



STANFORD
CENTER ON
LONGEVITY

PROVIDING LIFETIME INCOME IN DC PLANS

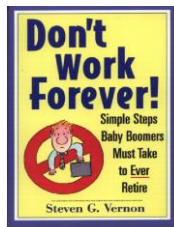
Steve Vernon, FSA

Research Scholar, Stanford Center on Longevity

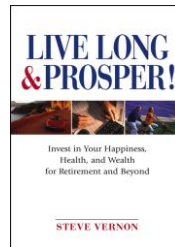
London June 19, 2014

Today's Agenda

- I. Summary of retirement planning environment
- II. Review of relevant trends
- III. Summary of methods to generate retirement income from savings
- IV. Analysis of retirement income generators (RIGs)
 - Features – pros and cons
 - Projections of amount of retirement income at retirement and beyond
 - Projections of remaining wealth
- V. What are optimal solutions?
- VI. Putting it all together: Retirement income strategies
- VII. Next phases of analysis



1995



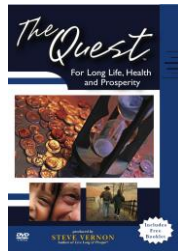
2005



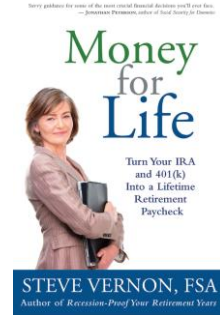
2013



2010



2007



2012



2009-2014

3



THE NEXT EVOLUTION IN DEFINED CONTRIBUTION RETIREMENT PLAN DESIGN

A Guide For DC Plan Sponsors To Implementing Retirement Income Programs

By Steve Vernon, FSA
Consulting Research Scholar, Stanford Center on Longevity

Stochastic analyses by Dr. Wade Pfau
Professor of Retirement Income
The American College

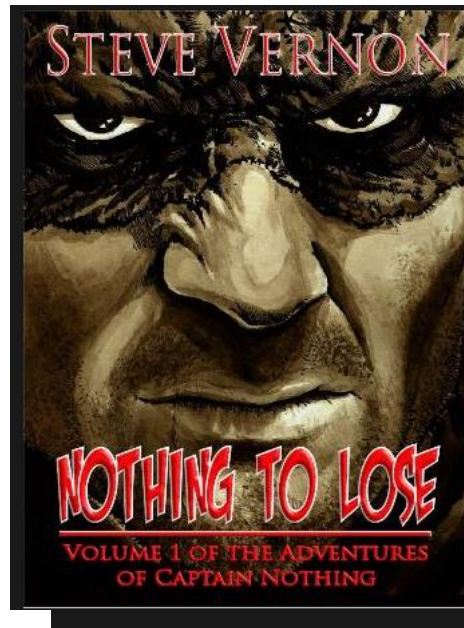
Fiduciary discussion by Fred Reish, Bruce Ashton,
and Joshua Waldbeser
Drinker Biddle & Reath LLP

September 2013



Prepared in collaboration with
the Society of Actuaries' Committee
on Post-Retirement Needs and Risks

longevity.stanford.edu/financial-security



About this author

Hi! I'm Steve Vernon and I'd love to scare you..

I. Retirement Planning Environment

Retirement Planning is Complex!

- Quantifiable risks
 - Market/sequence of returns
 - Longevity
 - Withdrawal rates too high
 - Inflation
 - High fees
 - Insurer insolvency
 - Liquidity
 - Inadequate protection for surviving spouse
- Behavioral risks
 - Inadequate understanding of issues with generating income
 - Temptation to spend more today
 - Mistakes, fraud, or cognitive decline
 - Poor/biased advice
 - Inability to assess and self-execute

I. Retirement Planning Environment

Retirement Planning is Complex!

- Decisions on retirement income made in following context
 - Claiming government pension
 - Existence of traditional pensions
 - Deploying home equity
 - Role of continued work
 - Threat of high expenses for medical or long-term care
 - Desire to leave a legacy
 - Expected pattern of living expenses
 - Amount of debt
 - Level of income taxes

7



II. Review Trends Employer-Sponsored DC Plans

DC Plan Investment Menu Design at Sophisticated Employers

- Passive funds, drive fees as low as possible
- Limited menu of core index funds in domestic, small cap and international stocks, bonds, REITs
- Target date funds that package the core index funds
- Employees can elect target date funds or mix their own asset allocation

8



II. Review Trends Employer-Sponsored DC Plans Academic Research Shows Underperformance of Actively Managed Portfolios

By LARRY SWEDROE MONEYWATCH April 3, 2014, 5:55 AM

Study puts another nail in active management's coffin

Comment / Shares / Tweets / Stumble / Email More +

An ongoing debate among investors is whether an active or passive strategy is most likely to give you the best results. Twice a year, Standard & Poor's releases their **active vs passive score card** (officially called the S&P Indices Versus Active Fund report, or SPIVA for short.) The analysis compares actively managed funds against S&P index benchmarks, or put simply, different asset classes of active funds are pitted against their respective passive counterparts.

The SPIVA is important to investors because it shows that the past is not prologue. Investors cannot use past performance to identify which of the active funds will outperform in the future. Outperformance should be randomly expected, and the SPIVA shows why. Despite active managers claiming they can beat benchmarks, the data tell a different story. Today we'll report on some of the key findings from S&P's latest study.

First, S&P looked at the individual years covering the 10-year period 2004-13. They then took the average figure of the outperformance by the benchmarks for each of the 10 individual years. They found that in every domestic equity asset class, the majority of actively managed funds underperformed their appropriate index benchmark. The best performance was for actively managed large-cap growth funds, in which "just" 57 percent underperformed.

9

III. Three Types of Retirement Income Generators (RIGs)

1. Investment income: Invest savings, spend investment income, leave principal intact
2. Systematic withdrawals: Invest savings, withdraw principal cautiously to avoid outliving principal (but no guarantee)
3. Annuity: Purchase guaranteed lifetime income from insurance company

Many possible variations and combinations with each approach

III. Variations on Retirement Income Generators (RIGs)

Systematic withdrawals	Annuities
Constant amount, real or nominal (4% rule)	Single premium immediate annuities (SPIA)
Endowment method (constant % of assets)	Fixed deferred annuities
Life expectancy method (IRS RMD)	Variable deferred annuities
Payout over fixed period	Variable immediate annuities
	GLWB/GMWB
	Longevity annuities

11



III. Features of RIGs in DC Plans

- In-plan vs. out-of-plan
- Products vs. advice vs. guidance
- At retirement vs. leading up to retirement

12



IV. Analysis of RIGs

Evaluation Criteria for RIGs in DC Plans

- Amount of income
- Lifetime guarantee
- Pre-retirement protection
- Post-retirement potential for increases
- Post-retirement protection
- Access to savings
- Inheritance potential
- Investment control
- Withdrawal control

13



IV. Analysis of RIGs

Evaluation Criteria for RIGs in DC Plans

Table 8.1 How Different RIGs Meet Various Criteria from Retiree Perspective

Criteria	Systematic withdrawals (any self-managed method)	Systematic withdrawals (advisory service or managed payout fund)	Deferred fixed income annuity	Immediate fixed income annuity	Immediate variable income annuity	Immediate inflation-adjusted income annuity	GMWB annuity
Lifetime guarantee	No	No	Yes	Yes	Yes	Yes	Yes
Preretirement protection	No	No	Yes	No	No	No	Yes
Postretirement increase potential	Yes ¹	Yes ¹	No	No	Yes ¹	Yes ³	Yes ²
Postretirement protection	No ¹	No ¹	Yes	Yes	No ¹	Yes	Yes
Access to savings	Yes	Yes	No	No	No	No	Yes ⁴
Inheritance potential	Yes	Yes	No	No	No	No	Yes ⁴
Investment control	Yes	No ⁵	No	No	Yes ⁶	No	Yes ⁶
Withdrawal control	Yes	No ⁵	No	No	No	No	Yes ⁷

From Society of Actuaries' report: The Next Evolution in Defined Contribution Retirement Plan Design

14



IV. Analysis of RIGs

Evaluation Criteria for RIGs in DC Plans

- Simpler approach: **A-LIFE** rating system
 - **A**mount of income
 - **L**ifetime guarantee
 - **I**nflation protection
 - **F**lexibility, financial legacy
 - **E**xposure to market risk

From *Money for Life: Turn Your IRA and 401(k) Into a Lifetime Retirement Paycheck*

15



IV. Analysis of RIGs

Evaluation Criteria for RIGs in DC Plans

A consumer approach – systematic withdrawals

Goal	Systematic Withdrawals Cautious	Systematic Withdrawals Optimistic
Amount of initial income	○	◐
Longevity protection	◐	○
Inflation protection	●	◐
Flexibility and Financial legacy	●	◐
Exposure is minimized	◐	○

- = high or strong
- ◐ = medium or maybe
- = low or none

From *Money for Life: Turn Your IRA and 401(k) Into a Lifetime Retirement Paycheck*

16



IV. Analysis of RIGs

Evaluation Criteria for RIGs in DC Plans

A consumer approach – immediate annuities

Goal	Immediate fixed annuity	Immediate inflation-adjusted annuity	Immediate variable annuity
Amount of initial income	●	○	●
Longevity protection	●	●	●
Inflation protection	○	●	◐
Flexibility and Financial legacy	○	○	○
Exposure is minimized	●	●	○

● = high or strong
 ◐ = medium or maybe
 ○ = low or none

From *Money for Life: Turn Your IRA and 401(k) Into a Lifetime Retirement Paycheck*

17



IV. Analysis of RIGs

Projections of Retirement Income

- Stochastic forecasts of:
 - Systematic withdrawals – constant amount 4% rule
 - Systematic withdrawals – constant percentage 4% of assets
 - Systematic withdrawals – IRS RMD
 - SPIA – inflation adjusted
 - SPIA – fixed
 - GMWB
- Assumptions
 - Systematic withdrawals and GMWB assume 60/40 equity/bond allocation
 - Institutional pricing
 - Assumptions on inflation, investment returns and annuity pricing reflect current low-interest environment
 - See Appendix for details
- Forecasts prepared by Dr. Wade Pfau, professor of retirement income at The American College

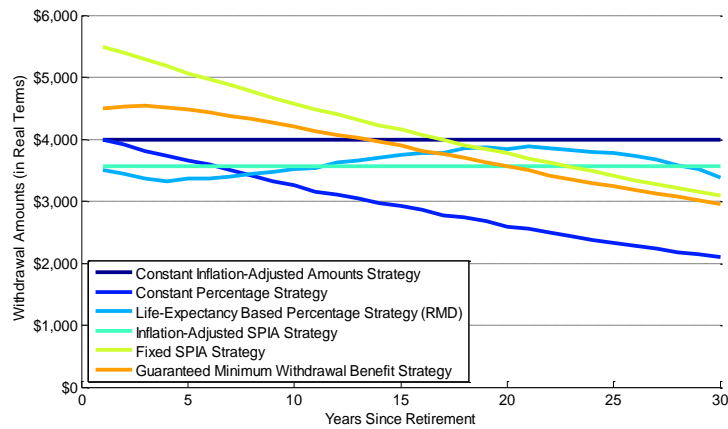
18



IV. Analysis of RIGs

Projections of Retirement Income

Real retirement incomes – *expected* scenario 50th percentile
Flat line keeps pace with inflation

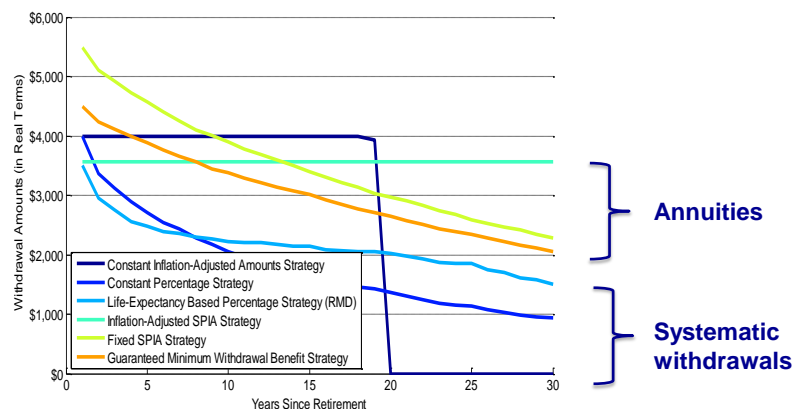


From Society of Actuaries' report: The Next Evolution in Defined Contribution Retirement Plan Design

19



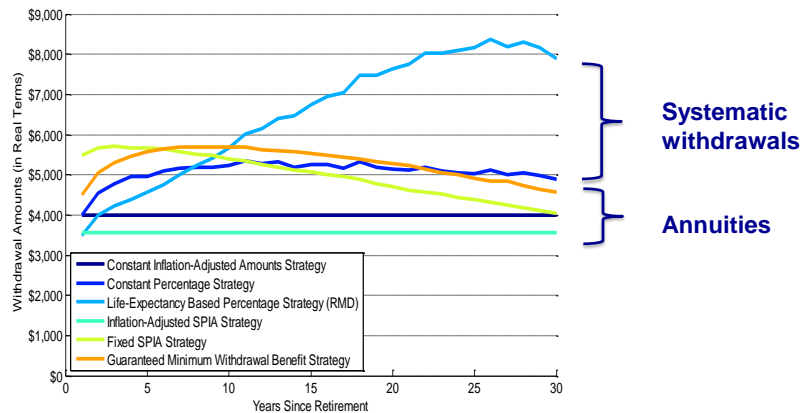
IV. Insured Products Fare Better in *Unfavorable* Scenarios



10th percentile of stochastic forecast
\$100,000 in retirement savings for 65 year-old couple



IV. Investing Solutions Fare Better in *Favorable* Scenarios

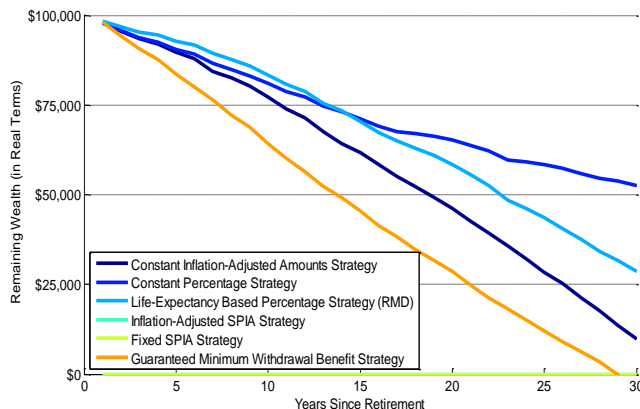


90th percentile of stochastic forecast
\$100,000 in retirement savings for 65 year-old couple



IV. Analysis of RIGs Projections of Remaining Wealth

Expected scenario - 50th percentile



From Society of Actuaries' report: The Next Evolution in Defined Contribution Retirement Plan Design

22



V. What Are Optimal Solutions?

- It depends on how you define optimal!
- Possible approaches to developing retirement income:
 - Probabilistic approach
 - Safety first
- Possible analyses:
 - Stochastic forecasts of retirement income
 - Efficient frontier analyses
 - Scenario planning (deterministic forecasts)
 - Others?

23



V. Illustrating Tradeoffs with Retirement Income Frontiers

Two types of efficient frontiers

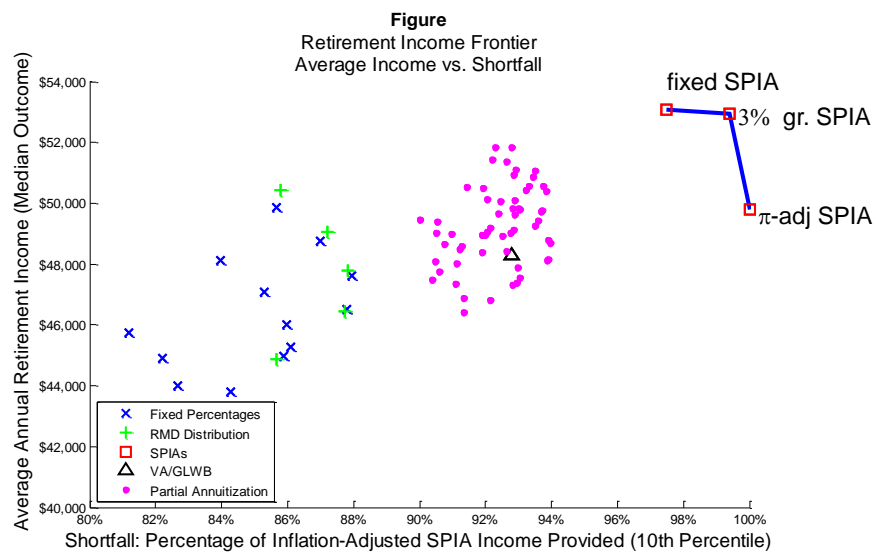
1. **Emphasize retirement income**
 Shortfall relative to Inflation-adjusted SPIA
 vs.
 Average Annual Real Retirement Income
2. **Balance between income and legacy**
 Survival-weighted remaining real wealth over lifetime
 vs.
 Average Annual Real Retirement Income



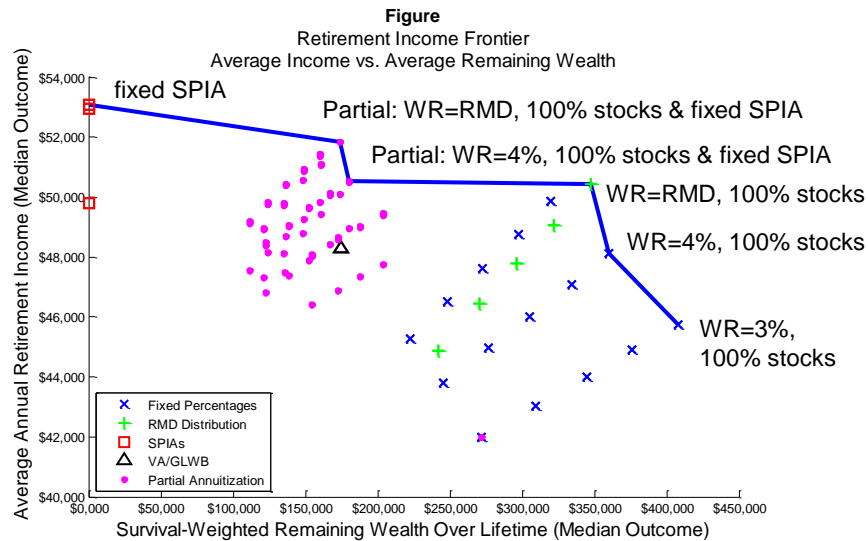
V. Constrained Retiree #1

- Married 65-year old couple
- \$400,000 of assets
- Social Security @ 65 = \$22,493 & \$11,054
- Product Pricing:
 - Inflation-Adjusted SPIA: 4.06%
 - Fixed SPIA: 6.02%
 - SPIA with 3% growth rate: 4.29%
 - GLWB: 4.5%

V. Emphasize Retirement Income Leads to Traditional Annuities



V. Emphasize Balance Between Income and Accessible Wealth Leads to Combinations of Traditional Annuities and Systematic Withdrawals



VI. Putting It All Together Retirement Income Strategies

- Solutions combining SWPs and annuities strategies may produce reasonable compromise
 - For example, cover nondiscretionary expenses by guaranteed sources of lifetime income: Government pension, employer-provided pension, annuity
 - Cover discretionary expenses with SWP strategy
 - May justify higher withdrawal rate and/or aggressive asset allocation

VII. Next Phases of Analysis

- Examine strategies combining SWPs and SPIAs using efficient frontier analysis
- Practical considerations with combining SWPs and longevity annuities
- How can retirement income be protected in period leading up to retirement?
 - Fixed deferred annuities
 - GLWB/GMWB annuities
 - Target date funds
- Behavioral finance considerations the next frontier in plan design

29



STANFORD
CENTER ON
LONGEVITY

DISCUSSION

30

svernon@stanford.edu

Appendix: Assumptions for Stochastic Forecasts Institutional Pricing

Table C.1. Assumptions Used for Stochastic Forecasts

	Real Returns			Correlation Coefficients		
	Arithmetic Mean	Geometric Mean	Standard Deviation	Stocks	Bonds	Inflation
Stocks	5.1%	3.1%	20.0%	1.0	0.1	-0.2
Bonds	0.3%	0.2%	7.0%	0.1	1.0	-.6
Inflation	2.1%	2.0%	4.2%	-0.2	-0.6	1.0

Annuity purchase rates as percent of assets:

- 5.49% fixed SPIA
- 3.57% inflation-adjusted SPIA
- 4.50% GMWB

For 100% J&S, both age 65

SWP investment expenses: 50 bps

GMWB investment and insurance expenses: 150 bps