

Institutional Investment Advisors and Consultants Forum: *Developing Expertise and Insights*

OPTIMIZING OUTCOMES WITH AVAILABLE SOLUTIONS

Steve Vernon
Stanford Center on Longevity

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Innovation, Communication, Evaluation



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

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

longevity.stanford.edu/financial-security

Key Takeaways



- Plan sponsors don't need to wait to implement retirement income solutions; sufficient solutions exist today.
- Employers can and should build a strong business case for implementing a retirement income program.
- Plan sponsors can follow a rigorous process to carry out their due diligence when designing a retirement income program.
- The one perfect retirement income generator (RIG) doesn't exist; plan sponsors should design programs to meet a variety of participants' needs and circumstances.
- Optimal solutions might combine insurance and investing RIGs and integrate with Social Security claiming strategies.

The Business Case



- Developing retirement income solutions is hard for the average plan participant.

“For many people, being asked to solve their own retirement savings problems is like being asked to build their own cars.”

- Richard Thaler, University of Chicago

The Business Case (continued)



- Designing and implementing retirement income solutions is hard for the average plan participant.
- Older workers might delay retirement if they're unsure about retirement income.
- Institutional retirement income solutions have the potential to increase retirement income by 10% to 20%, compared to retail solutions.
- Implementing a program of retirement income is an inexpensive benefit improvement.
- It's the right thing to do for your plan participants.

The Due Diligence Process



- Learn about the different retirement income generators (RIGs) available today.
 - Insurance vs. investing solutions
 - In-plan vs. out-of-plan
- Understand their features and pros and cons.
 - The goals and circumstances that different RIGs address.
 - Features: amount of initial retirement income, guarantees, how income might increase or decrease, and accessibility of assets.
 - Administrative and communications challenges.

The Due Diligence Process (continued)



- Assess needs and circumstances of retiring workers.
 - Financial literacy and capability.
 - The risks they face.
 - The context in which retirement income solutions are made.
 - Existence of other retirement income resources.
 - Work/life considerations.

- Understand your population segments:
 - Do it for me.
 - Help me do it.
 - I'll do it myself.

The Due Diligence Process (continued)



- 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

The Due Diligence Process (continued)



- Decisions on retirement income made in following context
 - Social Security claiming
 - 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

The Due Diligence Process (continued)



- Design a retirement income program (aka retirement income menu) with the flexibility to address a broad range of needs and circumstances.
- Key ingredients:
 - The specific RIGs that are offered.
 - Design handful of solutions that combine RIGs.
 - Default retirement income solution.
 - Communications.
 - Decision support.
 - Administrative capability.

Three Types of Retirement Income Generators (RIGs)



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

Notes:

- Many possible variations and combinations with each approach
- In qualified plans, first two RIGs devolve to IRS required minimum distribution soon after age 70-1/2 (see Appendix A)

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

Features of RIGs in DC Plans



- In-plan vs. out-of-plan

- Type
 - Products
 - Advice
 - Administrative plan feature combined with education/guidance (in-plan systematic withdrawals)

- At retirement vs. leading up to retirement

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

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

Evaluation Criteria for RIGs in DC Plans



- Simpler approach for plan participants: **A-LIFE** rating system
 - Amount of income
 - Lifetime guarantee
 - Inflation protection
 - Flexibility, financial legacy
 - Exposure to market risk

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

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
 - GLWB/GMWB

Analysis of RIGs

Projections of Retirement Income

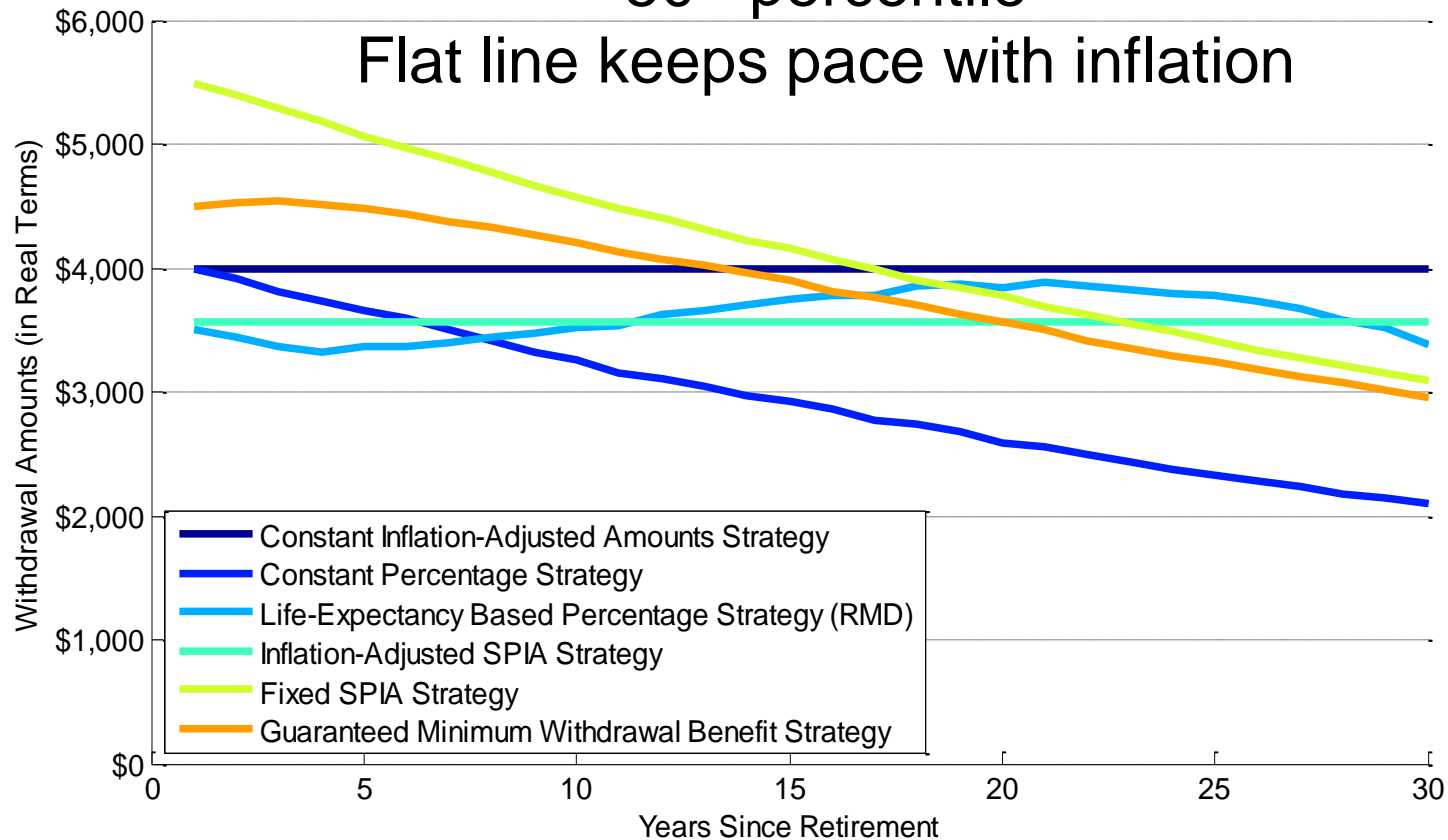


- Assumptions
 - Systematic withdrawals and GLWB/GMWB assume 60/40 equity/bond allocation
 - Institutional pricing
 - Assumptions on inflation, investment returns and annuity pricing reflect current low-interest environment
 - See Appendix B for details
- Forecasts prepared by Dr. Wade Pfau, professor of retirement income at The American College

Analysis of RIGs

Projections of Retirement Income

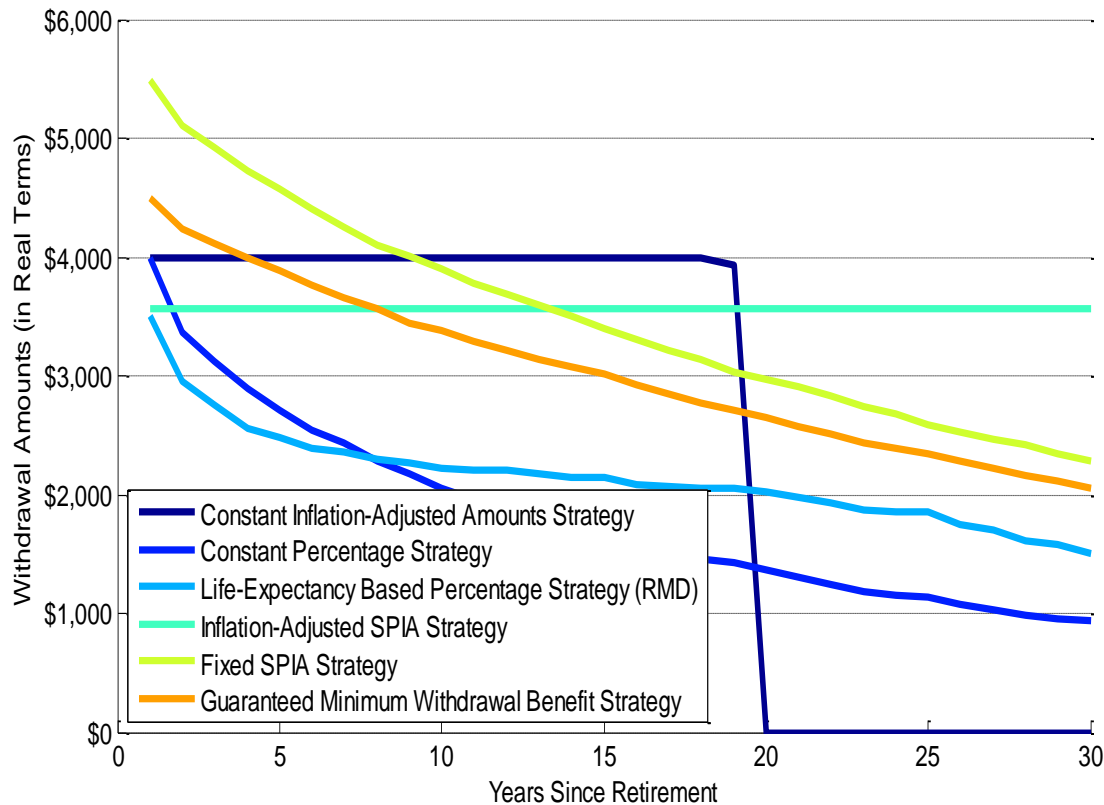
Real retirement incomes – *expected* scenario
50th percentile



Insured Products Fare Better in *Unfavorable* Scenarios



Real retirement incomes – *unfavorable scenario* 10th percentile



Annuities

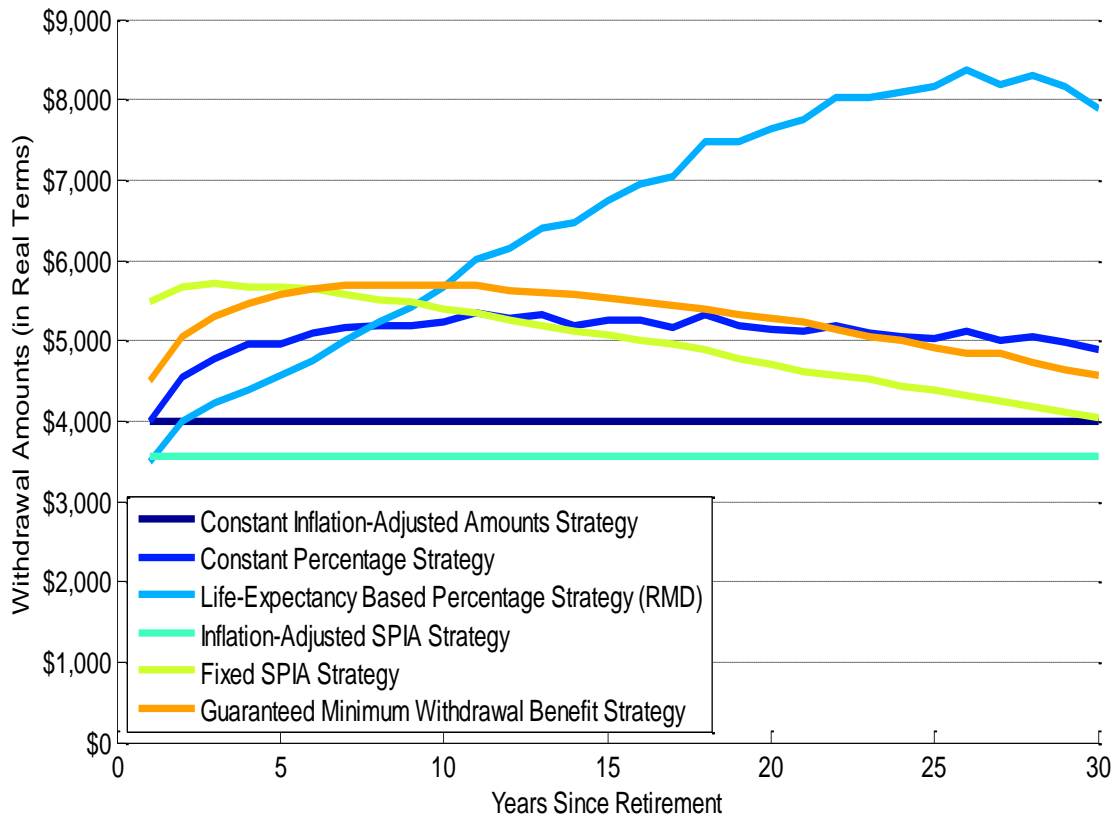


Systematic withdrawals

Investing Solutions Fare Better in *Favorable* Scenarios



Real retirement incomes – *favorable scenario* 90th percentile



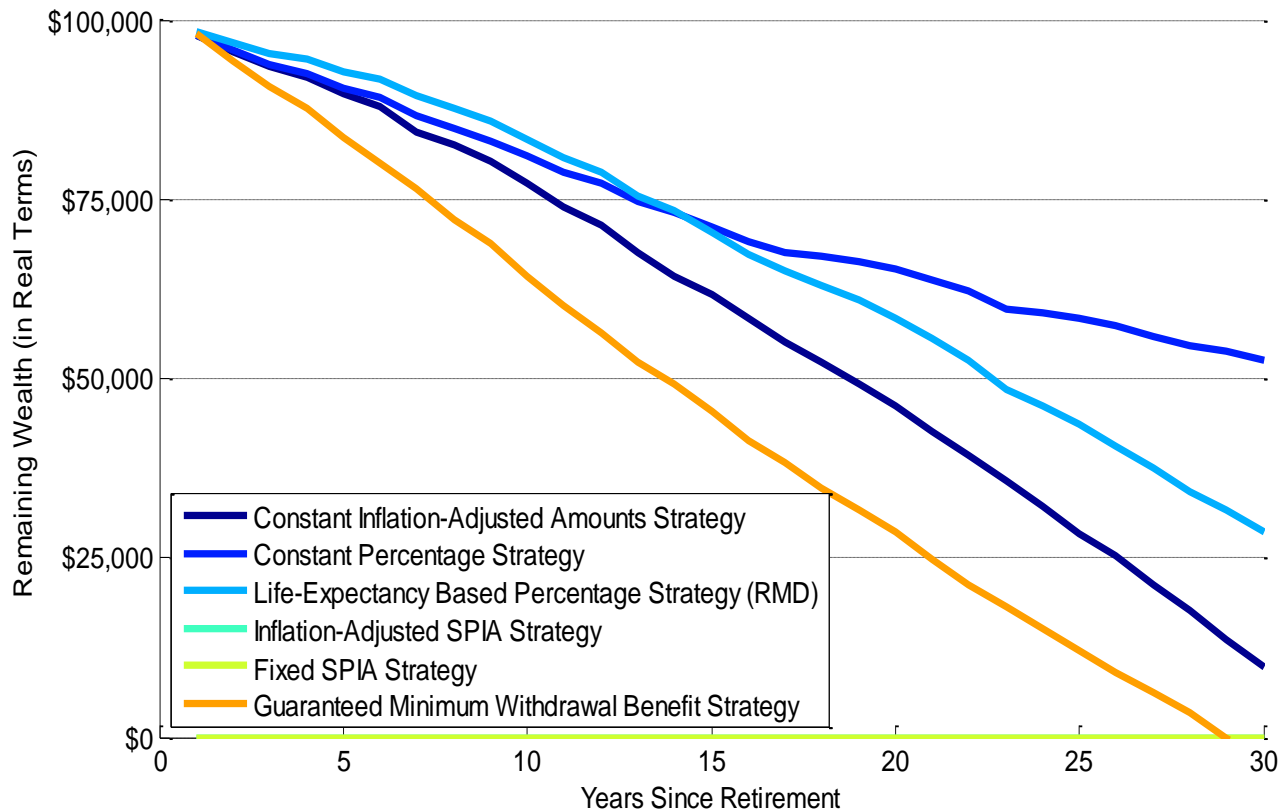
Systematic withdrawals

Annuities

Analysis of RIGs

Projections of Remaining Wealth

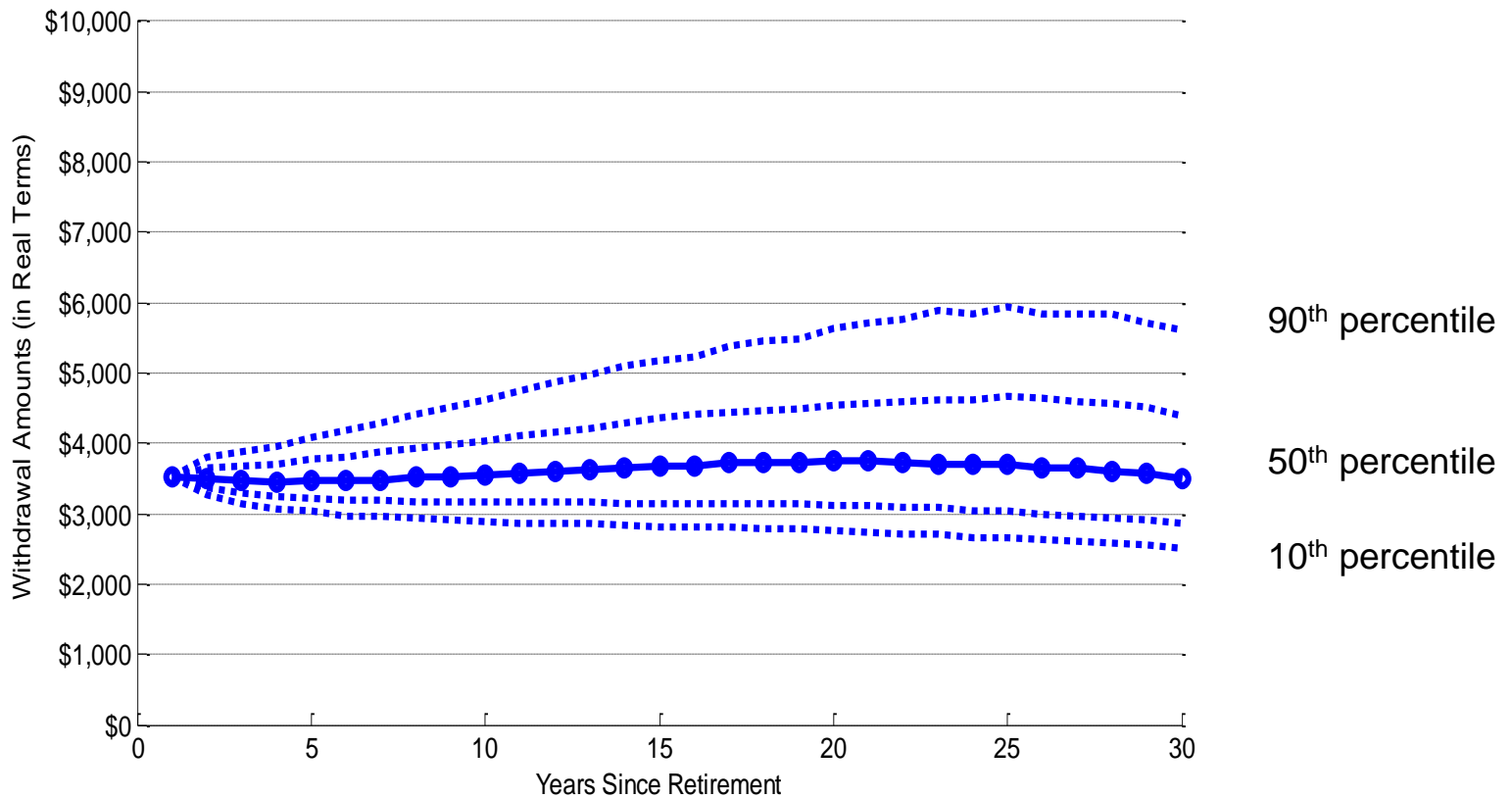
Expected scenario - 50th percentile



Analysis of RIGs

Projections of Retirement Income

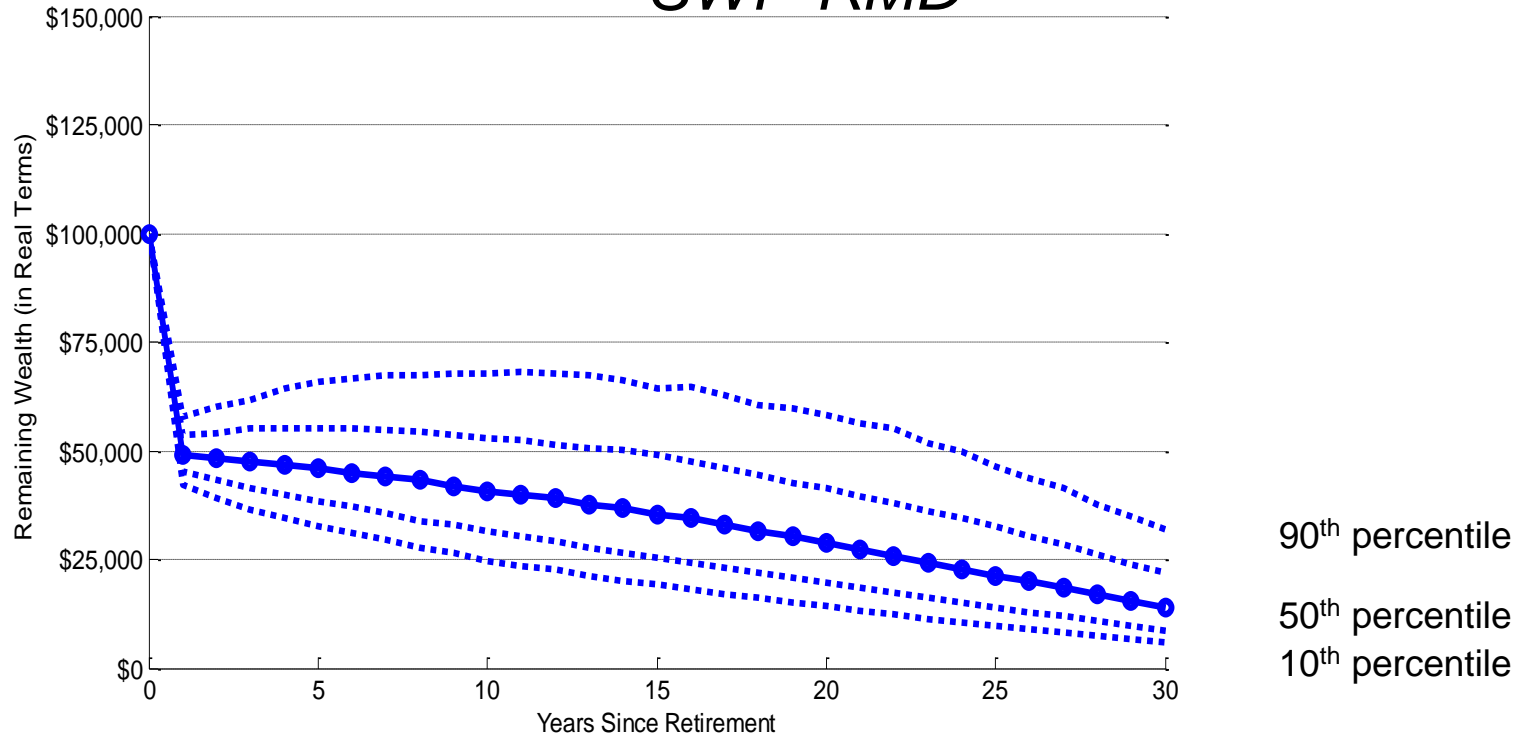
*50/50 combination of inflation-adjusted SPIA,
SWP-RMD*



Analysis of RIGs

Projections of Remaining Wealth

50/50 combination of inflation-adjusted SPIA, SWP-RMD



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: Social Security, pension, annuity.
 - Cover discretionary expenses with SWP strategy.
 - May justify higher withdrawal rate and/or aggressive asset allocation.
 - Subject of next phase of analyses by Stanford Center on Longevity.
- Best systematic withdrawal solutions adjust retirement income to reflect emerging investment experience (i.e. income determined each year as percent of remaining assets).

Putting It All Together

Retirement Income Strategies



- Use DC assets to enable delaying Social Security to age 70.
 - Increase in Social Security income can be viewed as “annuity purchase” at a rate far more favorable than open market.
 - Analysis by Dr. John Shoven, director Stanford Institute for Economics Policy Research.
 - To enable, set up SWP program to replace SS benefits that are being delayed, up to 8 years from age 62 to 70.

Next Phases of Analysis



- Examine strategies combining SWPs and SPIAs using efficient frontier analysis.
- Does delaying Social Security extend efficient frontier?
- Practical considerations with combining SWPs and qualified longevity annuity contracts (QLACs).
- How can retirement income be protected in period leading up to retirement?
 - Fixed deferred annuities
 - GLWB annuities
 - Target date funds
- Behavioral finance considerations can be equally important as financial analyses.

Optimal Retirement Income Project Goals



- Illustrate an analytical framework using stochastic forecasts and efficient frontiers for hypothetical retirees, for determining retirement income generators (RIGs) that could be offered in a DC retirement plan.
- Determine the RIGS or combination of RIGs that could be considered optimal according to specified criteria.
- Encourage plan participants, plan sponsors, and advisors to adopt a portfolio approach to developing retirement income strategies.
- Project sponsored by Society of Actuaries; coauthors are Steve Vernon, FSA, Dr. Wade Pfau and Joe Tomlinson, FSA.

Optimal Retirement Income Summary of Analyses



- Phase 1 analyzes RIGs that are currently available in DC retirement plans and are straightforward to implement. Phase 1 establishes a baseline for comparing to future phases.
- Phases 2, 3 and 4 will analyze more complex retirement income solutions, to determine if additional complexity improves projected outcomes and can be justified by delivering more effective results.
 - Phase 2: Use retirement savings to enable delaying Social Security benefits.
 - Phase 3: Combine longevity annuities with systematic withdrawals.
 - Phase 4: Protect retirement income in the period leading up to retirement with deferred income annuities and GLWBs.

Optimal Retirement Income Summary of Analyses



- Analyze various retirement income solutions for three hypothetical retirees:
 1. Single female retiring at age 65 with \$250,000 in assets.
 2. Married couple both age 65, retiring with \$400,000 in assets.
 3. Married couple both age 65, retiring with \$1,000,000 in assets.

Defining Optimal with Retirement Income Efficient Frontiers



- “Optimal” is in the eye of the beholder
 - Different definitions of optimal will produce different solutions that could be considered optimal.

- Other possible analyses of optimal could consider:
 - Volatility in retirement income amount from year to year.
 - The chance that savings will be exhausted.
 - The chance that retirement income could fall below a specified threshold.

- Plan sponsors should define criteria for optimal solutions that best meet their participants’ goals and characteristics.

Details on Efficient Frontier #1



- Participant's most important goal: Maximize lifetime income that maintains purchasing power.
 - Tradeoff: Return vs. risk, defined in terms of retirement income.
- Measure of return (Y-axis): Average annual real retirement income from the retirement income solution under the median stochastic forecast throughout retirement. This average is calculated using the projected amount of income at each future age, multiplied by the probability of survival to each future age and adjusted for projected inflation.

Details on Efficient Frontier #1 (cont'd)



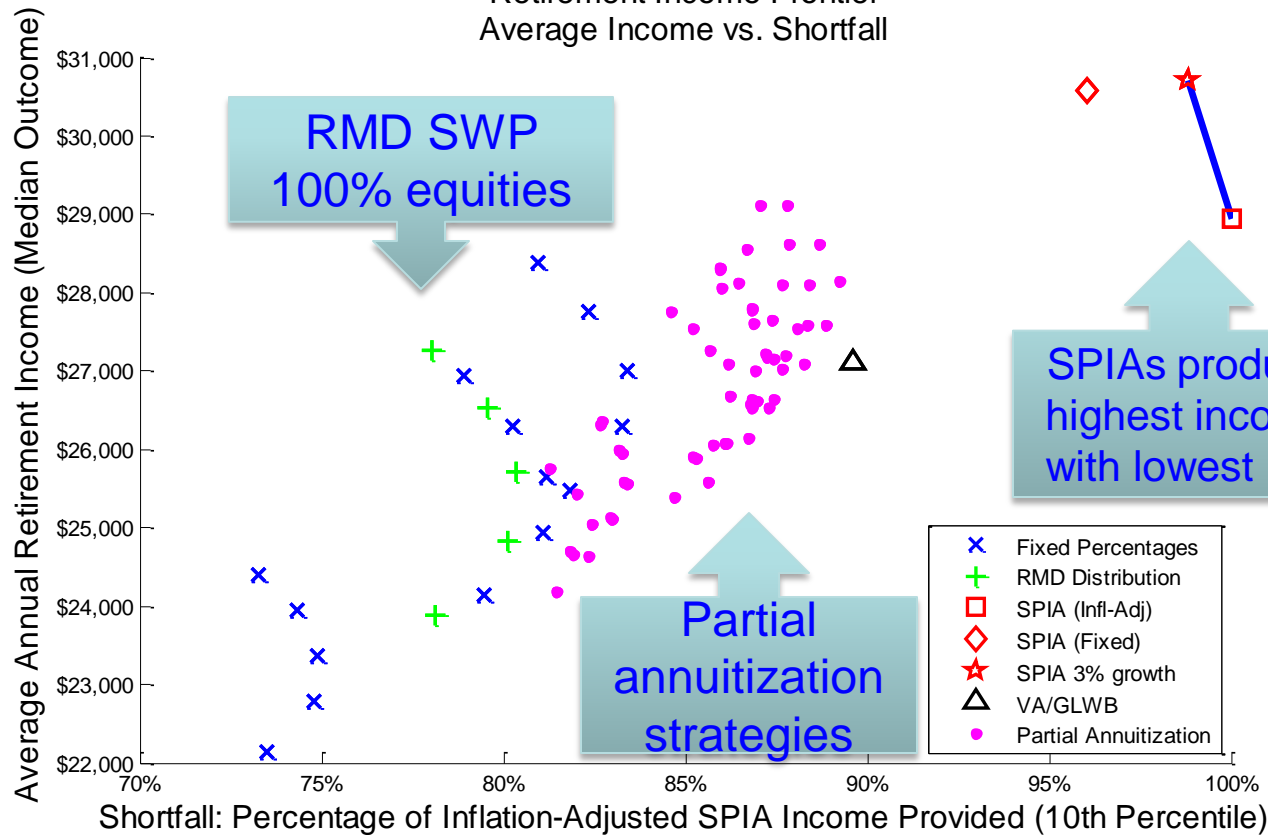
- Measure of risk (X-axis): Average annual amount of real income shortfall throughout retirement relative to an inflation-adjusted SPIA under unfavorable economic scenario, adjusted for survival probabilities.
- Rationale: An inflation-adjusted SPIA represents a guaranteed lifetime income with inflation-protection. Can another solution be expected to generate a higher amount of annual income by assuming some additional risk compared to the SPIA?

Efficient Frontier Analysis #1: Emphasize Retirement Income

Hypothetical Retiree #1: Single female age 65 with \$250,000



Figure
Retirement Income Frontier
Average Income vs. Shortfall

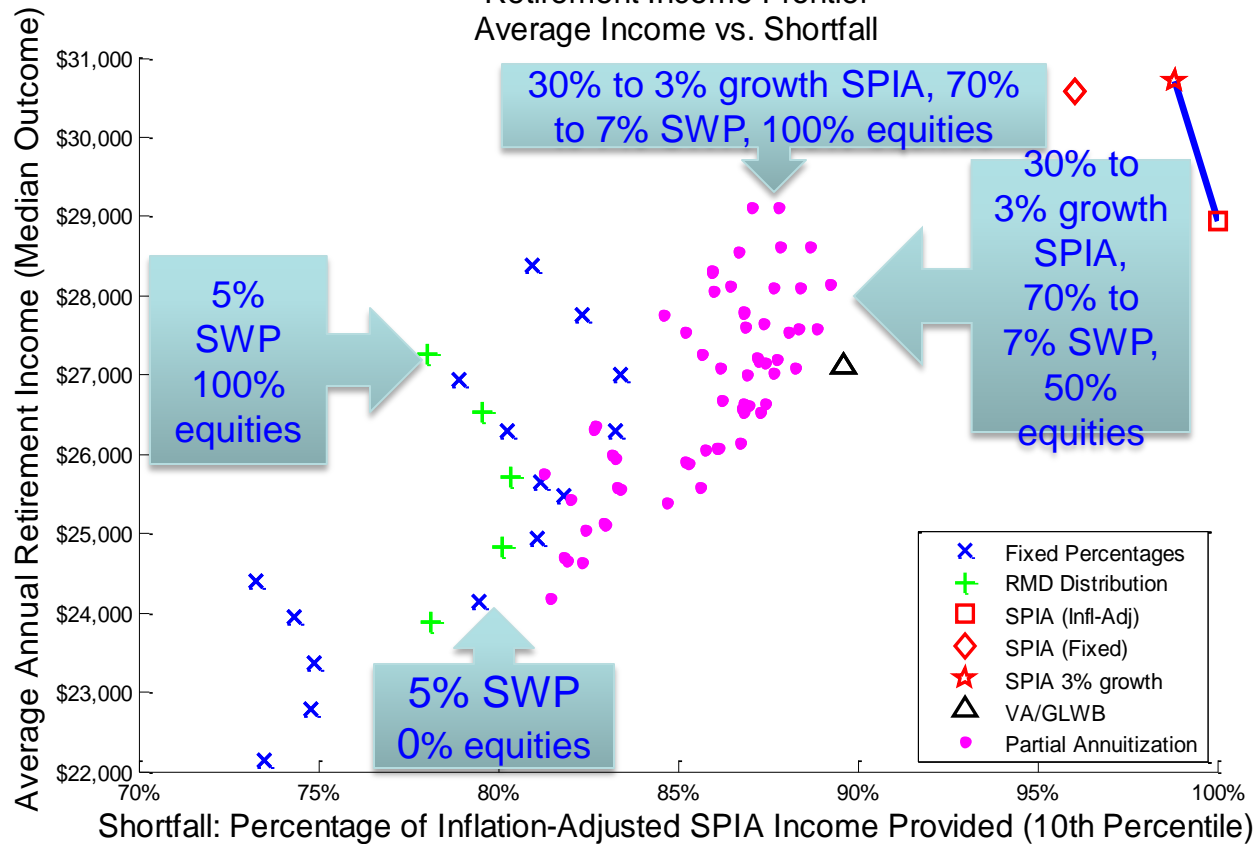


Efficient Frontier Analysis #1: Emphasize Retirement Income

Hypothetical Retiree #1: Single female age 65 with \$250,000



Figure
Retirement Income Frontier
Average Income vs. Shortfall



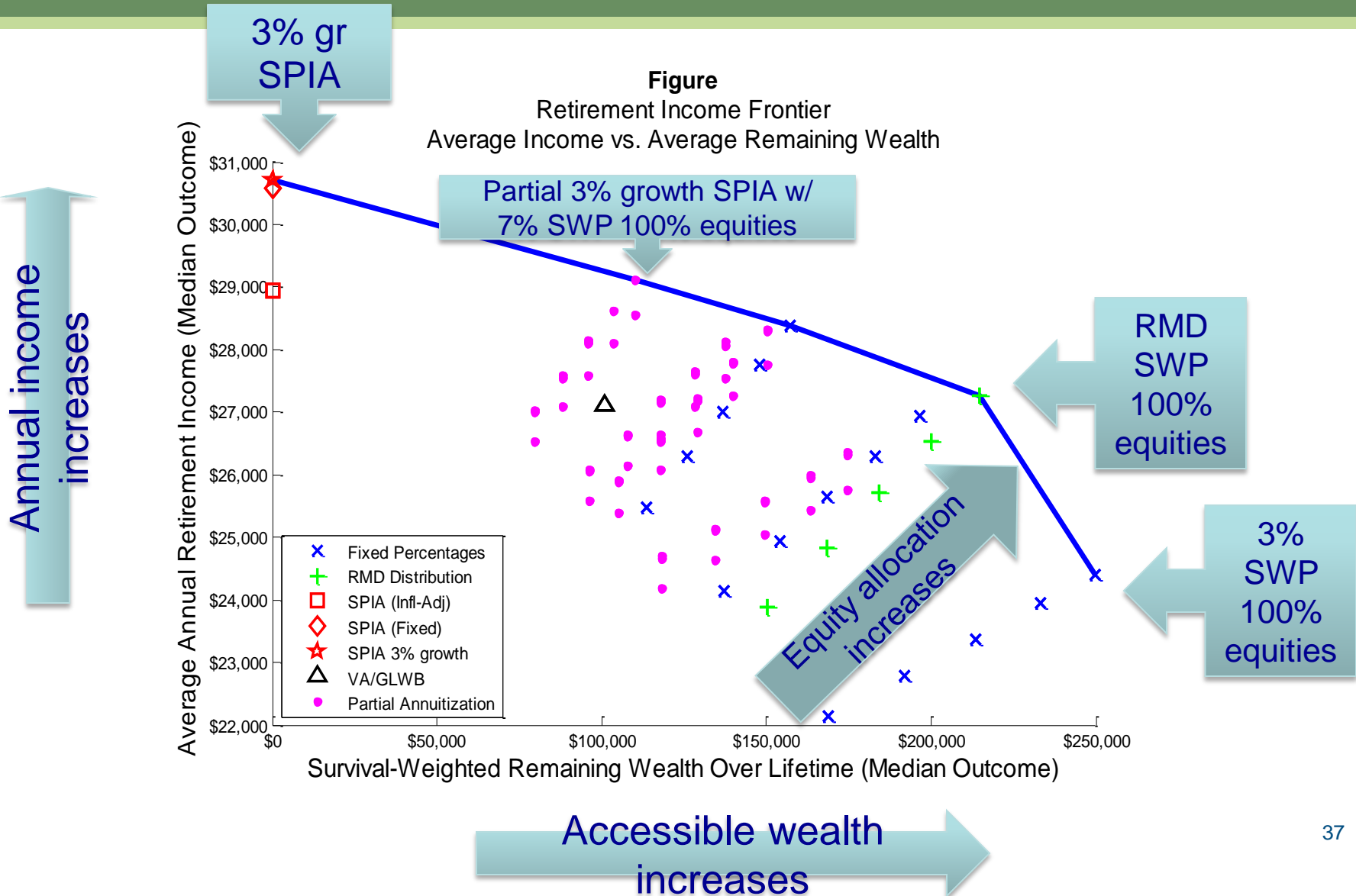
Details on Efficient Frontier #2



- Goal is to balance amount of expected retirement income with amount of expected accessible savings throughout retirement.
- Measure of return (Y-axis): Average annual real retirement income from retirement income solution, adjusted for the probability of survival to each future age (same as efficient frontier #1).
- Measure of accessible wealth (X-axis): Average amount of real accessible savings throughout retirement under the median stochastic forecast, adjusted for the probability of survival to each future age.
- Rationale: Many participants are hesitant to devote substantial resources to irrevocable annuities, and desire some access to savings and/or legacy. How much retirement income must be sacrificed to provide access to savings?

Efficient Frontier Analysis #2: Tradeoff Between Income and Access

Hypothetical Retiree #1: Single female age 65 with \$250,000



Preliminary Results

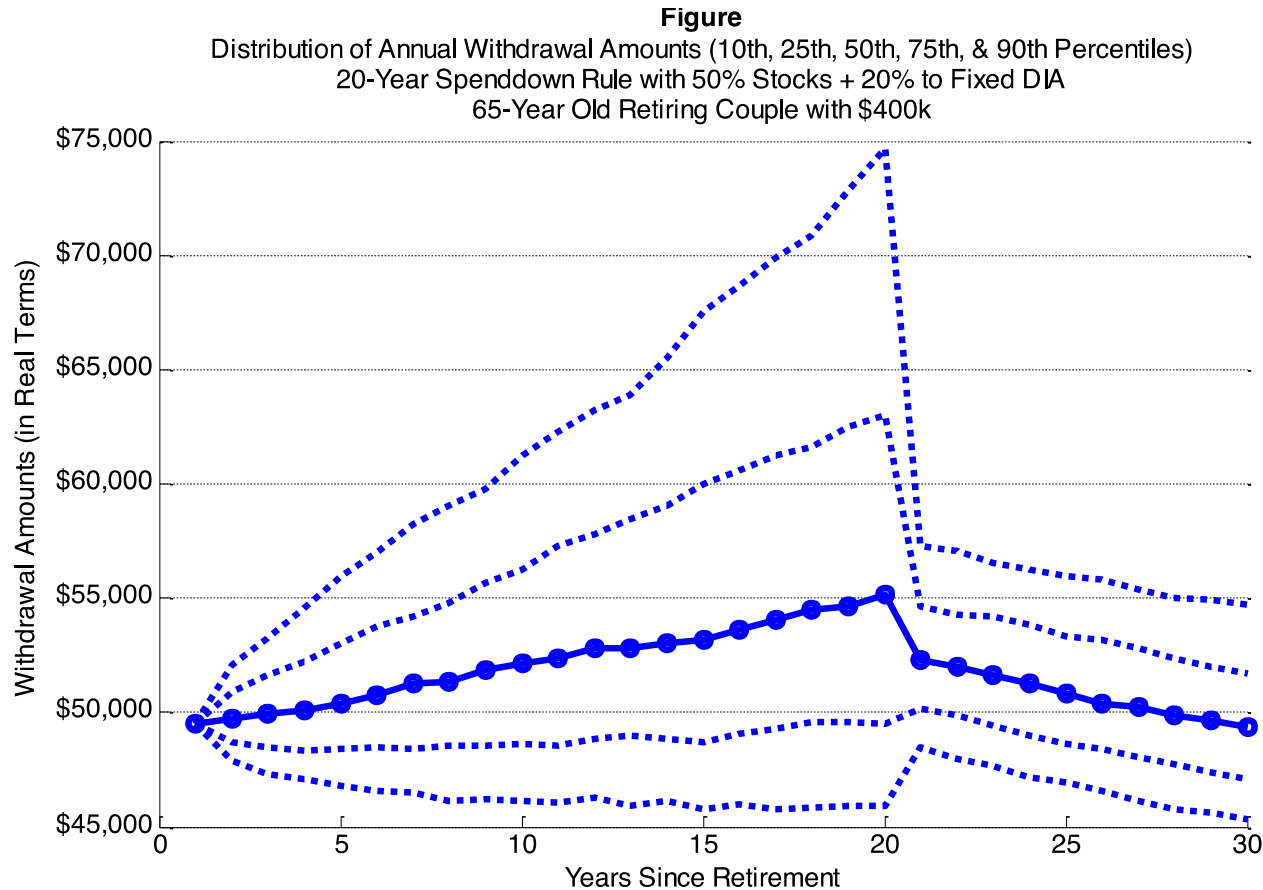
Phases 2, 3, and 4



- Using retirement savings to enable delaying Social Security benefits extends the efficient frontier in most cases.
- Combining SWPs with QLACs is easier said than done.
 - Big potential mismatch of income at age 84 and 85.
 - Asset allocation until age 85 is a challenge.
- Using deferred annuities in target date funds is easier said than done.
 - Challenge is structuring asset allocation for remaining invested assets in a generalized way.
 - May want to consider buying pieces of deferred annuity starting at age 55 and leaving asset allocation static for remaining assets. Will result in more conservative asset allocation over time.

SWP + QLAC challenges

20 year spend-down rule with 20% of initial assets to DIA

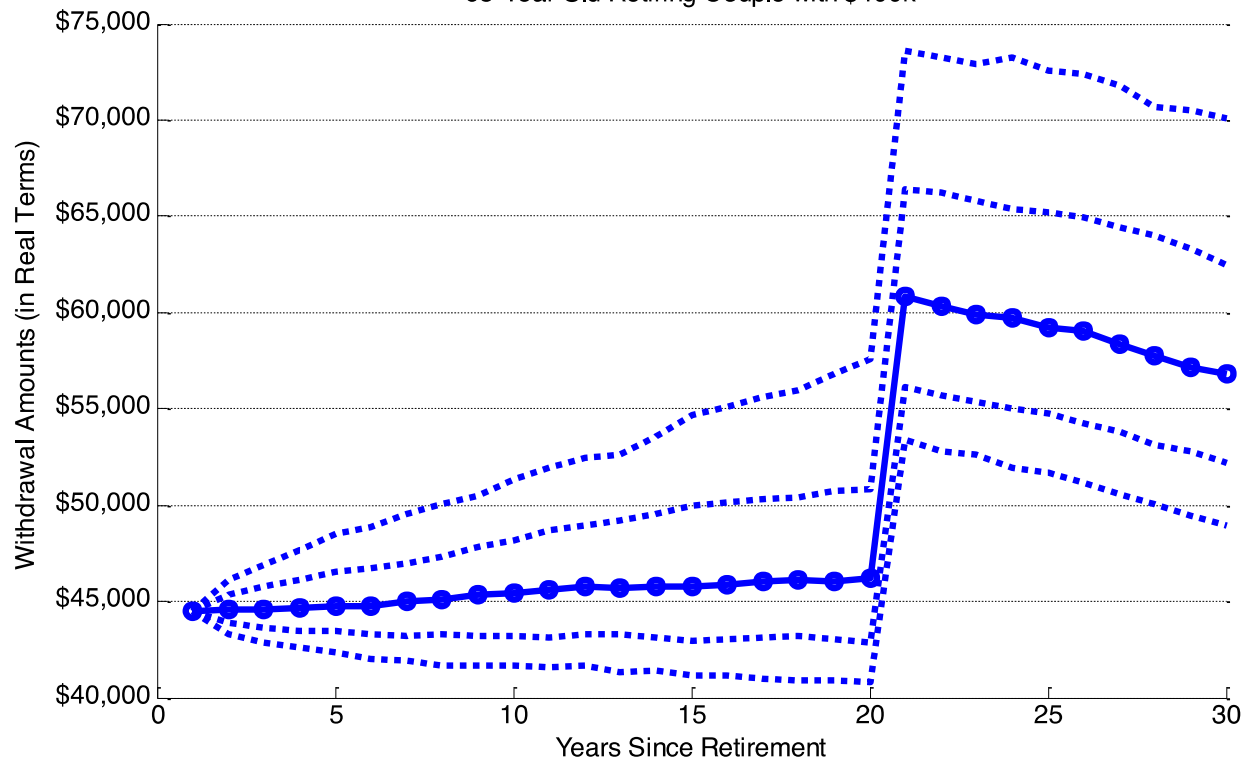


SWP + QLAC challenges

RMD spend-down rule with 15% of initial assets to DIA



Figure
Distribution of Annual Withdrawal Amounts (10th, 25th, 50th, 75th, & 90th Percentiles)
RMD Spenddown Rule with 50% Stocks + 15% to Fixed DIA
65-Year Old Retiring Couple with \$400k



Possible Plan Sponsor Actions



- Basic retirement income program:
 - Systematic withdrawals as plan administrative feature.
 - Out-of-plan annuity bidding platform for SPIAs.
 - Period certain payout to enable delaying Social Security.
 - Combinations of RIGs as packaged solutions.
 - Default is IRS RMD combined with QDIA.

- Justification: Apply 404(c) regulations applicable in accumulation phase as template for decumulation phase.
 - Three distinct RIGs.
 - Ability to allocate among more than one RIG.
 - Default enables changing your mind after retirement income starts.

Possible Plan Sponsor Actions (cont'd)



- Possibilities for more complex programs, if it can be demonstrated that additional complexity justified by expected results:
 - GLWB/GMWB annuities.
 - Deferred annuities purchased in period leading up to retirement, income starts at retirement.
 - Possibly as fixed income portion of target date fund
 - Advanced life deferred annuities packaged with SWPs
 - SWP delivers income until age 80 or 85
 - Deferred annuity starts at age 80 or 85 to cover tail longevity risk
 - Default is not same as basic program, may involve annuities.

Summary



- Plan sponsors will want to demonstrate a rigorous due diligence process.
 - This presentation shows just one example; other methods may be appropriate.
- Build the business case.
- Learn about available alternatives.
- Design a program that best meets their participants' needs and circumstances, and is reasonable to administer and communicate.
- Consider both the financial and behavioral considerations.
 - For example, there can be good reasons for adopting solutions not on the efficient frontier.
- Document the rationale for their decisions.

Appendix A: IRS Required Minimum Distribution (RMD) When You Reach Age 70-1/2



TABLE 12.2 PAYOUT RATES RESULTING FROM RMD RULES

Age	Distribution period in years	Minimum payout rate
70	27.4	3.65%
71	26.5	3.77%
72	25.6	3.91%
73	24.7	4.05%
74	23.8	4.20%
75	22.9	4.37%
76	22.0	4.55%
77	21.2	4.72%
78	20.3	4.93%
79	19.5	5.13%
80	18.7	5.35%
81	17.9	5.59%
82	17.1	5.85%
83	16.3	6.13%
84	15.5	6.45%
85	14.8	6.76%
86	14.1	7.09%
87	13.4	7.46%
88	12.7	7.87%
89	12.0	8.33%
90	11.4	8.77%

Appendix B: 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