Using Enterprise Risk Management to Create and Manage Value

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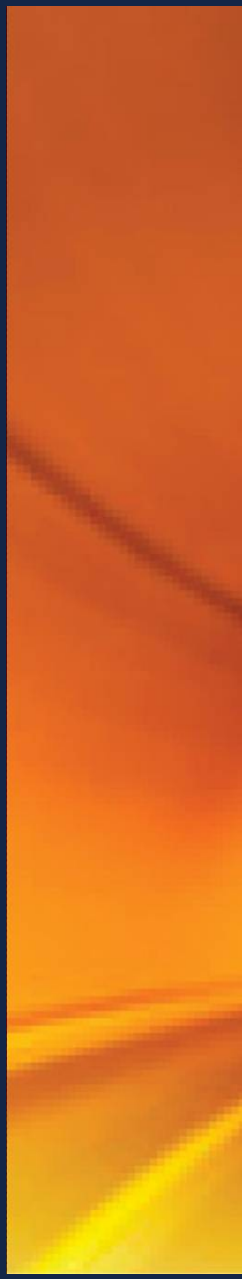
AGENDA

I. ERM: Virtues and limitations

II. Beyond ERM: Value Based Capital Management

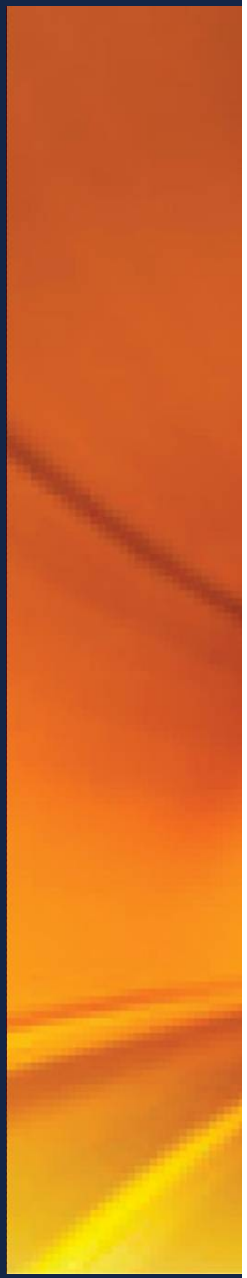
III. VBCM vs. Dynamic Reinsurance Optimization

IV. Conclusion



ERM:

Virtues and Limitations



Enterprise Risk Mgt

The origins and virtue of ERM

- My first boss
- 1989: Dennis Weatherstone, J.P. Morgan
- 2005-7: Rating agencies embrace ERM
- The virtue of ERM: its emphasis on **total** risk

Enterprise Risk Mgt

Weaknesses of ERM

- Excessive focus on measurement
- No answers to capital management
- Risk appetite/risk tolerance/utility are slogans, not answers
- Cost vs. lack of **demonstrated value**

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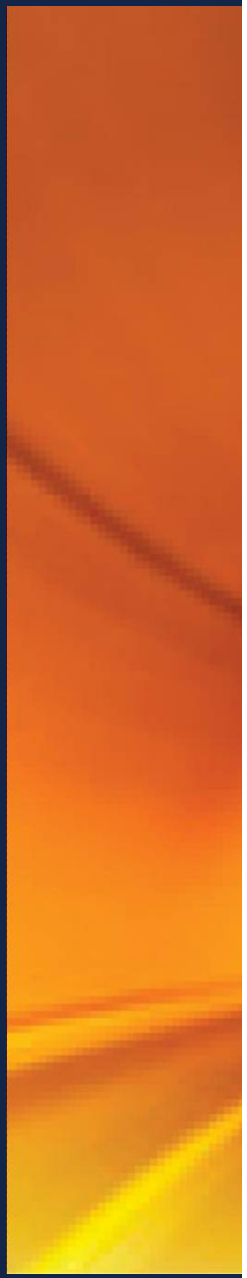
Beyond ERM:

Value Based Capital Management



Value Based Capital Mgt

VBCM makes value the central focus of ERM

- VBCM is based on an explicit model of an insurer's value
- Value reflects the firm's future, not just its current balance sheet
- Reinsurance and capital management options are chosen for their value impact

The Components of Value

Liquidation versus franchise value

- Liquidation value = value of firm in runoff
  - Approximately = book value
  - Reflects **past** decisions
  - Relatively fixed

The Components of Value

- Franchise value = value of firm as a **going concern**
  - Reflects anticipated future earnings
  - Discounted for time value
  - Adjusted for potential impairment
  - Can be enhanced by management decisions

Threats to franchise value

Adjustment for impairment is crucial

- Impairment:
  - Diminution of ability to produce future earnings
  - Temporary or permanent
  - Partial or complete
  - Typically has multiple sources
  - As in ERM, **total** risk matters

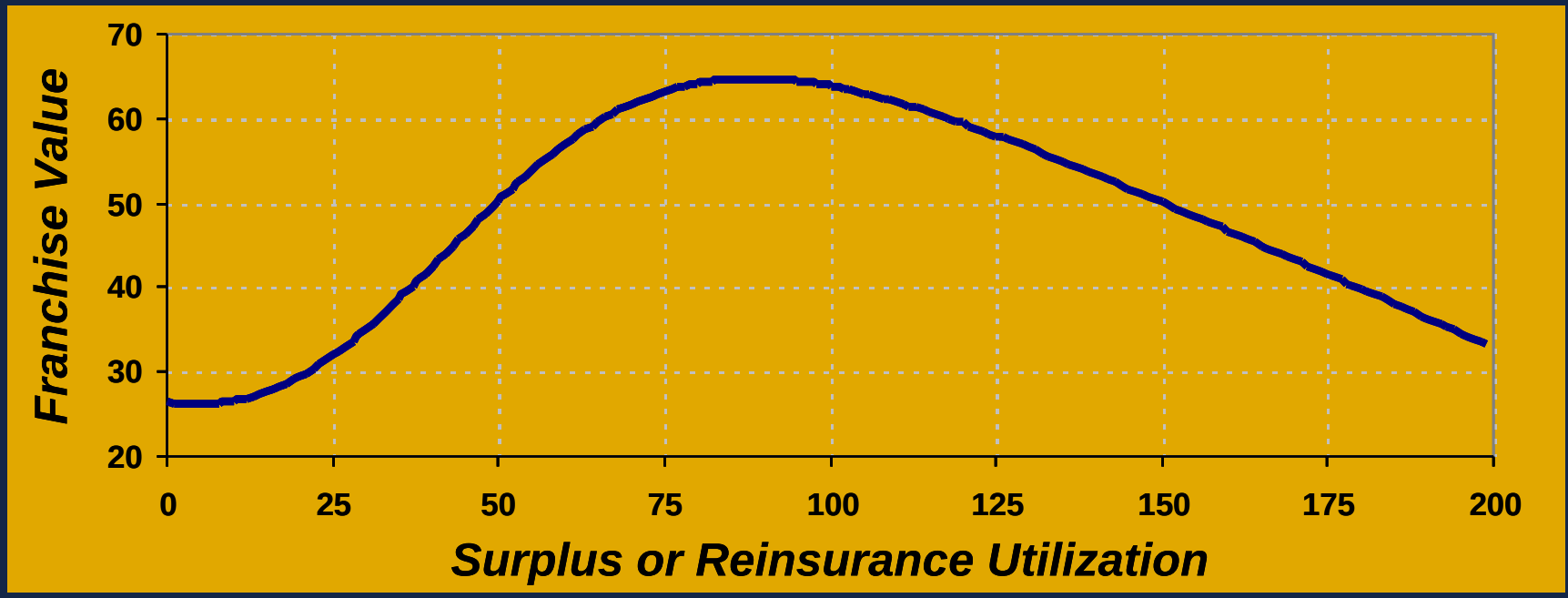
Threats to franchise value

Potential sources of impairment

- Underwriting losses
- Adverse loss reserve development
- Stock market decline
- Fixed income defaults
- Reinsurer failure
- These may in turn trigger rating agency actions

The Objective of VBCM

Identify the capital and risk management strategy that maximizes franchise value



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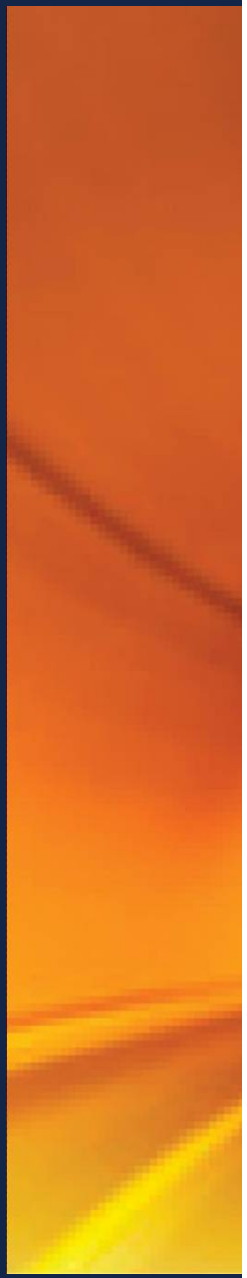
Key Features of VBCM

Value of firm = impairment-adjusted present value of future earnings

- Tradeoff between earnings & safety
- Heavy emphasis on capital, ratings
- Includes all major risks, not just U/W
- Value as basis for choice

VBCM versus Dynamic Reinsurance Optimization



An Example Firm

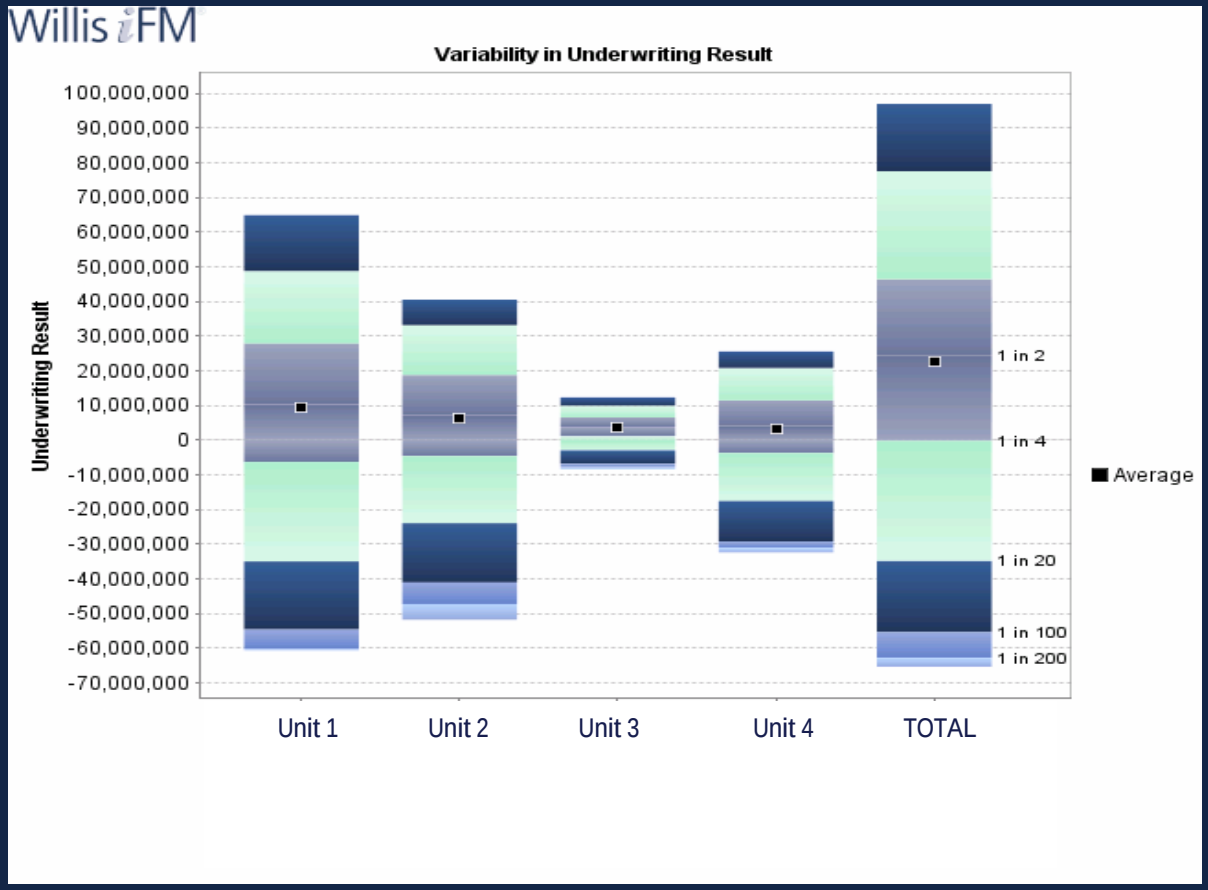
Business Unit	Gross Written Premium ($M)	Max Limit Offered ($M)	Average Limit Offered ($M)	Expiring Reinsurance Retention ($M)
1	234.0	10.0	7.0	1.0
2	130.0	10.0	7.0	0.5
3	71.5	1.0	0.7	0.25
4	65.5	10.0	5.0	1.0
Total	501.0	10.0	5.9	N/A

Gross Loss Modeling

Standard actuarial analysis

- Experience and exposure analysis
- Apply credibility weighting
- Develop frequency/severity model
- Apply to business units and total firm

Gross Loss Modeling



Conventional Analysis

Focus on efficient frontier

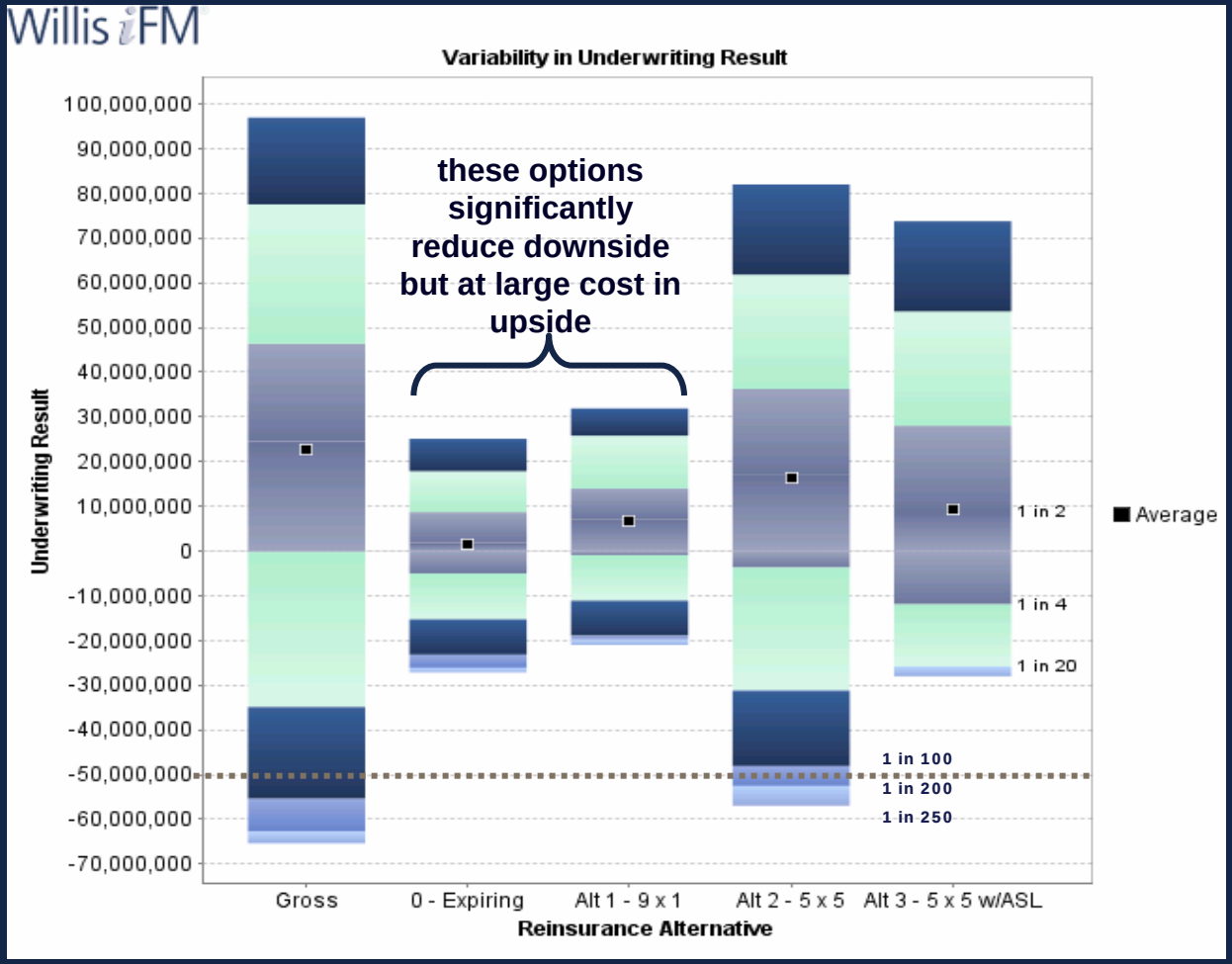
- Select several reinsurance programs
- Estimate pricing/cost for each
- Simulate earnings & volatility results
- Reject the inefficient alternatives
- Choose among the remainder

Simulated U/W Results

Underwriting Result Percentiles

	Gross	0 - Expiring	Alt 1 - 9 x 1	Alt 2 - 5 x 5	Alt 3 - 5 x 5 w/ASL
mean	22,700,437	1,642,079	6,873,906	16,356,752	9,493,256
stdev	33,682,459	10,160,345	11,081,880	28,599,285	26,153,918
0.1% ile	(77,832,005)	(27,887,057)	(24,593,748)	(68,830,395)	(38,280,395)
0.4% ile	(65,359,384)	(27,125,304)	(20,989,957)	(56,946,737)	(27,990,694)
0.5% ile	(62,780,753)	(26,123,315)	(19,755,366)	(52,528,017)	(25,810,000)
1% ile	(55,399,231)	(23,151,597)	(18,930,723)	(48,086,894)	(25,810,000)
5% ile	(34,872,501)	(15,276,002)	(11,054,623)	(31,176,618)	(25,810,000)
25% ile	(181,145)	(5,057,254)	(899,470)	(3,704,001)	(11,929,001)
50% ile	24,520,696	1,840,227	7,190,476	16,987,017	8,762,017
75% ile	46,404,606	8,722,718	14,030,205	36,287,054	28,062,054
95% ile	77,550,714	17,874,349	25,810,542	61,854,054	53,629,054
99% ile	96,946,065	25,111,938	31,895,364	82,005,089	73,780,089
99.5% ile	102,094,923	27,102,727	35,046,852	86,515,980	78,290,980
99.6% ile	103,568,105	27,652,192	36,598,109	87,059,394	78,834,394
99.9% ile	114,519,163	30,469,050	40,313,924	91,888,796	83,663,796

Retained Volatility



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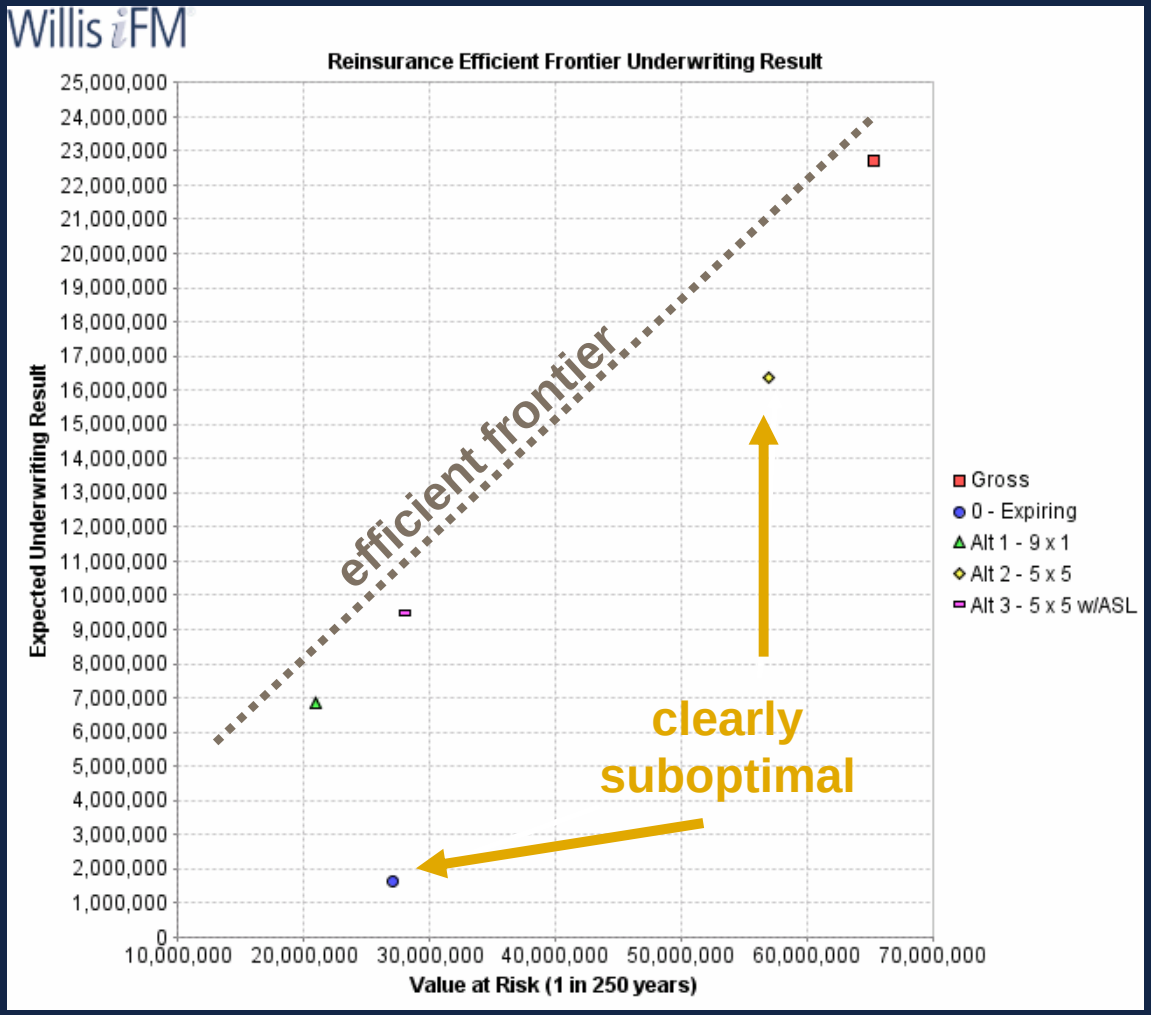
The Risk-Volatility Tradeoff



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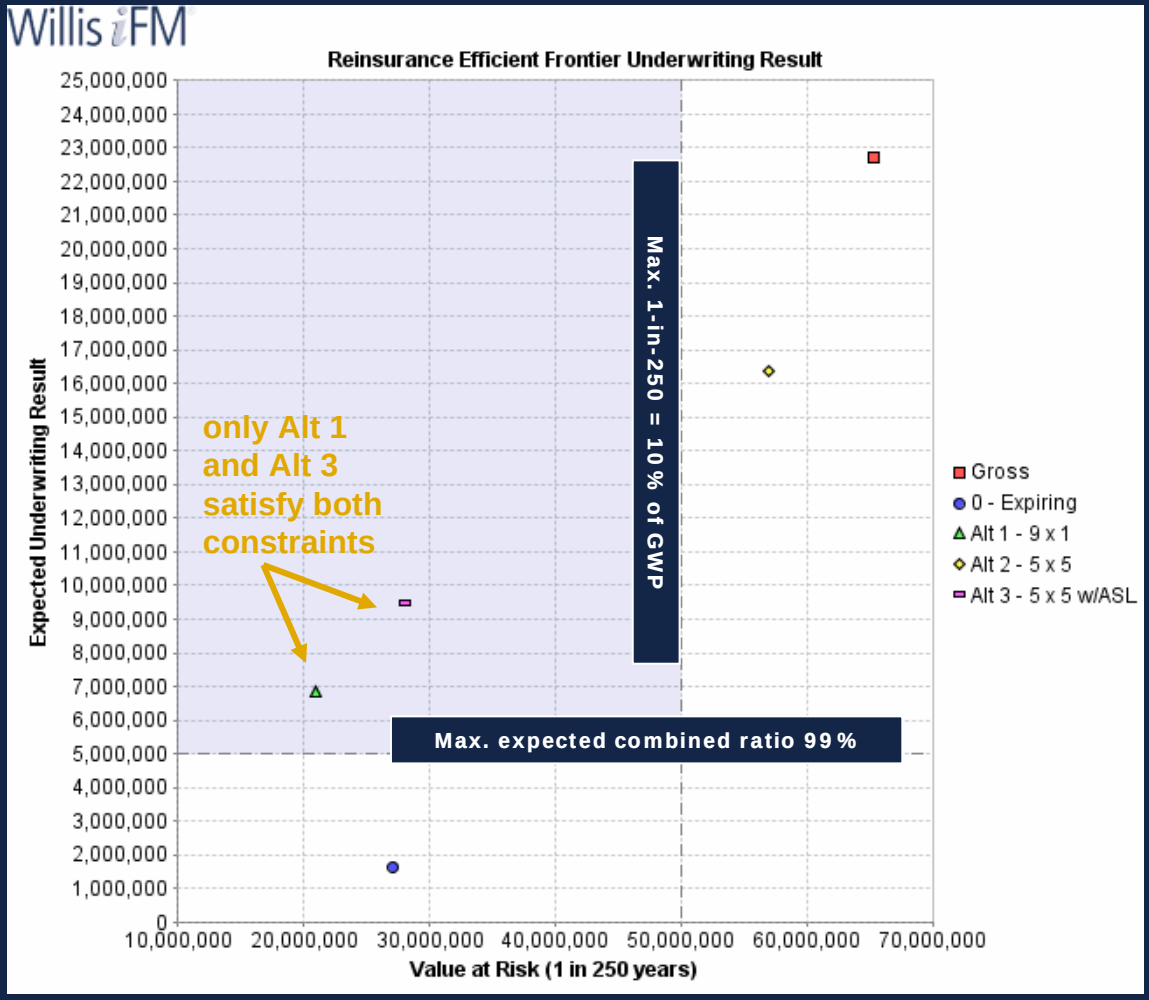
How to choose?

We can invent and add constraints that limit choice

- Rule out combined ratio > 99%
- Rule out 1-in-250-year loss > 10% of GWP
- Are these arbitrary?

Adding optional constraints



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How is VBCM different?

Focus on value

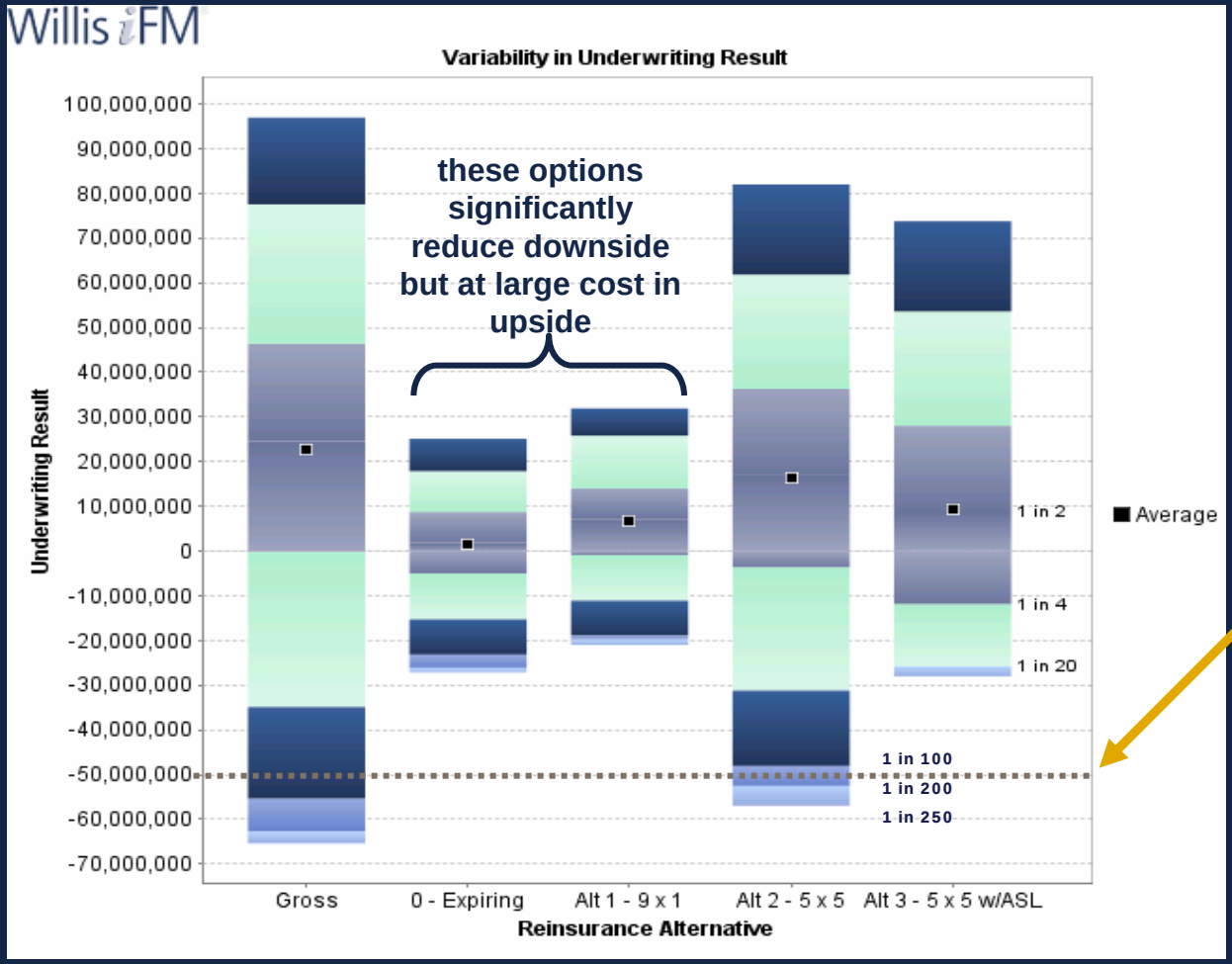
- Include all principal risks, not just U/W
- Identify impairment threshold
- Simulate multiple future years
- Measure impairment-adjusted PV of future earnings (franchise value)

How is VBCM different?

Simplifications to VBCM made here:

- Incorporates **only** underwriting risk
- Impairment threshold is represented as a cliff, not a slope

Retained Volatility



Impairment threshold: net underwriting loss of more than 50M

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VBCM Results

	Gross	0 - Expiring	Alt 1 - 9 x 1	Alt 2 - 5 x 5	Alt 3 - 5 x 5 w/ASL
Expected Reinsurance Premium (reflecting profit share)	-	202.4	175.4	30.1	39.9
Net Premium	501.0	298.6	325.7	470.9	461.1
Net Retained Losses	328.0	146.6	168.5	304.3	301.3
Expenses	150.3	150.3	150.3	150.3	150.3
Net Underwriting Result (A)	22.7	1.6	6.9	16.4	9.5
Net Income (B)	100	78.9	84.2	93.7	86.8
Value At Risk (1 in 250 years)	65.4	27.1	21.0	56.9	28.0
Risk-Adjusted ROE Calculations					
Time-Weighted Capital (= VaR x life of capital)	196.1	81.4	63.0	170.8	84.0
5% Cost of Capital (C)	9.8	4.1	3.1	8.5	4.2
Economic UW Result (A-C)	12.9	(2.4)	3.7	7.8	5.3
Economic UW Return on Capital	6.6%	-3.0%	5.9%	4.6%	6.3%
Total Economic Return on Capital	11.6%	2.0%	10.9%	9.6%	11.3%
VBCM Calculations					
Probability of Impairment	1.0%	0.1%	0.1%	0.5%	0.1%
Impairment-Adjusted Discount Factor (D)	0.961	0.970	0.970	0.966	0.970
Perpetuity Multiplier = D / (1-D)	24.8	32.2	32.2	28.4	32.2
Franchise Value = B * Perpetuity Multiplier	2,475.0	2,545.8	2,707.0	2,672.3	2,803.6
Benefit to Franchise Value		70.8	232.0	197.3	328.6

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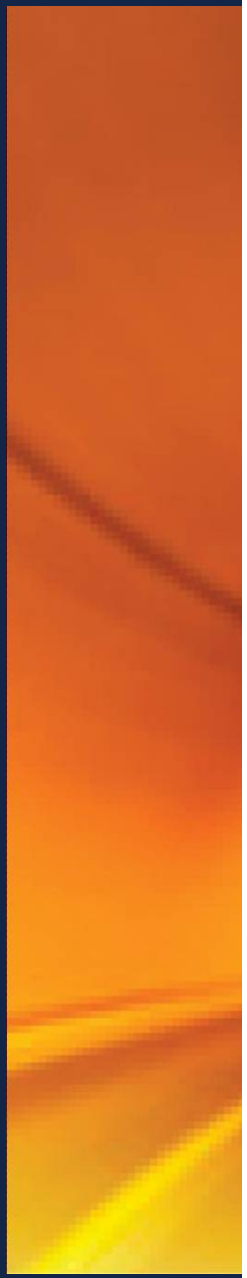
Conclusion



Conclusion: Why VBCM?

It provides a compelling criterion for deciding how much capital a firm needs to support its risk

- Avoids vague criteria (risk tolerance) or imitation of supposed peers

Conclusion: Why VBCM?

It enables decisions that benefit shareholders or stakeholders and can be explained, to them & others

- Note that maximizing return on surplus may not be the best criterion

Conclusion: Why VBCM?

It focuses on measuring and managing the future (franchise value) rather than the past

- In contrast to reliance on statutory accounting measures, which focus on liquidation value

Managing the Invisible

At many firms, franchise value is invisible

- It is not measured or estimated
- It is therefore not managed explicitly
- **VBCM** makes franchise value visible & attempts to explicitly identify actions that will maximize it

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