Retirement Income Planning:

A New Efficient Frontier and Outcome Based Investment Strategies

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a Morningstar company

Agenda

- x Investor Goals
 - Maintain a comfortable lifestyle in retirement (convert savings into a sustainable lifetime income)
 - **×** Bequest
- × Shortfall Factors
 - x Market risk
 - x Longevity risk
 - x Inadequate savings
- **x** Solutions
 - x Controlling the 3 risk factors
 - New Efficient Frontier between traditional assets and outcome based investment products: Principal Protected Products, Annuities (Payout or VA+GLiB)

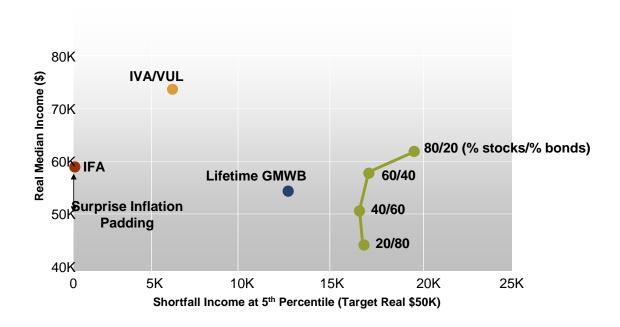


New Efficient Frontier for Retirement Income

- x Traditional Mean-Variance Efficient Frontier
 - x Does not handle "outcome based" strategy well
- × New Income Frontier
 - x Average Sustainable Income vs. Shortfall Income for a given horizon
 - x Shortfall Income → Value-at-Risk (VAR)
 - × VAR → estimate of the loss that we expect to be exceeded with a probability (e.g. 5%)
 - Shortfall Income → shortage of income against a target in the worst scenario (5th percentile)



Real Median Sustainable Income vs. Real Shortfall Income **30 Year Horizon**



Source: Ibbotson Associates



Asset Allocation with Payout Annuity and VA+GLiB: Key Factors

Proportion to Implement with PA or

Factor	VA+GMWB	Reason
Large Bequest	Lower	Preference to leave more
High Income Sustainability	Higher	Preference for personal consumption
High Subjective Survival Probability	Higher	Perceived longevity risk / suitability
High Fees	Lower	Fees reduce returns
Large Wealth	Varies	Ratio of wealth to income need
High Income	Varies	Ratio of wealth to income need

*Ibbotson has US Patent 7120601B2. Granted October 10, 2006



Asset Allocation with Payout Annuities or VA+GLiB

Objective Factors

- × Financial Wealth
- × Retirement Income Need
- × Guaranteed Income

Subjective Factors

- × Subjective Survival
- Likelihood of Holding for Life
- x Consumption vs. Bequest





Summary

- × New retirement income efficient frontier is more effective for tradeoffs on retirement income than traditional meanvariance efficient frontier
- Shortfall Factors can be Managed by combining Traditional Asset Allocation with outcome based products
- × Caveats
 - × Default risk
 - x Investor with shorter retirement period
 - For investors with existing market risk and retirement income risk coverage, the benefit will be smaller (existing DB)

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Lifetime Financial Advice: Human Capital, Asset Allocation, and Insurance



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Human Capital, Asset Allocation, and Life Insurance

Peng Chen, CFA, Roger G. Ibbotson, Moshe A. Milevsky, and Kevin X. Zhu

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The unified model we discuss is intended to provide practical guidelines for optimal asset

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Retirement Portfolio and Variable Annuity with Guaranteed Minimum Withdrawal Benefit (VA+GMWB)

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