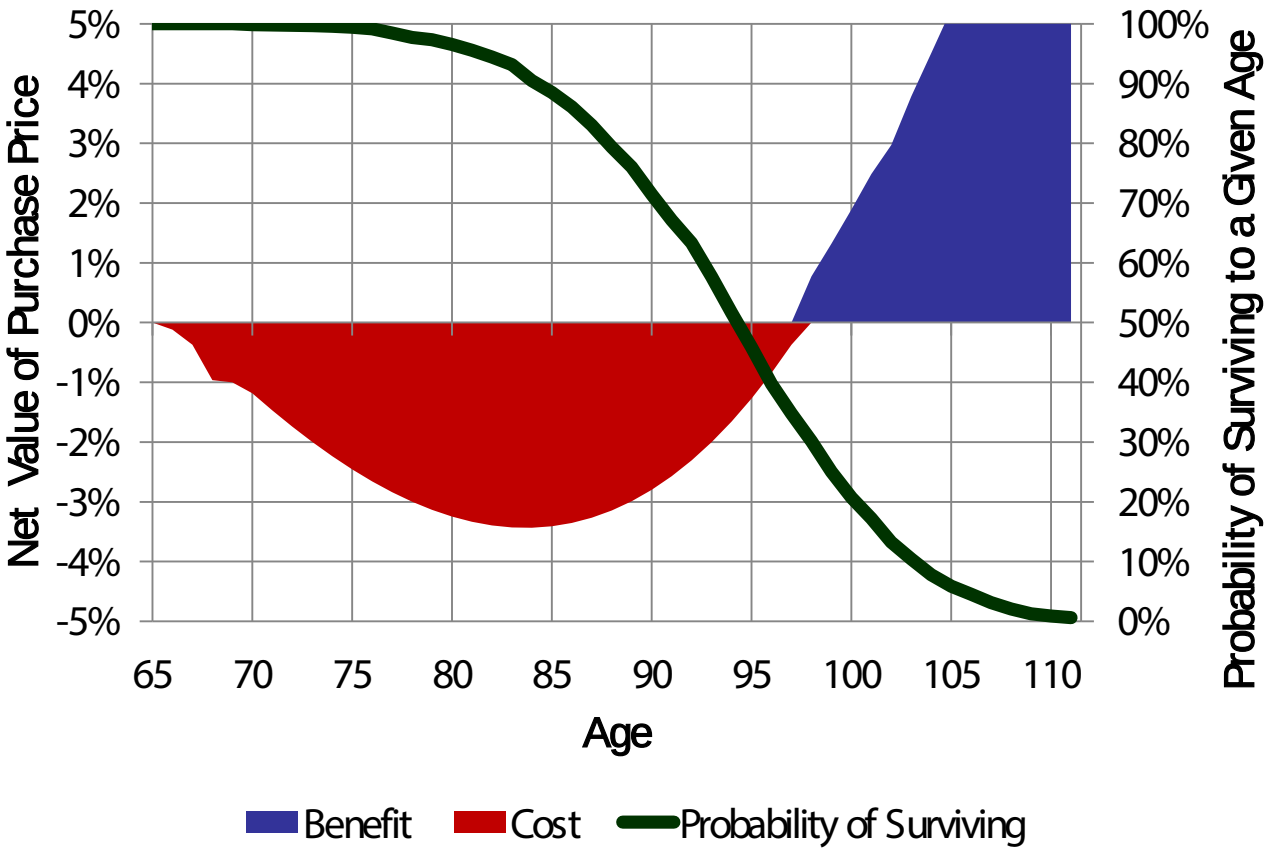
1. Pfau, Wade. 2011. http://www.advisorperspectives.com/newsletters11/GLWBs-Retiree_Protection_or_Money_Illusion.php
2. Tomlinson, Joseph. http://www.josephtomlinson.com/Thoughts_on_the_Future_of_Retirement_Income_Products.pdf

Quantifying the Payoff

Comparison Portfolio Equity %		Probability	Average	Percentile		
				Median	25th	5th
	20%	68%	18%	9%	26%	89%
	25%	63%	14%	6%	23%	84%
	30%	58%	11%	5%	19%	67%
	35%	54%	6%	1%	15%	59%
	40%	48%	2%	-2%	11%	44%
	45%	37%	-2%	-5%	7%	32%
	50%	26%	-7%	-9%	3%	23%
	55%	23%	-14%	-14%	-4%	20%
	60%	18%	-20%	-20%	-7%	21%
	65%	20%	-27%	-23%	-8%	20%
	70%	19%	-35%	-26%	-6%	24%

Source: Author's calculations. For illustration only.

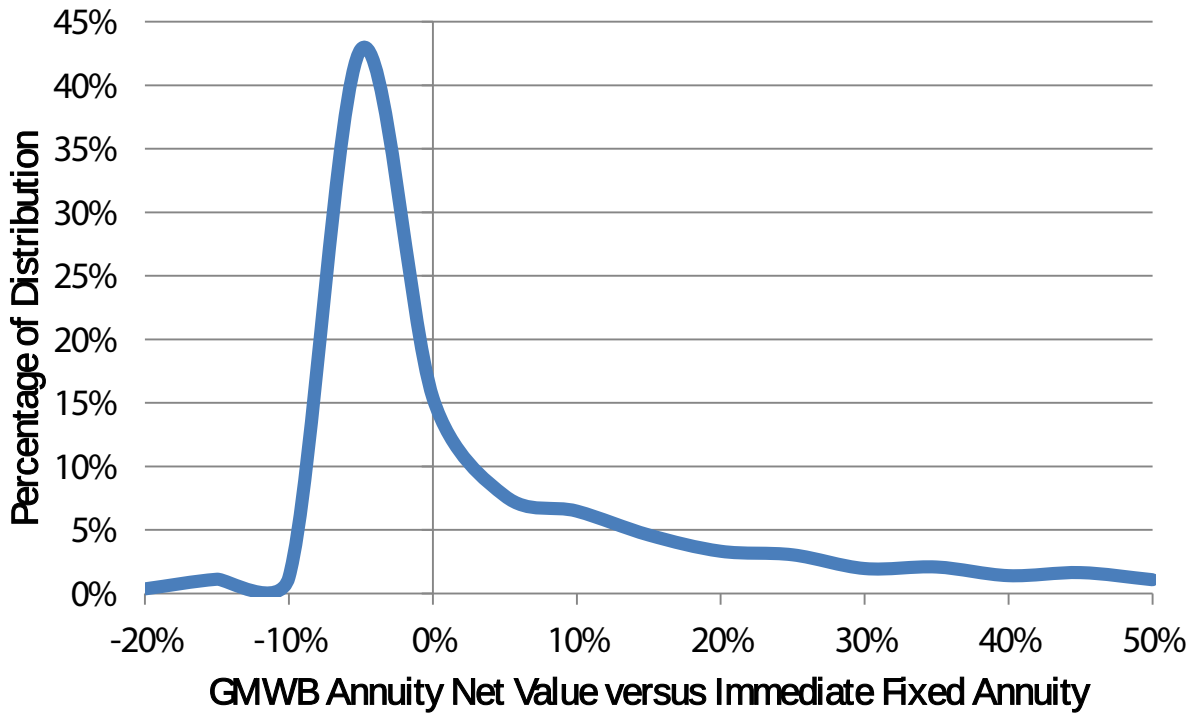
Quantifying the Payoff



Source: Author's calculations. For illustration only.

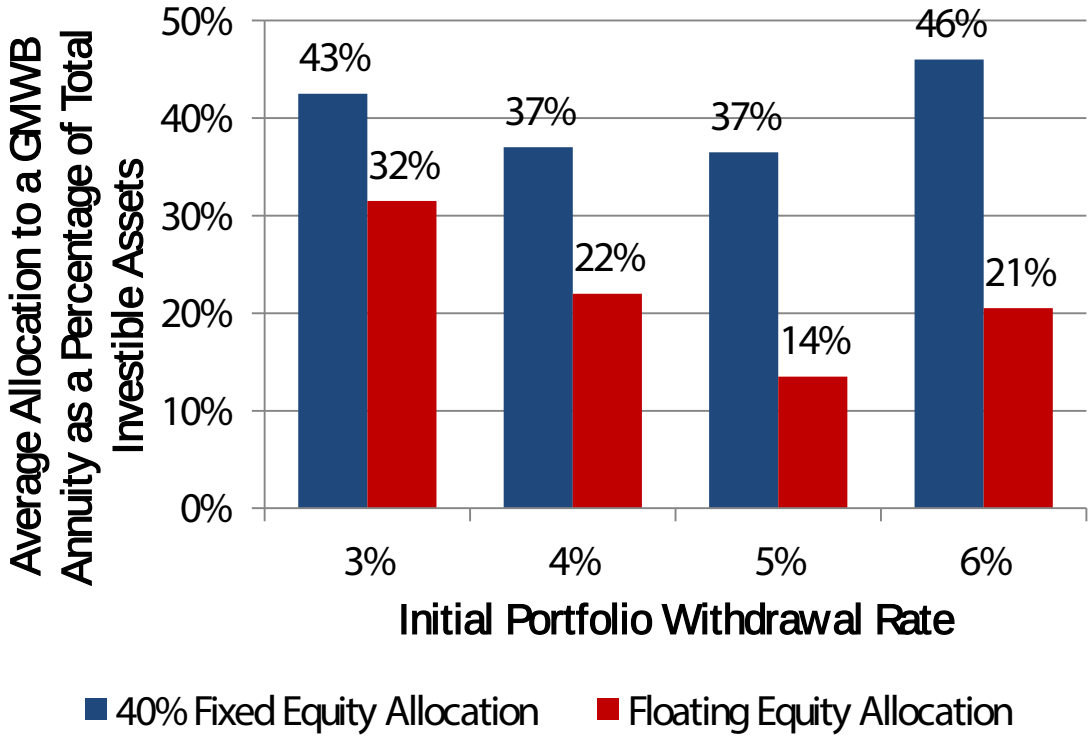
GMWB Annuity versus IFA

- GMWB Annuity + 9.0% net value vs IFA average, -1.5% median



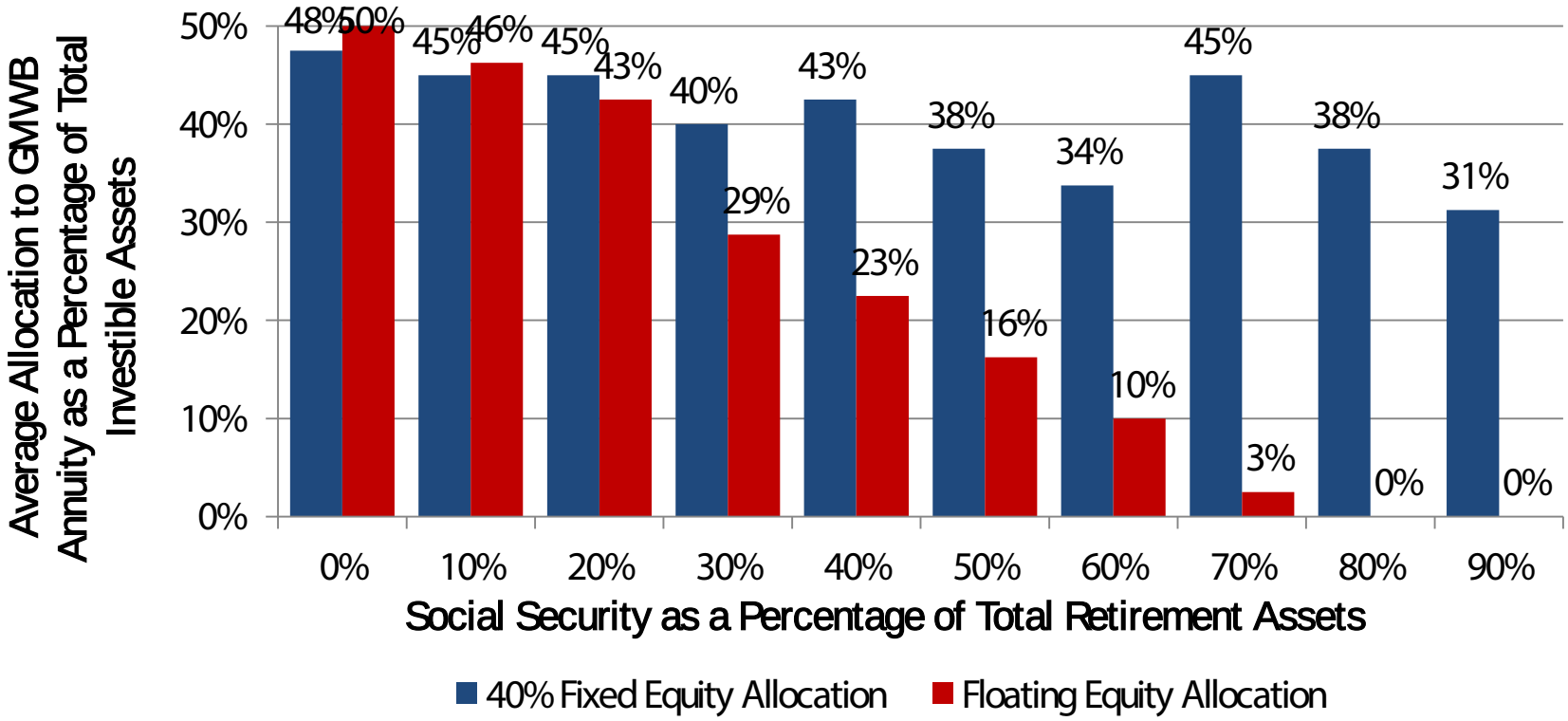
Source: Author's calculations. For illustration only.

Average GMWB Annuity Allocation for Different Initial Withdrawal Rates



Source: Author's calculations. For illustration only.

Average GMWB Annuity Allocation for Different Levels of Pension (Social Security) Income



Source: Author's calculations. For illustration only.

Effective Asset Allocation

- A GMWB annuity can still be attractive for a retiree targeting a more aggressive equity allocation
- Assuming an "effective" asset allocation of 40% for the GMWB annuity, a retiree targeting a 60/40 allocation, and a $500,000 portfolio. Two choices:

  1. $300,000 in stocks, $200,000 in bonds

  2. $250,000 in stocks, $125,000 in bonds, $125,000 in GMWB annuity
- Utility from blended approach is higher

Source: Author's calculations. For illustration only.

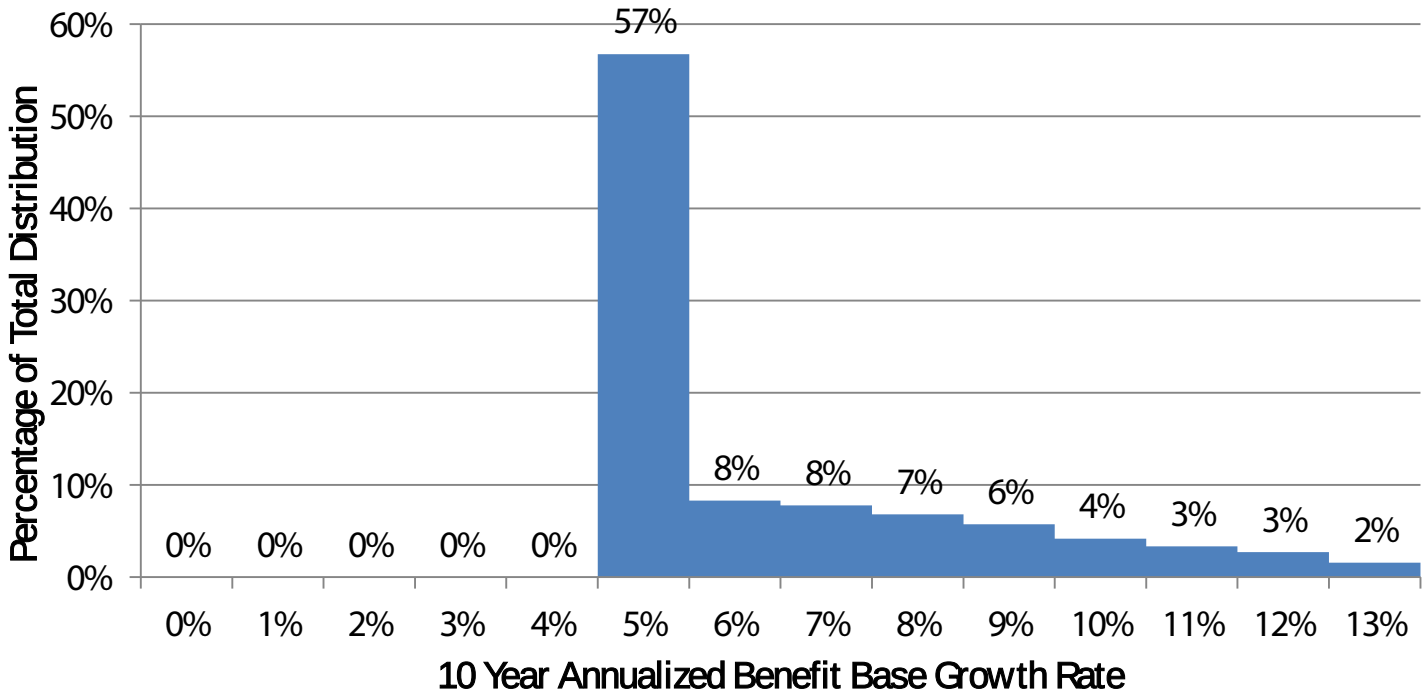
Activating the GMWB Rider During Accumulation

- Many GMWB annuities offer a step-up benefit where the benefit base is assumed to grow at some fixed percentage (e.g., 5%).
- Upon annuitization, if the contract value is less than this guaranteed rate, the distribution factor is based on this value
- Activating the GMWB rider, though, activates the rider fee (~ 110 bps) therefore reducing the growth of the contract value
- Effectively trading the likelihood of a higher benefit base for lower future account value (due to fees)

Source: Author's calculations. For illustration only.

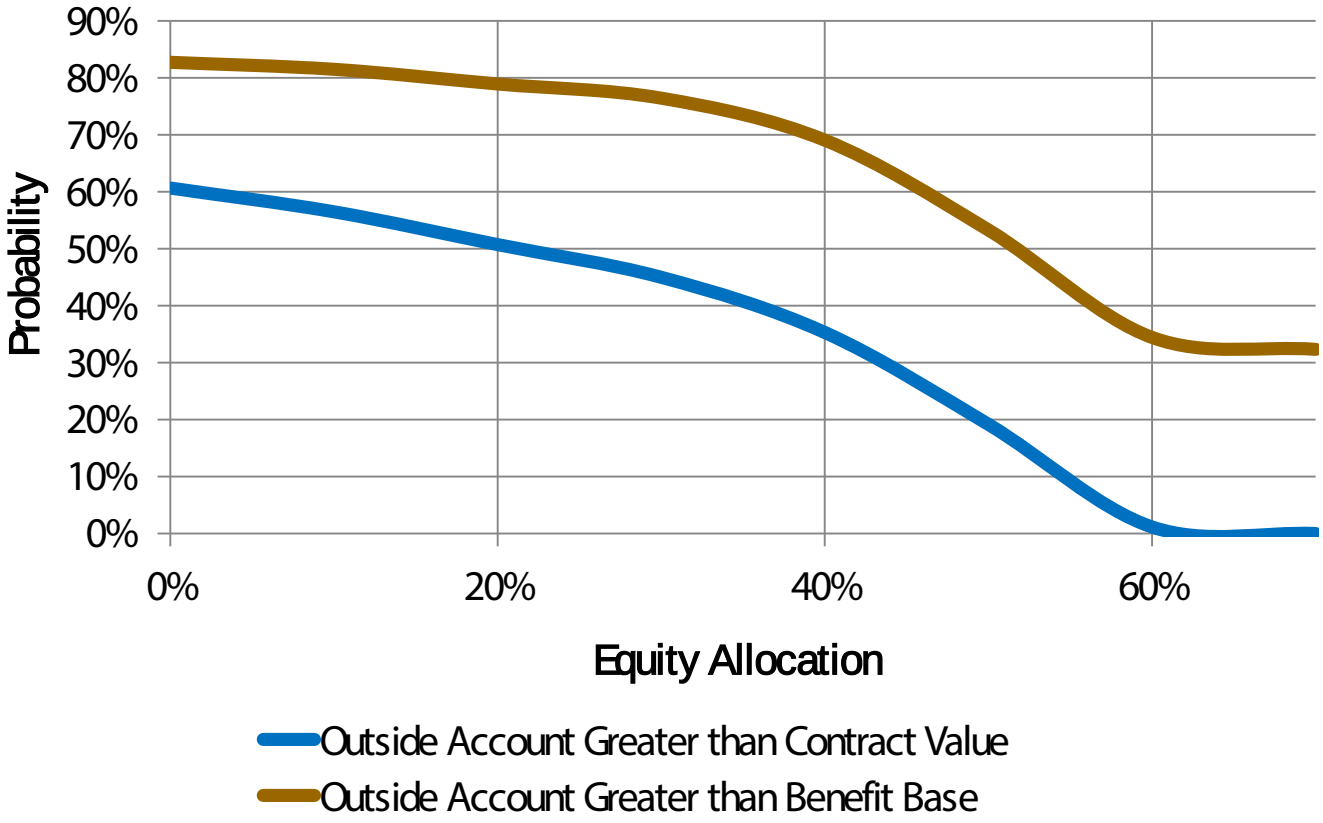
Activating the GMWB Rider During Accumulation

- ~ 50% probability of achieving a higher benefit base over a 10 year period
- Favorable return distribution



Source: Author's calculations. For illustration only.

Activating the GMWB Rider During Accumulation



Source: Author's calculations. For illustration only.

Summary Thoughts on GMWB Annuities

- Not as bad as they are made out to be, but there are "bad apples" out there
- Less affected by low current interest rate environment (like IFAs and longevity insurance)
- Allow a retiree to take on more risk than he or she might without the annuity
- Best for retirees who are going to target a relatively conservative portfolio allocation
- While "inefficient" as an individual product, improves the "retirement income efficient frontier"

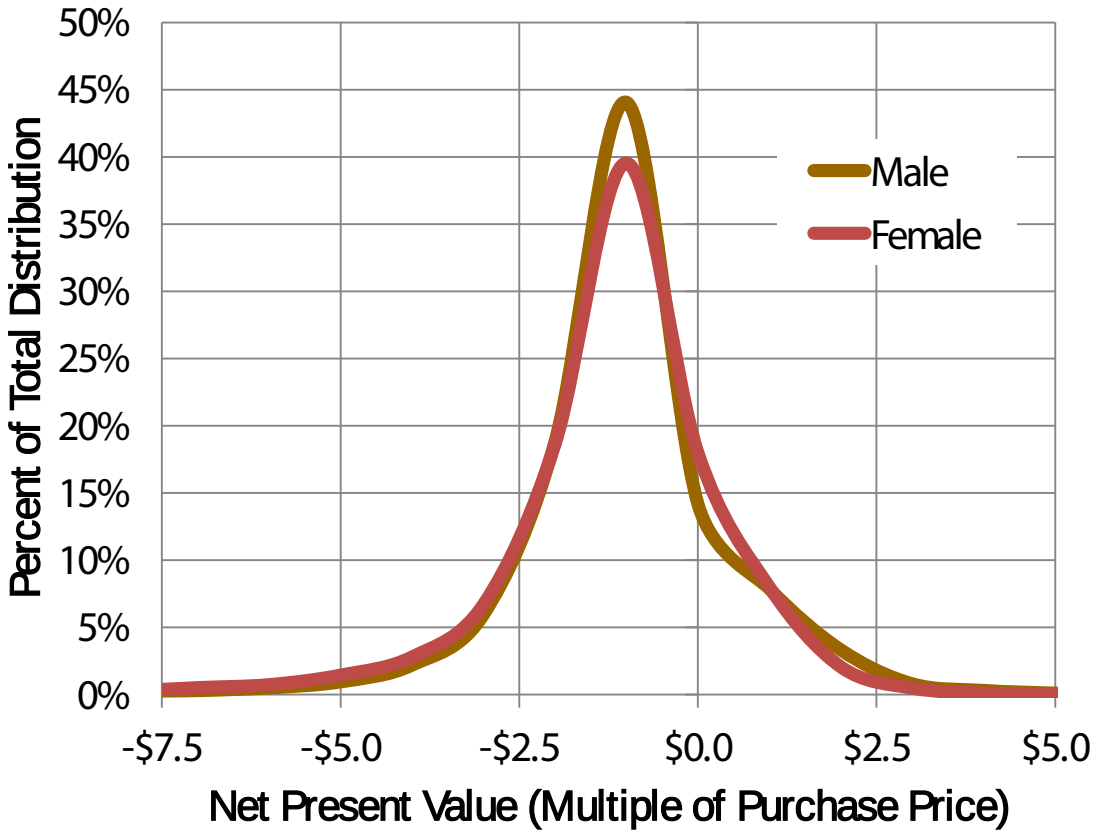
Milevsky, Moshe A. 2007 "Asset Allocation and Guaranteed Living Benefits in Variable Annuities." Retrieved from: http://www.ifid.ca/pdf_workingpapers/WP2007JUNE28_AAVA.pdf

Longevity Insurance

Longevity Insurance

- Guarantees a fixed amount of monthly income that starts in the future and lasts as long as you live (or as long as both you and your spouse or partner lives).
- Features are available with a death benefit or without (e.g., MetLife's Flexible Access versus Maximum Income Version)
- Effectively term life insurance… but in reverse

Longevity Insurance Net Present Value Distribution



Source: Author's calculations. For illustration only.

Longevity Insurance versus an IFA

- Current IFA rate for an 85 year old male and female = ~ 15%
- To create a ~ 60% annual future replacement you will need 4 times the value of the assets in 20 years (assuming IFA rates don't improve). Therefore, you would need $400,000 in 20 years assuming an initial potential purchase of $100,000
- ~ 60% chance you will have $400,000 in an outside portfolio with a 40/60 equity allocation (which would pass 100% to heirs)
- ~ 78% chance you will have $300,000 in an outside (i.e., generate 75% of the required income
- ~ 93% chance you will have $200,000 in an outside (i.e., generate 50% of the required income

Source: Author's calculations. For illustration only.

Longevity Insurance: Parting Thoughts

- These can be excellent solutions when the fit is right
- Requires a lower total allocation to a guaranteed product, therefore likely more palatable for some retirees versus allocating some large portion to an IFA or GMWB annuity
- The most "expensive" protection currently based on the net present value of the expected benefits. This is likely primarily due to the low interest rate environment and the relative attractiveness of these products could improve ***materially*** (on a relative basis, in my opinion) should interest rates go up

Comparison Summary

Contrasting IFAs, GMWBs, and a Traditional Portfolio

- Features and Conceptual "Scores" for Various Income Options from Harlow and Milevsky (2007)

	Inflation	Longevity	Liquidity	Estate	Fees
Immediate Fixed Annuities	Low	High	Low	Low	Low
VA+GMWB	Medium	Medium	Medium	Medium	High
Traditional Assets	High	Low	High	High	Medium

Source: Harlow, W. Van and Moshe A. Milevsky, 2007, "Structuring Income for Retirement," Research Report, Fidelity Research Institute

Conclusions

Conclusions

- All annuities are not bad, but most annuities are expensive
- The relative attractiveness of annuities are heavily influenced by interest rates, which are at historic lows
- The majority of annuitants cannot "make money", so any type of "average" analysis will yield unfavorable results
- A better approach to estimate the "cost" is to take total portfolio approach and incorporate some type of preference model (like utility)
- Each of three types of annuities reviewed (immediate fixed annuities, GMWB annuities, and longevity insurance) are different, and work best in different scenarios

Questions?

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