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Session 2b –Pension Product Pricing and Longevity Risk Management

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Pension Product Pricing and Longevity Risk Management

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Agenda

- US Defined Benefit Pension Plans
- Pension Risk Transfer Market
- Pricing Methodologies and Considerations
- Ongoing Product Management



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US Defined Benefit Pension Plans

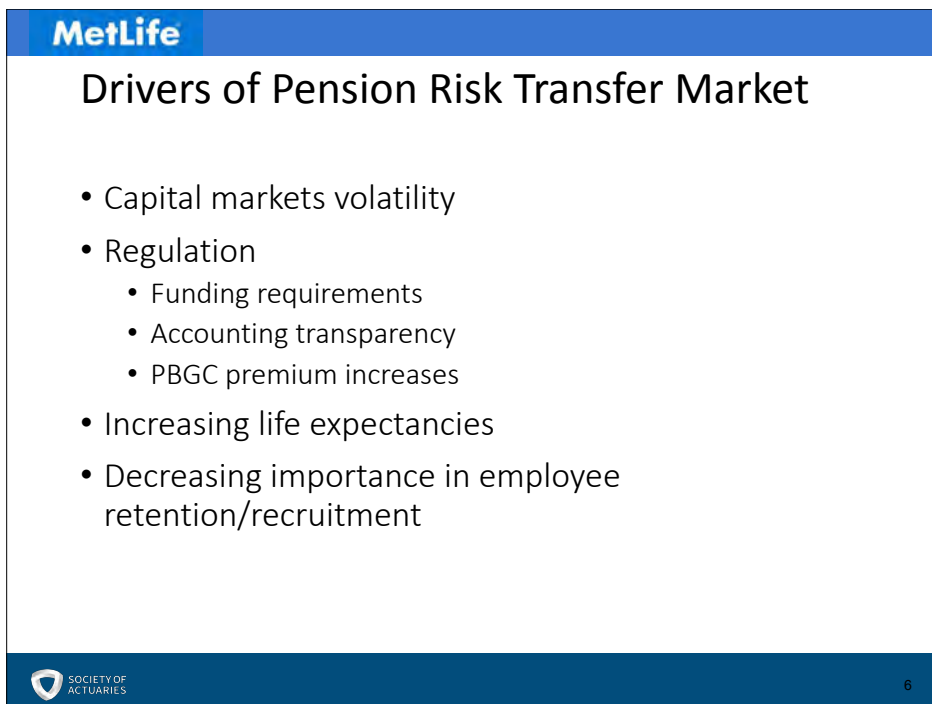
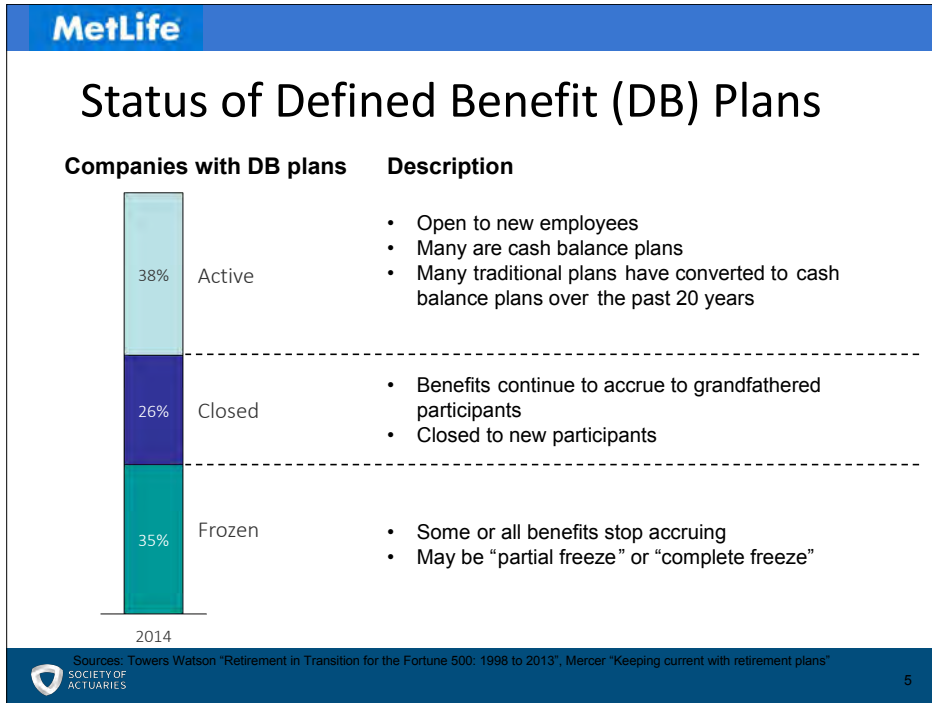
Defined Benefit Plans: How They Work

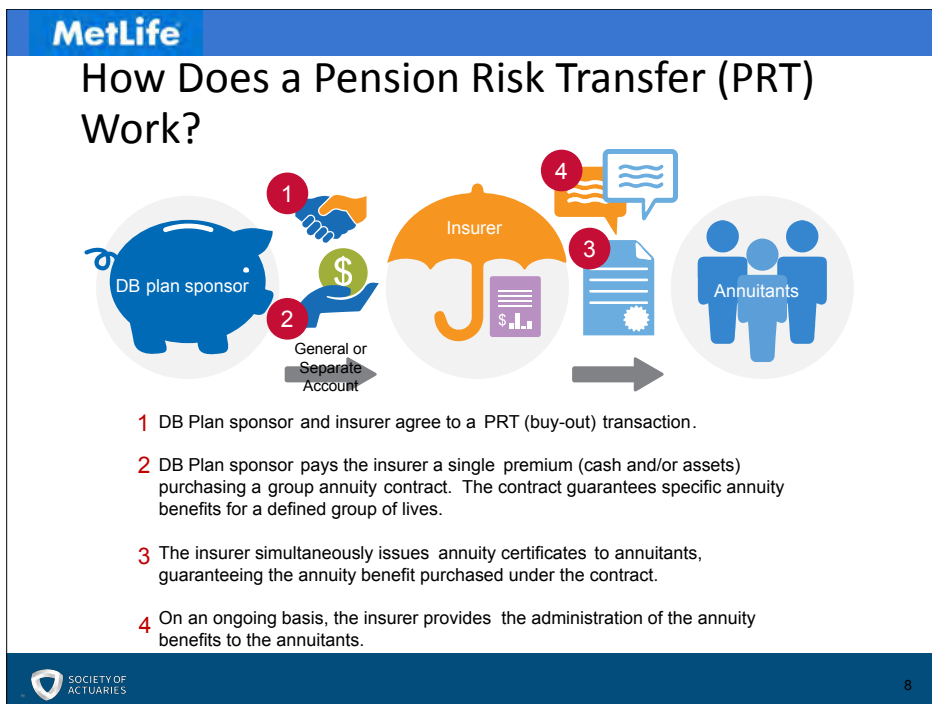
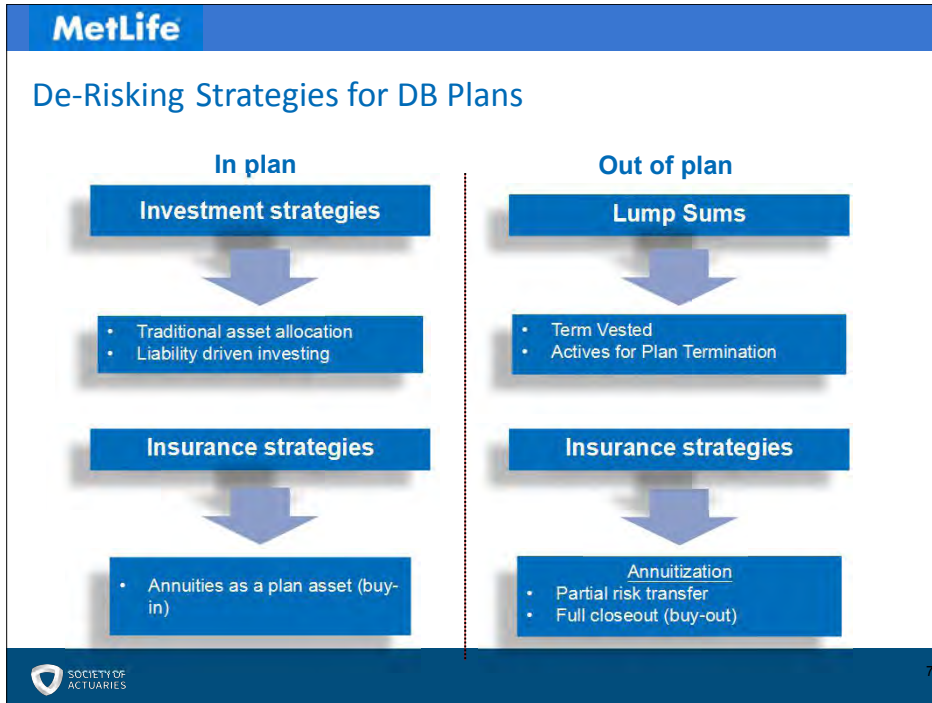
Traditional Plans

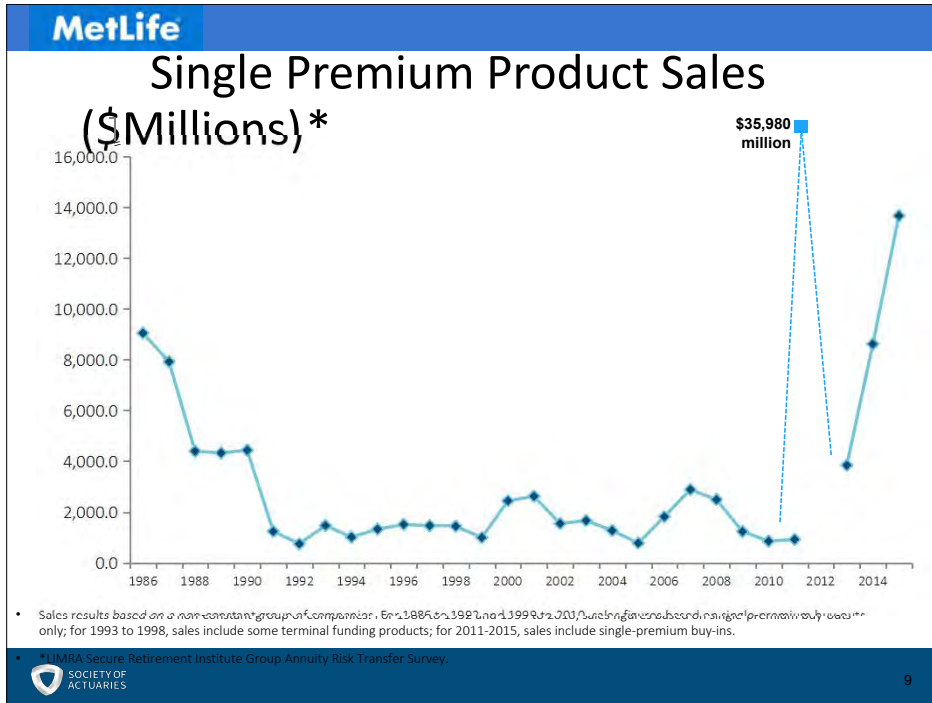
- Annuity at retirement typically reflects salary and years of service
- Normal retirement age usually 65, with early retirement options available
- Forms of annuity such as Life, Joint and Survivor

Cash Balance Plans

- Participant accumulates an account reflecting pay credit and interest credit
- Interest credit fixed rate or reset periodically based on an index rate
- Upon termination or retirement can elect a portable lump sum or annuitize their account at current rates







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Trends in Pension Risk Transfer

Partial risk transfer, focusing on retirees

- Reduces the size and risks of the plan
- Lower risk to the insurer, leading to a price closer to the liability held by the Plan
- Less communication and administrative issues for implementation
- Lump sum offers to terminated vested participants

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Trends in Pension Risk Transfer (cont.)

Assets in Kind

- Reduces transaction costs and investment ramp-up time
- May be attractive assets for Insurer

Separate Account Structures

- Insulated from claims of the Insurer's other creditors
- Consideration for fiduciary decision of selecting annuity provider

Pricing Methodologies and Considerations

Pricing Process Overview

- Life-by-life census with annuity information, gender, date of birth, etc.
- Plan specifications, including deferred life options
- Bid requirements, structure, and timing
- Mortality study (for large quotes)
- Assets-in-kind information (for large quotes)

Pricing Methodology: Investment

- Duration-matched, predominantly fixed-income portfolio
- Specific target portfolio developed for larger opportunities
- Rates are updated daily
- Premium typically received within a few days of quote acceptance

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Illustrative Assets-in-Kind Portfolio		
Asset Class	Illustrative Allocation for Intermediate Duration Liability	Directional Change for Longer Duration
US Government	1% to 5%	↑
Inv. Grade Public Corporate	20% to 60%	↑
Structured Assets (ABS, MBS, CMBS)	2% to 10%	↓
Inv. Grade Private Corporate	20% to 60%	↓
Below Investment Grade Public Corporate	3% to 8%	↓
Commercial Mortgage	15% to 25%	↓
Agricultural Mortgage	5% to 10%	↓
Alternative Assets, Real Estate Equity	3% to 8%	↓

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Pricing Methodology: Best Estimate Longevity	
<ul style="list-style-type: none"> • Case-specific, based on demographics of the group • Base table may reflect the following: <ul style="list-style-type: none"> • Type of work or Industry (blue/white collar) • Income/salary • Size of annuity • Form of annuity • Disability • Gender • Availability of lump sum • Employment status (active, terminated vested) • Geographic location 	

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Pricing Methodology: Best Estimate Longevity (cont.)

- May adjust industry table for Insurer's expectations
- May reflect Insurer's experience for inforce block
- Large plans provide mortality experience, which can be used, subject to credibility

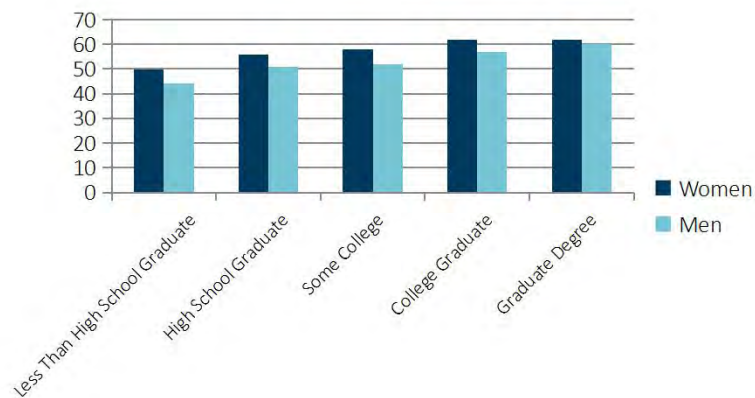


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Remaining Years of Life for US Adults at Age 25 by Educational Attainment (2005)



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Source: Brian L. Rostron et al., "Education Reporting and Classification on Death Certificates in the United States," *Vital and Health Statistics Series 2*, no. 151 (2010), 1-16.

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Group Annuity Experience:

SOA 2007-2010 Group Annuity Mortality Experience Report

- Experience by annuitant income

	\$0-4,999	\$5,000-9,999	\$10,000-24,999	\$25,000-49,999	\$50,000+
A/E Ratio	112.4%	106.6%	97.3%	83.4%	73.0%
% of Exposure	25.0%	21.2%	30.5%	15.9%	7.4%

- Consistent pattern across almost every age group with sufficient amount of exposure
- A/E declines as annuity income rises

Group Annuity Experience:

SOA 2007-2010 Group Annuity Mortality Experience Report

- Experience by form of annuity (survivor option)

	Single Life	1% - 50% J&S	51% - 75% J&S	76%-100% J&S	Unknown
A/E Ratio	105.2%	88.6%	98.8%	93.7%	96.6%
% of Exposure	50.7%	11.2%	9.1%	7.1%	21.9%

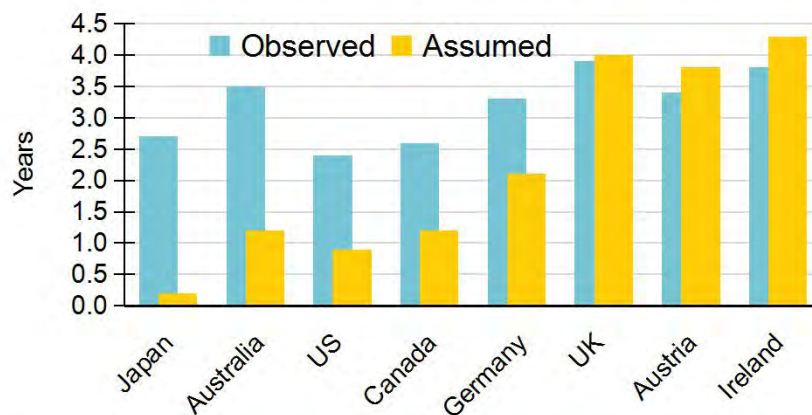
Some options, typically elected by married individuals, have A/E ratios below 100% for males and females

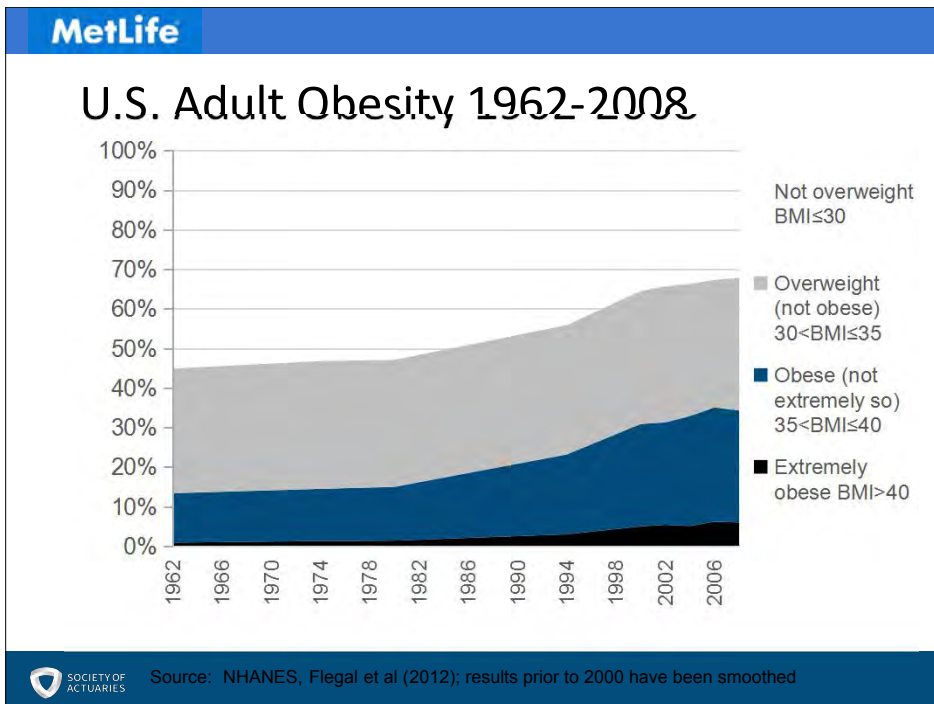
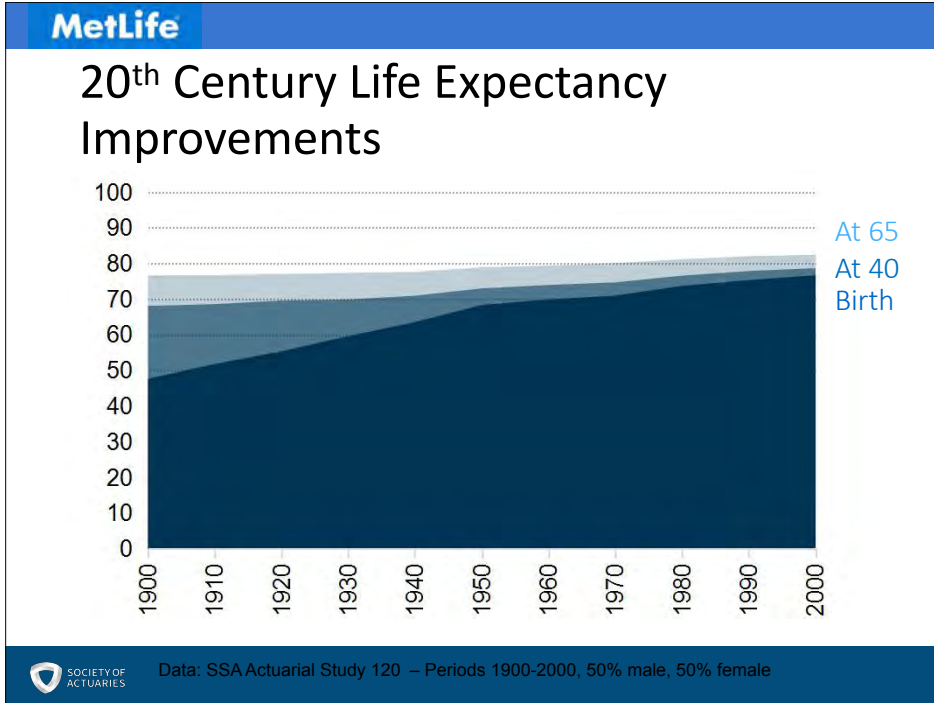
- Consistent with studies indicating greater longevity for married individuals

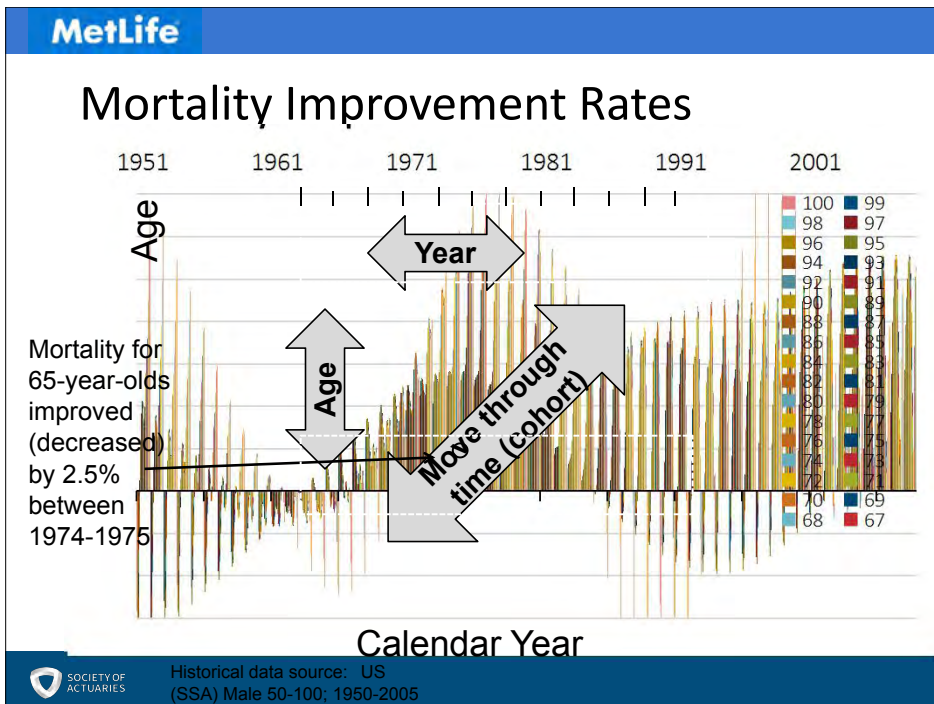
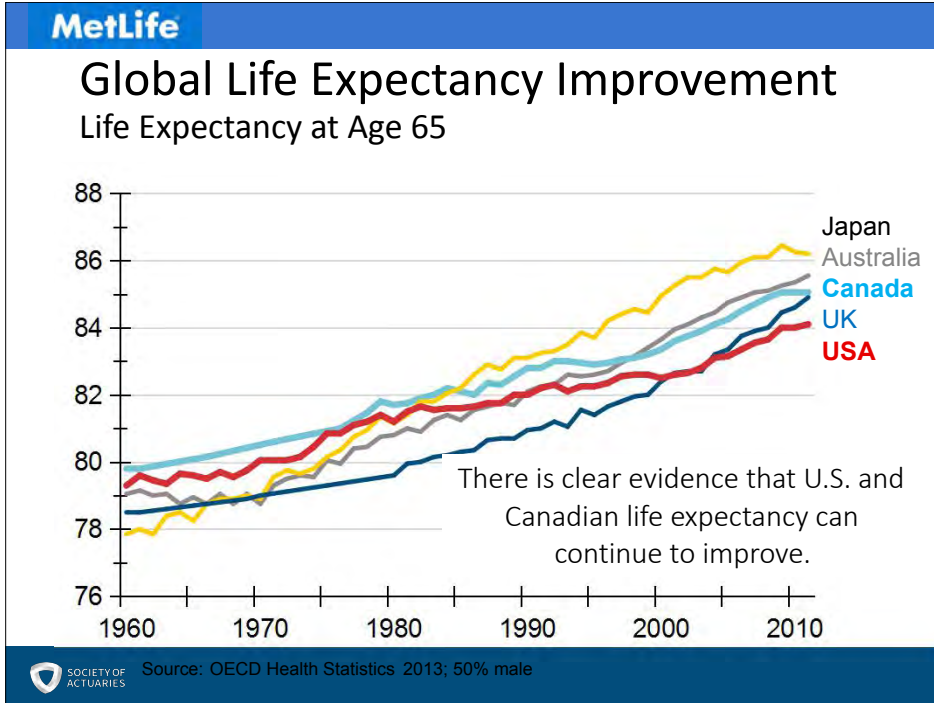
Pricing Methodology: Longevity Improvement

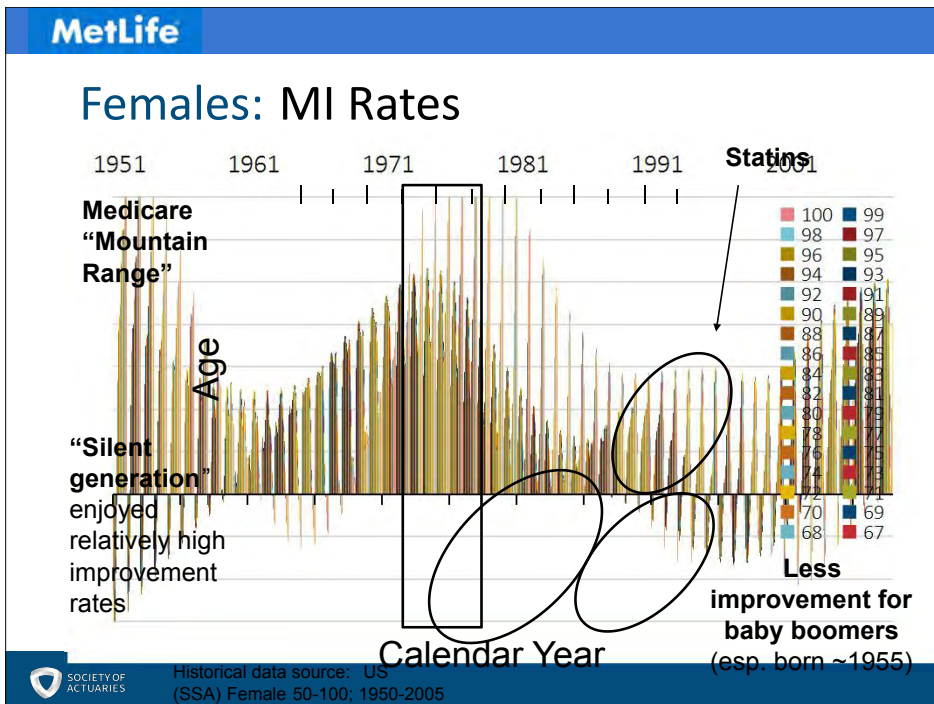
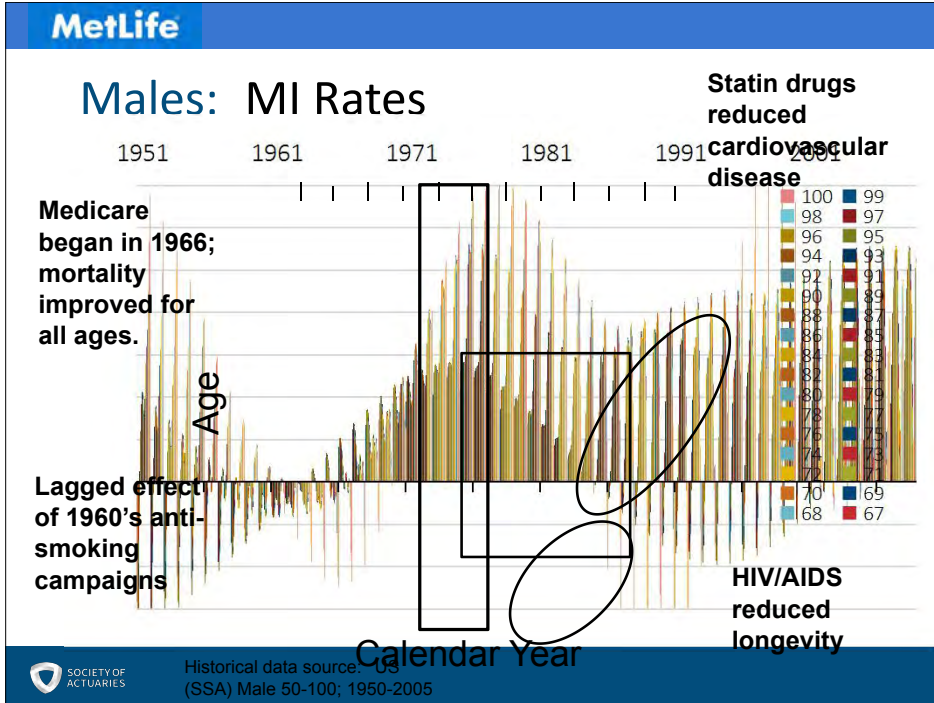
- Industry tables a typical starting point
- Dynamic projection anticipates future improvements
- Had typically been 'one-dimensional' with a single rate for each age and gender
- 'Two-dimensional' tables reflect cohorts and future changes in improvement rates

Pension Valuations Around the Globe Assumed Mortality Improvement in 2010 vs. Observed Mortality Improvement Since 1990









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New Mortality Improvement Scales for US Pension Plans: MP-2014/2015

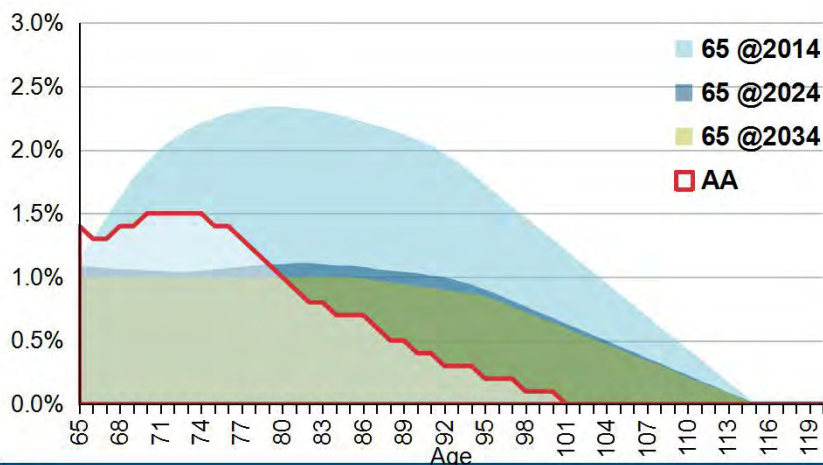
- Underlying principles
 - Short-term improvement rates based on recent experience
 - Long-term improvement rates based on expert opinion
 - Blend short-term rates into long-term rates
- Reflects recent Social Security Administration experience and expert opinion (ultimate rates)
- Two-dimensional table (male/female), replaces one-dimensional table, AA



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MP-2014 vs Scale AA Male Age 65



Pricing Methodology: Participant Options for Deferred Lives

Early Retirement/Termination/Disability

- Often early retirement is subsidized, providing more favorable factors than actuarial equivalent
- May depend on years of service and employment status
- Consider Insurer experience, industry studies, and case-specific experience

Form of Annuity

- More limited risk since typically close to actuarial equivalent
- Can impact the duration of the liability
- Lump sums not broadly available
- Consider Insurer experience, industry studies, and case-specific experience

Pricing Methodology: Risk & Capital

- Various capital methodologies used
 - Risk Based Capital: statutory basis, prescribed by NAIC
 - Economic capital: Insurer's measure of risk
- Profitability metrics
 - IRRs and break-even year under capital measures
 - Earnings emergence—GAAP and Statutory
 - Asset margin
 - Metrics under shock scenarios

Ongoing Product Management

Liability Management

- Experience Studies: Insurer's and Industry studies
 - Validates/updates pricing assumptions
 - Captures recent trends to enhance pricing
 - Identifies potential administrative enhancements
- Reinsurance
- Potential diversification with life insurance mortality exposure

Ongoing Administration

- Identification of Deaths
 - Informed by annuitants' family or others
 - Social Security Administration Death Master File
 - Other
- Benefit Calculations/Retirement Elections
- Contact with Deferred Annuitants

