Handout for Class #15

Asset Management, Lifecycle Investing, and Retirement Finance

Robert C. Merton

15.467

Classes #15

Monday, April 12, 2021

Lecture

Meeting the Challenges of Funding Retirement: A Next-Generation Solution, Part II

Prof. Robert C. Merton

TA: Zaki Dernaoui zaki@mit.edu

15.467 Asset Management, Lifecycle Investing and Retirement Finance

IV. Retirement Finance: Design of Plans and Development of Tools and Products

2:30 pm Mon., April 12, 2021

TOPIC

Class 15: Meeting the Challenges of Funding Retirement: A Next-Generation Solution Part II

MATERIALS

<u>Required Reading</u>:

"The Crisis in Retirement Planning," R.C. Merton, *Harvard Business Review*, July-August 2014.

"Applying Life-Cycle Economics: An Income-Oriented DC Retirement Solution that Integrates Accumulation and Payout Phases," R.C. Merton, UK NEST, 2013.

"Glide Paths Based on a Retirement Goal and Depleting Human Capital," P. Mladina and C. Grant, *The Journal of Investing*, February 2019, 28, pp. 8-16.

<u>Optional Reading</u>

"Observations on Financial Education and Consumer Protection," R.C. Merton, in *Lifecycle Investing: Financial Education and Consumer Protection,* CFA Institute 2012 (corrected Jan 2013).

"Pensions: An Urgent Call," Gabriel Plata, Inter-American Development Bank, January 2019.

“Defined Contribution: The Engagement Fallacy,” C. S. Moreolo, *Investments & Pensions Europe*, January 2021.

"How Much Retirement Income is Enough?” Marlena I. Lee, *Defined Contribution Insights*, PSCA (Plan Sponsor Council of America), Mar/Apr 2012.

"BlackRock: DC Participants Most Concerned About Monthly Income in Retirement," Meaghan Kilroy, *Pensions & Investments*, March 6, 2018.

"The Fundamental Problem with Retirement Funds," P. Cairns, *Moneyweb*, April 3, 2018. (South Africa)

"Alexander Forbes Clarity,” Alexander Forbes Group Holdings Limited (South Africa, browse).

"QSuper's Permanent Revolution," David Rowley, *top1000funds.com*, May 9, 2014.

"Redefining DC Plans for the Future: Top 10 Updates to Our DC Vocabulary for 2018," WillisTowerWatson, 2017.

<u>Background References</u>

"Funding Retirement: Next Generation Design," R.C. Merton, *JASSA: The Finsia Journal of Applied Finance,* Issue 4, 2012.

"Mercer Suggests Top Priorities for DC Plan Sponsors in 2018," R. Moore , *Administration | PlanSponsor.com*, December 18, 2017.

"It's the Income, stupid," J. Greenwood, *Money Marketing,* August 17, 2013.

"California on Verge of Creating Retirement Plan for Private-Sector Workers," K. Pender, *San Francisco Chronicle*, March 9, 2018.

"Nobel Prize Winner to Pension Funds: Simplify!" P. Cairns, *Moneyweb*, July 24, 2015. (South Africa)

“Retirement Income for Today's DC Plans: Targeting Income," C. Castillo, BlackRock, 2016.

"Set a Retirement Target You Can Achieve," L. du Preez, *IOL*, November 14, 2015. (South Africa)

"Disrupting Strategies to Fulfil Retirement Goals," B. Ndweni, *FINWEEK*, July 30, 2015, p. 17. (South Africa)

"Income the Key Dimension," A. White, *top1000funds.com*, March 16, 2016.

"Retirement for Ordinary People," *The Business Times*, January 31, 2014, p. 11. (Singapore)

"How to Save for Retirement When Politicians Keep Making it Harder," P. Powell, *MarketWatch.com*, April 18, 2017.

"What Does It Take to Measure Retirement Adequacy?" R. Moore, *Data and Research | PlanSponsor.com*, November 7, 2017.

"Planning and Investing for Retirement Consumption," M. DeSantio, Defined Contributions, Fall 2017, p. 2-4.

"Innovative Indexing Approach to Manage Uncertainty of Retirement Income," S&P Dow Jones Indices, January 25, 2016.

"Road Testing a New Pension Approach," Project M, *Alliaz Global Investors,* September 2011, pp. 34-35.

"Pot of Money' Approach is Wrong," L. du Preez, *IOL*, July 25, 2015. (South Africa)

"Next-Generation Retirement Planning," Interview with R.C. Merton, DC Dimensions, July 2011.

"Focus on Meaningful Information," S. Levitan and R.C. Merton, Collective Insights, *FINWEEK*, October 22, 2015.

"How United Technologies Created the Retirement Plan of Tomorrow," P.A. Gladych, United Technologies, May 12, 2017.

"Why Stocks are Riskier than You Think," Zvi Bodie and Rachelle Taqqu, *The Wall Street Journal,* March 12, 2012.

"The Evolution of Target-Date Funds: More Assets, More Complexity, More Choices," *Pensions* & *Investments,* March 3, 2014.

"Observations on Individually Funded Pension System Design: Advances for the Future," R.C. Merton, *Developing the Potential of the Individually Funded Pension Systems,* International Federation of Pension Fund Administrators, 2010.

"The Future of Retirement Planning," R.C. Merton, *CFA Institute,* 2007.

"Consumer Financial Protection in the Current Economy," Paula Hogan, May 2012.

"DFA Gives managed Accounts a New Dimension," Kerry Pechter, *Retirement Income Journal,* October 2012.

"Solutions for the Future," Robert C. Merton, *Pensions Insight,* January 28, 2010.

"How to Retire in a Rapidly Aging World," Interview with R.C. Merton, D. Goldstein, Seekingalpha.com, April 28, 2014.

Providing Core Retirement Funding for Working- and Middle-Class Households Creating Next-Generation Solution

Lifecycle Hypothesis: Balance between the standard of living during the work years and the standard of living in the retirement years.

Goal: Provide standard of living in retirement equal to the standard of living enjoyed in *latter* part of the work life.

Goal Representation: Provide inflation-protected income for life in retirement adequate to maintain the standard of living in *latter* part of work life

Objective Function: Maximize probability of achieving desired target income (replacement ratio) subject to a minimum income (replacement ratio) and other risk constraints

Key Design Principles to Achieve a Good Retirement

1. Set **replacement income** as the goal for retirement
2. Address risks relevant to the goal: **income shortfall**, not return volatility
3. Deliver an asset allocation strategy to manage **retirement income risk**
4. Make efficient use of all **dedicated retirement assets**
5. Offer **personalization** based on one's retirement account characteristics
6. Take account of changes in both **market and personal** circumstances
7. **Be effective** even for those who are **completely unengaged**
8. Supply **only meaningful information** offer **actionable choices** to improve outlook
9. Offer **robust, scalable and low cost** investment strategies
10. Offer **seamless transition** and **payout flexibility at retirement**

Focus on Income Rather than Portfolio Value or Return

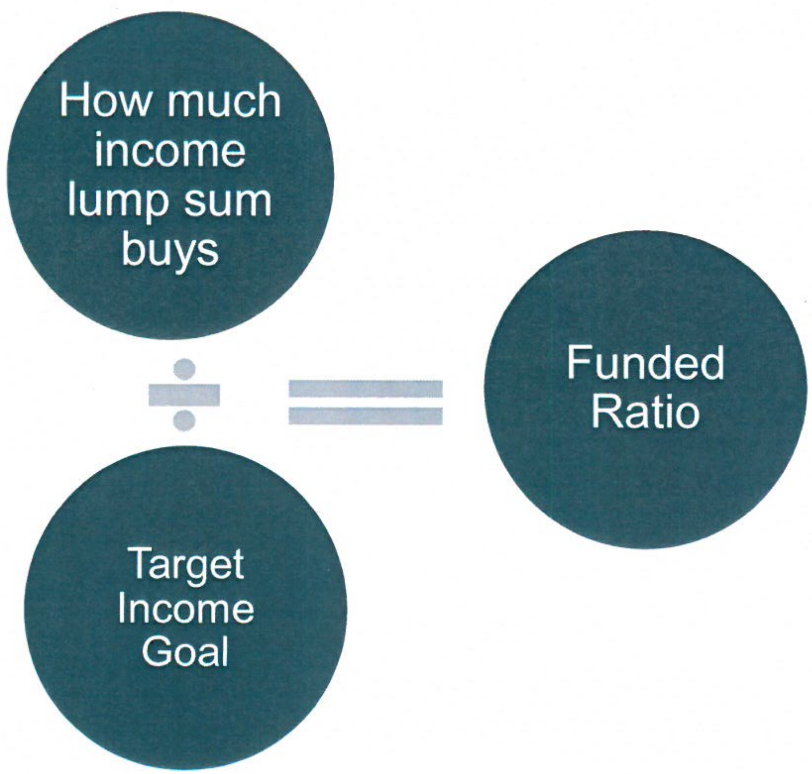
The risk to be managed is the risk that the ultimate goal will not be realized, namely that there will be a shortfall of income.

- 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, which are both variable and uncertain.

What is Your Number? The Wrong Number! Income not Wealth!

Measuring the Participant's Progress to Retirement Goal
Retirement Income Vs Wealth Accumulation

Income is what matters and funded ratio—NOT account balance–is the correct measure of status



- Average duration needed to hedge an immediate life annuity is about 13 years
- Risk managers and mandated DC reporting rules emphasize wealth (price) volatility over retirement-income volatility
- To correct this, mandated DC rules should report and emphasize the *funded ratio* and its change, instead of account balance and its change
- If risk is measured incorrectly, one cannot possibly manage risk correctly

Building the Solution

Design Principle #3

The Starting Point for Any Asset Allocation Strategy is its Goal

Glide Path

Apply lifecycle theory to consider the evolution of human capital and financial capital, where the investment strategy gradually grows more conservative over time.

Asset Classes

Offer a combination of assets that provide reasonable growth through diversified exposure to equities and the income risk management hedging asset.

Income Risk Management

Identify the balance of assets designed to reduce uncertainty relative to a member's goal for future retirement income.

Current Most Popular and Largest AUM Practice for Default [aka unengaged] Retirement Accumulation Solution: Target-Date Fund

- Target Date Funds have been designated Qualified Default Alternative Investment (QDIA) which provides "safe harbor" litigation protection to plan sponsors who adopted them, which makes them very attractive

- TDF have a pre-specified asset allocation between equities and debt which changes every 5 years up to the target date with the feature that the allocation to equities decreases over time as the investor approaches the target date which is generally the expected date of retirement

- TDF do not specify a goal but simply define a prespecified asset-allocation path which is called a "glide path"

- Because the TDF uses age [aka retirement date age] as its only distinguishing variable and age of a person in the future is known with certainty now , no new market or personal information about the investor is incorporated into the investment allocation. Legally for fiduciary determination purpose, TDFs do not provide investment advice.

- See "Unsafe at Any Speed? The Designed-In Risks of Target-Date Glide Paths", Z. Bodie, RK Fullmer, and J Treussard, *Journal of Financial Planning, Vol. 23, No. 3, March 2010, p42-48*

Design Principle #5

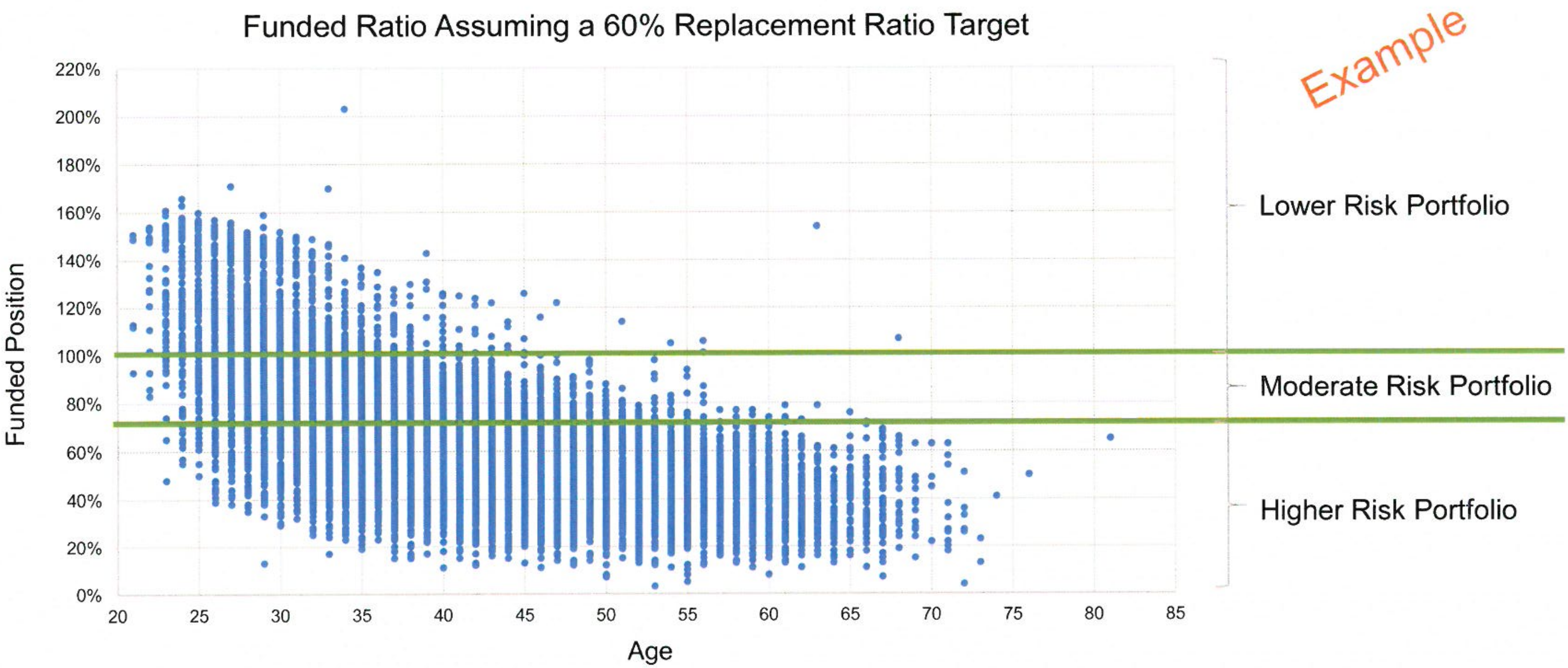
Customization of Dynamic Asset Allocation Based on Individual Circumstances

- Account Balance
- Contributions
- Salary
- Age
- Retirement Age
- Income Goal

→ Funded Status Relative to Achieving Income Goal

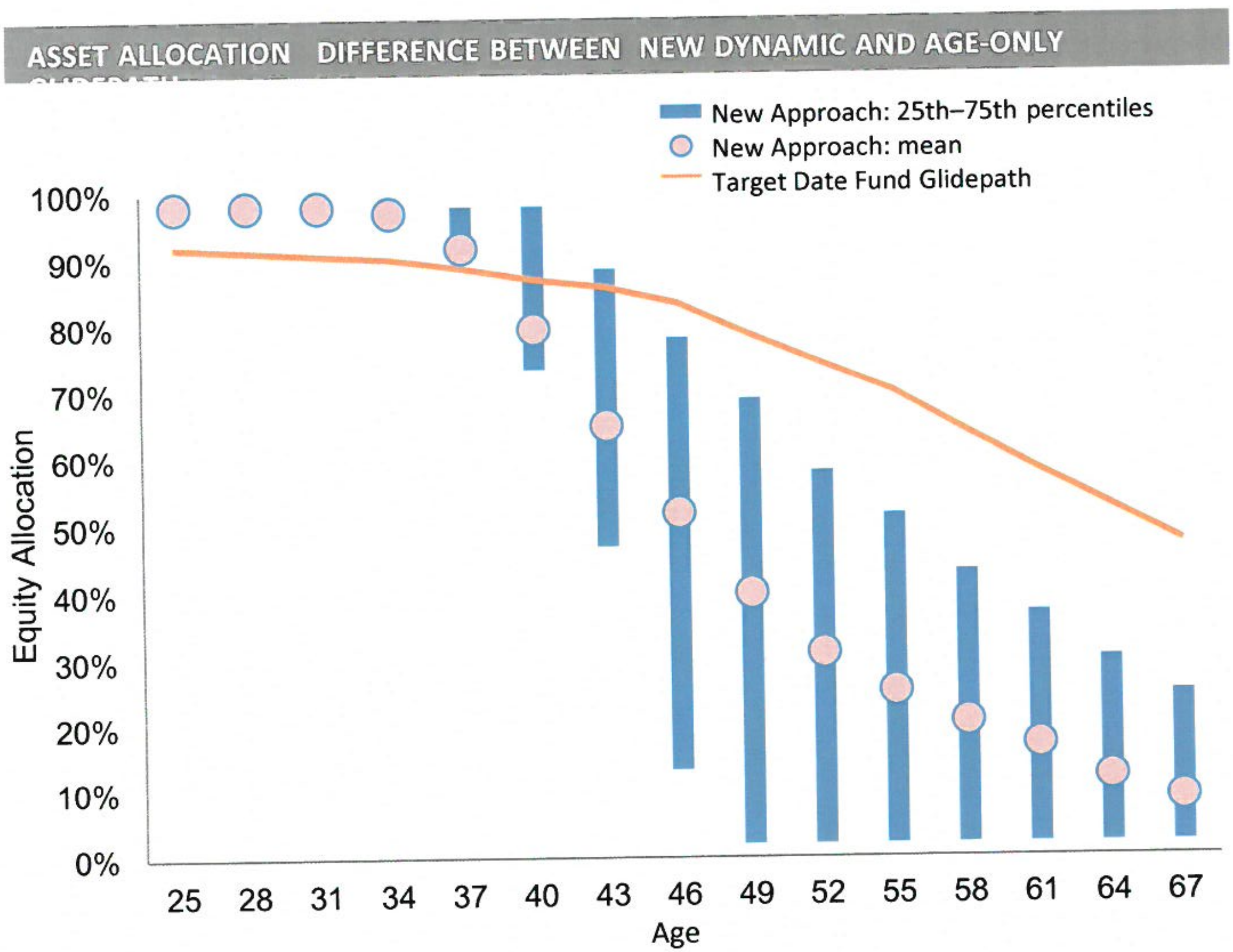
Principle #5

Members Receive a More Tailored Experience Based on How Close or Far Away They Are From Achieving Their Income Goal



Dynamic Multi-Attribute vs. Pre-set Age-Based-Only Asset Allocations

A hypothetical 25-year-old participant's equity path to retirement



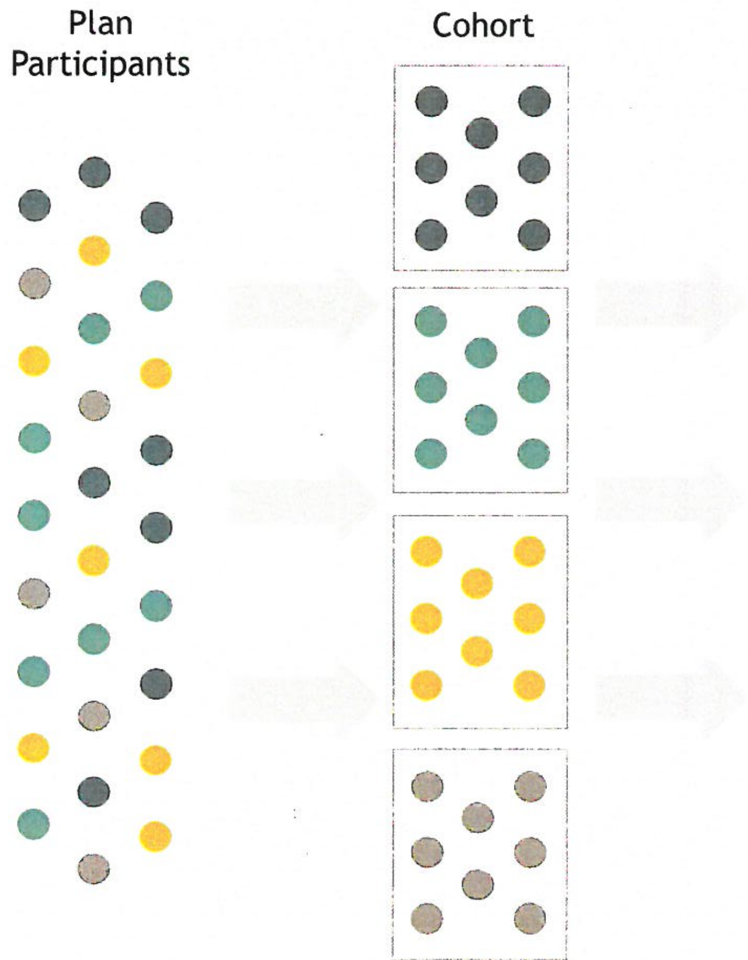
Hypothetical Inputs:

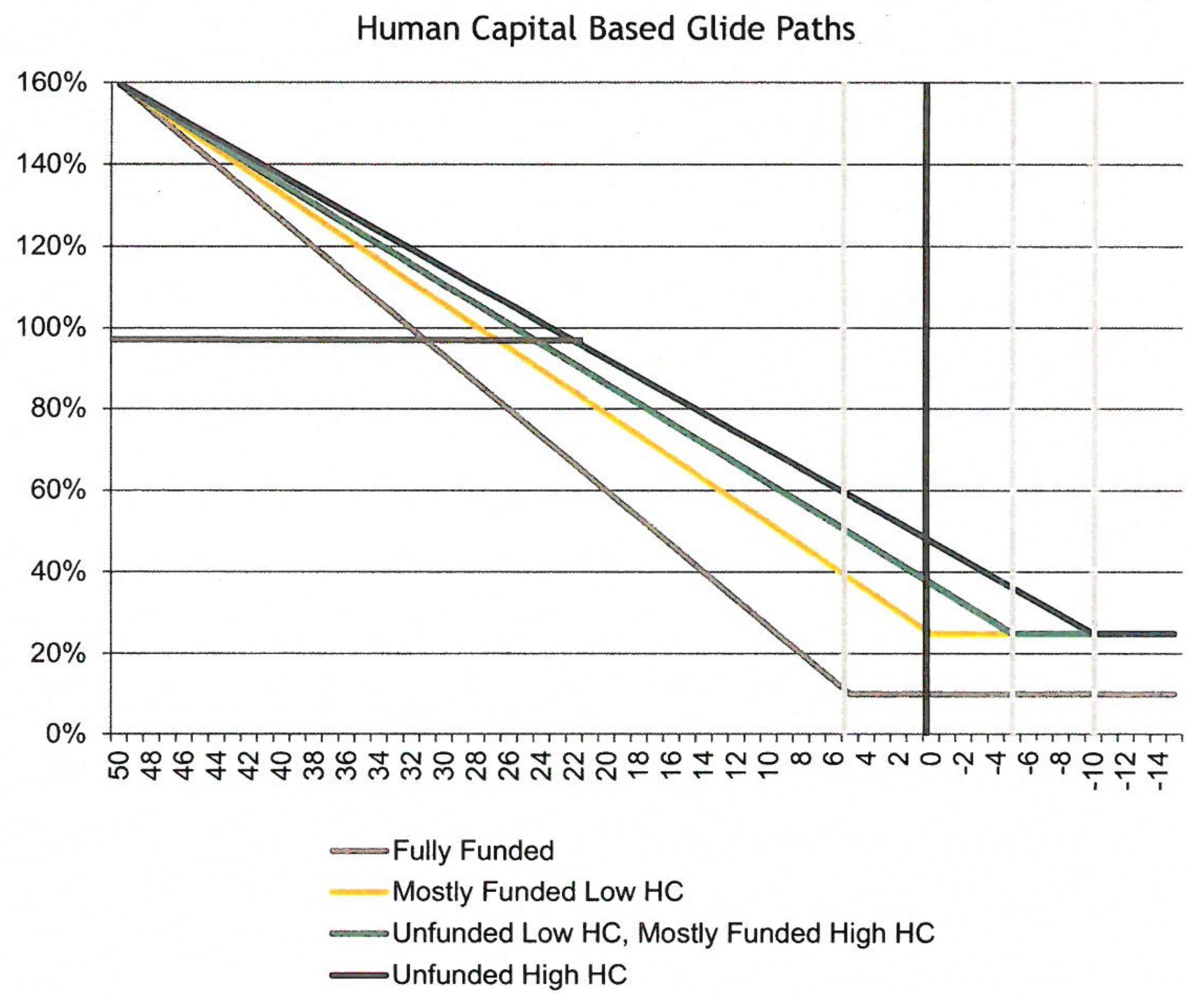
- Age: 25
- Contribution Rate: 7%
- Current Salary: $37,500
- Final Salary: $58,719
- Balance: $5,000
- Social Security: $23,604
- Retirement Age: 67
- Desired Income: $40,237
- Conservative Income: $29,513

Design Principle #6

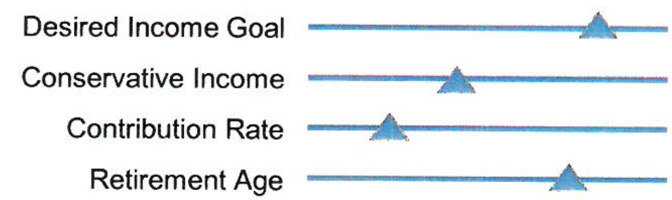
Assessment of Participant Dynamic Portfolio Allocation

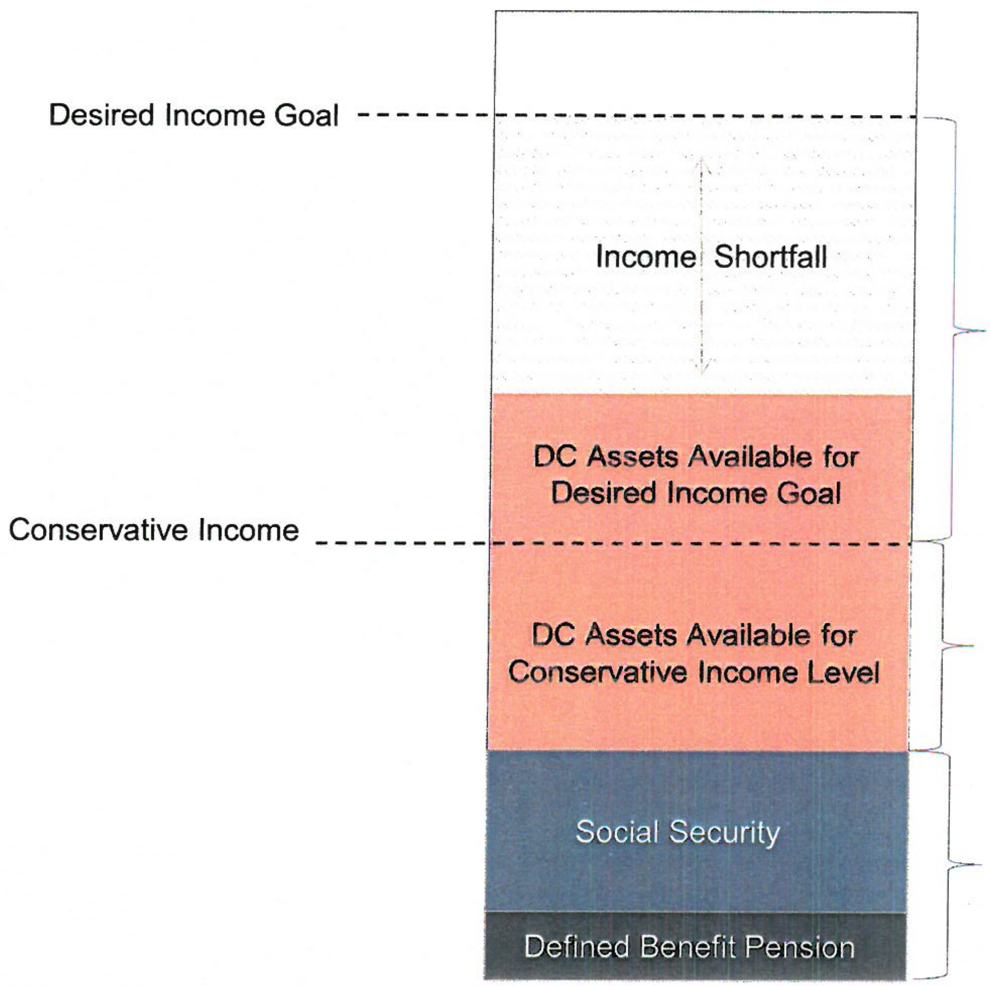
Driven by Changes in Market and Personal Information,
Allocation Based on Both Funding Ratio ("FR") and Human Capital ("HC")





Simplification from Only Meaningful Information and Meaningful, Easy-to-Make Choices, with Feedback





LEVEL 3 – Seek to maximize the estimated probability of achieving the desire income goal.

- Portion of savings allocated to a combination of equity and fixed income
- Reduce equity exposure target is estimated to be achieved

LEVEL 2 – Aim to achieve at least the conservative income level

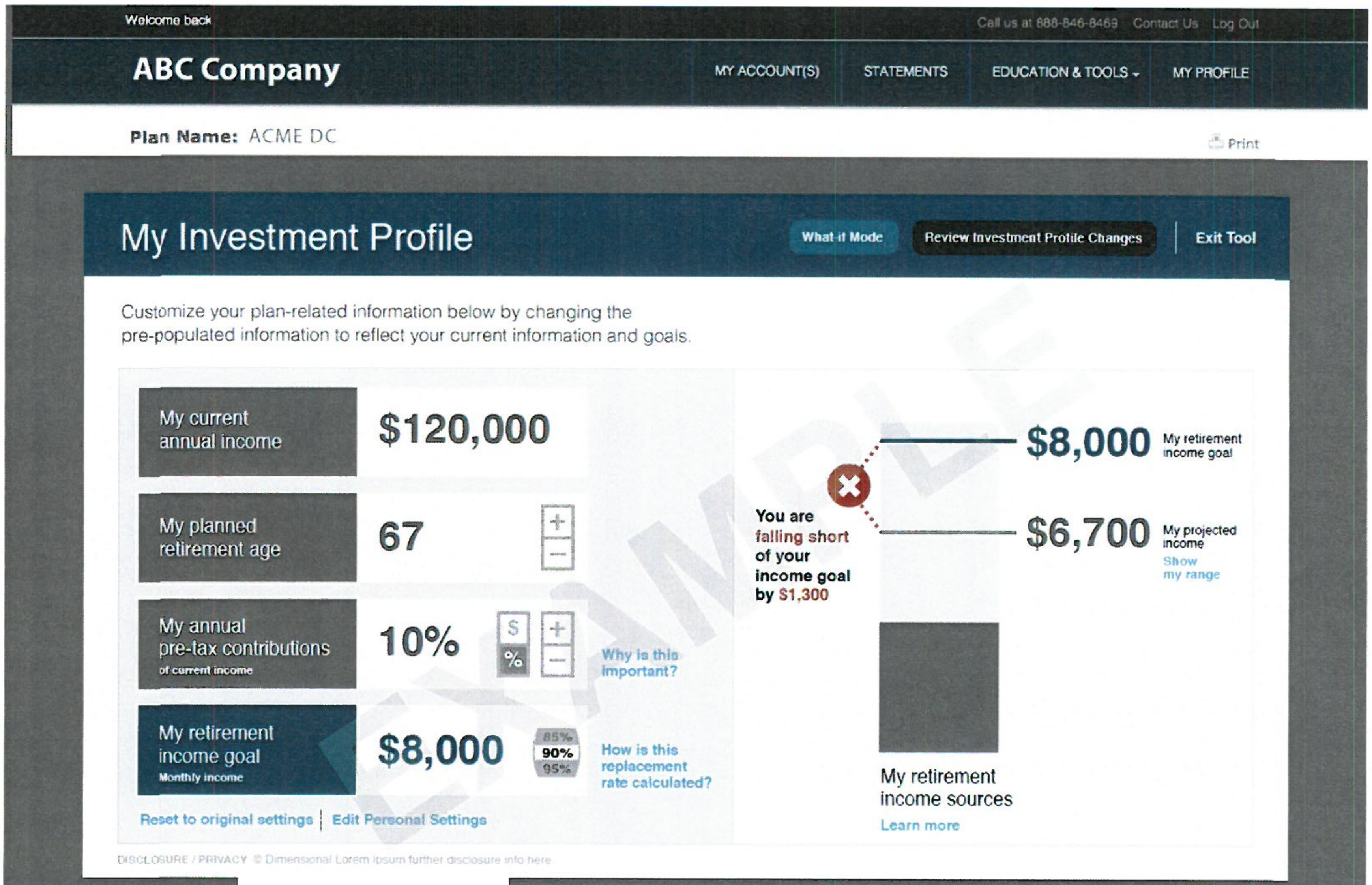
A lower "baseline" income achievable at a higher estimated probability

- Portion of savings allocated to fixed income

LEVEL 1 – Guaranteed retirement benefits

- Included in retirement income goals

Engaging Participants Can Access Meaningful Information and Make Actionable Choices to Improve Retirement Outcomes



Post-Accumulation Flexible Spend-Down Strategies

These four components can be customised to individual needs

1

Guaranteed income for life

- Annuity
- Age Pension
- DB Pension

2

Conservative draw-down
(minimum-risk income)

- Not guaranteed
- No longevity protection
- Provides liquidity
- Room for bequests

3

Desired income growth goal

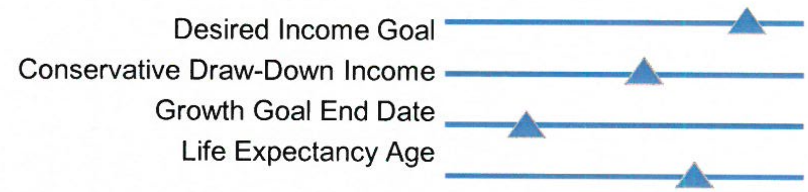
- Targeted increase in income starts at specified date in retirement
- Invest in risk asset

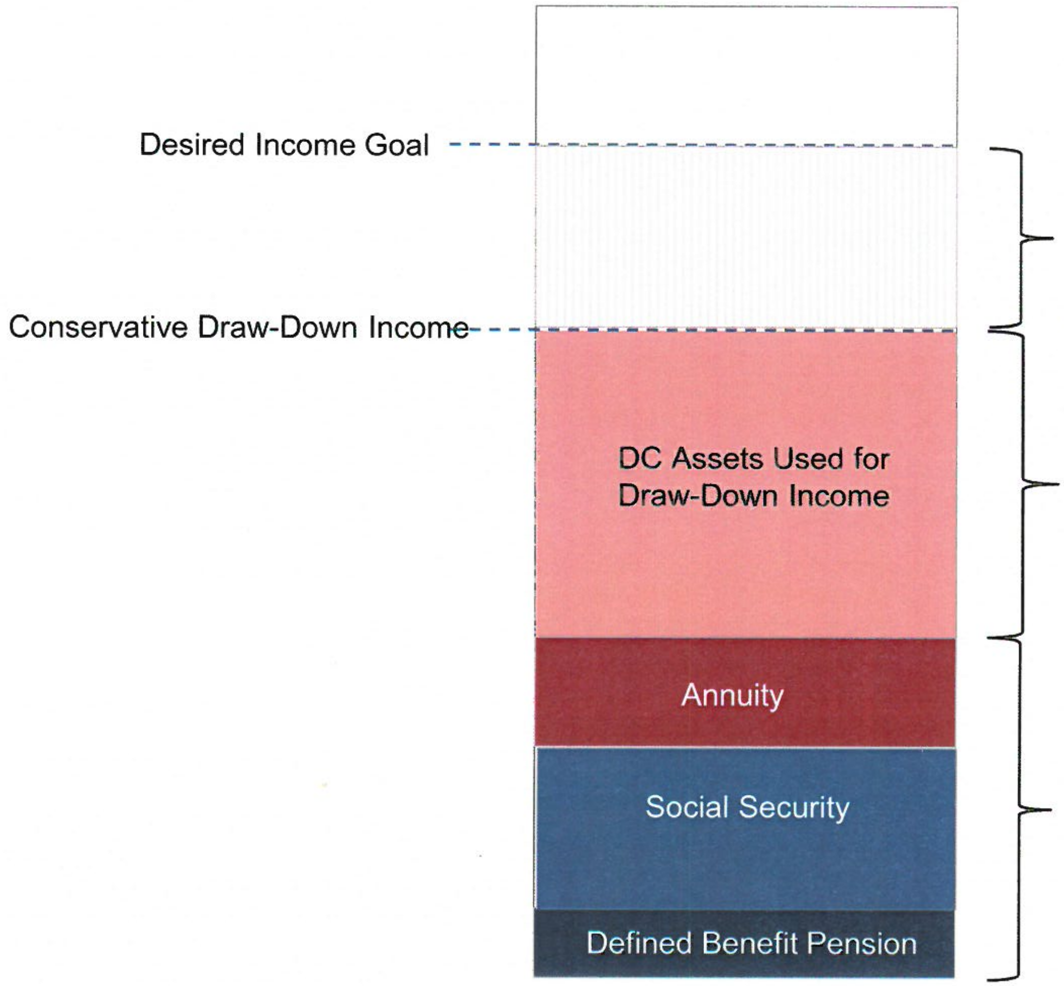
4

Longevity insurance

- Deferred annuity

Retirement Income Post-Accumulation Phase
Transit Smoothly from Accumulation Phase





LEVEL 3 – Desired Income growth goal
- Portion of savings allocated to equities
- Targeted increase in income to begin at specified date
- Added to Level 2 income when goal is achieved

LEVEL 2 – Conservative Draw-Down Income
- Provides minimum-risk income for a set time period
- Provides liquidity and flexible bequest opportunities
- Not guaranteed - No longevity protection

LEVEL 1 – Guaranteed income for life
- Combination of state benefits, defined benefit pension plan, and annuity (if available)

Design of Define-Contribution Retirement Plans to Improve Participation and Good Choices: “Opt-Out” versus “Opt-In”

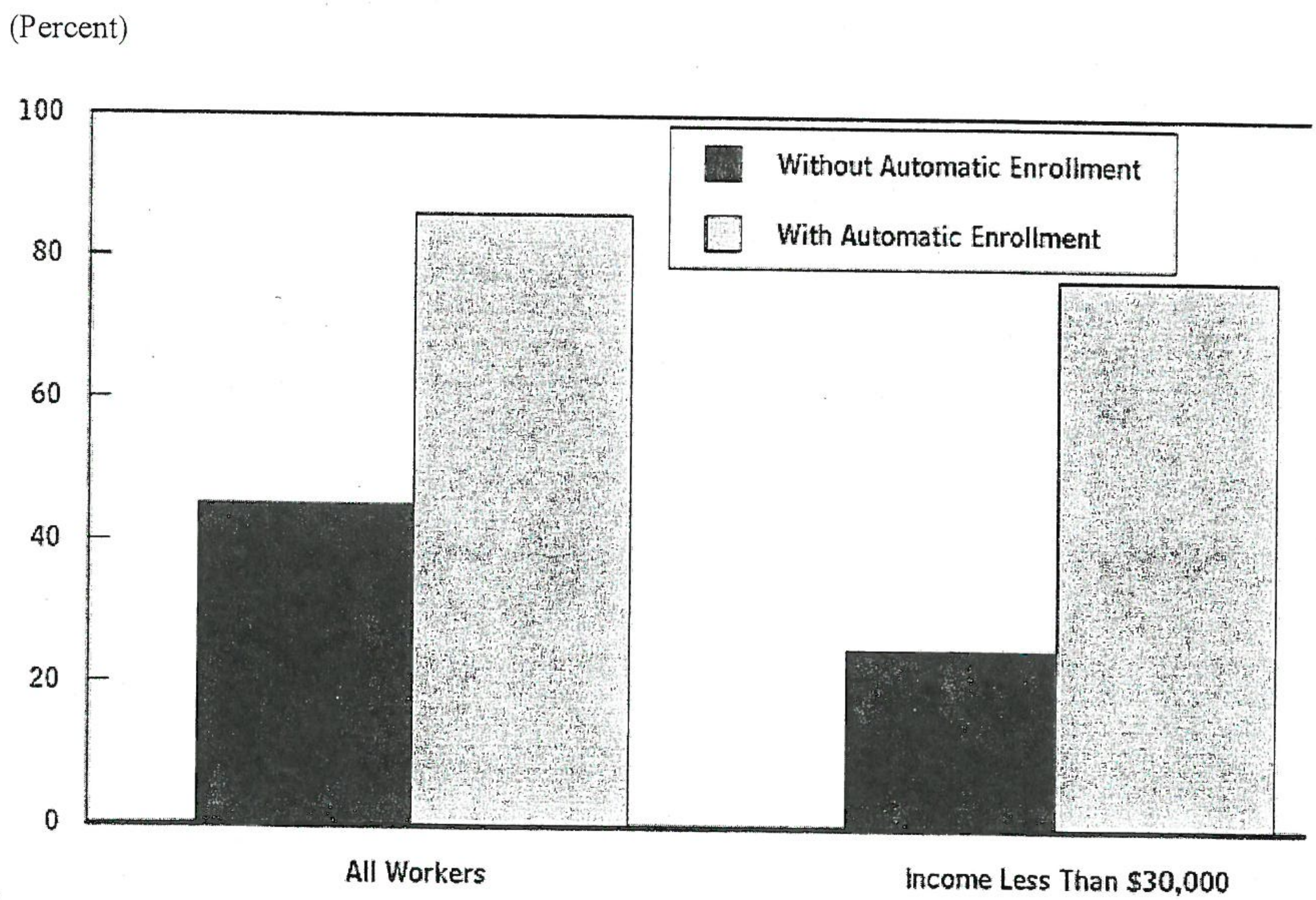
http://www.cbo.gov/ftpdocs/96xx/doc9673/Presentation_RRC.1.1.shtml

“Opt-Out”: automatic enrollment with a default investment ,must choose to get out of pension plan

“Opt-In”: employee must choose to enroll and the investments
Inertia is a powerful force in decision-making, so people tend to stick with a default, even when they can, at very low cost, pick another option.

Figure 1.

The Effect of Automatic Enrollment on Initial Participation Rates in Companies with 401(k) Plans



Source: Congressional Budget Office based on William E. Nesmith, Stephen P. Utkus, and Jean A. Young, "Measuring the Effectiveness of Automatic Enrollment," Vanguard Center for Retirement Research, vol. 31 (2007).

"Opt-in" Defaults can be used to not only encourage participation in savings plans but also increase the rate at which participants save, which can solve a dysfunctional aspect of automatic-enrollment plans. Such plans tend to feature relatively low default contribution rates, averaging about 3 percent of pay. Those defaults, it has been shown, tend to anchor people at an inadequate savings rate, including people who, in the absence of a default, would have saved more. But plans could automatically increase the savings rate over time, requiring people to opt out if they wished to avoid the increases. For example, Richard Thaler and Shlomo Benartzi have proposed a plan called "Save More Tomorrow," which automatically increases savings rates whenever employees receive a raise.[6] Such an approach harnesses the power of inertia. It also ensures that the automatic increases never result in reduced disposable income, thus recognizing the strong aversion most people feel toward anything they can characterize as "a loss." This mechanism has been shown to substantially increase savings rates among participants. As of 2007, about 33 percent of the 401(k) plans that offered automatic enrollment also offered some form of automatic escalation in savings rates, up from about 9 percent only three years before.

Changes in other defaults could also improve outcomes for a number of other decisions related to saving and retirement. For example:

- **Automatic Individual Retirement Accounts.** About half of U.S. workers do not have access to an employer-sponsored retirement plan. To aid them, some researchers have suggested automatic IRAs (individual retirement accounts), whereby companies that do not have an employer-sponsored retirement plan can, unless workers opt out, directly deposit some share of employees' salaries.
- **Automatic Investment Portfolios.** Extensive research in behavioral economics has found that people often act irrationally in picking their investment portfolio. One way to overcome such failures in decision-making is for companies to set default investment portfolios that are rationally diversified, unless workers choose to select their own investments. The Pension Protection Act has taken a step in that direction, by establishing incentives for employers to use what are termed "qualified default investment alternatives" for employees automatically enrolled in defined-contribution plans.
- **Automatic Annuitization.** In order to prevent retirees from running out of assets late in life, one proposal would automatically annuitize a substantial portion of an employee's 401(k). It would allow employees to opt out of the arrangement and receive a lump-sum payment within the first two years of receiving income from the annuity.

See John Beshears and others, "The Importance of Default Options for Retirement Saving Outcomes: Evidence from the USA," in Stephen J. Kay and Tapen Sinha, eds., *Lessons from Pension Reform in the Americas* (Oxford: Oxford University Press, 2008), pp. 59–87; William G. Gale, J. Mark Iwry, and Peter R. Orszag, "The Automatic 401(k): A Simple Way to Strengthen Retirement Saving" (Washington, D.C.: Retirement Security Project, 2005); Brigitte C. Madrian and Dennis F. Shea, "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior," *Quarterly Journal of Economics,* vol. 116, no. 4 (2001), pp. 1149-1187; and William E. Nesmith, Stephen P. Utkus, and Jean A. Young, "Measuring the Effectiveness of Automatic Enrollment," Vanguard Center for Retirement Research, vol. 31 (2007).

“AGE OF REASON” David Laibson Summary

65 and older Adults

- 34% of Household wealth or around $18 trillion

- Finance cognitive performance peaks at age 50s

- Cognitive impairment (without dementia)
  Age 71-79 16%; Age 80-89 29%l Age 90+ 39%

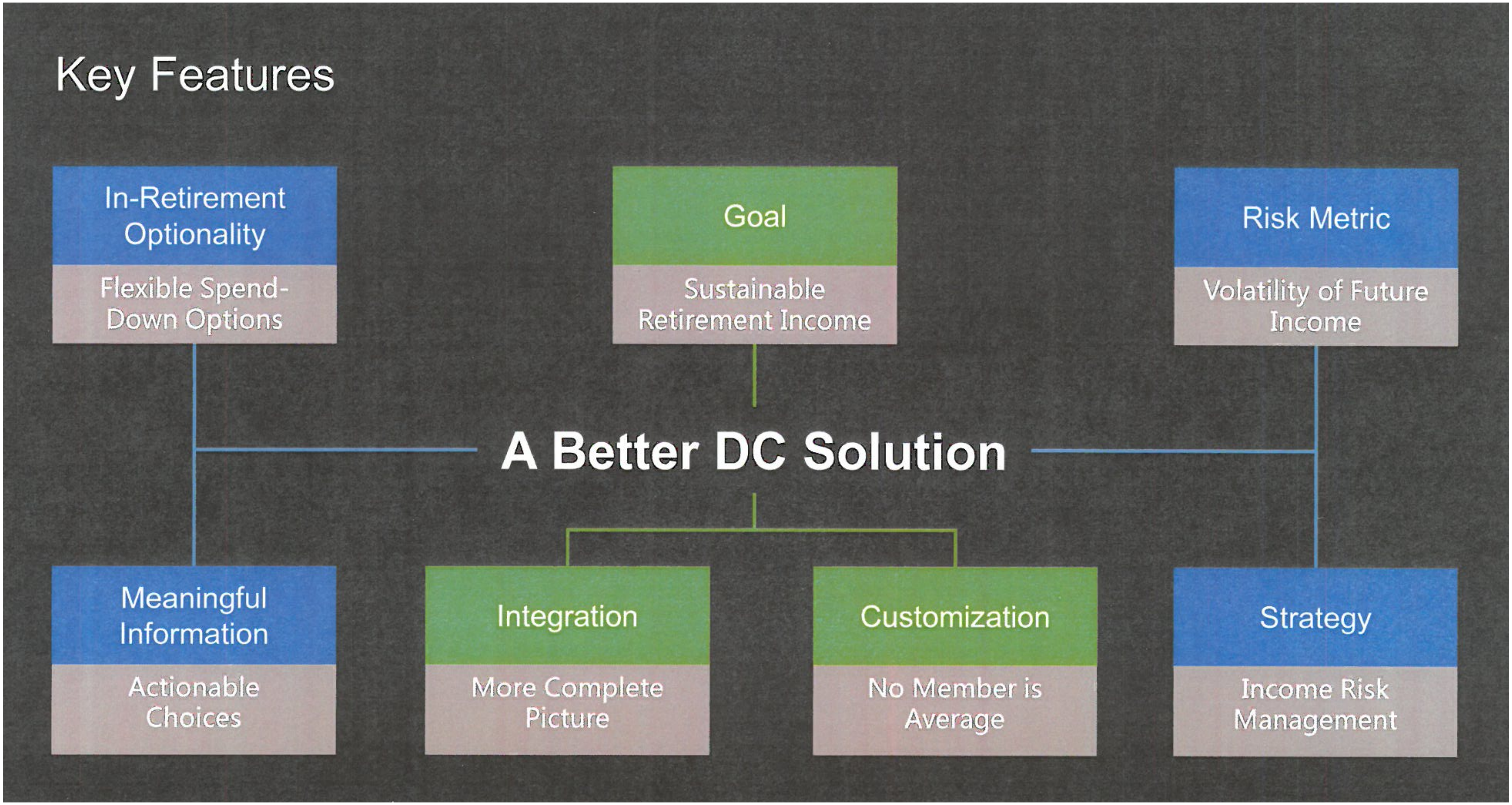
- Annuity Resistance
  Army officers: 52 % chose $46,219 cash over annuity with NPV = $82,908
  Army enlisted: 95% chose $22,283 over annuity with NPV = $39,972

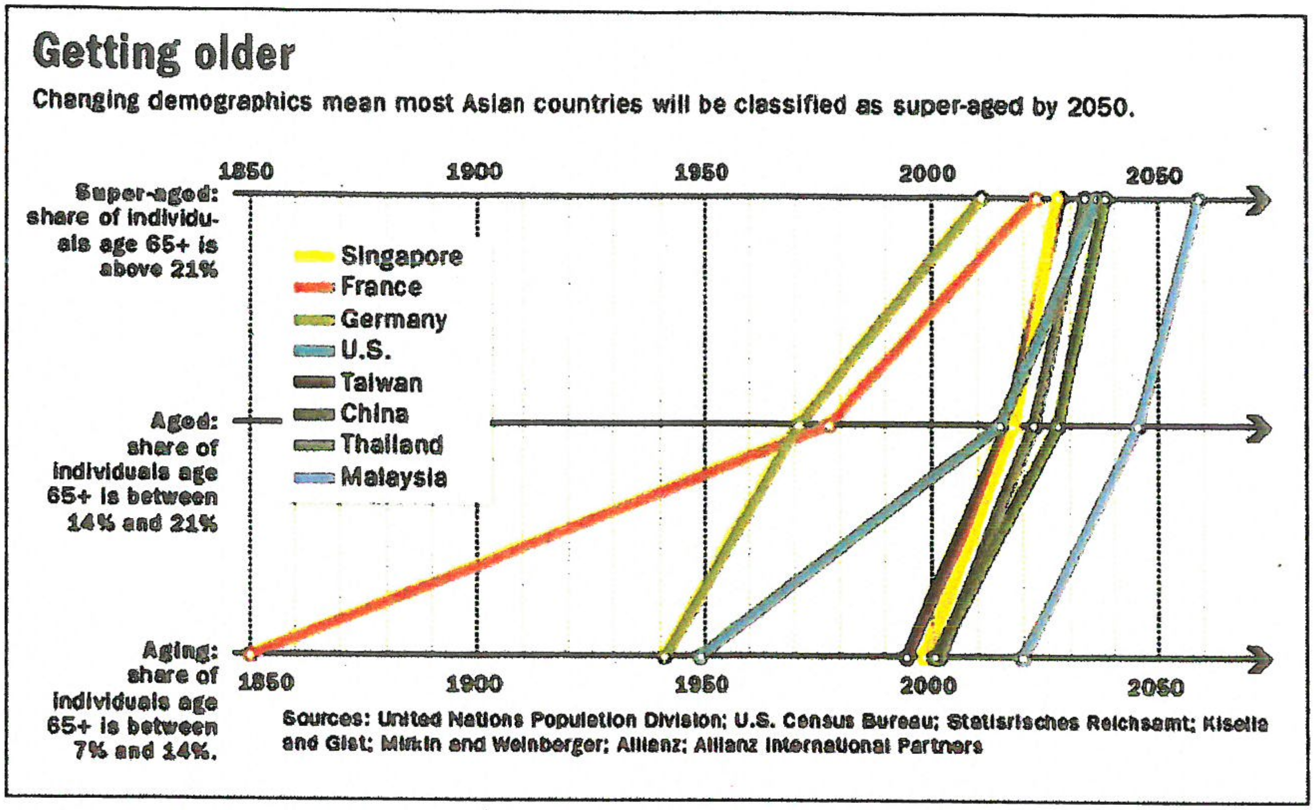
As Cognition Slips, Financial Skills Are Often the First to Go

By Tara Siegel Bernard The New York Times

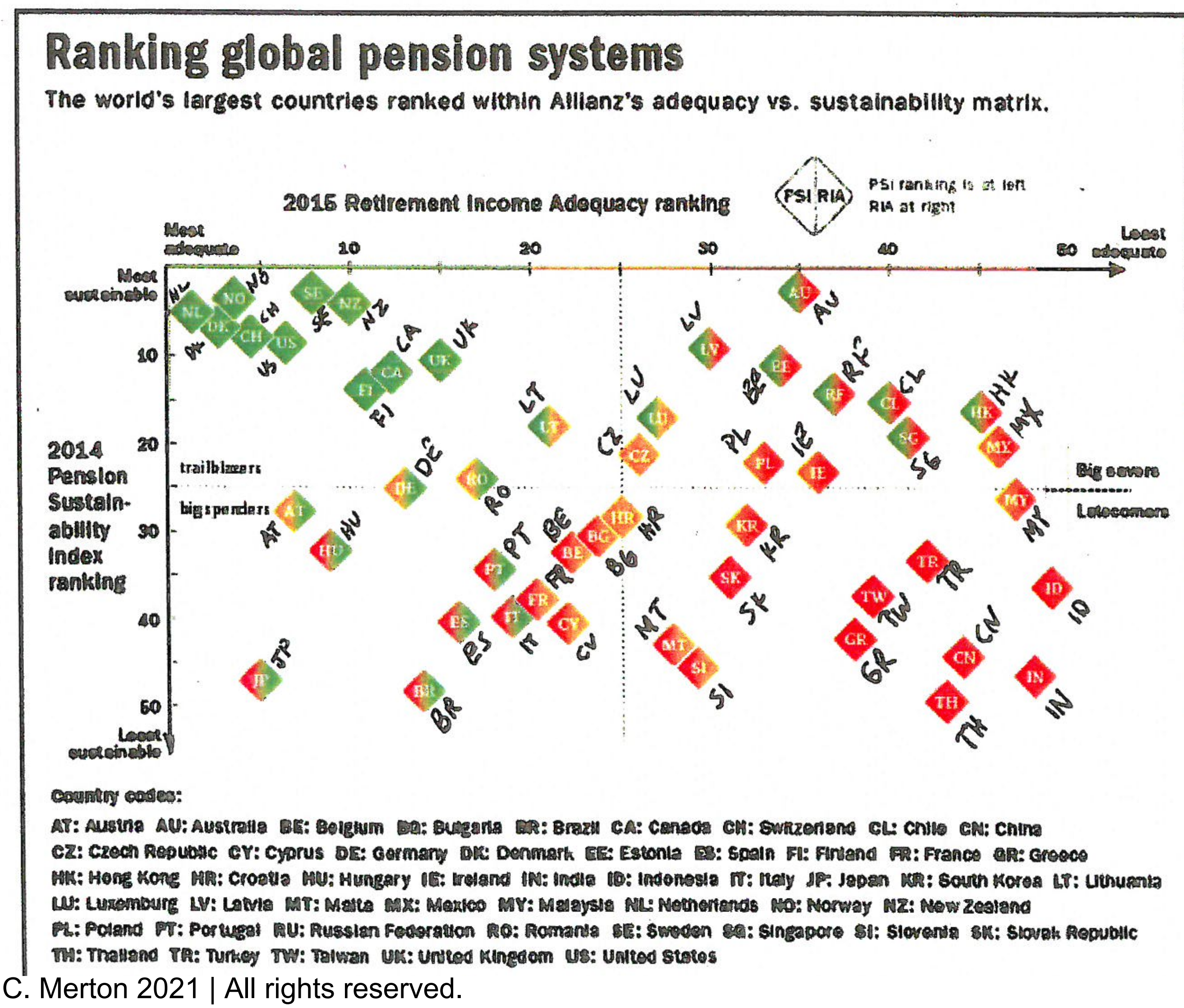
April 24, 2015

Francis, 84, with his daughter-in-law, Helen Clark. He has mild dementia, and his family says his former wife took advantage of him. Max Whittaker for The New York Times


Key Features
In-Retirement Optionality
Flexible Spend-Down Options
Goal
Sustainable Retirement Income
Risk Metric
Volatility of Future Income
A Better DC Solution
Meaningful Information
Actionable Choices
Integration
More Complete Picture
Customization
No Member is Average
Strategy
Income Risk Management



BEST PRACTICE IN GLOBAL PENSION SYSTEMS



It's time to measure 21st century aging with 21st century tools

March 4, 2016 **The Conversation**

Warren Sanderson_ Professor of Economics, Stony Brook University (The State University of New York)

Sergei Scherbov_ Deputy Director of World Population Program, International Institute for Applied Systems Analysis (IIASA)

The populations of most countries of the world are aging, prompting a deluge of news stories about slower economic growth, reduced labor force participation, looming pension crises, exploding health care costs and the reduced productivity and cognitive functioning of the elderly.

These stories are dire, in part because the most widely used measure of aging – the old-age dependency ratio, which measures the number of older dependents relative to working-age people – was developed a century ago and implies the consequences of aging will be much worse than they are likely to be. On top of that, this ratio is used in political and economic discussions of topics such as health care costs and the pension burden – things it was not designed to address.

Turning 65 in 2016 doesn't mean the same thing as hitting 65 in 1916. So instead of relying on the old-age dependency ratio to figure out the impact of aging, we propose using a series of new measures that take changes in life expectancy, labor participation and health spending into account. When you take these new realities into account, the picture looks a lot brighter.

Our tools to measure aging have aged

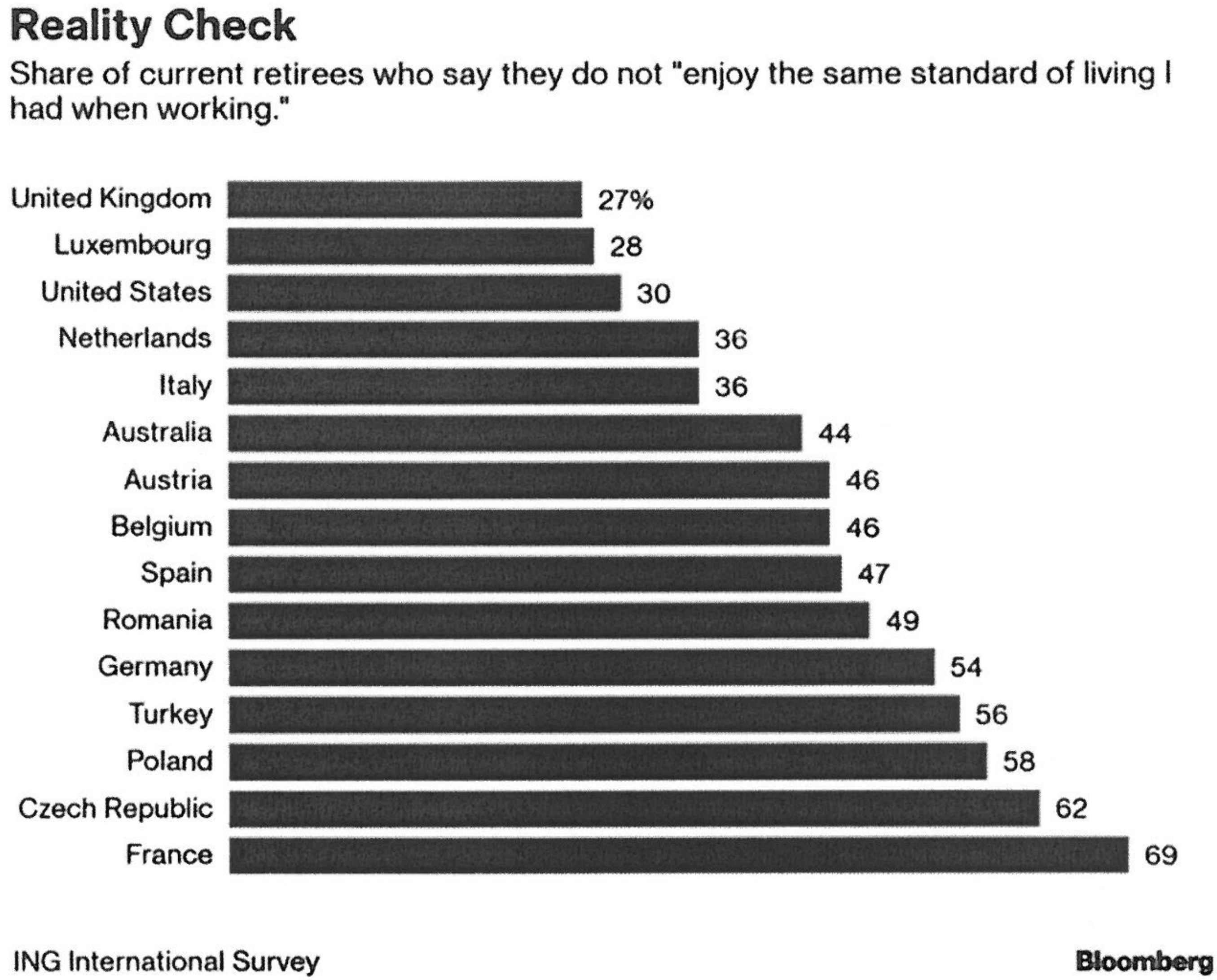
The most commonly used measure of population aging is the "old-age dependency ratio," which is the ratio of the number of people 65 years or older to those 20 to 64.

But, since the old-age dependency ratio was introduced in the early 1900s, most countries have experienced a century of rising life expectancy, and further increases are anticipated.

For instance, in 1914, life expectancy at birth in Sweden was 58.2 years (average for both sexes). By 2014, it had risen to 82.2 years. In 1935, when the U.S Social Security Act was signed into law, 65-year-olds were expected to live 12.7 more years, on average. In 2013, 65 year-olds may expect to live 19.5 years more.

But these changes aren't reflected in the conventional statistics on aging. Nor is the fact that many people don't just stop working when they turn 65, and that people are staying healthier for longer.

To get a better sense of what population aging really means today, we decided to develop a new set of measures that take these new realities into account to replace the old-age dependency ratio.



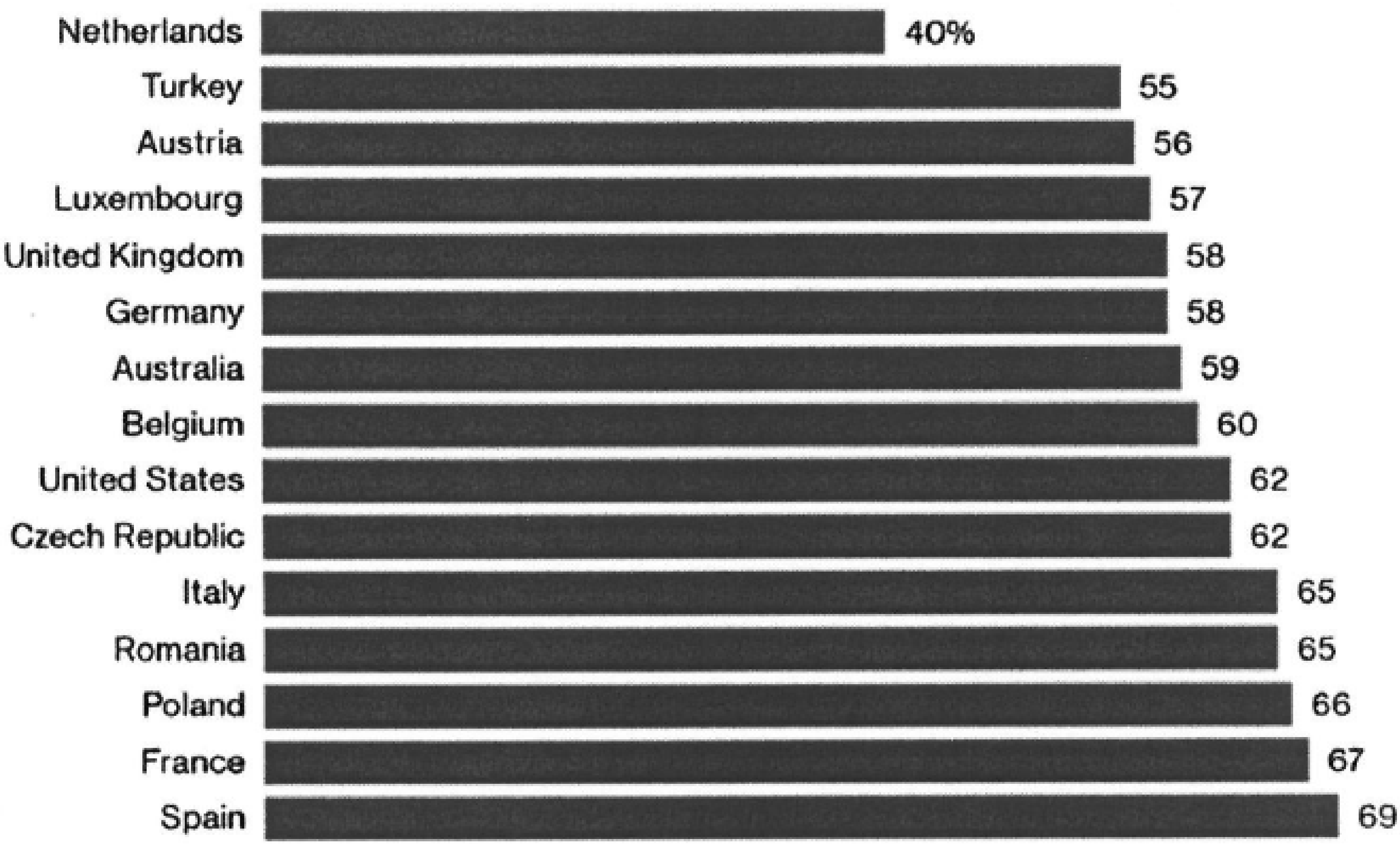
ING International Savings Survey 2019

The ING International Survey Savings 2019, the eighth in an annual series, surveyed 14,695 people in Europe, the US, and Australia

https://www.zerohedge.com/news/2019-02-21/study-warns-americans-and-europeans-are-terrified-about-retirement

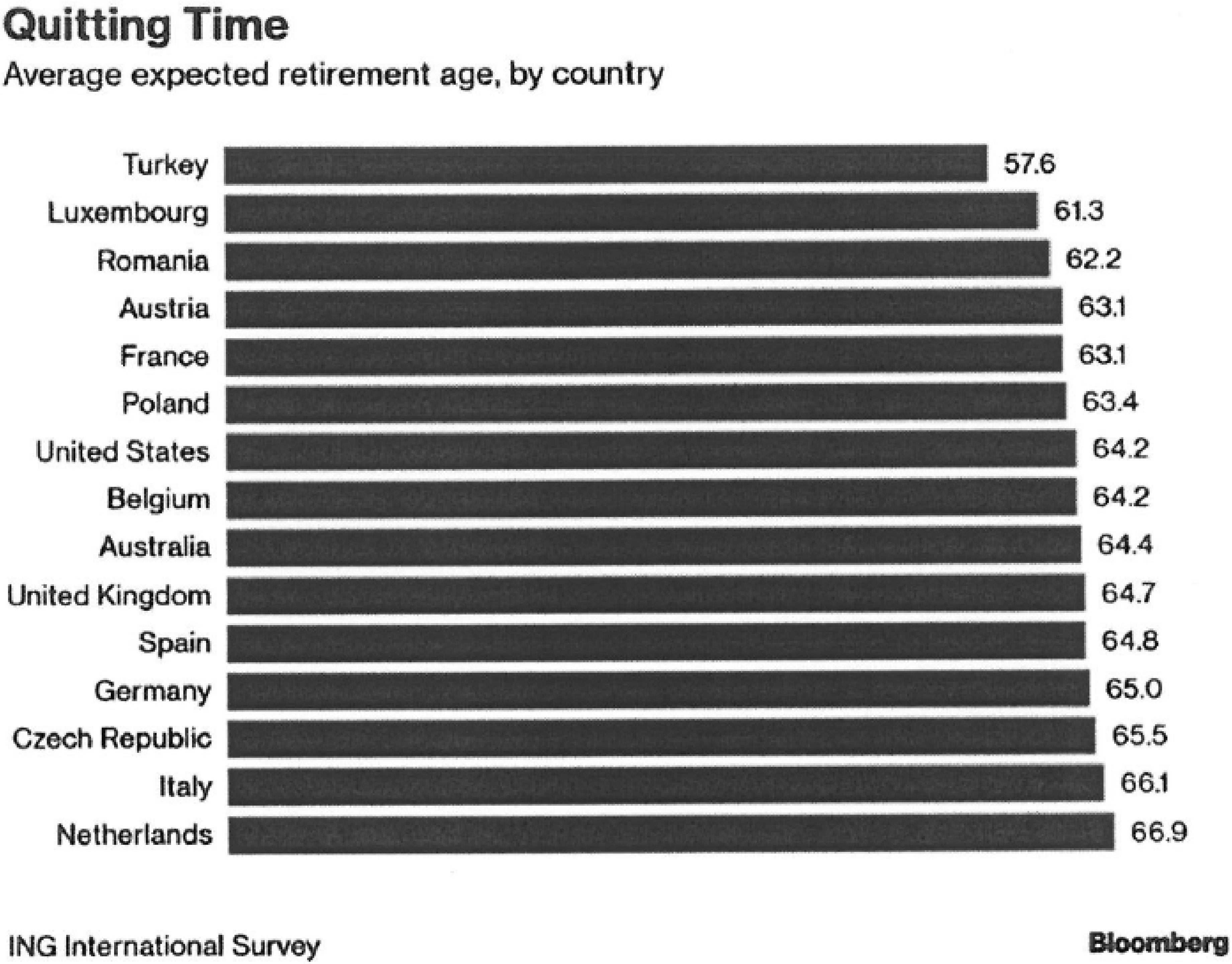
Financial Fear Factor

Share saying "I worry about whether I will have enough money in retirement."



ING International Survey

Bloomberg


Quitting Time
Average expected retirement age, by country
Turkey 57.6
Luxembourg 61.3
Romania 62.2
Austria 63.1
France 63.1
Poland 63.4
United States 64.2
Belgium 64.2
Australia 64.4
United Kingdom 64.7
Spain 64.8
Germany 65.0
Czech Republic 65.5
Italy 66.1
Netherlands 66.9
ING International Survey
Bloomberg

