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Efficient Retirement Financial Strategies

by

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Introduction & Overview



The Problem:

With trillions invested in self-directed pension plans, many retirees face the daunting task of determining an appropriate spending and investment strategy for their accumulated savings.

A retiree has a retirement financial strategy that determines all investment and spending. This is often determined by specifying two independent components:

- an investment strategy, a plan that governs all investment decisions, and
- a spending strategy, a plan that governs all spending decisions.

Two Approaches:

- **The Financial Economist's approach:**

- Maximize the retiree's expected utility.
- Assume markets are "complete."
- Result: Investment & Spending Rules

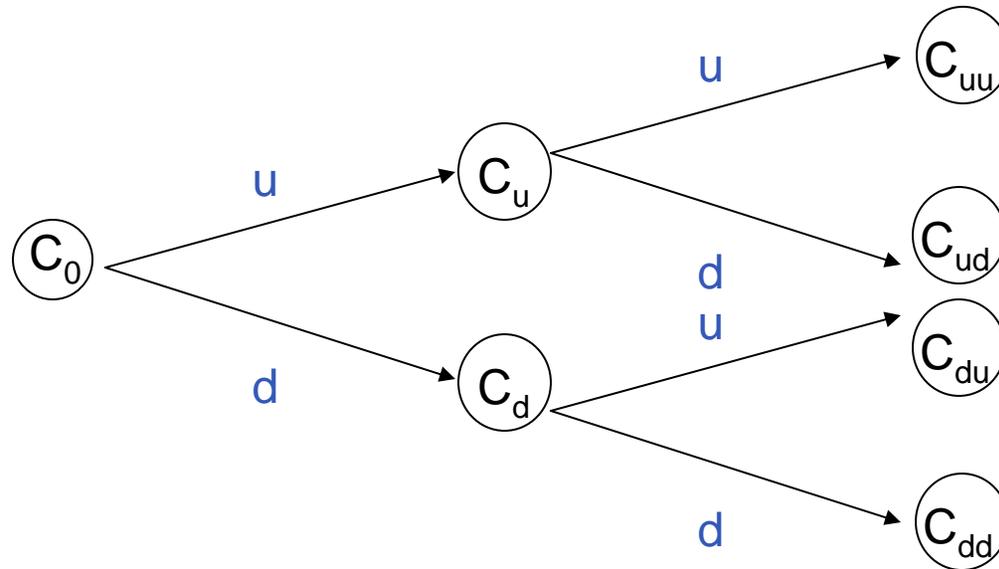
- **The Financial Advisor's approach:**

- Assume an investment rule: "Equity allocation equals 100-age"
- Assume a spending rule: "4% of initial wealth rule"
- Question: Are these rules optimal for any investor?

Our Goal:

- **The goal of this paper is to consider whether some popular retirement financial strategies are or are not consistent with the approach often advocated by financial economists.**
 - A rule is consistent if it can be shown to result from an expected utility maximization for at least some investor in a standard market setting.
 - If a rule is consistent, we say it is efficient, and refer to the utility function as the revealed utility.
 - Many rules are inconsistent, but not all, and some can be altered to produce an efficient rule that would be preferred by an expected utility maximizer.

Retirement Strategy: Two Period Binomial



Retirement Strategy:

$C_0, C_u, C_d, C_{uu}, C_{ud}, C_{du}, C_{dd}$

Asset Pricing Theory & Efficient Strategies

- All paths with the same cumulative market return have the same ratio of state price to probability
- To maximize expected utility one should select a strategy in which spending is a monotonic function of the ratio of state price to probability
- Hence for a strategy to be efficient for an expected utility maximizer, spending should be an increasing monotonic function of total market return.
 - Since non-market risk is not rewarded, none should be taken.

Quick Tests for Efficient Strategies:

- **Spending must be path independent.**
 - We can always replace a path dependent rule by its average, which will always be preferred by a risk-averse investor.
- **Wealth must be path independent.**
 - A wealth violation ultimately results in either a spending violation or money left over.

Financial Advisor's Rules of Thumb

Topics

- **“100 – age” rule of thumb (age-based risk)**
 - Lifecycle funds use 120-age--Jennings and Reichenstein (2007)
 - Rule is silent on appropriate spending!
 - Significant constraints on implied efficient spending
- **“4% Rule” (fixed spending and market investment)**
 - What is the rule?
 - Efficiency analysis
 - How can it be fixed?
- **Summary: lessons from efficiency**

4% Rule: What is it?

- **Spending rule: fixed real spending**
 - Initial spending: 4% of wealth
 - Ongoing spending: keeps up with inflation
- **Investment rule: market portfolio**
 - 50%-75% equity allocation (essentially a market portfolio)
- **Support for rule:**
 - Using historical returns, wealth lasted 30-40+ years using this spending/investment strategy.

4% Rule – Efficiency Analysis

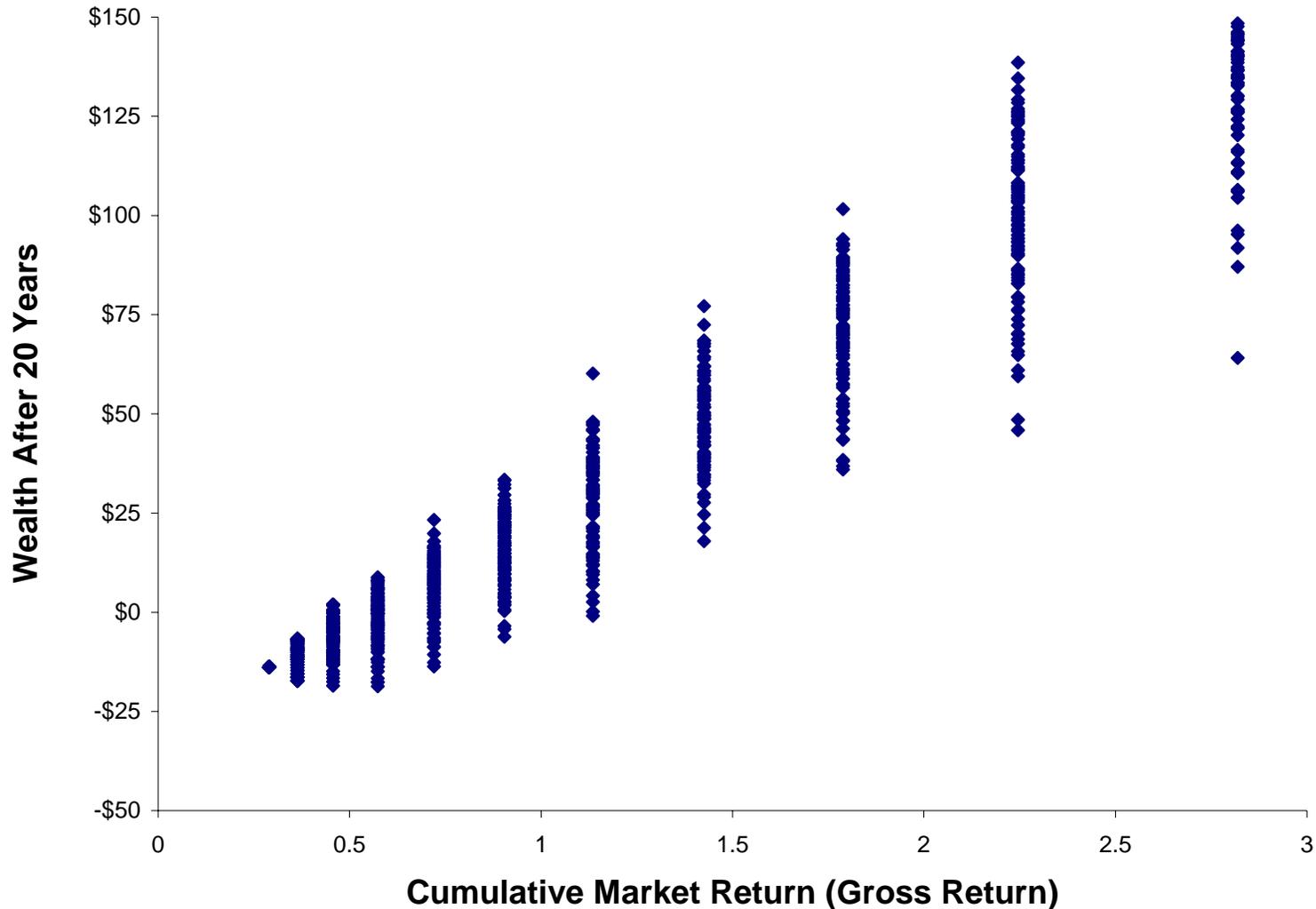
- Efficiency → spending and investment are linked.
- For a given spending plan, exists a single minimum cost investment strategy to support spending.
- Constant risk example:

$$\frac{C_u}{C_d} = \frac{R_u^B}{R_d^B}$$

- Efficiency requires *spending volatility track investment volatility*
- **4% rule: Spending and investment mismatch**
 - Risky investments
 - Fixed spending
 - Very inefficient strategy (even bankruptcy possible)

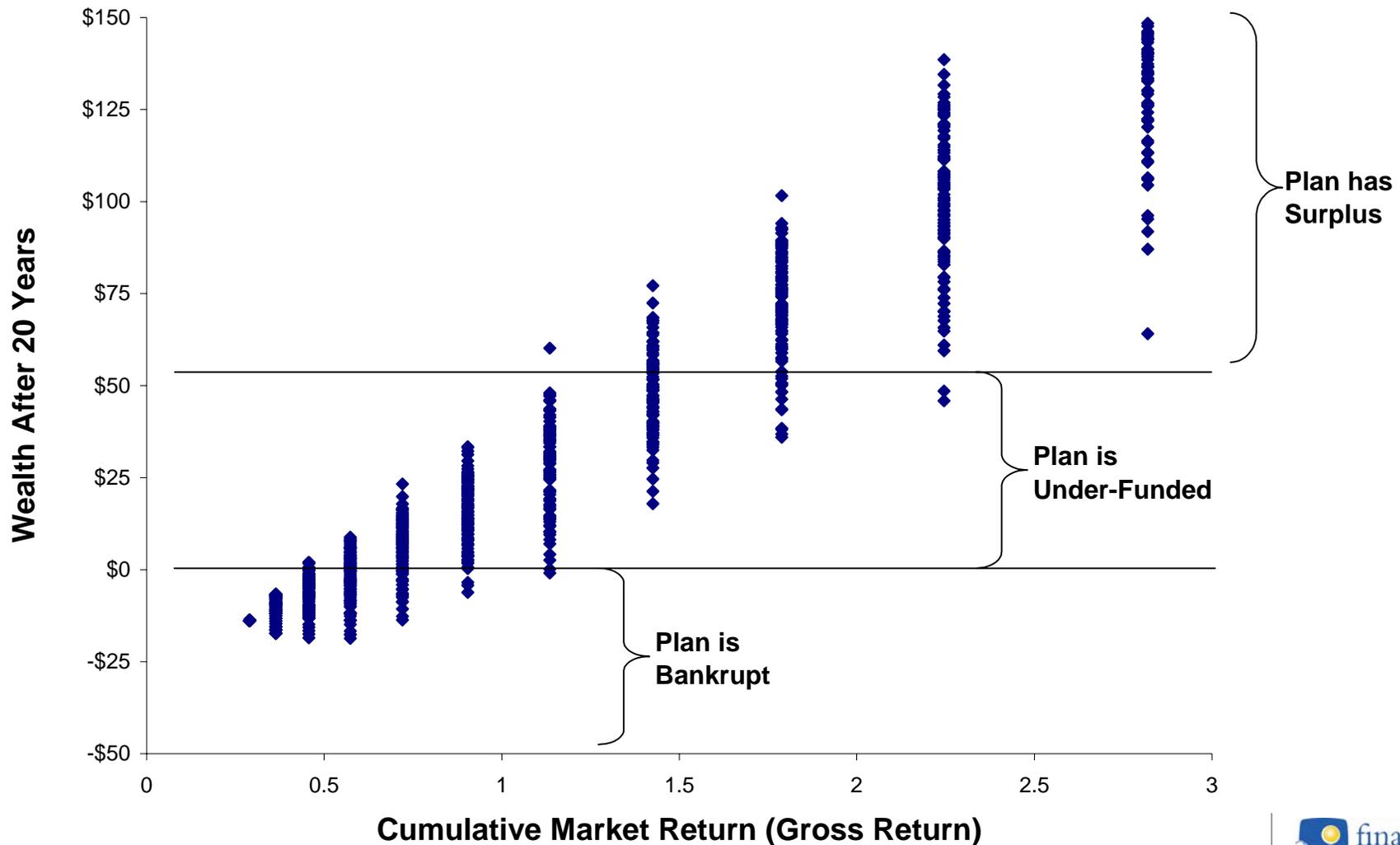
4% Rule – Efficiency Analysis

"4% Rule" -- Fixed Spending with Market Investment
Wealth After 20 Years (\$100 Initial Wealth)



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Summary: Lessons From Efficiency

- **Investment rule and spending rule linked**
 - Investment performance must translate to spending adjustments
- **Typical advice ignores spending/investment links**
 - Age-based risk silent on spending rule (lockbox glide path inefficient)
 - 4% rule creates large inefficiencies with fixed spending and volatile investments

And, on a Positive Note

- If markets are sufficiently complete then wealth can be allocated among a set of lockboxes, one for each future calendar date
- For each lockbox there is an efficient static or dynamic investment strategy.
- The result can be an efficient strategy suited for a particular investor's utility function
- For more details, see the paper

