



# **Impact of VM-20 and 2017 CSO on Life Insurance Pricing**

**(2017 Actuaries' Club of Hartford & Springfield)**

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# **Background & 2017 CSO**

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# VM-20 and 2017 CSO are here!!!

- Effective January 1, 2017
- 3 year transition period (January 1, 2020)
  
- Principle-based reserves
- 2017 CSO Table
  
- References
  - Valuation Manual (NAIC adoptions through 8/29/2016)  
[http://www.naic.org/documents/committees\\_a\\_latf\\_related\\_valuation\\_manual\\_noapf\\_160829.pdf](http://www.naic.org/documents/committees_a_latf_related_valuation_manual_noapf_160829.pdf)
  - AG-48:  
[http://www.naic.org/documents/committees\\_ex\\_pbr\\_implementation\\_tf\\_related\\_actuarial\\_guideline\\_ag48.pdf](http://www.naic.org/documents/committees_ex_pbr_implementation_tf_related_actuarial_guideline_ag48.pdf)
  - 2017 CSO Tables  
<https://www.soa.org/experience-studies/2015/2017-cso-tables/>

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# 2017 CSO Tables

- 14 sets of tables (94 unique tables) on SOA website
  - Loaded vs Unloaded
  - Composite vs Smoker-Distinct
  - Gender-Blended vs Gender-Distinct
  - Preferred Structure
  - Select and Ultimate
  - Age Nearest Birthday and Age Last Birthday table versions

# SOA Website for 2017 CSO

## 2017 Commissioner's Standard Ordinary (CSO) Tables

### Updates

- 8/29/16 – Composite Loaded CSO, Composite Loaded CSO Gender-Blended, Composite Loaded CSO Ultimate and Composite Loaded CSO Gender-Blended Ultimate tables were updated.
- 11/23/15 – 2017 CSO Report added
- 10/28/15 – Ultimate tables have been added.
- 10/26/15 – The age 18, duration 1 and age 17, duration 2 rates on the female ALB composite table have been updated.
- 10/26/15 – Gender-blended nonsmoker, smoker and composite tables have been added.

The Valuation Table Team has completed their work on the 2017 Commissioner's Standard Ordinary (CSO) Tables. These include male / female, smoker / nonsmoker and age-nearest birthday (ANB) / age-last birthday (ALB).

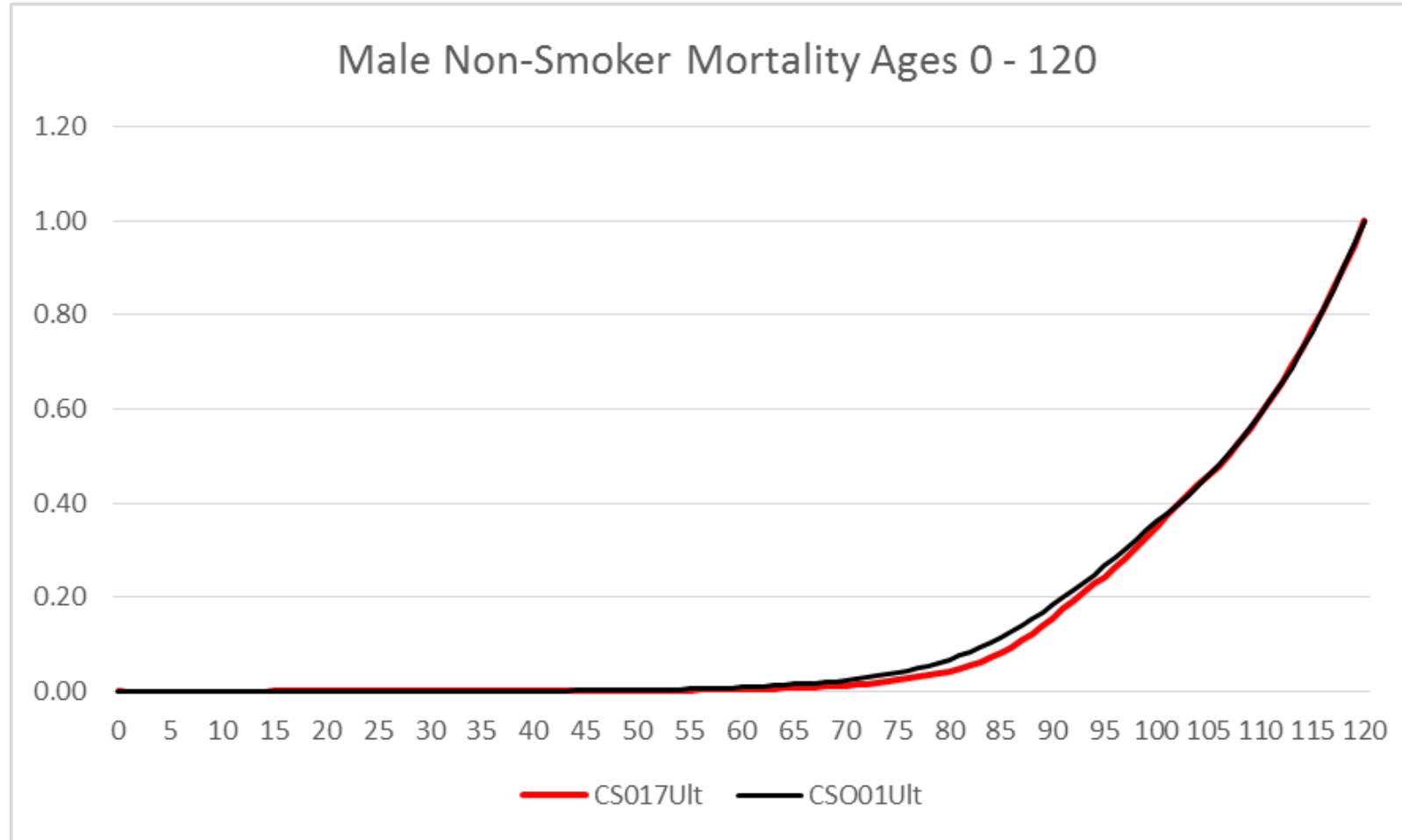
- [2017 CSO Report](#) PDF
- [2017 Loaded CSO Composite Tables](#) XLS
- [2017 Loaded CSO Smoker-Distinct Tables](#) XLS
- [2017 Unloaded CSO Smoker-Distinct Tables](#) XLS
- [2017 Loaded CSO Preferred Structure Tables](#) XLS
- [2017 Unloaded CSO Preferred Structure Tables](#) XLS
- [2017 Loaded CSO Nonsmoker Gender-Blended Tables](#) XLS
- [2017 Loaded CSO Smoker Gender-Blended Tables](#) XLS
- [2017 Loaded CSO Composite Gender-Blended Tables](#) XLS
- [2017 Loaded CSO Composite Ultimate Tables](#) XLS
- [2017 Loaded CSO Smoker Distinct Ultimate Tables](#) XLS
- [2017 Loaded CSO Composite Gender-Blended Ultimate Tables](#) XLS
- [2017 Loaded CSO Nonsmoker Gender-Blended Ultimate Tables](#) XLS
- [2017 Loaded CSO Smoker Gender-Blended Ultimate Tables](#) XLS
- [2017 Unloaded CSO Composite Tables](#) XLS

### ■ 14 Excel Files

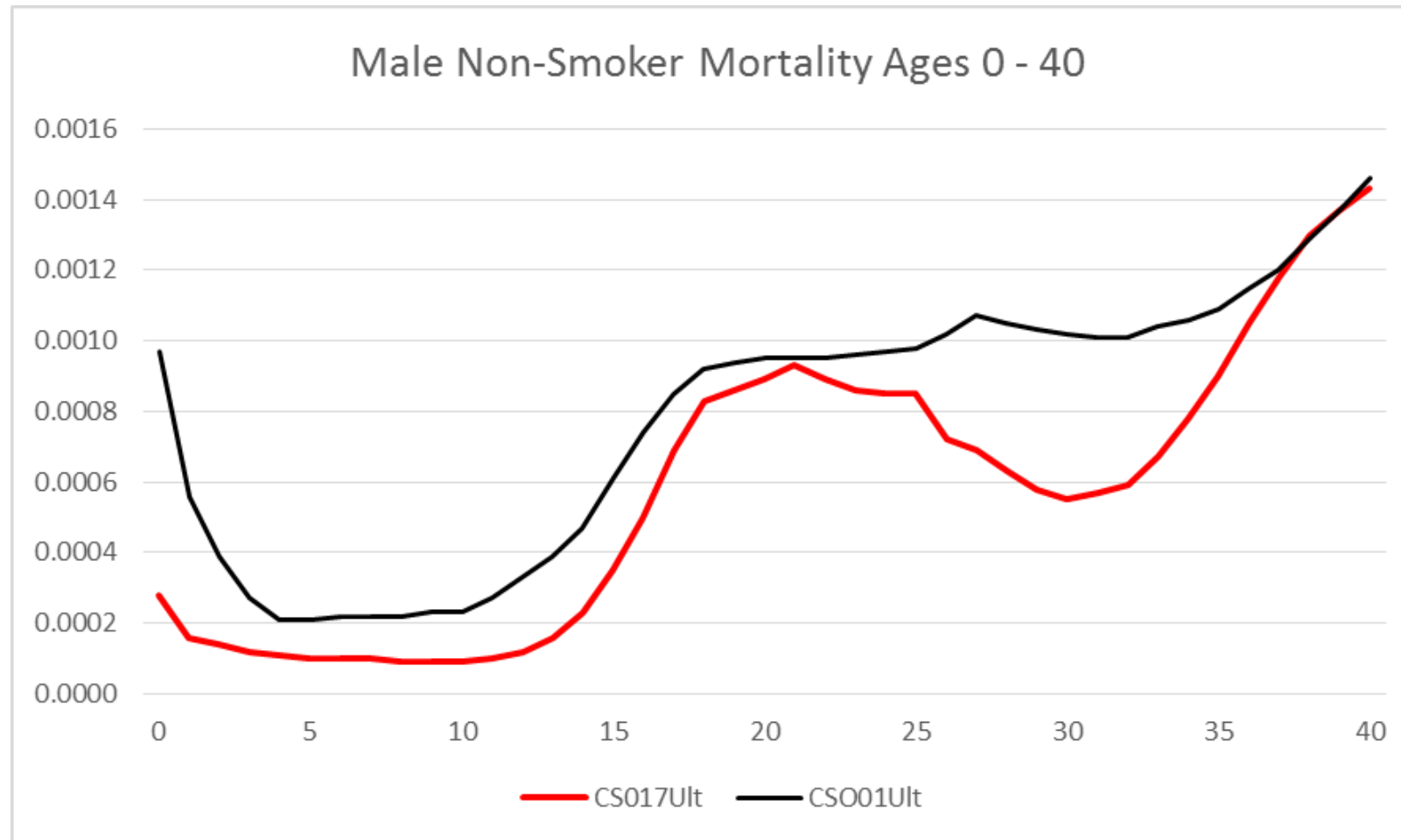
- From:  
<https://www.soa.org/experience-studies/2015/2017-cso-tables/>

If you have any questions about this work, you may contact Patrick Nolan, SOA Experience Studies Actuary, at +1-847-273-8860 or [pnolan@soa.org](mailto:pnolan@soa.org).

# High Level Comparison to 2001 CSO



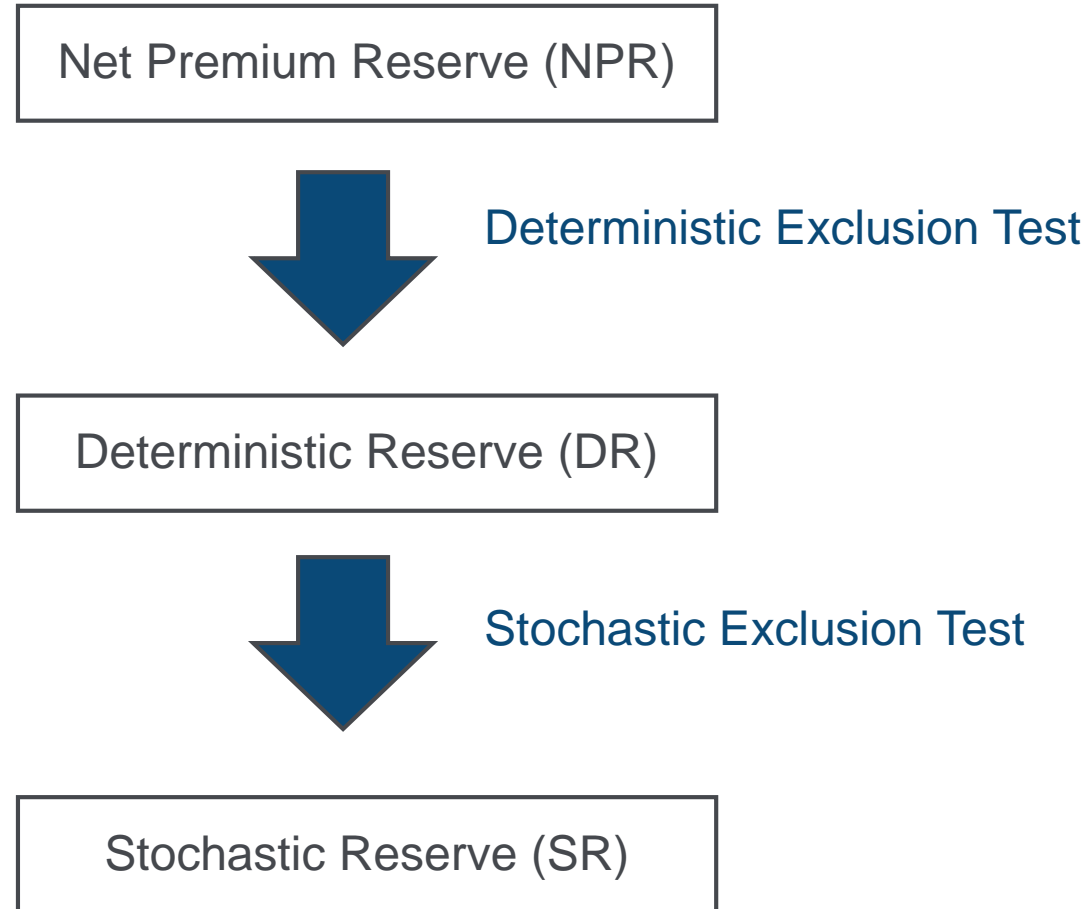
# High Level Comparison to 2001 CSO – Early Ages





# Reserves under VM-20

Reserve conceptually is the max of NPR, DR, SR



# **NPR Considerations**

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## NPR for Term: Section 3.B.4

- Similar to CRVM

$$\text{NPR} = \text{PV}(\text{Ben}) - \text{PV}(\text{NP})$$

- Net premium based Adjusted Gross Premiums
- Prescribed mortality and lapses
- Shock lapse adjustments

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# NPR for ULSG

NPR for ULSG is greater of\* reserve under Section 3.B.5 and reserve under Section 3.B.6

## Section 3.B.5

- Ignores secondary guarantee
- Reserve = Funding Ratio \* [ PV(Ben) – PV(NP) – UnamortEA ]

## Section 3.B.6

- Focuses secondary guarantee
- Reserve = Funding Ratio \* PV(Ben) – UnamortEA

\*floored at max of cash value and amount to cover charges until next period

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# ULSG NPR Funding Ratio under Section 3.B.6

## Funding Ratio

= Actual Secondary Guar / Fully Funded Secondary Guar

## Specified Premium designs

- Actual Secondary Guarantee
- Fully Funded Guarantee
- AG38 funding ratio is based on *excess* premiums
- Causes Funding Ratio under VM-20 to be higher than under AG38
- NAIC working group is reviewing

# ULSG NPR Funding Ratio: Specified Premium Example

## Generic Policy with Hypothetical Unitized Values

Issued as 65 year-old female, currently in policy year 10

Accumulated Minimum Premium at t=10: \$250

Fully Funded basis at t=10

Accumulated Premium: \$600

Accumulated Excess Premium: \$600 - \$250 = \$350

Actuals at t=10

Accumulated Premium: \$450

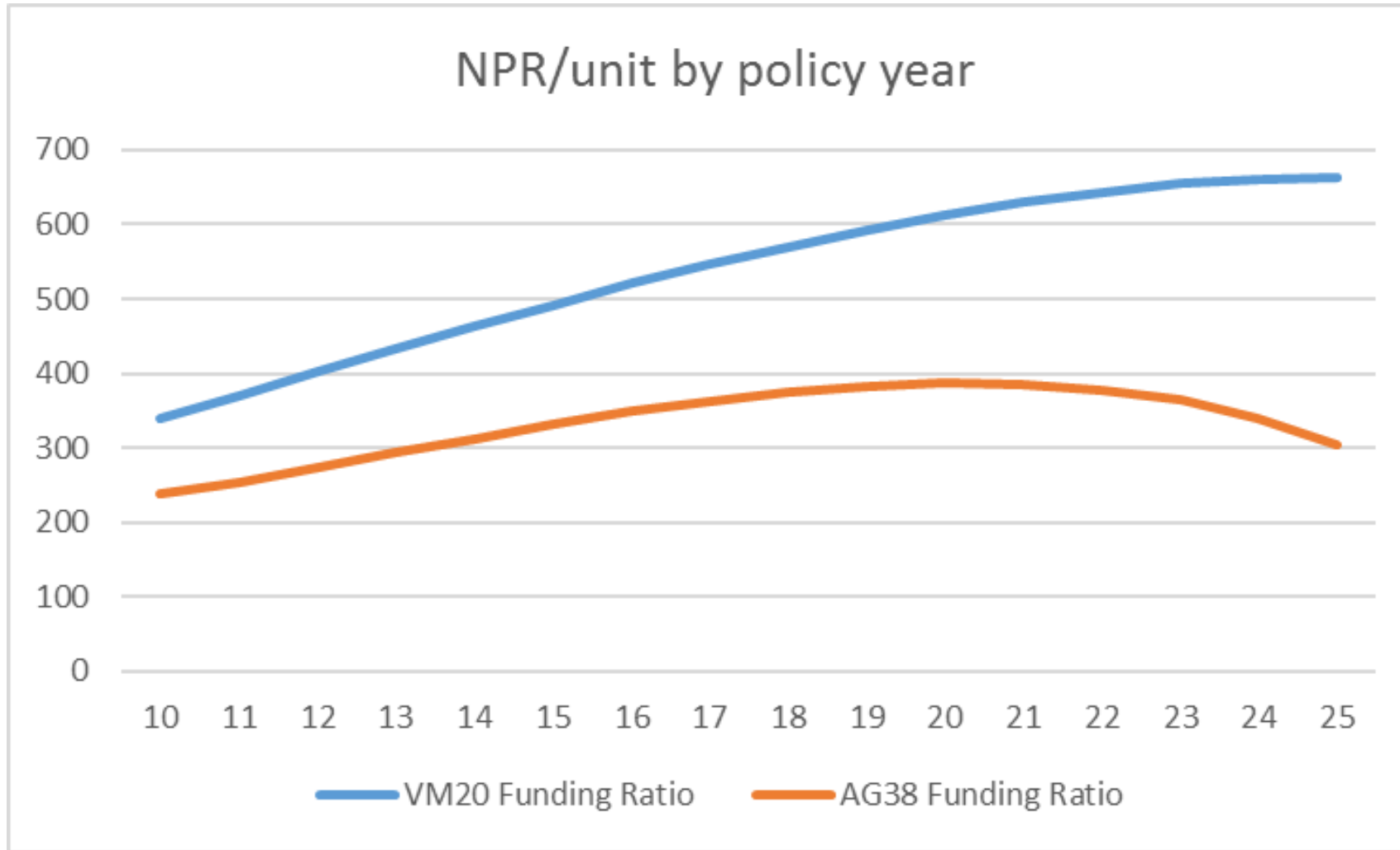
Accumulated Excess Premium: \$450 - \$250 = \$200

## Funding Ratios

AG38 →  $200 / 350 = 57.1\%$

VM-20 →  $450 / 600 = 75.0\%$

## Example: ULSG NPR Funding Ratio under Section 3.B.6



# **Deterministic / Stochastic Reserve Considerations**

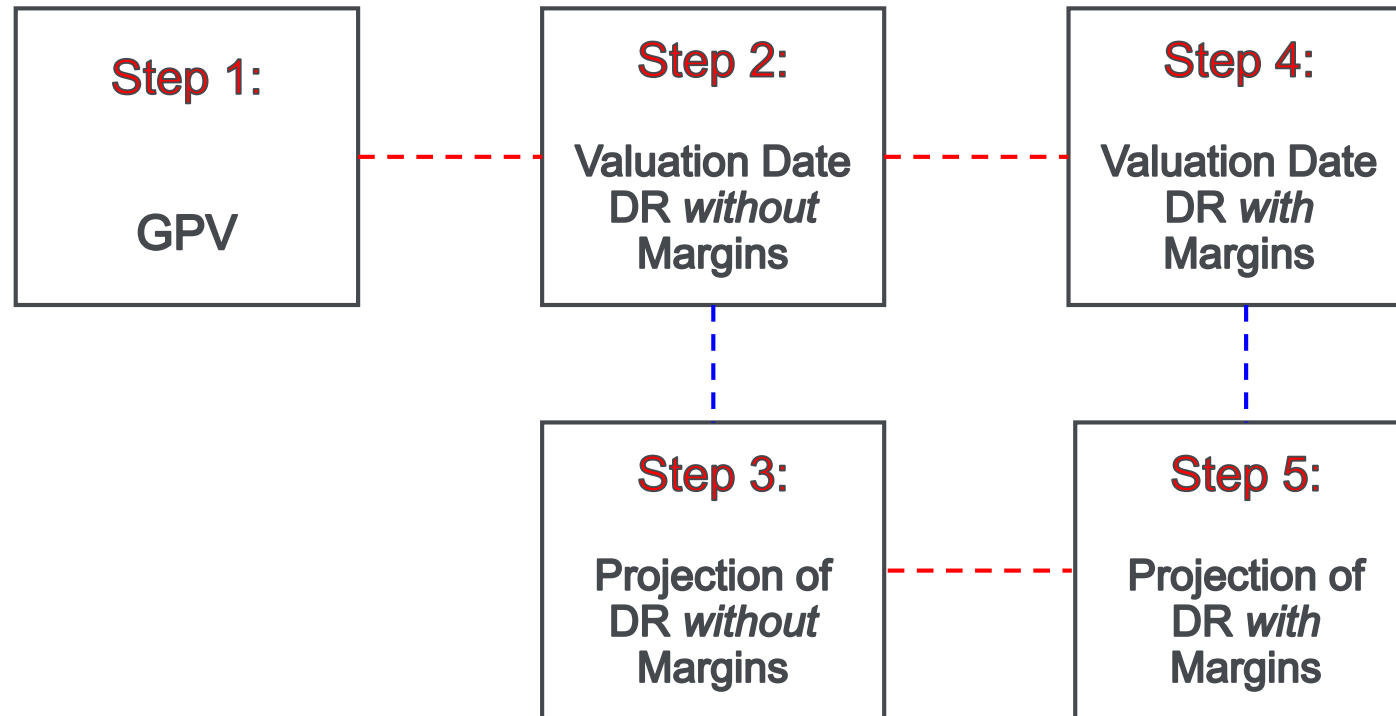


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# Deterministic Reserve

- Aggregate reserve
- Present value of liability cash flows discounted at investment portfolio rate
- Ability to use prudent best estimate
- Uses projection model that is dependent on assets

# Deterministic Reserve Implementation



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# Stochastic Reserve

- Similar methodology as DR, but with Academy prescribed scenarios
- CTE70 of greatest present value of accumulated deficiencies under those scenarios
- Number of scenarios is enough such that adding more scenarios doesn't materially change results
- Stochastic Exclusion Test (SET) should be considered
- Run time concerns

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# Other PBR Considerations

- Reinsurance
- Integration of inforce models
- Potential Simplifications
- Sensitivity
- Small Company Exemption
- Impact on Tax Reserves

# **Considerations Beyond PBR**

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# Considerations for Rates

- Traditional Products: Premium Rates
- Universal Life: COI Rates
- Dependent on what was filed
  - Contract
  - Actuarial Memorandum
  - Variability Memorandum
  - Rates
- Benefits are reasonable in relationship to premiums

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# IRS Section 7702 - Basics

- Created by DEFRA in 1984
- IRS Definition of Life Insurance
  - Death Benefits are tax-free
  - Inside build-up of cash value is tax-deferred
- Cash Value Accumulation Test (CVAT)
- Guideline Premium and Corridor Test (GPT)

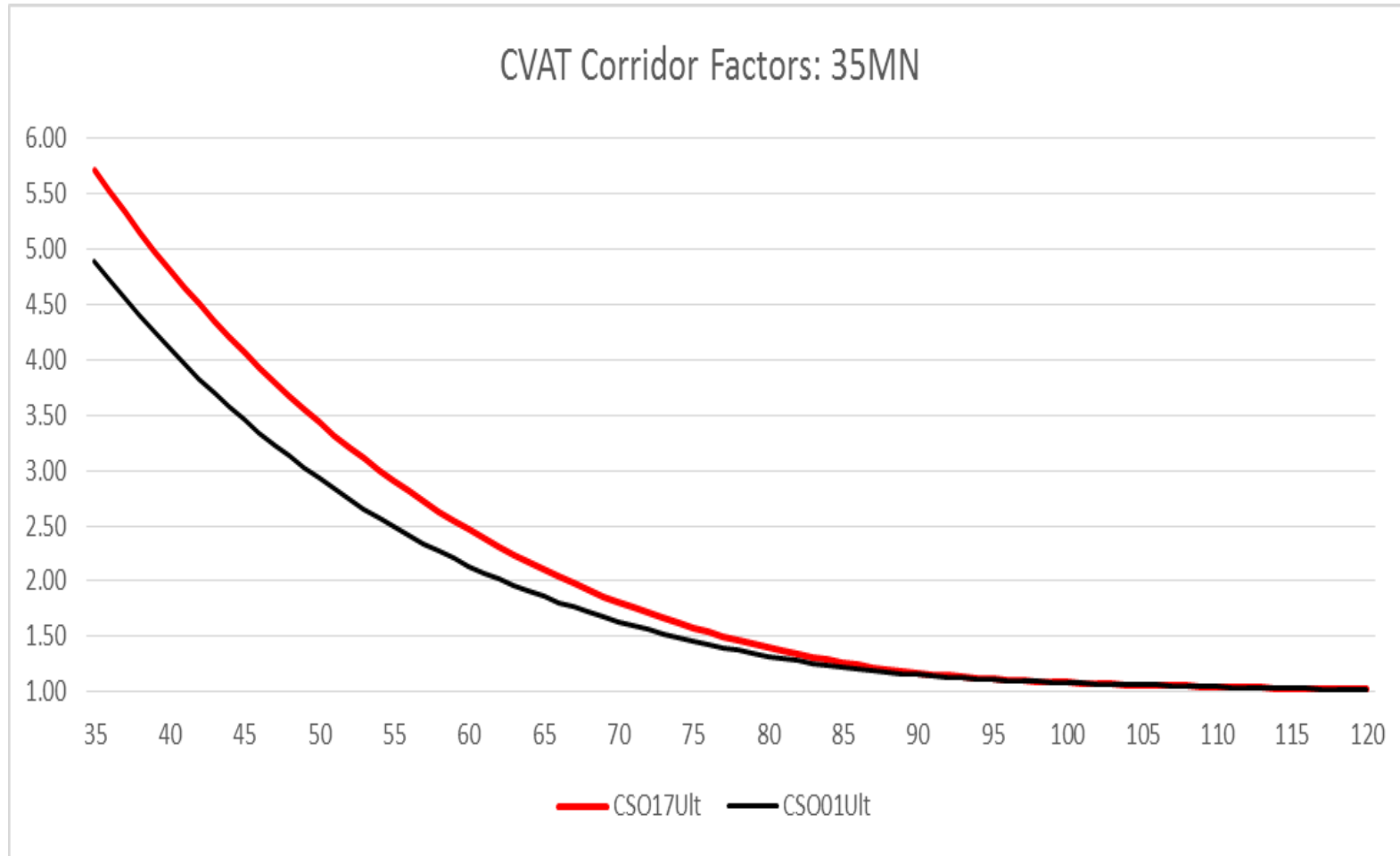
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# IRS Section 7702 – Mortality Assumption

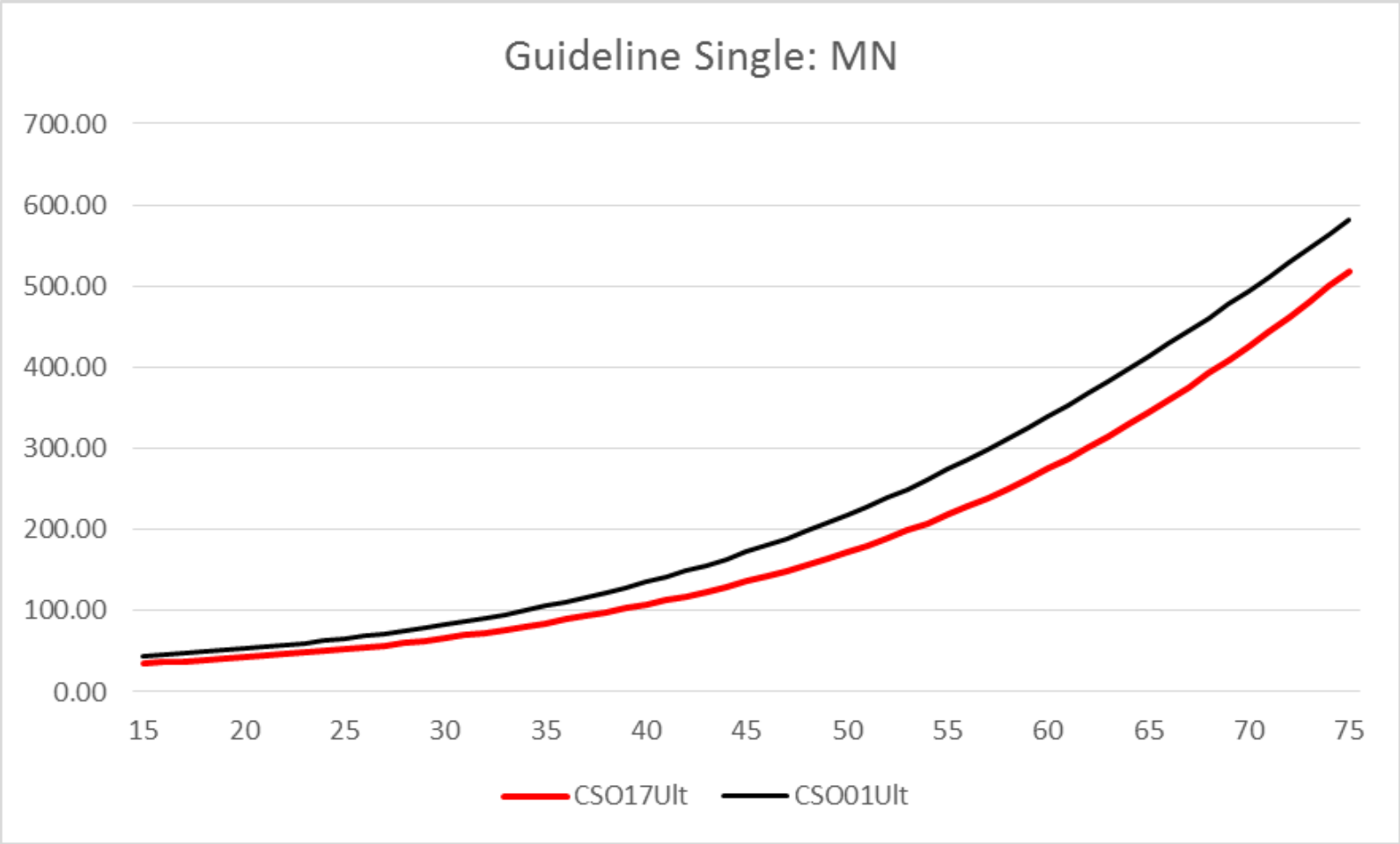
- How does 2017 CSO impact 7702?
- 7702(c)(3)(B)(i):
  - “*reasonable mortality* charges that meet the requirements (if any) prescribed in regulations and that (except as provided in regulations) *do not exceed the mortality charges specified in the prevailing commissioners’ standard tables* (as defined by section 807(d)(5)) as of the time the contract is issued”
- Subject to company interpretation
- Sample generic calculations based on CSO Ultimate tables without expenses



# IRS Section 7702 – CVAT Generic Example



# IRS Section 7702 – Guideline Single Premium Example

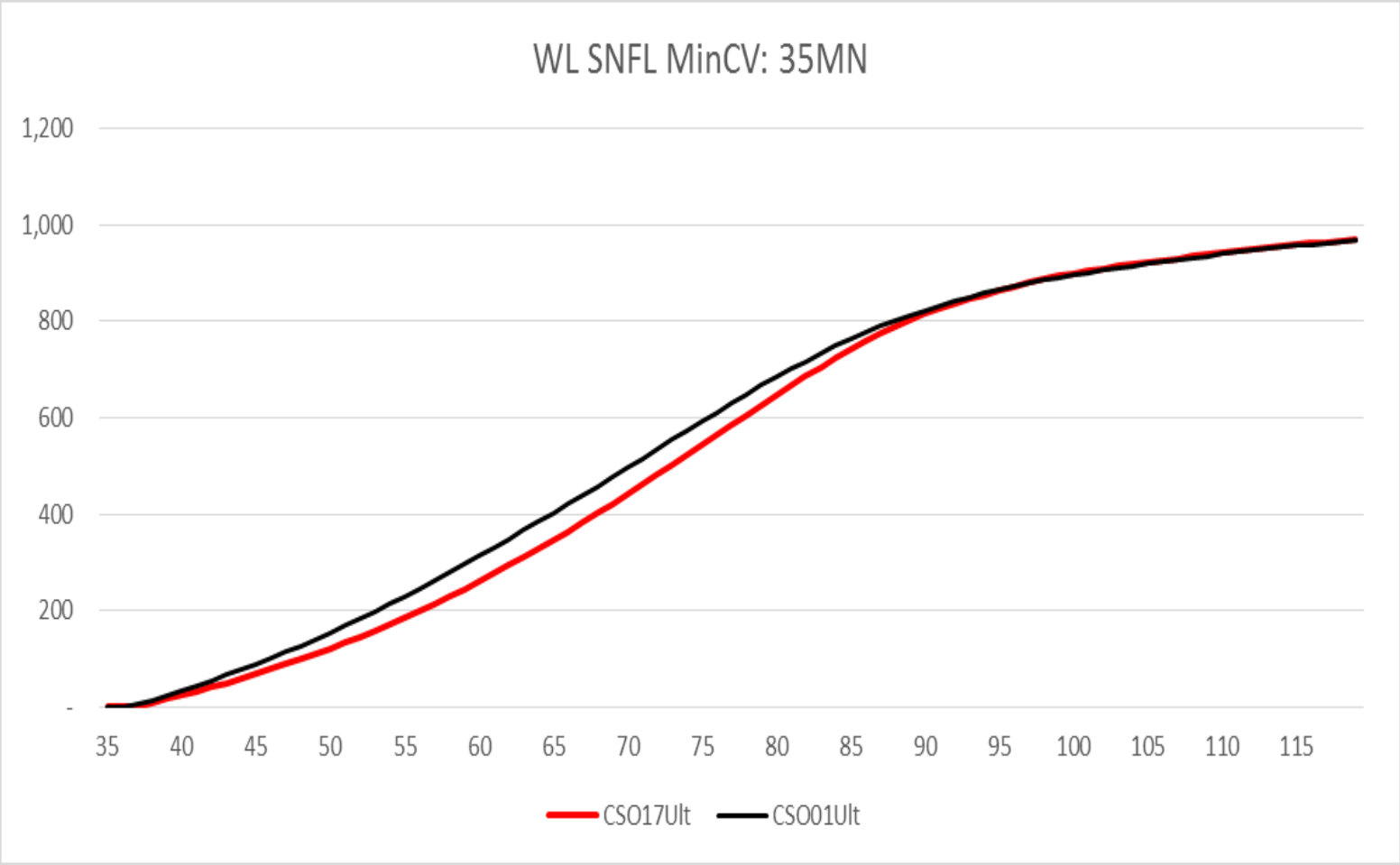


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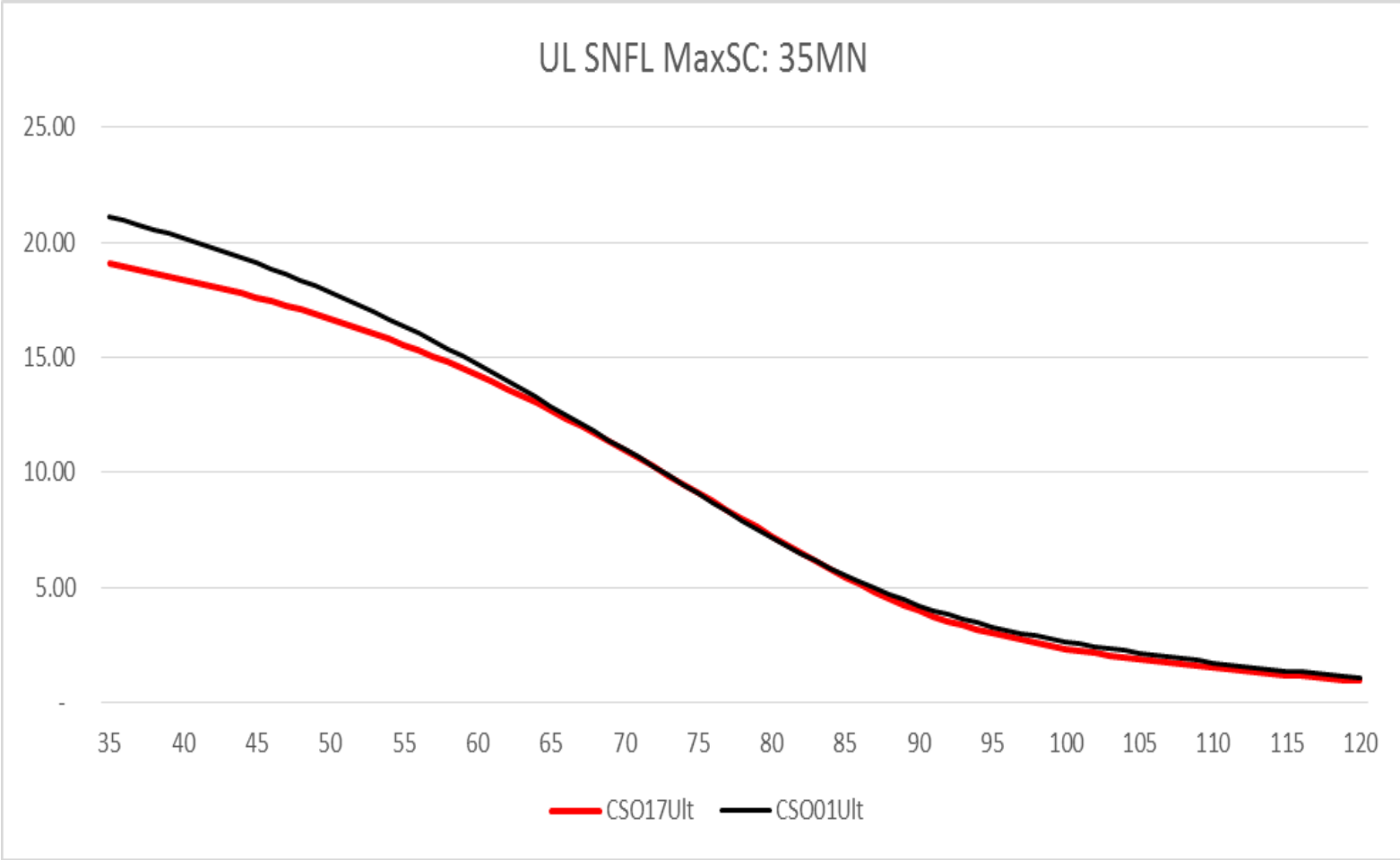
# Standard Non-forfeiture Law - Basics

- NAIC Standard Non-forfeiture Law (SNFL) in 1948
- Calculation to set minimum cash value for traditional products
- NAIC Universal Life Model Regulation in 1994
  - For Universal Life, application of SNFL is to set a maximum expense charge.
  - For illustrative purposes of Universal Life, we are showing generic calculations based on CSO ultimate tables and assume level charges for the first 20 years so the full expense allowance is amortized.

# SNFL Whole Life – Generic Example



# SNFL Universal Life – Generic Example



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# Conclusions

- Within a company, who is taking the lead?
- Model Governance
- Pros/Cons of Simplifications
- Potential product impacts
- Pricing Strategy

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# Thank you for your time!



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