# Career-Accomplishment-Summary

## Loss Development Model - Damped Harmonic Oscilator

### Over Damped: Cummulative Development

$$Factor = 1 - (C)e^{(-at)} - (1 - C)e^{(-bt)}$$

### Under Damped: Cummulative Development

$$Factor = 1 - (C)sin(at)e^{(-bt)} - cos(at)e^{(-bt)}$$

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### Critically Damped: Cummulative Development

$$Factor = 1 - (C)te^{(-at)} - e^{(-at)}$$

## Amount of insurance model factors

$$Factor(L) = \frac{(e^{(1-e^{(\frac{-L}{S})})} - 1)}{(e^{(1-e^{(\frac{-L(b)}{S})})} - 1)}$$

## Deductibles by amount of insurance factors

$$Factor(D|L) = (\frac{(1 - \frac{(e^{(1-e^{(\frac{-D}{S})})} - 1)}{(e^{(1-e^{(\frac{-L}{S})})} - 1)})}{(1 - \frac{(e^{(1-e^{(\frac{-D(b)}{S})})} - 1)}{(e^{(1-e^{(\frac{-L(b)}{S})})} - 1)})}$$

# Increased Limits Model

## Occurance Limit = Claim Limit ex 500/500 or 500CSL

$$ILF = e^{(1-e^{(\frac{-L}{S})})} - 1$$

## Occurance Limit = 2xClaim Limit ex 250/500

$$ILF = (e^{(1-e^{(\frac{-2L}{S})})} - 1) - (e^{(\frac{-L}{S})} - e^{(\frac{-2L}{S})}) * (e^{(e^{(\frac{-L}{S})} - e^{(\frac{-2L}{S})})})$$

## Occurance Limit = 3xClaim Limit ex 100/300

$$ILF = (e^{(1-e^{(\frac{-3L}{S})})} - 1) - (e^{(\frac{-L}{S})} - e^{(\frac{-3L}{S})}) * (e^{(e^{(\frac{-L}{S})} - e^{(\frac{-3L}{S})})}) + \frac{1}{2}((e^{(\frac{-L}{S})} - e^{(\frac{-2L}{S})})^2) * (e^{(e^{(-LS)} - e^{(-2LS)})}$$

# Homeowners Catastrophe Model (aggregate)

## Mean of aggregate distribution = mean(f)*mean(s)

$$mean(f) * mean(s) = \frac{rp}{1-p}(\alpha AOI)(\Gamma(1+\frac{1}{d})).$$

**Assume:**

**The frequency follows a negative binomial distribution.**

**The severity follows a weibull distribution - behaves like a fractal.**

## Variance of aggregate distribution

$$Var(AggDist) = \sum_{n=1}^{\infty}(nE(S^2)) + n(n-1)E(S)^2 - 2nE(S)(mean(f) * mean(s)) + (mean(f) * me$$

**Where:**

**E(S) = Mean of Severity distribution.**

**E(S^2) = Second Moment of the Severity Distribution about the origin.**

**n = number of events**

**r = number of successes.**

# Price implementation model

**Many times we can only move toward the proposed from current due to disruption.**

**The following optimizes it and assumes that the rates will be in effect for a year.**

$$FiledFactor = \frac{(PC)}{(C + (P - C)e^{(-\alpha)})}$$

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