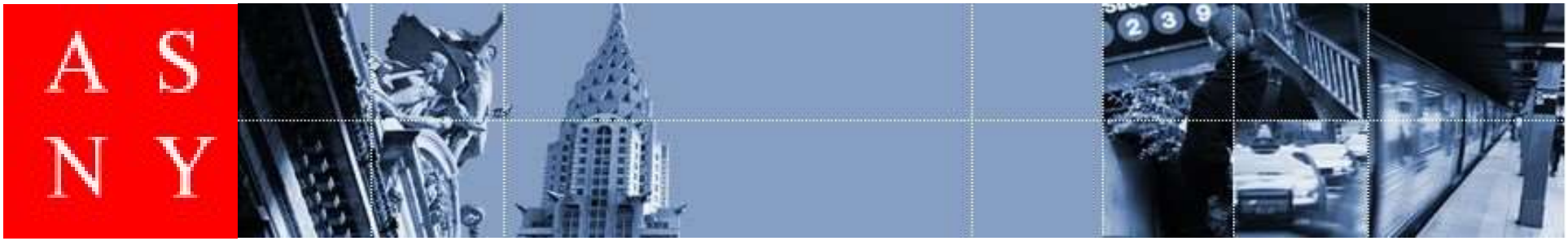


LDTI Changes:
Technological aspect

How new disclosure requirements impact modeling needs

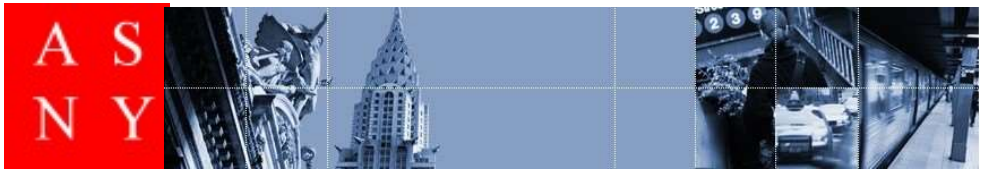
Daniel Dvorin
Manager, Insurance and Actuarial Advisory Services
Ernst & Young LLP

ASNY Annual Meeting
Monday, November 25, 2109

Disclaimer

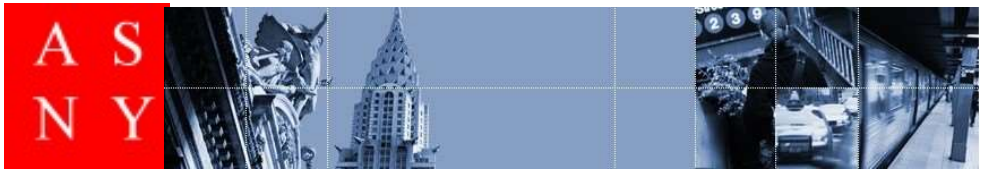
- The views expressed by the presenters are not necessarily those of Ernst & Young LLP or other members of the global EY organization.

- These slides are for educational purposes only and are not intended to be relied upon as accounting, tax or other professional advice. Please refer to your advisors for specific advice.

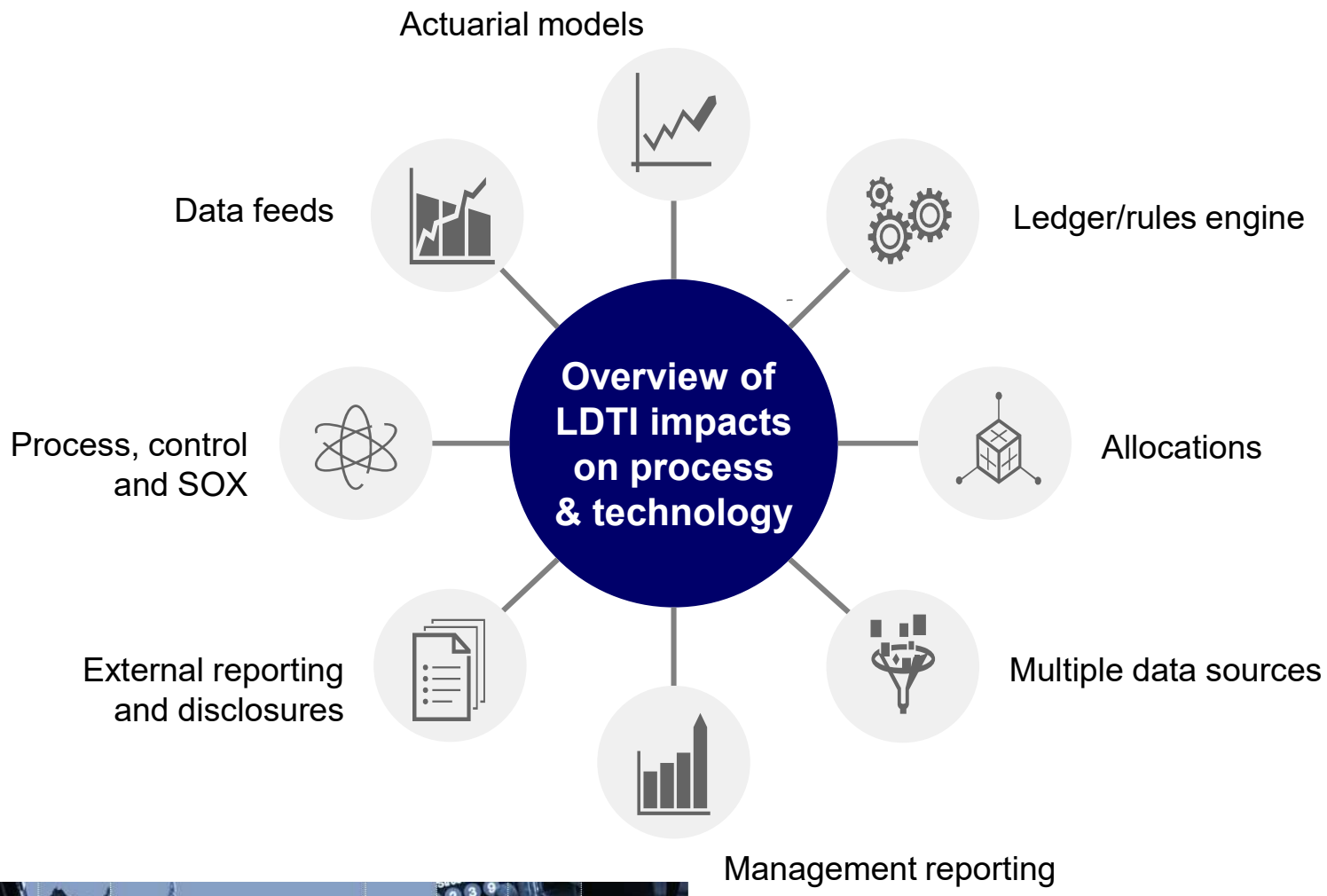


Focus Areas

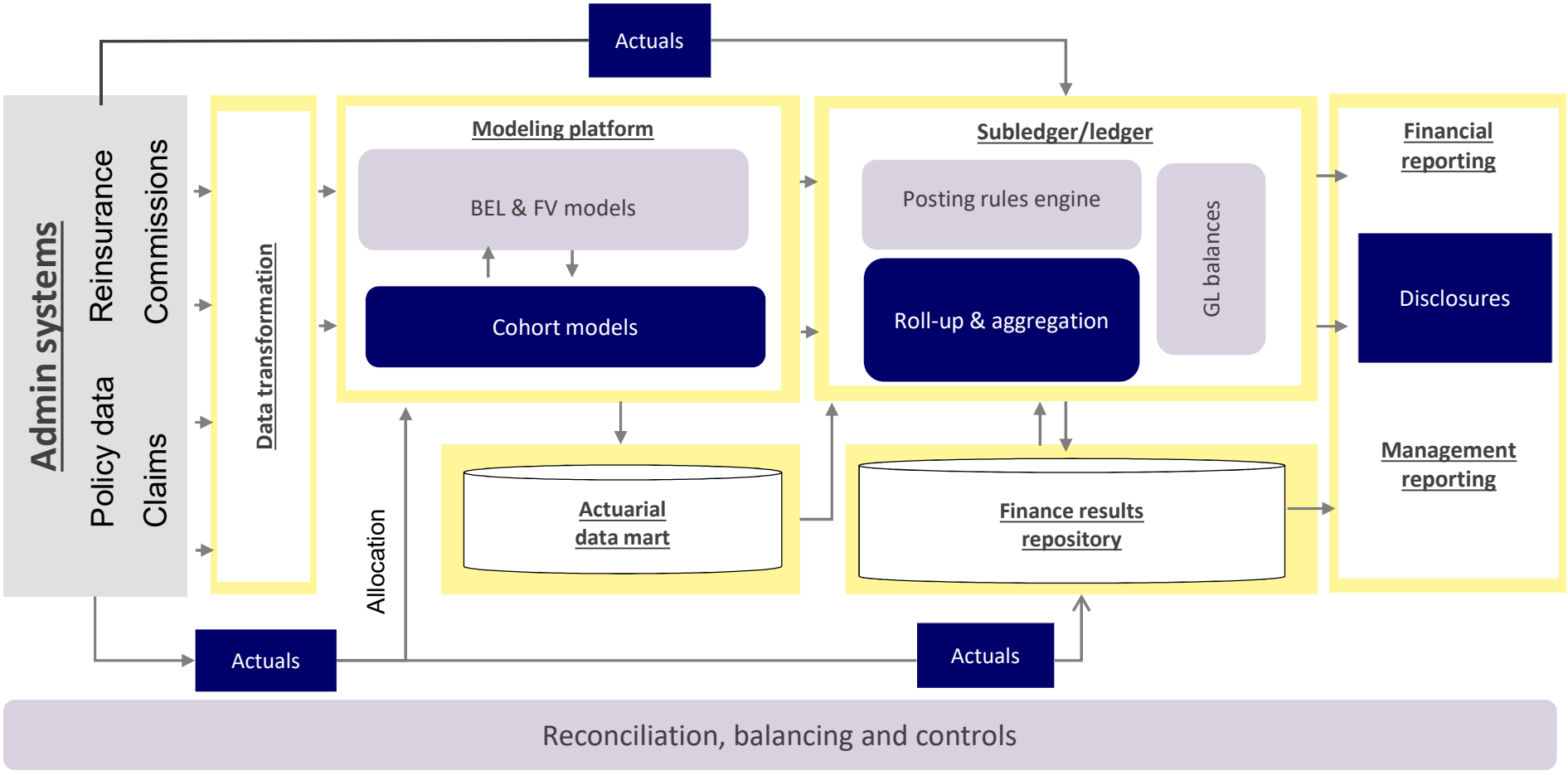
- Technological implications of rollforward disclosures requirements for Future Policy Benefits (FPBs)
- Technological implications of rollforward disclosures requirements for Market Risk Benefits (MRBs)

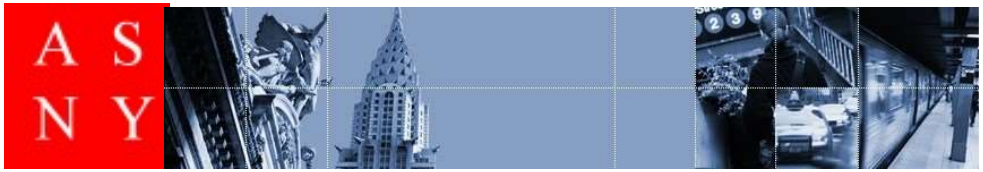


Overview of key LDTI impacts on process and technology



LDTI data flow





Impacted solution components

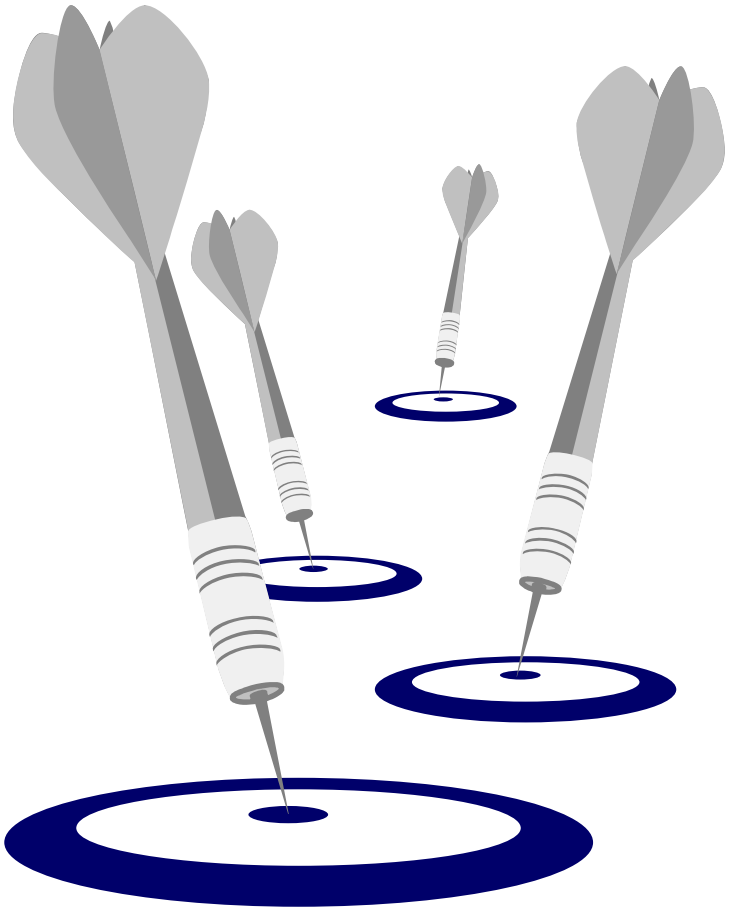
Existing components

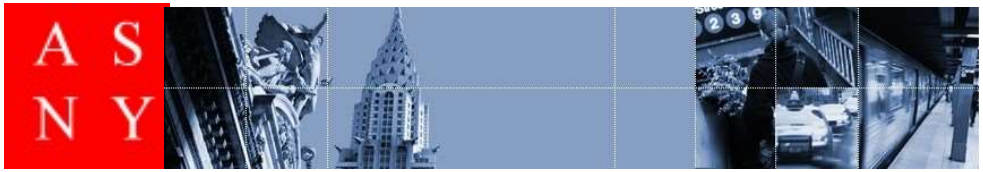
LDTI-specific component

LDTI – Enhanced Disclosures

Goals of disclosures

- Provide internal and external stakeholders with insight into period-over-period changes in the liability balances
- Improve comparability of periodic liability movements across the industry
- Serve as a key control in companies' reserve movement analysis





Future Policy Benefits (FPB) rollforward

New concepts:

- Beginning of period experience remeasurement
- Derecognition

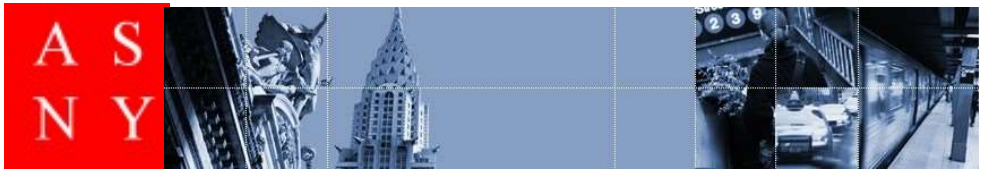
Demonstrating impacts of capping/flooring:

- The net premium ratio used to calculate net premiums is capped at 100%
- Net reserves are floored at zero

Interim rollforward of annual cohort:

- Impact of new business on open cohort
- Geography of impacts of new business in rollforward

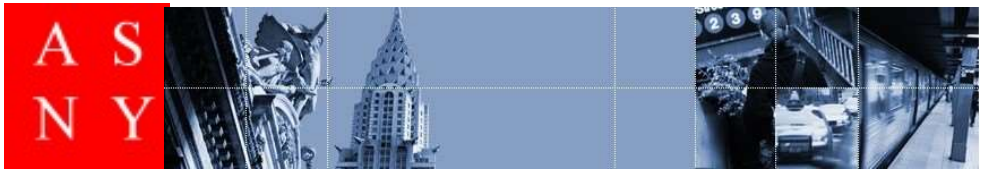
Illustrative FPB Rollforward	t=2	t=1
Present Value of Expected Premiums	**Whole Life**	**Whole Life**
Balance, beginning of year	**B**	$0
Beginning balance at original discount rate	**A**	$0
Effect of changes in cash flow assumptions	X	$0
Effect of actual variances from expected experience	X	$0
Adjusted beginning of year balance	**A'**	**$0**
Issuances	X	X
Interest accrual	X	X
Net premium collected	(X)	(X)
Derecognition (lapses)	(X)	(X)
Ending balance at original discount rate	**C**	**A**
Effect of changes in discount rate assumptions	(X)	$0
Balance, end of year	**D**	**B**
Present Value of Expected Future Policy Benefits		
Balance, beginning of year	**F**	$0
Beginning balance at original discount rate	**E**	$0
Effect of changes in cash flow assumptions	X	$0
Effect of actual variances from expected experience	X	$0
Adjusted beginning of year balance	**E'**	$0
Issuances	X	X
Interest accrual	X	X
Benefit payments	(X)	(X)
Derecognition (lapses)	(X)	(X)
Ending balance at original discount rate	**G**	**E**
Effect of changes in discount rate assumptions	(X)	$0
Balance, end of year	**H**	**F**
Net liability		
Net liability for future policy benefits	**H - D**	**F - B**
Less: Reinsurance recoverable	(X)	(X)
Net liability for future policy benefits after reinsurance recoverable	**J**	**I**



Modeling implications
Future Policy Benefits (FPB)

- **Remeasurement Gain/Loss:**
  Quantifying the effect of actual variances from expected experience requires:
  - A segment of actual cash flows from the rollforward period
  - A segment of projected cash flows based following the segment of Actuals

- **Modeling challenges:**
  - Sourcing actuals data
  - Projection of inforce population based on actuals rather than model assumptions



Modeling implications
Future Policy Benefits (FPB)

A

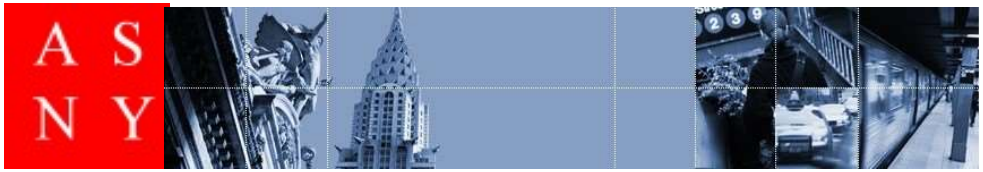
Integration of actuals in model mechanics

Model must be able to project inforce based on actual decrements and cash flows such that the projected inforce at the end of the period is equal to the actual inforce used for the end-of-period valuation

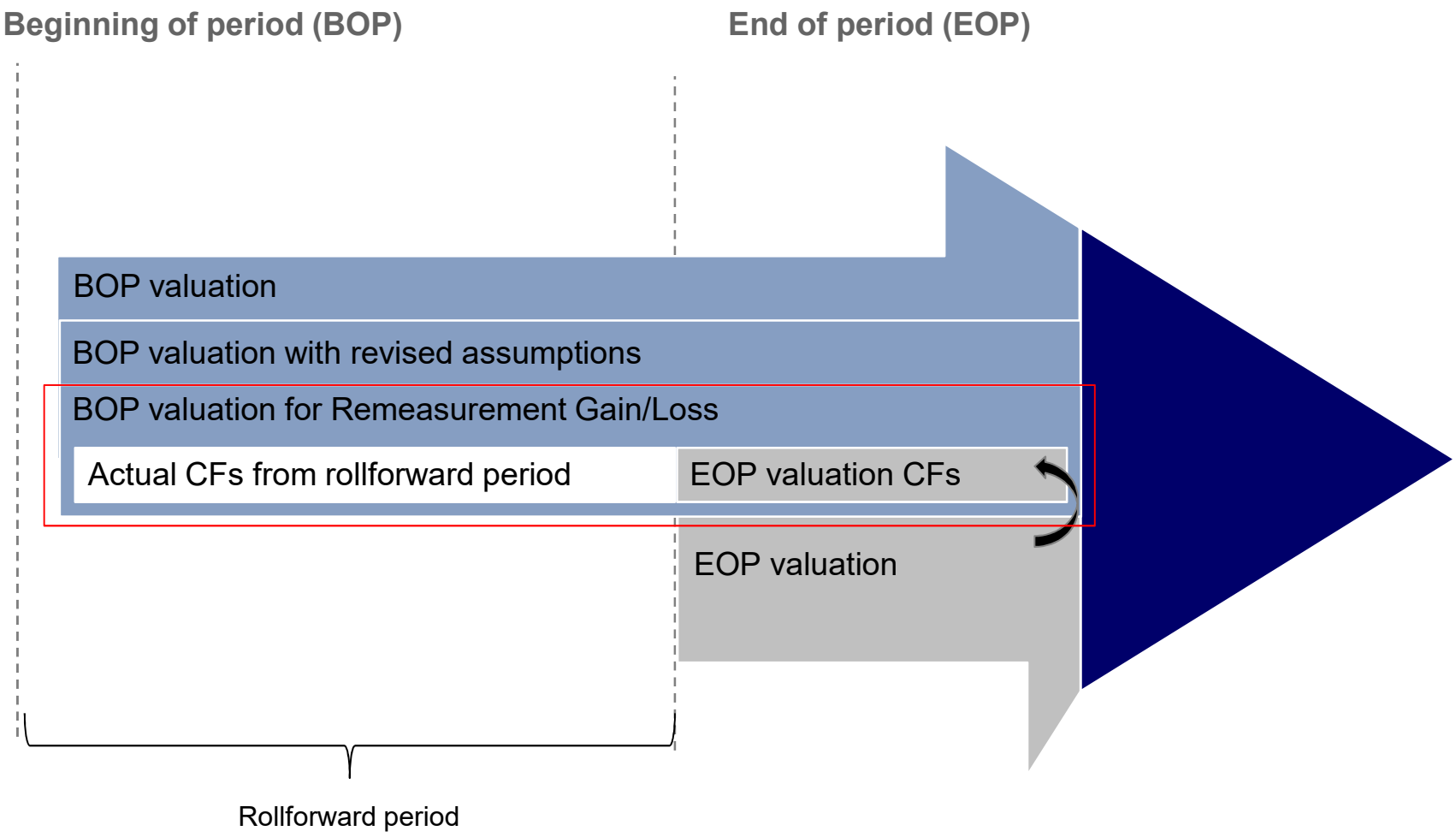
Synthesis of multiple model runs

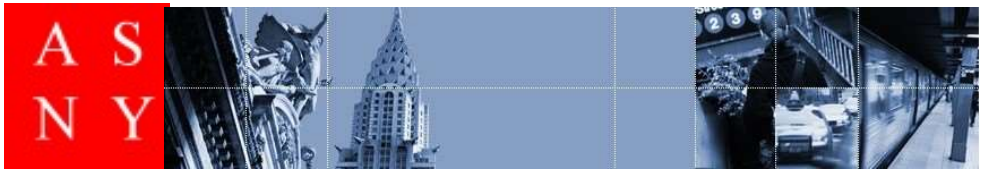
B

Model is structured to combine actual cash flows from the rollforward period with projected cash flows from the end-of-period valuation run



Modeling implications
Future Policy Benefits (FPB)





Market Risk Benefits (MRB) rollforward

Basis for 'expected' liability

- Risk Neutral calculation vs. Real World rollforward

Modeling challenges related to granular attribution

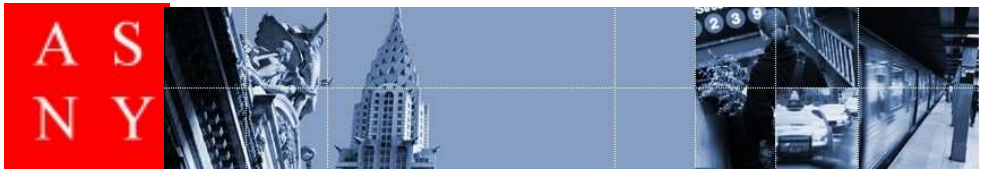
- Maintaining cash flows in order to rollforward along expected path
- Overwriting 'on-the-fly' scenario generators

Interim rollforward of annual cohort:

- Impact of new business on open cohort
- Geography of impacts of new business in rollforward

Illustrative MRB Rollforward

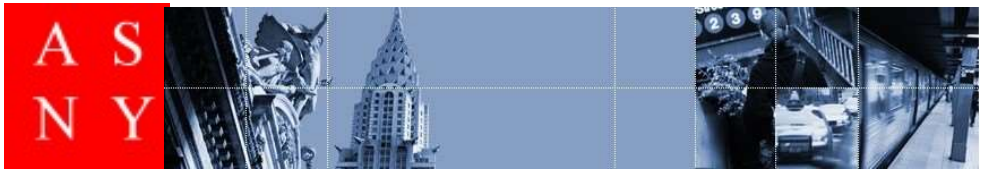
		t=2 Variable Annuities	t=1 Variable Annuities
Balance, beginning of year		**B**	0
Balance, beginning of year, before changes in the instrument specific credit risk		**A**	0
Interest accrual	Expected rollforward	X	0
Attributed fees collected	Expected rollforward	X	0
Claims paid	Expected rollforward	(X)	0
Effect of changes resulting from fund performance	A/E over the period	(X)	0
Effect of actual decrements different from expected	A/E over the period	(X)	0
Effect of other inforce changes	A/E over the period	X	0
Effect of changes in interest rates	Prospective changes	(X)	0
Effect of changes in equity index volatility	Prospective changes	(X)	0
Effect of changes in other future expected assumptions	Prospective changes	X	0
Issuances		X	X
Balance, end of the year, before changes in the instrument specific credit risk		**B**	**A**
Effect of changes in the instrument specific credit risk		(X)	0
Balance, end of year		**C**	**B**
Reinsurance recoverable, end of year		(X)	(X)
Balance, end of year, net of reinsurance		**E**	**D**



Modeling implications
Market Risk Benefits (MRB)

- Rollforward of expected MRB balance is challenging due to stochastic projections. One must choose whether to rollforward on:
  - Average of the stochastic paths
  - Deterministic expectation
  - Actual cash flows

- **Modeling challenges:**
  - Sourcing actuals data
  - Extracting individual cash flows from a stochastic projection
  - Isolating various inforce changes for granular reporting



Questions or comments?