

LIVING  
to 100

SOCIETY OF ACTUARIES  
INTERNATIONAL SYMPOSIUM

2020 Symposium  
Jan. 13–15  
Lake Buena Vista, FL

## 2B - Retirement Income Strategies

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# 2020 Living to 100 Symposium

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**Session 2B: RETIREMENT INCOME STRATEGIES**

**Monday January 13, 2020 11:30 AM – 12:45 PM**



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# COMMON APPROACHES TO SPENDING

- 4% (+/-) Rule: A percentage of initial retirement savings used annually; increasing by inflation.
- MRD Approach: Based on the factor used to determine minimum required distributions under the Internal Revenue Code.
- Bucketing: Multiple accounts (each with varying asset allocations) holding estimated funds needed for a specified time period.
- Laddering: Bonds and other fixed income securities with varying maturity dates going out to the retiree's life expectancy or longer.

# SHORTCOMINGS OF COMMON APPROACHES

- No modeling of the impact of the inclusion of insured lifetime income products (immediate or deferred).
- No consideration of the impact of integration with other income sources (i.e. Social Security or company pension)
- No modeling of the variable range of possible lifespans,
- Not designed to model or analyze a predetermined total annual spending goal subject to desired future increases/decreases
- No explicit measurement of projected liquidity or legacy levels

# A RETIREMENT SPENDING STRATEGY

- A TOTAL monthly income goal generated from all sources (can be constant or changing)
- Includes the selection of a Social Security benefit commencement age
- May include the use of an insured guaranteed income product; could be immediate or deferred.
- Incorporates a specified investment asset allocation; holdings in equity, fixed income or other classes
- May include other components where applicable, and if reasonable assumptions can be developed (tax implications, use of home equity, LTC need & insurance,...)

# PURPOSES OF AN ACTUARIAL APPROACH

- Can be used to analyze a **STRATEGY** using stochastic methods
- Can illustrate a probabilistic range of outcomes
- Can be run with varying assumptions
- Can be used to compare alternative strategies
- Can overcome some shortfalls of common spending approaches
- Can provide an analytical determination of optional decisions.

# ANALYZING A STRATEGY

- Likelihood of achieving an income goal over an uncertain lifetime in uncertain markets.
- If the income goal is not likely to be achieved, what percentage of the goal can be expected.
- Estimating the remaining investment balance available (liquidity or legacy) at each future age.
- Strategies providing a high likelihood of achieving an income goal *may* result in low liquidity or legacy potential.
- For some retirees there is a desire to consider both income likelihood and liquidity/legacy levels

# AN ACTUARIAL MODEL

- An expected age at death (EAD) is randomly generated based on life expectancies
- For each year up to the EAD, a gross income goal (GIG) is established.
- For each year up to the EAD, rates of return are generated based on assumptions and asset classes.
- For each year up to the EAD, investment earnings are calculated based on investment balance (IB)
- For each year up to the EAD, the projected income (PI) from each source is calculated
- The amount of the IB used each year will vary as is needed to satisfy the GIG for the year
  - If total PI is  $>$  the year's GIG, the IB is increased by the excess.
  - If total PI is  $<$  the year's GIG, the IB is reduced by the shortfall to meet the year's GIG
- For each year  $(\text{total PI})/\text{GIG}$  is calculated. Will start at 100% but likely drop in later years.
- At each EAD the  $(\text{remaining IB}) / (\text{initial IB})$  is calculated. (Can be done on an inflation adjusted basis)
- All the above is repeated 10,000 times
- Average  $(\text{total PI})/\text{GIG}$  &  $(\text{remaining IB})/(\text{Initial IB})$  at each EAD is determined from 10,000 simulations

# REQUIRED ASSUMPTIONS

- Rates of return and volatility for each investment class as well as correlation between investment classes.
- Inflation expectations (Used for income subject to inflation linked increases or if wish to measure remaining IB ratios on an inflation adjusted basis)
- Probabilities of death by age that are sex distinct and adjusted for the retiree's health.
- Other assumptions may be required depending on the model's sophistication.
- Examples include future tax rates, incidence of long-term care needs, or reverse mortgage rates

# DEVELOPING SINGLE METRICS

- Used as one simplified way to compare strategies
- Average (total PI)/GIG & average (remaining IB)/(Initial IB) at each age are weighted.
- Weightings based on probability of survival to each age (income) & probability of death at each age (investment balance)
- These two metrics can be scored from 1 to 10 to help facilitate strategy comparisons
- If only considering a single Strategy these combined metrics are of little use

# OUTPUT

- The following is provided for each strategy:
- A graph illustrating at each future age the average (total PI)/GIG percentage & the average (remaining IB)/(Initial IB) percentage.
- Overall weighted grading on a 1 to 10 scale for each metric. To be used for comparing strategies.
- Income by source bar charts illustrating the expected income from each source.

# EXAMPLE

- Income Goal: \$6,000 monthly increasing annually by 2%
- Female
- Very Healthy
- Date of Birth: May 1, 1957 (Age 62)
- Social Security benefit at Social Security Retirement Age is \$2,500 (SSRA is 66 and 6 months)
- Retirement Investment Balance (net of emergency fund) \$1,000,000
- Ready to Retire
- Has home with no mortgage; will use home equity as reverse mortgage for Long Term Care if needed
- Employer retirement incentive: \$5,000 per month payable for 3 years.

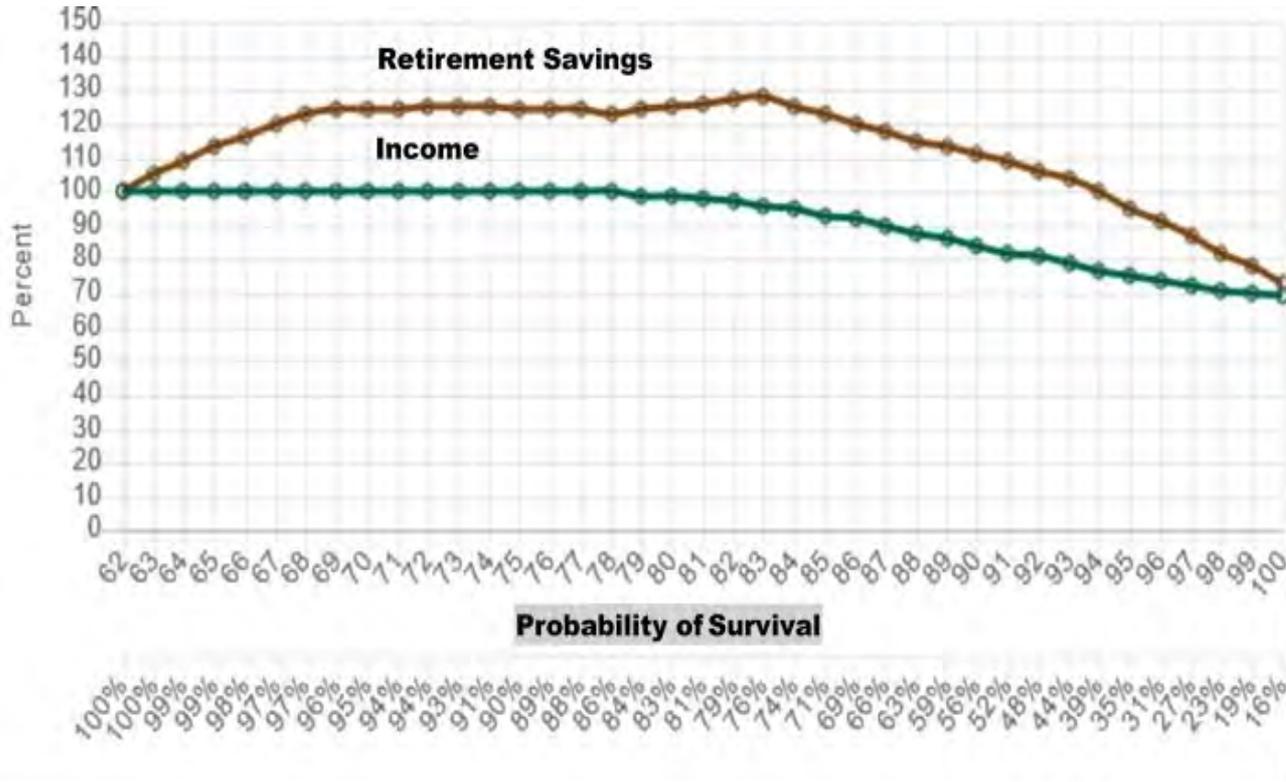
# ASSUMPTIONS SELECTED

- Fixed Income Return/Standard Deviation: 2.95%/4.4%
- Equities Return/Standard Deviation: 6.95%/15.6%
- Assumed Correlation: none
- Inflation: 2.6%
- Mortality: RP 2014 projected to 2019; sex distinct with setbacks/forwards for health. Four year set back for very healthy status
- Immediate Annuity Purchase Rate at age 62 (Female): \$58.80/year per \$1,000 of premium

# STRATEGIES TO BE ANALYZED

- A: SSRA 62; 60/40 portfolio; no fixed income annuity purchase
- B: SSRA 66; 70/30 portfolio; 250k fixed income annuity purchase
- C: SSRA 70; 80/20 portfolio; 500k fixed income annuity purchase

# STRATEGY A RESULTS

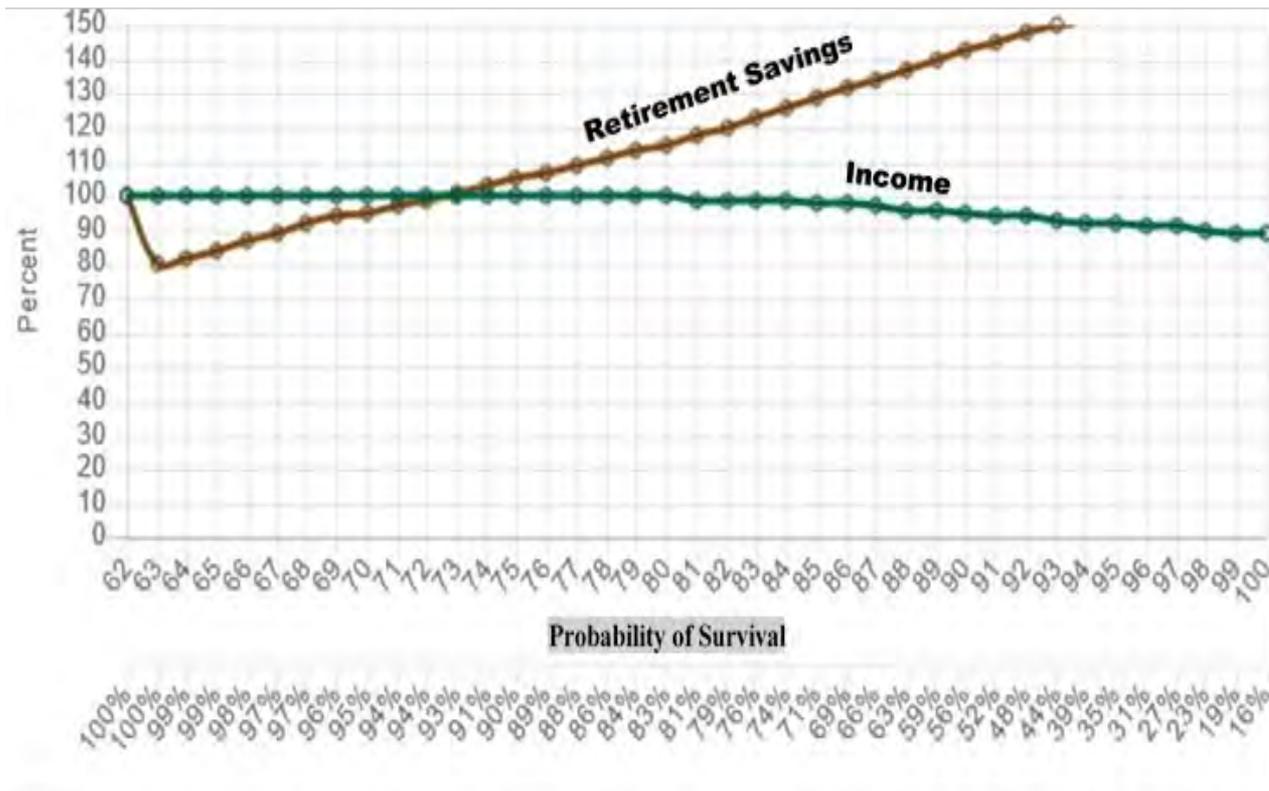


Monthly Income is \$6,000  
with an annual increase of 2.0%.

The Income Score: 6 out of 10  
The Investment Balance Score: 9 out of 10

Social Security: 62  
Fixed Income Annuity Purchase: \$0  
Allocation: Equity 60% & Fixed Income: 40%

# STRATEGY B RESULTS

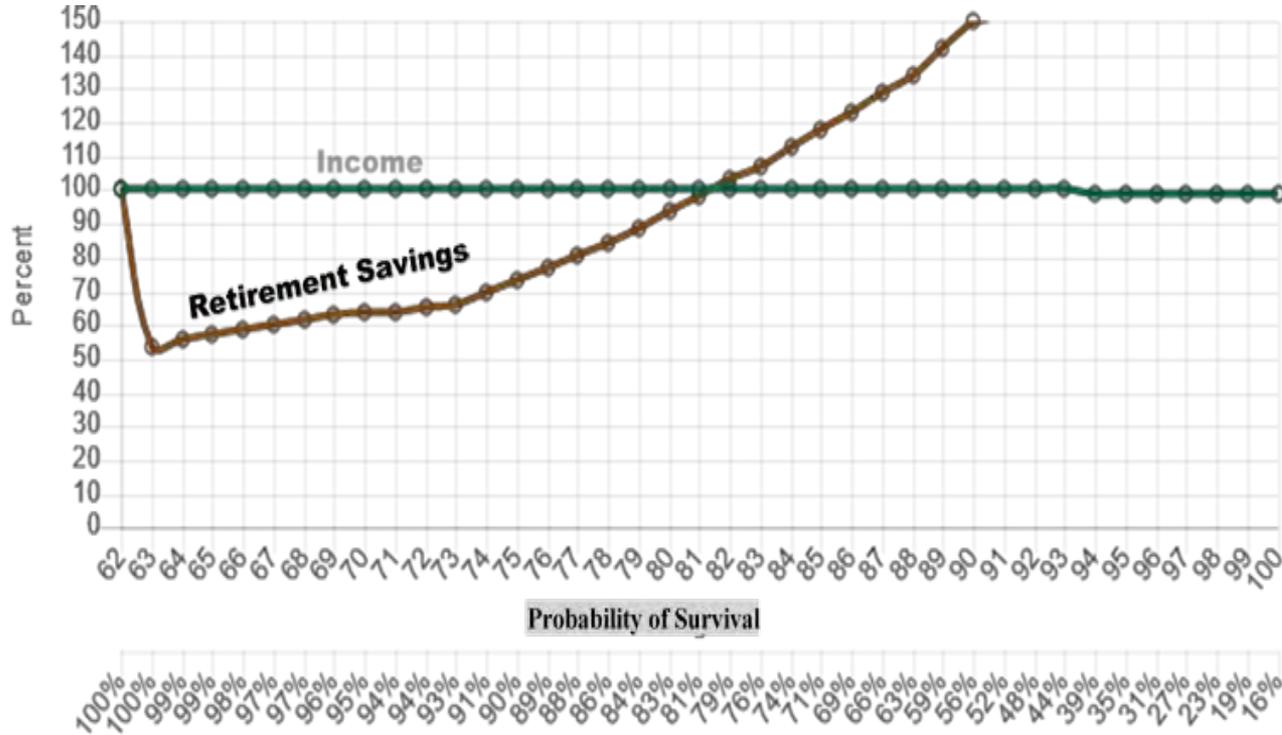


Monthly Income is \$6,000  
with an annual increase of 2.0%.

The Income Score: 9 out of 10  
The Investment Balance Score: 9 out of 10

Social Security: 66  
Fixed Income Annuity Purchase: \$250,000  
Allocation: Equity 70% & Fixed Income: 30%

# STRATEGY C RESULTS



Monthly Income is \$6,000  
with an annual increase of 2.0%.

The Income Score: 10 out of 10  
The Investment Balance Score: 7 out of 10

Social Security: 70  
Fixed Income Annuity Purchase: \$500,000  
Allocation: Equity 80% & Fixed Income: 20%

# SOME SPECIFIC OBSERVATIONS

- Strategy A provides for a potential solid investment balance (9), but with a tradeoff for the possibility of long term low income security (6).
- Strategy B provides for solid overall income (9) and investment balance (9) results. The investment balance expectation is slightly lower in earlier years due to the fixed income annuity purchase.
- Strategy C has the superior income score (10) due to the delay of Social Security to 70 and a large fixed income annuity purchase. It doesn't score well on investment balance (7) in earlier years.

# SOME GENERAL OBSERVATIONS

- A 100% income goal represents a near certainty that the goal will be achieved at that age
- A 100% or greater investment balance indicates *on average* (see *last bullet*) at that age the investment balance will be at least equal to the initial amount. Can be inflation adjusted
- For those not concerned about liquidity or legacy the investment balance percentage is likely not important.
- Due to averaging, results may indicate positive investment balance percentage projections at ages with less than 100% income goals.

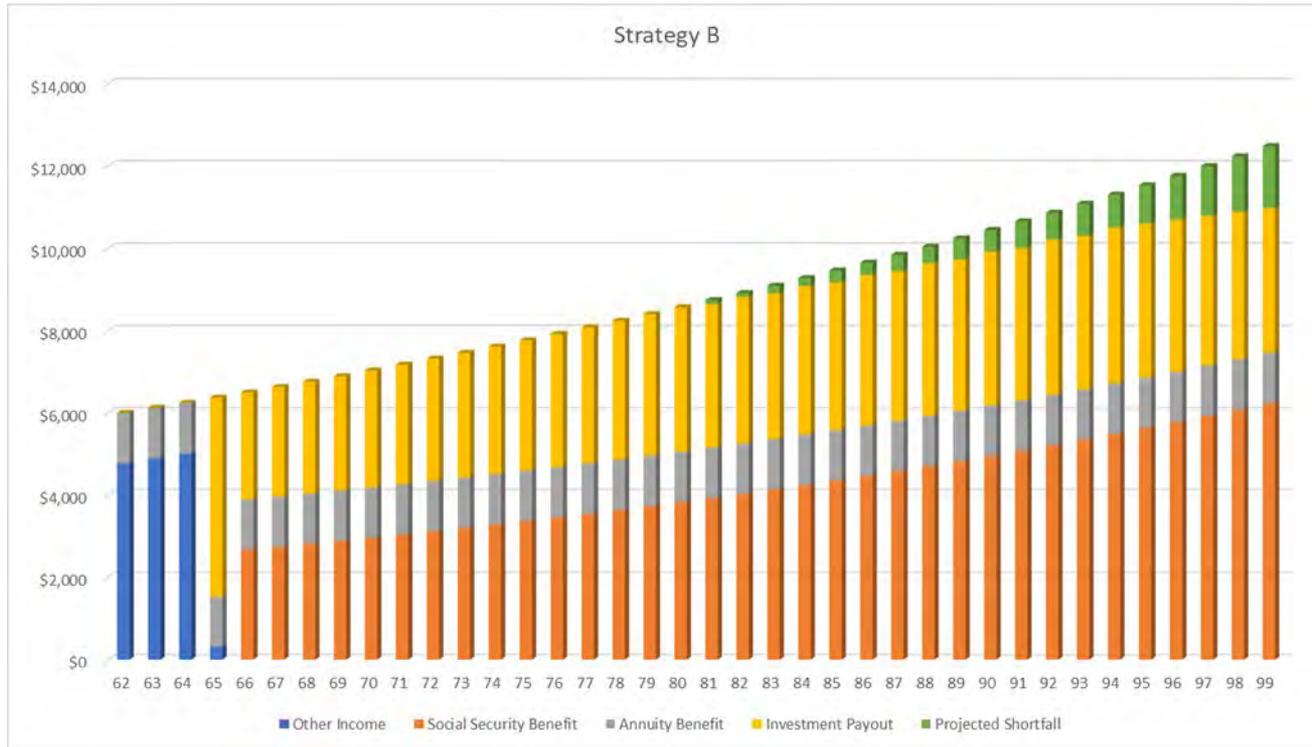
# SOURCES OF INCOME

- The bar graphs below illustrate for each of the strategies the sources of projected income by age.
- The bottom sections represent income that is virtually guaranteed (other income, Social Security, and insured fixed income).
- The yellow section is income based upon the investment balance and earnings.
- The top section in green (if any) represents the average expected shortfall in the income goal.

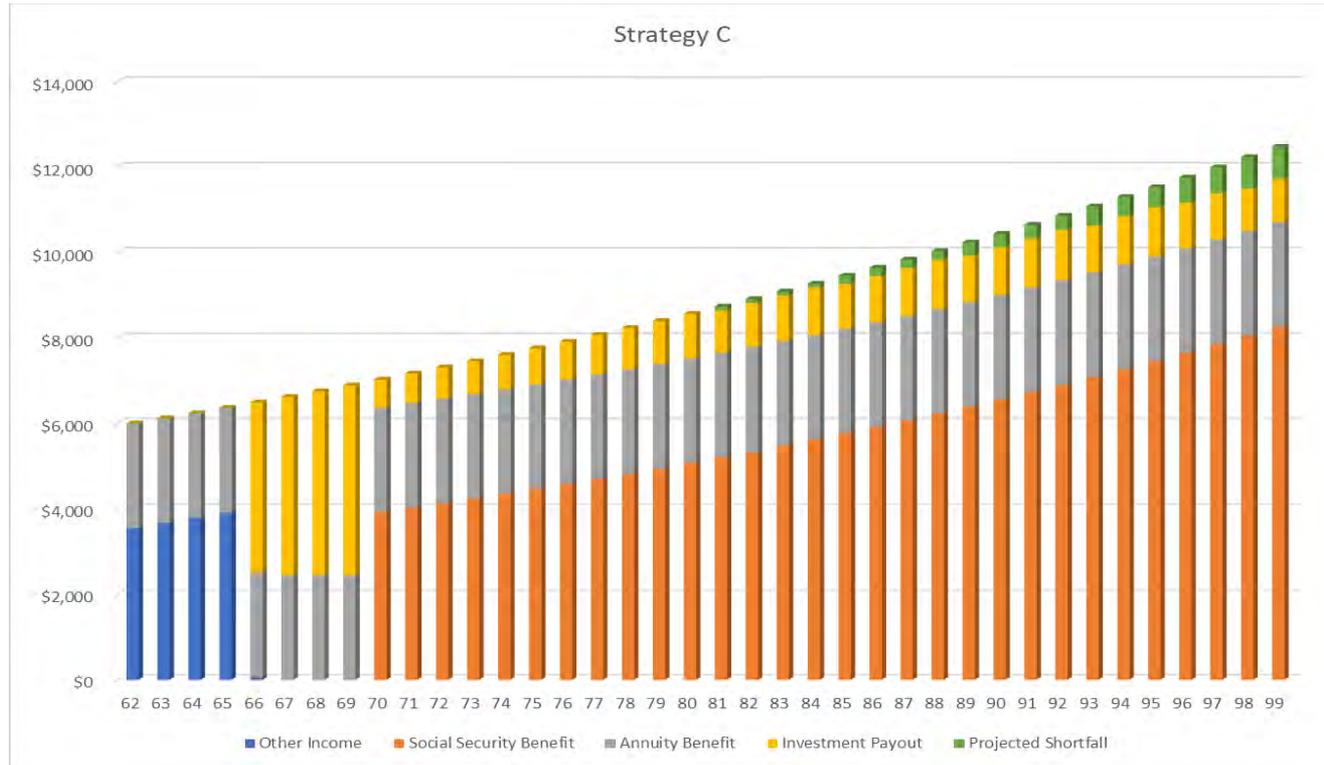
# SOURCES OF INCOME (CONTINUED)



# SOURCES OF INCOME (CONTINUED)



# SOURCES OF INCOME (CONTINUED)



# PARTING THOUGHTS

- A quantitative analysis is of value when used in conjunction with qualitative considerations.
- Using modeling based on future assumptions needs to be done with caution.
- Selection of appropriate unbiased assumptions is critical.
- This paper illustrated a relatively simple example comparing just 3 strategies with 3 decision points. (Social Security commencement age, fixed annuity purchase amount, and asset allocation)
- Other decisions could be modeled; joint life analysis, taxation, use of home equity, and others in addition to other asset classes or annuity products.
- The modeling could also be adapted to search for strategies that achieve specific goals
  - the strategy that maximizes the likelihood of achieving a specific income goal
  - the strategy that maximizes maintaining an investment balance level
- Could be modified to analyze the tail risk of a strategy
- The approach presented here is only a representative model.
- An actuarial approach is complex; may not be suitable for retirees without sufficient resources or professional advice



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