A SKI challenge:

Some thoughts on a personal capital spending tool for retirement

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Disclaimer

This presentation is intended to provide general information only. Where it contains general advice it has been prepared without taking into account any particular person or organisation's specific circumstances.

The views expressed in this presentation are based on the author's judgement at the time of writing and are subject to change.

The challenge

How to managing the pace of spending in retirement to:

- be confident that your wealth will be sufficient for your life
- avoid relying on social security
- avoiding unnecessary deferral of consumption
  (or worse, consumption by the kids after you die!)

Why now?

- Historically
  - most retirees have insufficient wealth → aged pension removes longevity risk
  - some have more than enough → bequests buffer longevity risk
  - few in the middle needing to worry about longevity risk
- Baby Boomers are different:
  - SGC assets have built up; BBs expect to self fund
  - But they have higher consumption aspirations
  - Government aged pensions unsustainable in real terms
  - Successful but expensive medical solutions → longer lives; more costs
  - BBs happy to spend the "spend the kids inheritance" → bequests not effective buffer for longevity risk

Design parameters

- Simple, but not simplistic
- Few inputs
- Demonstrate investment uncertainty
- Deal with individual (not group) longevity risk
- Incorporate social security
- Tool to suggest dynamic
  - investment strategy
  - spending levels
- Balance spending and bequest aspirations
- Intertemporal utility confronted head on

Questions to answer

- How much do I need?
- How much do I need to save?
- How much can I realistically spend next year and into the future?
- How risky can my investments be?
- What might happen? Can I live with this?

Information required (all in today's $)

Simple user input:

- Date of birth and sex for each partner
- Annual real savings pre retirement
- Age of Partner 1's retirement
- Desired rate of self funded spending in retirement
- Desired bequest

Sophisticated user input:

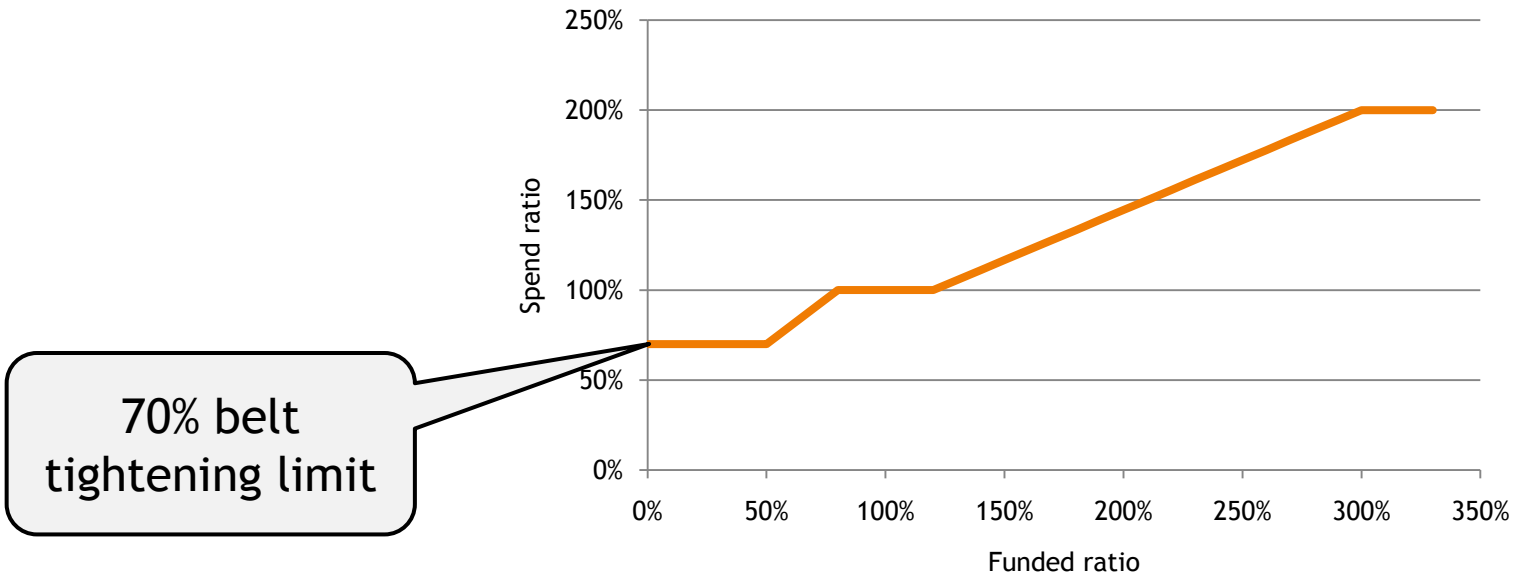
- Different patterns of savings and desired spending
- Mortality factors
- Discount rates
- Spending rule parameters
- Cash flow cascading rules
- Utility functions for retirement income and bequests
- Investment return assumptions

Value of future cash drawdowns at start of each year

- "Individual" conservative longevity:
  - Start with age-based death rates from Australian Life Tables 2005-2007 with improvements
  - Multiply by "individual dead or alive" factor. Default values:
    - 0 to age 80; 0.5 from age 90; linear blend for 80-90
    - only used to calculate value of future cash drawdowns; projection assumes individual alive at each date
- For each partner:
  $PVCD_t = PVCD_{t+1}*(1-ProbDie_t)/(1+DiscRate) + (Spend_t - Save_t)$

Also at the start of each year

- Market value of financial assets
- Access to social security based on assets test. (Income test is WIP)
- Deterministic value of future cash drawdowns
- Spending rule for self funded income = function of funded ratio



Drawdown rule

- First calculate wealth drawdown based on spending rule, ignoring available wealth
- Reduce drawdown to total assets available
- All flow calculations such as this assumed to occur on the first day of the year

Retirement income

- Sum of:
  - self funded drawdown
  - any social security

Rebalance according to cascading rules

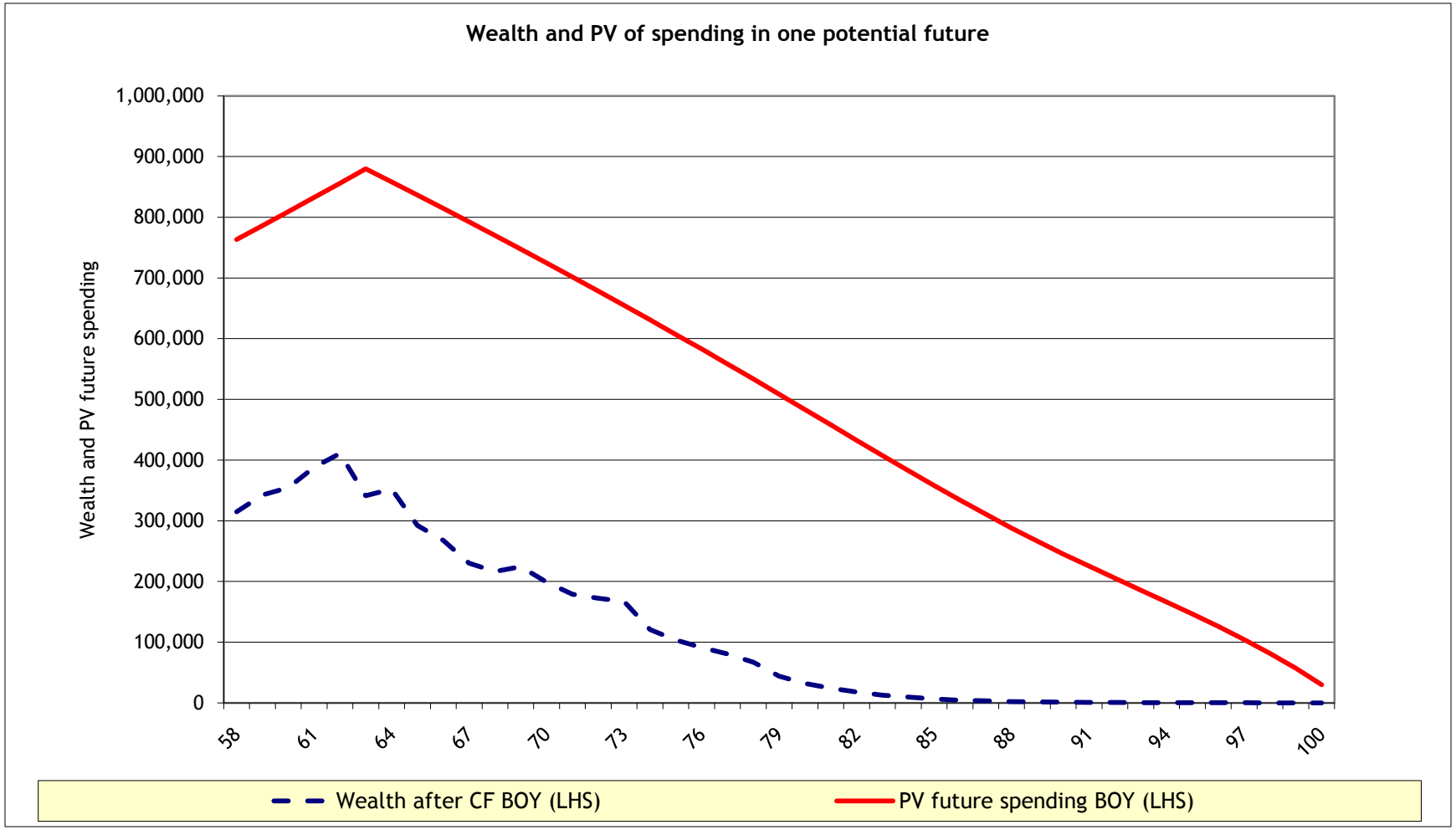
For example:

- Hold a 1 year TD to mature to fund next year's desired spend times current spending rule.
- Hold a 2 year TD to mature to fund following 2 years' desired spend times current spending rule.
- Adjust TD portfolio to these desired levels with a balanced portfolio (equities, bonds etc) being the source of funding.

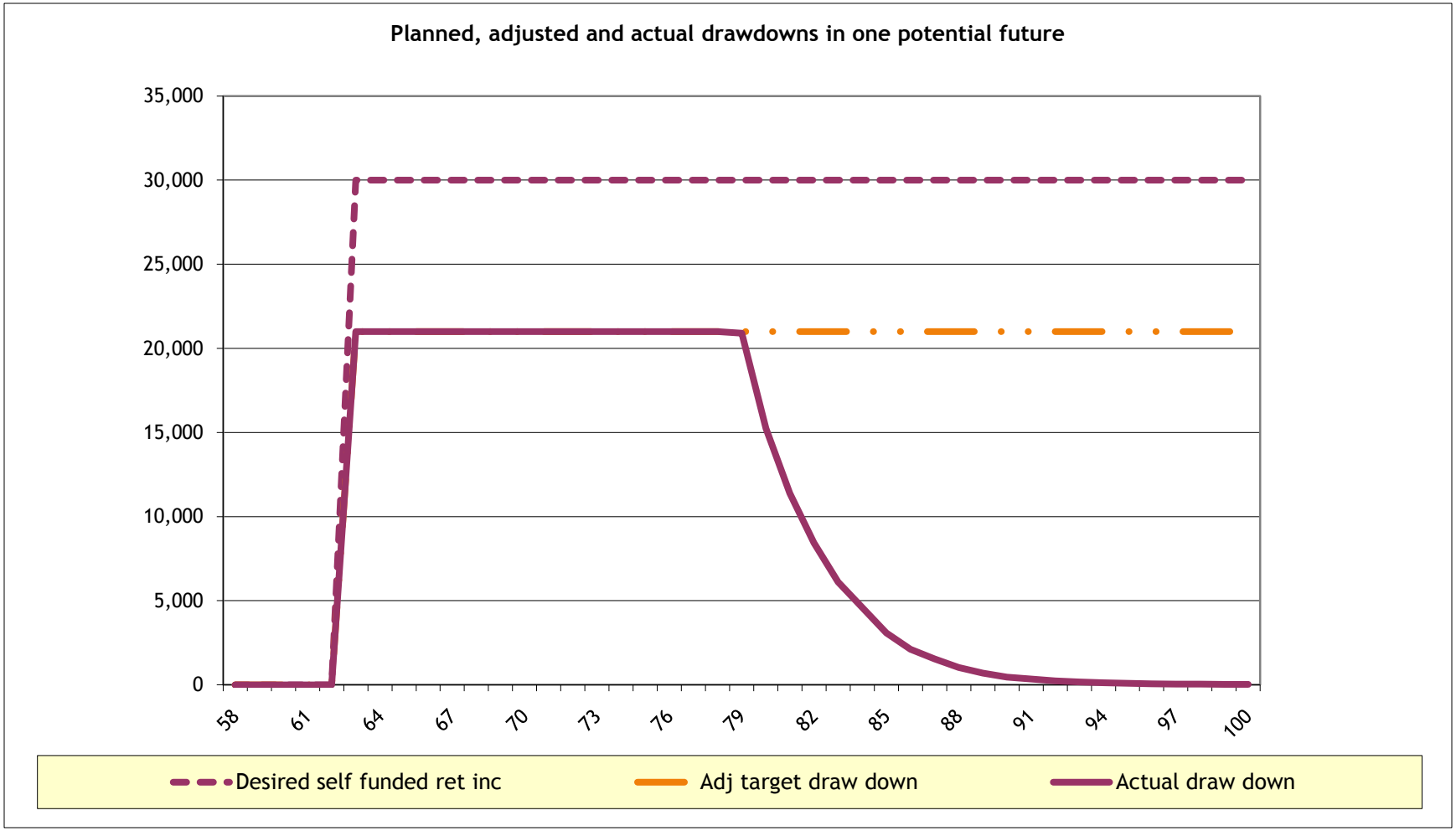
Example (all $ in real terms)

- Initial ages husband 58; wife 54
- Save $15,000 pa for next 5 years
- Current wealth $300,000
- Annual desired self funded retirement income $30,000
- Bequest target $200,000

One potential future:
... clearly they are too optimistic

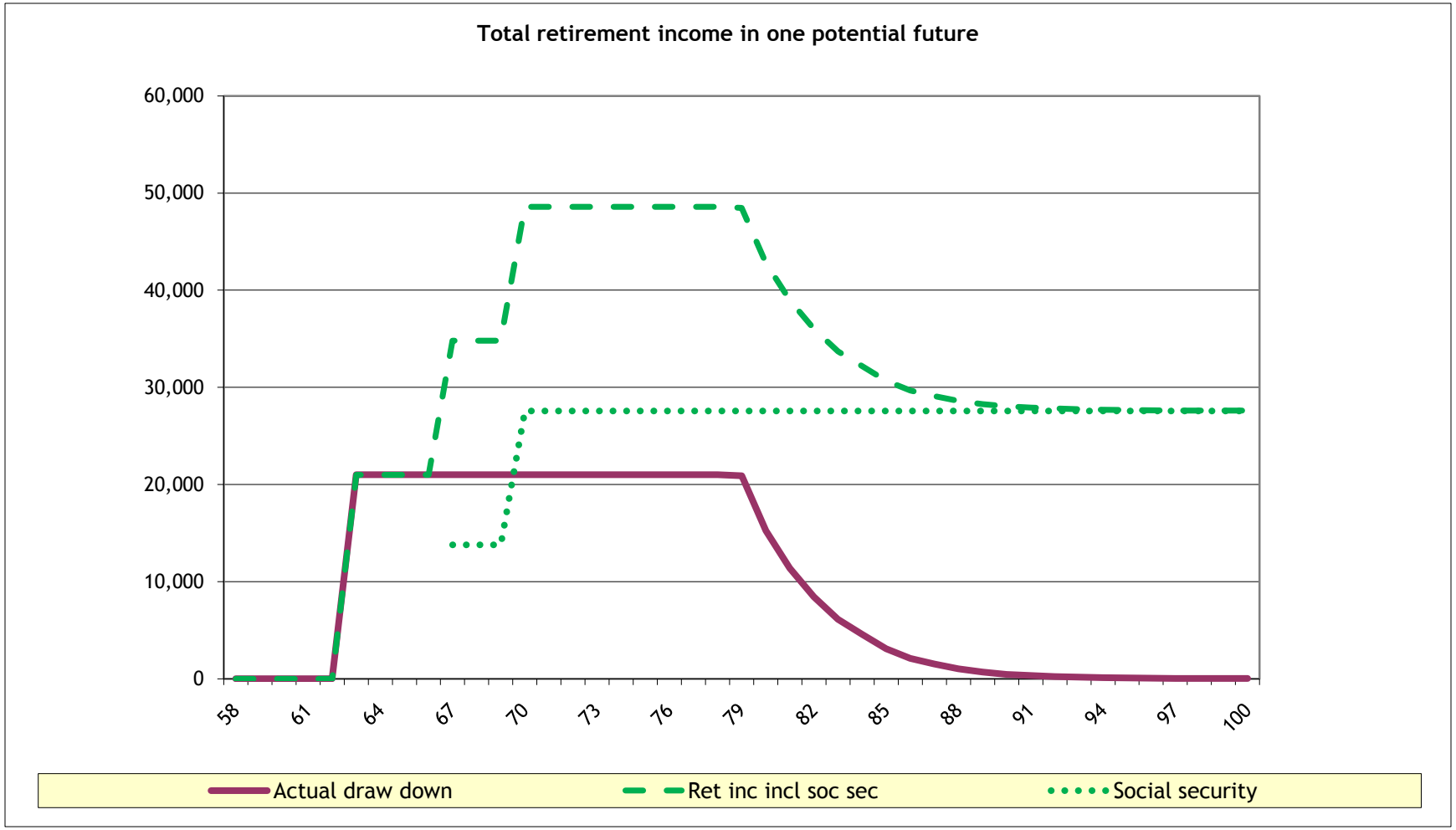


With this future they always have tight belts, ... but still their wealth starts to fail at age 80



Social security sits above this

... but can they rely on it?



This is just one possible future.
... How do you display the domain of uncertainty?

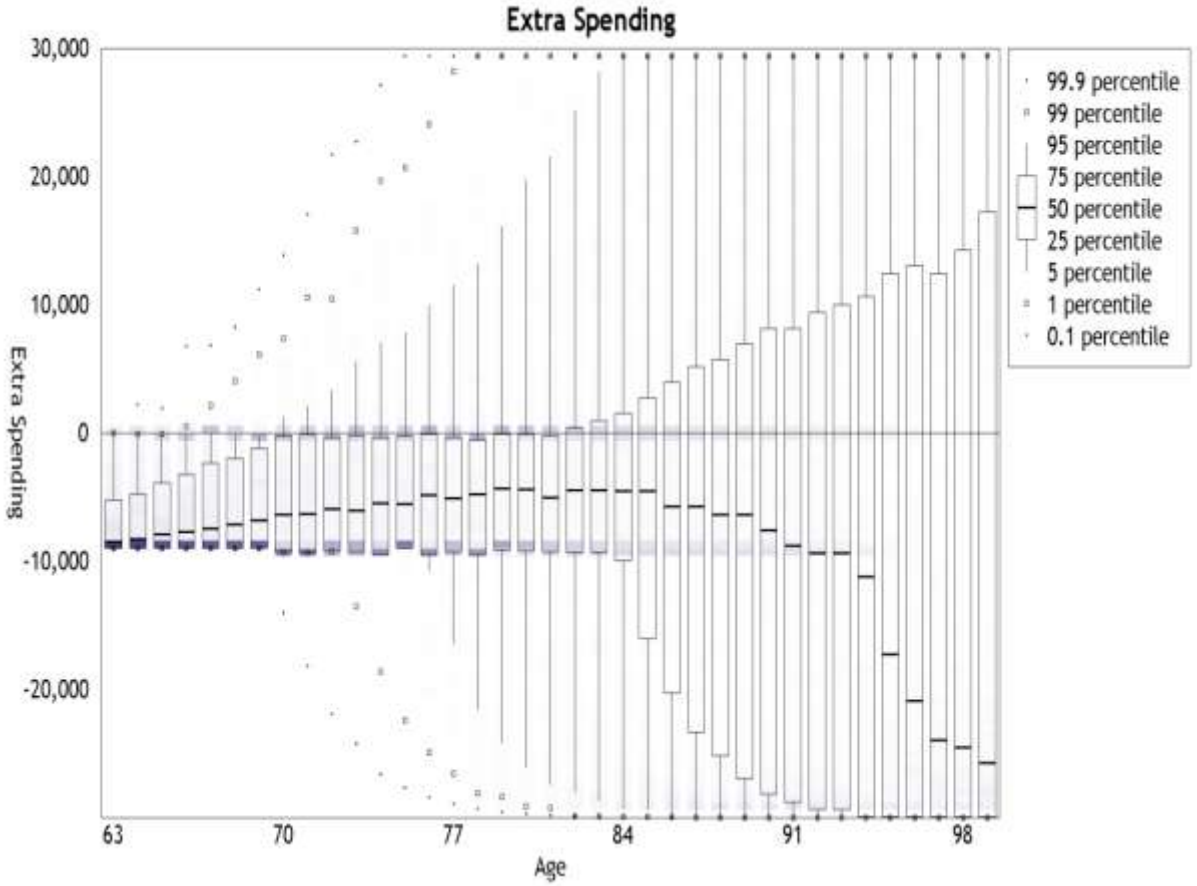
Two ideas, but more work is needed:

1. Dynamic display of Monte Carlo evolution
2. New concepts of intertemporal “satisfaction” and “risk”

Understanding the full picture
Idea 1: Dynamic display

Dynamic display of these lines, fading with each Monte Carlo iteration and slowly building a graduated display with darker areas more likely.

In this example, the result would end up being a a prettier version of this →



Understanding the full picture
Idea 2: New concepts of "satisfaction" and "risk"

Summary statistics analogous to expected return and volatility:

- expected return → "satisfaction" (defined next)
- volatility → "risk" (defined later)

"Satisfaction" defined

$$\text{satisfaction} = \frac{\{EU(RI_a)+EU(B_a)\}}{\{EU(RI_p)+EU(B_p)\}}$$

where:

$$EU(x) = \sum_t p_t U(x_t) v^t$$

p_t = the probability that the cash flow will be paid at time t

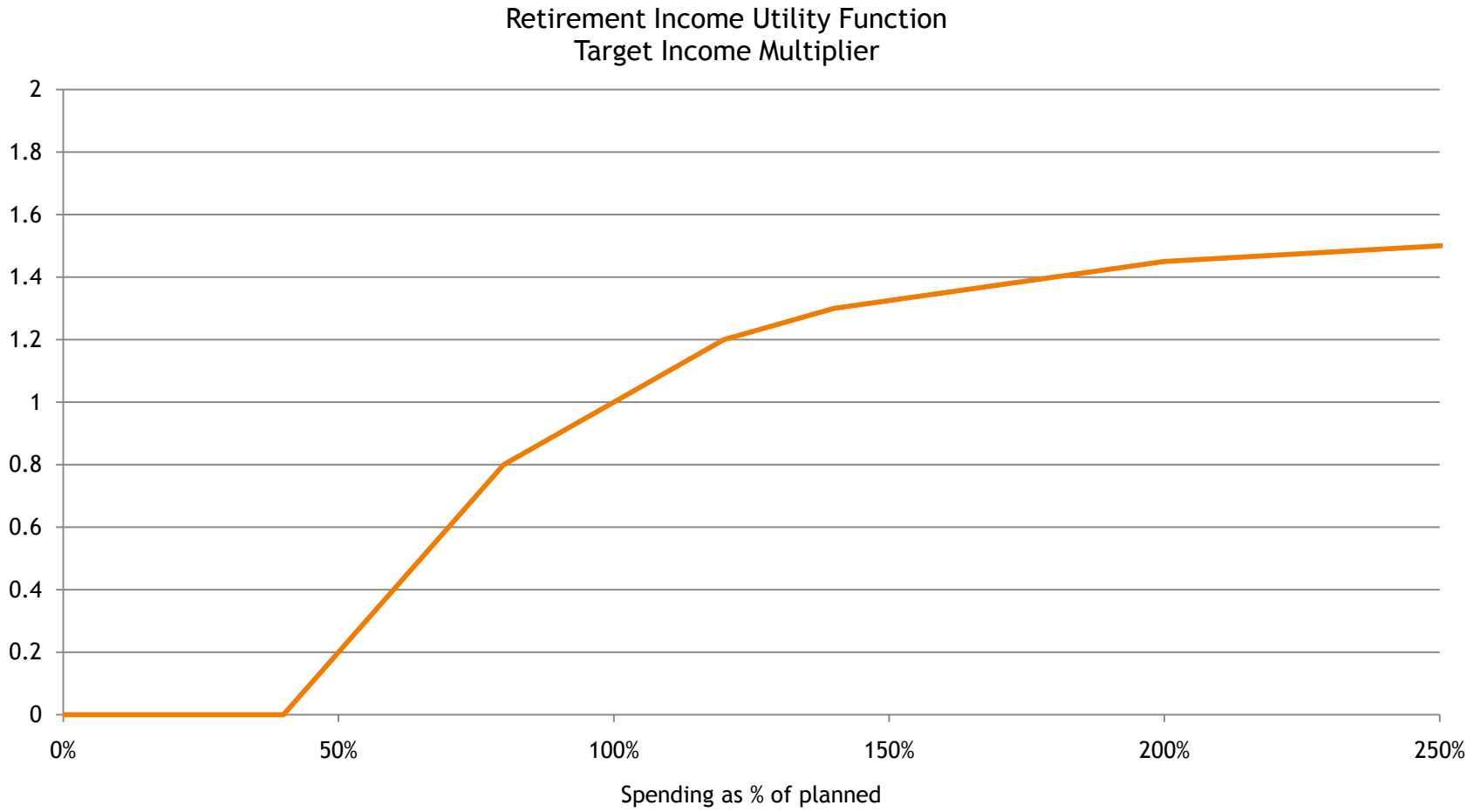
x_t = the cash flow at time t, either retirement income (RI) or bequest (B)

$$v = \frac{1}{(1 + \text{ risk free, real discount rate})}$$

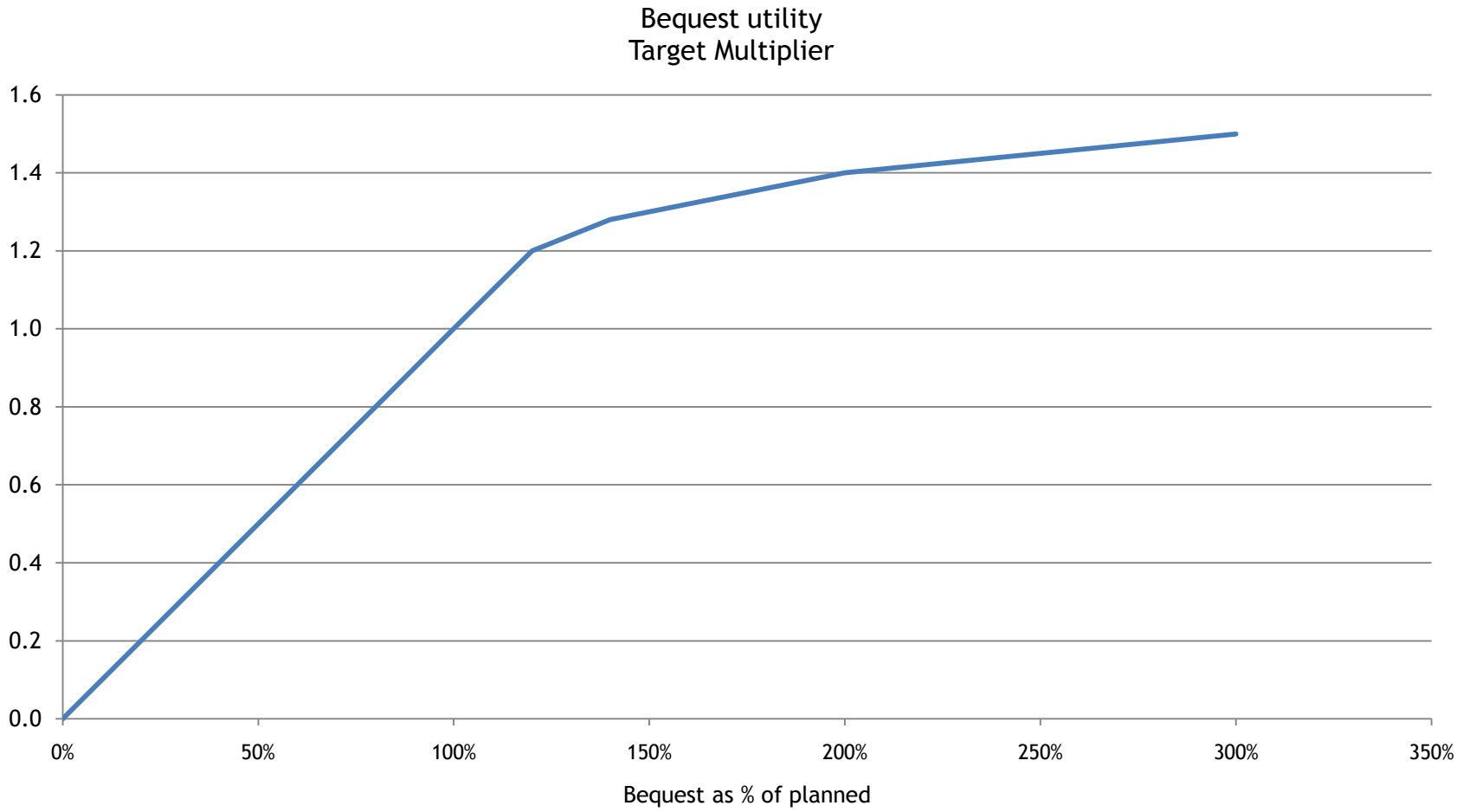
Subscripts: a denotes actual, p denotes planned target

$U(x)$ = utility of x

Utility of retirement income
... I used this arbitrary curve

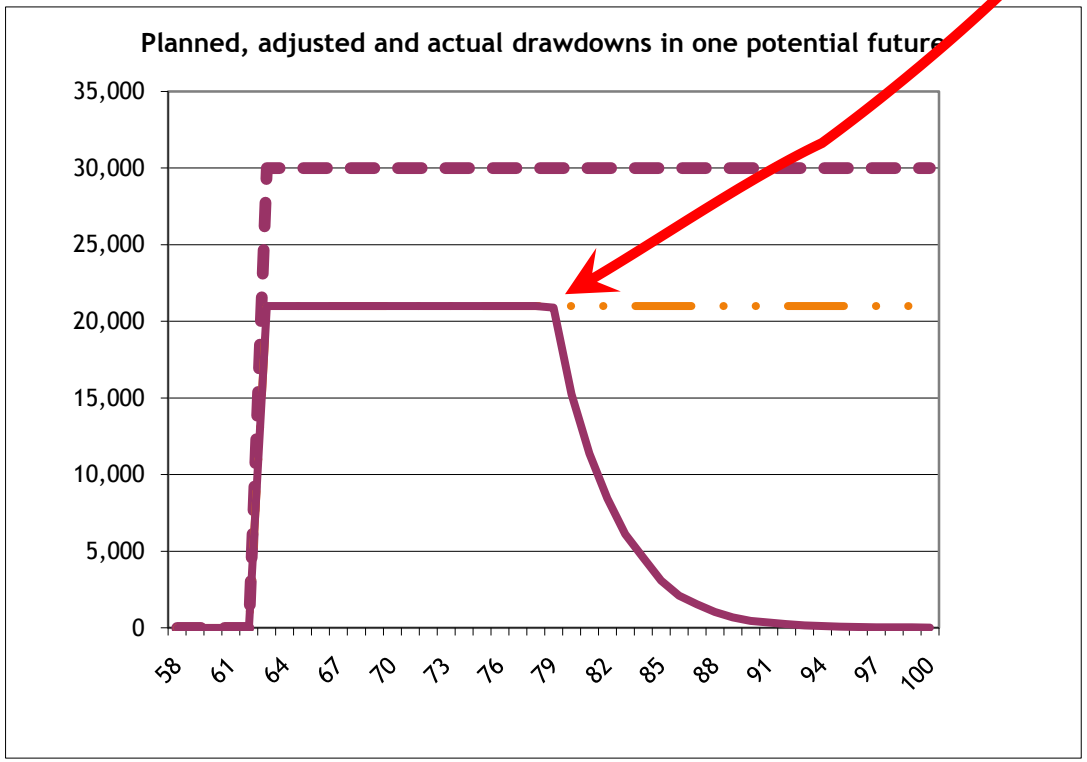


Bequest utility ... again arbitrary



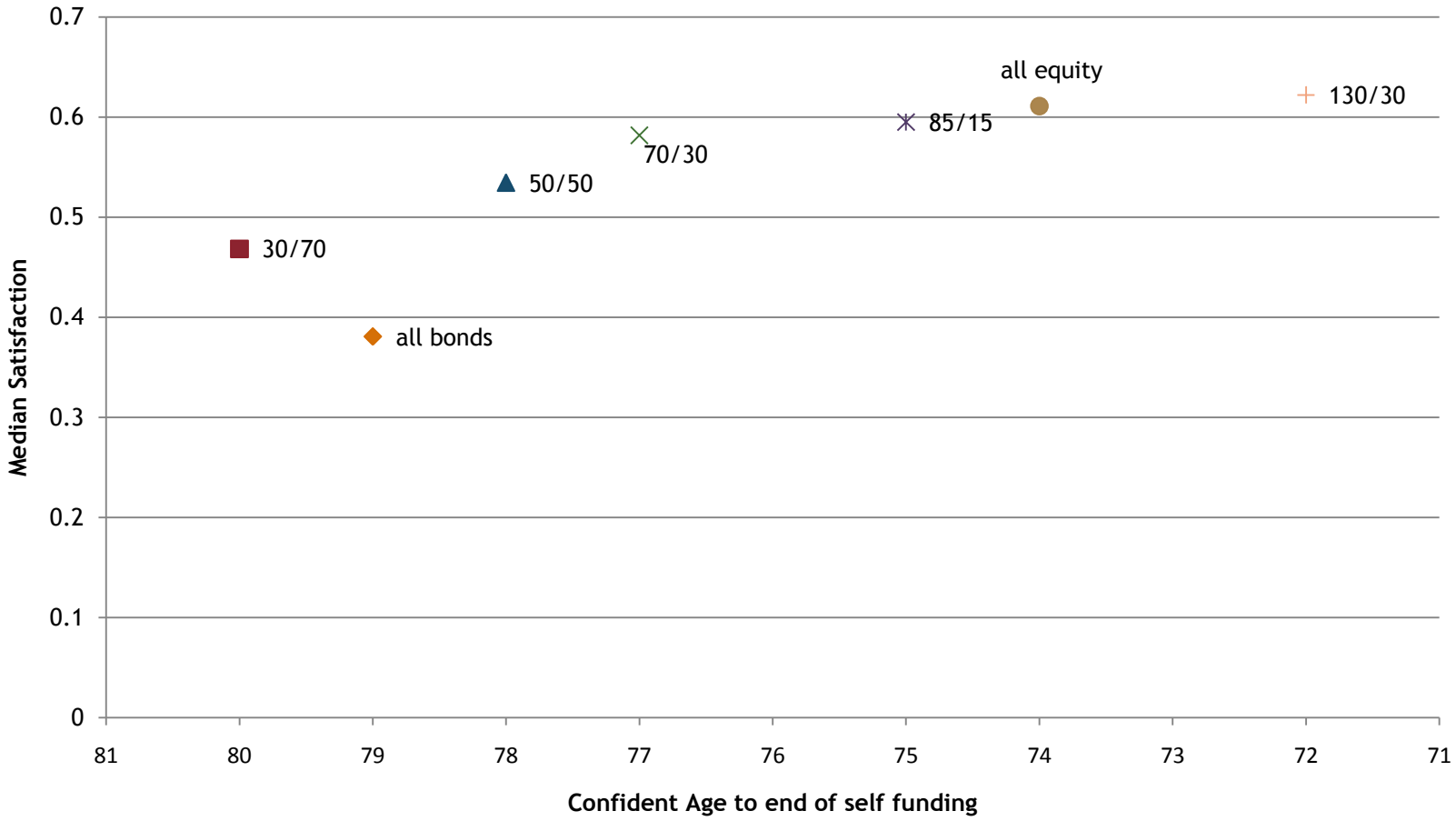
"Risk" defined

- Risk is defined at the age at which self funding begins to fail.
- It is displayed on an inverted axis to be consistent with natural thinking:
  - low risk
    = failure at high age
  - high risk
    = failure at low age



Satisfaction and risk

... a familiar shape this time, but not always



Summary

- Baby boomers need a way to reliably spend their capital in retirement
- But, it is really hard to understand, let alone balance, intertemporal preferences
- In reality, people adapt to circumstances
- This tool provides a simple way for these trade offs to be assessed