Retirement risk zone
Sequencing risk & aggressive constant mix
Displaced-V glide path
Why an up-sloping glide-path for retirees?
Bengen
Milevsky
Asset allocation formula
An economics-based plan for a 30-year retirement
Concluding comments
Retirement risk zone

• A fragile period in the financial life cycle of people in DC super.

• Described as running 5 to 10 years either side of the retirement year. Post retirement is especially tricky as your account is being depleted by living expenses.

• Primarily affects people of middle means—a lifelong high weight to growth assets matters less for people at the extremes.
Sequencing risk & “aggressive constant-mix”

- **Sequencing risk:** sensitivity of living standards to the timing of poor investment returns.

- **Aggressive constant-mix:** allocate a high and stable share of the portfolio to growth assets.
  - Australia: this share tends to be fixed at 70% to 90%--depends on definition of ‘income’ assets.
Displaced-V glide path

Share of growth assets

Percent

Risk zone

Age at start of working life
Age at retirement
Age at death

MACQUARIE UNIVERSITY
Why an up-sloping glide path for retirees?
(Assuming household retains capacity to manage growth assets)

1. Discretionary nature of bequests—evidence that bequests are luxury goods is strong.
2. Presence of essential expenditures in the budget (two candidates: energy; keeping up with the Jones’s).
3. Reduced (annualized) volatility of returns to growth assets over long horizons (not modelled here).
Why an up-sloping glide path for retirees? 
Luxury bequests buffer wealth shocks

Marginal utility of consumption in retirement

Shock

Marginal utility of bequests

Consumption in retirement before and after shock

Bequest before shock

Bequest after shock

Wealth before shock

Wealth after shock
Why an up-sloping glide path for retirees?
Luxury bequests buffer longevity shocks

Marginal utility of consumption in retirement, consumption rate

Marginal utility of bequests

Wealth

Consumption rate before & after shock

Bequest before shock

Bequest after shock
Bengen

• Generally assumes constant-mix allocations. 4 steps:

1. Divide 20th-century data into numerous (possibly overlapping) 30-year spans

2. Estimate how long a given real spending rate would have lasted over each historical span

3. Estimate the probability a given spending rate can last 30 years (i.e., perform a ruin analysis).

4. Recommend spending rates and asset allocations that trade off running out of money against leaving an overly generous estate.
Bengen (ctd)

- Recommended spending rate: 4% of initial capital.
- Recommended allocation to growth assets: 50% - 75% of capital.
- Empirically documented that bear markets are particularly damaging in early retirement.
- Cf. Merton 1969, 1971:
  1. Current spending is an age-dependent fraction of current financial wealth,
  2. Constant mix not optimal in general.
Milevsky et al

• Pioneering line of argument: you’re retired for 3 decades & gross decade-average returns follow 1.07, 1.27, 0.87 or 1.07, 0.87, 1.27.

The 1st sequence will generally be preferred.

• ..“the ideal risk management product [GMWBs] would convert [constant-mix wealth] paths that lead to early ruin and extend their lifespan by mitigating the negative return in the first 5 to 10 years”.
Milevsky et al
Issues for Australian applications

• The emerging market for retirement derivatives may be confined to self-funded retirees of middle means:
  ❖ Age Pension: a negative-beta asset & provides longevity insurance. Why should less-affluent retirees buy insurance against market and longevity risks when our gov’t provides it for free?
  ❖ Rich retirees tend to self-insure.
Milevsky et al
Retirement derivatives compared

• GMWBs probably preferable to collars, as long-maturity collars may impart excessive conservatism.

• *Methuselah puts* may be preferable to GMWBs, as they are micro-founded. Distinctive features:
  ❖ A strike price related to the parameter describing the extent to which bequests are luxuries
  ❖ Exercisable at the date of death (like funeral benefits).
Asset allocation formula

\[ x^*(t) = \left( \frac{\alpha - r}{\delta \sigma^2} \right) \left[ 1 - \frac{h}{rw(t)} (1 - e^{-r(T-t)}) + \frac{\theta a}{w(t)} e^{-r(T-t)} (1 - N(-d_2)) \right]. \]
Economics-based plan for a 30-year retirement: ensuring the spending plan drives asset allocation

- Expected real return to growth assets: 5% pa
- Volatility of returns to growth assets: 20% pa
- Real return to safe assets: 2% pa
- Luxury bequest parameter [non-standard]: $20,400
- Propensity to bequeath: 0.92
- Financial wealth taken into retirement: $1 million
- Annual expenditures on essentials: $2,900
- Rate of time preference: 3.7%
Economics-based plan for a 30-year retirement (ctd)

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An economics-based plan for a 30-year retirement

Discussion

• Retirement spending is $48,000 pa, or $8,000 pa higher than under the 4 per cent rule.

• Can implement by a bucket strategy: finance early retirement mostly by interest-bearing assets, & finance late retirement mostly by growth assets.

• Expected estate: $285,027. Could use instead for an unexpectedly long life, or unexpectedly low returns, or uninsurable late-life health setbacks.
Concluding comments

• Before mass DC super, lifetime asset allocation typically followed displaced-V glide paths.

• “Pension applications in December 2008 were around 50% higher than the number recorded in October of the same year” (Harmer 2009).

• Responsibility for shifting practice away from aggressive constant-mix rests with the industry, ASIC, APRA and individual households.