The Actuarial Profession
making financial sense of the future

Pensions, benefits and social security colloquium 2011
Jan Snippe

Dimensional Managed DC

A Next-Generation Retirement Solution

26 September 2011

Agenda

1. **Criteria for Good Design**
2. Risk Characteristics of Income versus Returns
3. Managed DC: Designed to Meet Criteria for Good Design
4. Offering the Best of DB and DC …. Plus More

Criteria for Good Design

A good solution must:

- Do everything possible to help participants achieve a stream of retirement income that is:
  - Sufficient to maintain their standard of living
  - Protected from inflation
  - Designed to last for life

- Manage the risk of not achieving this goal.

- Be effective for participants who are completely unengaged.

- Provide meaningful information to participants who *do* engage:
  - Whether they are on track to realize their retirement goals.
  - What they can do if they are not.

- Be portable and allow plan sponsors to control their costs and risk.

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## Focusing on income rather than portfolio value or return

The risk to be managed is the risk that the ultimate goal will not be realized, respectively that the shortfall will be too big.

- If the purpose of saving and investing for retirement is to maintain an adequate standard of living in retirement, the goal should be achieving an inflation protected retirement income.

- The risk to be managed is therefore the risk of not realizing that income goal.

- The patterns of portfolio value versus lifetime income are very different.

- The relation between portfolio value and retirement income will depend on
  – Inflation protected interest rates and mortality rates.
  – Both of which are variable and uncertain through time.
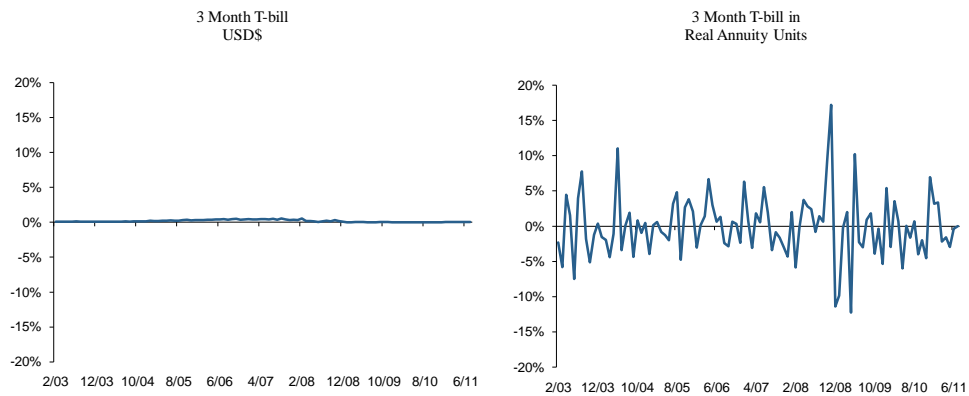
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Measuring Risk: Deferred Annuities Monthly Returns

High risk in value terms, low risk in income terms

Real Annuity
USD $

Real Annuity in
Real Annuity Units

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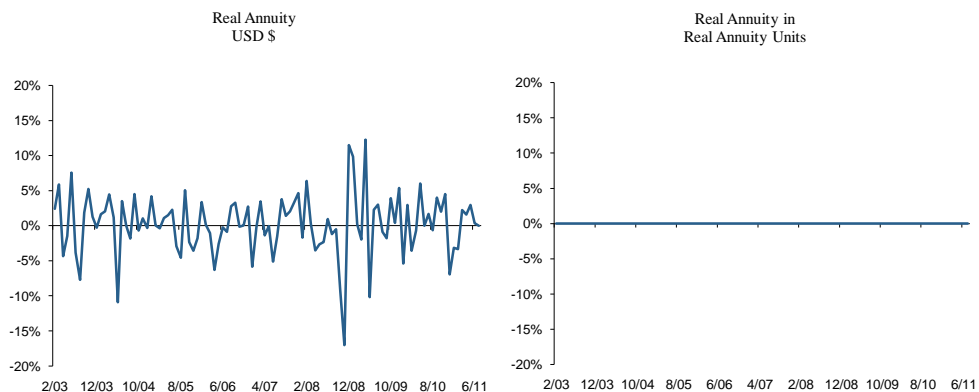
Measuring Risk: T-Bill Monthly Returns

Stable-value returns do not meet stable-income goals

3 Month T-bill
USD$

3 Month T-bill in
Real Annuity Units

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Life-cycle based approach does not provide a solution

It has no goal and manages the wrong risk

- Life-cycle principle aims to limit the volatility of returns as participants approach their retirement date.

- It focuses on the wrong risk.
  - Volatility of portfolio value and returns is not a good measure of shortfall risk.
  - The risk patterns of returns measured in terms of portfolio value and returns versus lifetime income are very different.

- The scope of it is too limited.
  - It ignores the impact of other assets, most notably future contributions.
  - It may cause participants to retain equity risk after their income goals are reached.

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Managed DC targets income

Using a proprietary, science based algorithm, Managed DC maximizes the estimated probability of realizing the Participant's Desired Income Goal subject to a Minimum Income Constraint for each account

- It first determines the allocation to inflation-linked duration matched fixed-income that will be required to minimize the estimated risk of not achieving Minimum Income.

- It then optimizes the allocation of the remaining assets to maximize the estimated probability of realizing the Desired Income target, and

- Rebalances regularly:
  - Adjusts to changes in the market and the participant's situation.
  - Reduces risk when it is no longer needed to reach the desired income target.

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Narrowing the Distribution of Possible Outcomes
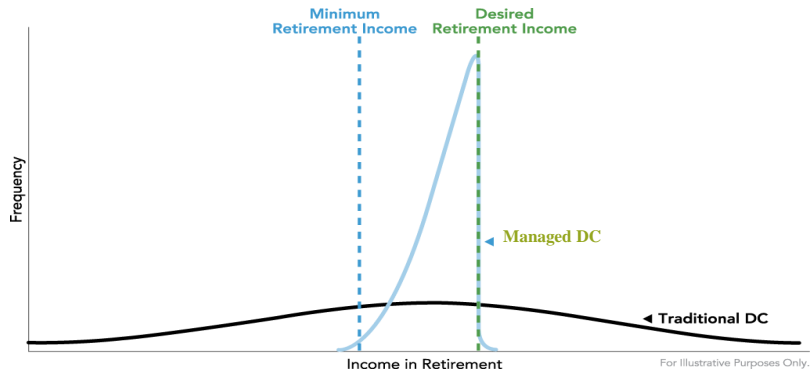
- The distribution reflects all modelled sources of risk (interest rate, market, inflation).
- Distribution is narrowed by Minimum Income constraint and selling off potential upside.

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Simulation of Managed DC versus (average) Target Dated Fund

25 year old member, £25,000 annual salary, no salary growth,10% contribution, incomes including £5,000 State Benefit
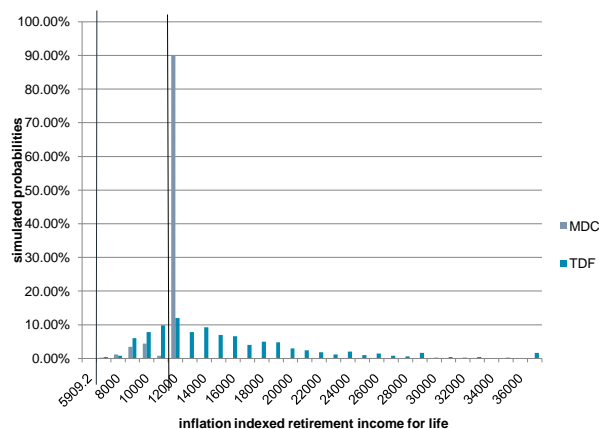
- The projections or other information generated by Managed DC regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. The information in this simulation is based upon management forecasts and reflects prevailing conditions and Dimensional's views as of this date, all of which are subject to change. See slides at the end of this presentation for explanations of methodology and additional disclosures.

- Further details are provided in Appendix 1.

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Engaged Members May Opt For Additional Customization

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Benefiting from Dynamic Management Both In and Out of Default

- Focus on Income Targets.

- Investment strategies will be dynamically managed.

- Customized to the participant's retirement income target and risk constraint.

- Participants are free from challenges that they are not equipped to deal with.

- 'Complexity is left under the hood'.

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Managed DC Provides Benefits of DB and Traditional DC … Plus More

Like DB

- Focuses on achieving an inflation-protected retirement income.

- Does not require employees to select investment strategies and/or individual investments.

- Manages the estimated risk of failure to achieve retirement goals.

- Does not require participants to be engaged.

- Leaves complexity 'under the hood'.

Like DC

- Reduces balance sheet and income risk for employers.

- Allows customization to individual circumstances.

- Facilitates portability.

Unlike both DB and DC

- Offers a personalized default.

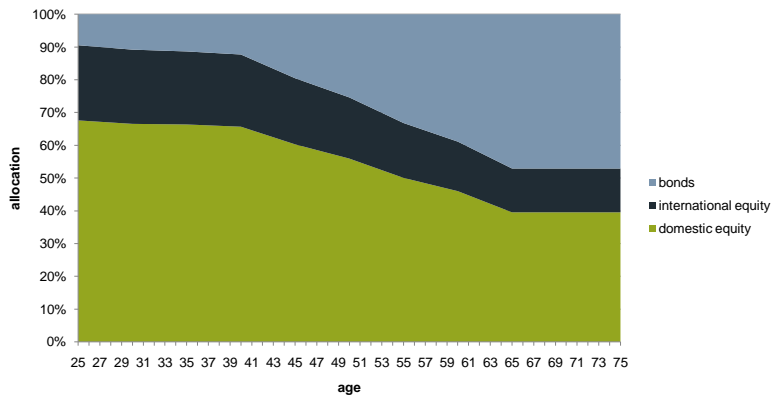- Makes further customization easy for employees who are engaged.

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Appendix 1

Methodology of Analysis of Managed DC versus Target Date Fund

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Target Date Fund Glide Path

Comparison is based on "Average Glide Path" of Fidelity, T. Rowe Price, and Vanguard Target Date Funds

The Target Date Fund "Average Glide Path" is calculated by an average of fund categories (International Equity, Domestic Equity, Long-term Bond and Short-term Bond) of the three largest TDF providers in the US by assets: Fidelity Investments, Vanguard Group and T. Rowe Price Group . They account for an approximate combined 77% of assets in the US market of $341 billion as of 12/31/2010.

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Methodology

This presentation includes the following methodology and assumptions:

Equity Return Simulations:

For both Target-date funds and MDC funds, we simulate the performance of the International Equity and Domestic Equity portfolios based on the following parameter assumptions:

- Global Equity: average risk premium of 3.3% with a standard deviation of 15.3%;

- Domestic (UK) Equity: average risk premium of 3.4% with a standard deviation of 18.8%.

Interest Rate Simulations:

For interest rate simulations we use the multi-factor interest rate model with the same parameters for both the TDF and MDC simulations.

Monte Carlo Simulations:

The TDF fund allocation is based on the average glide path between the start date and retirement.
The MDC allocation is determined by optimization under the constraint that the minimal income level will be reached with 96% probability.

The distribution of incomes graph is a result of 500 path Monte Carlo simulations given the above assumptions.
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Appendix 2

Contact details

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Contact details

Jan Snippe

Head of Dimensional Retirement Europe
Dimensional Fund Advisors

jan.snippe@dimensional.com

+31 20 7085840   office
+31 6 51915505   mobile

Amsterdam Symphony / HFC Plaza
Gustav Mahlerplein 113-115
1082 MS Amsterdam

P.O. Box 75926
1070 AX Amsterdam
The Netherlands

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