ERM & The Corporate Actuary

Do All Roads Lead To Rome?

(One Man's Journey to Sleep At Night)

2007 CAS Ratemaking Seminar

Curt Parker, VP Chief Actuary

Grange Mutual Insurance Companies

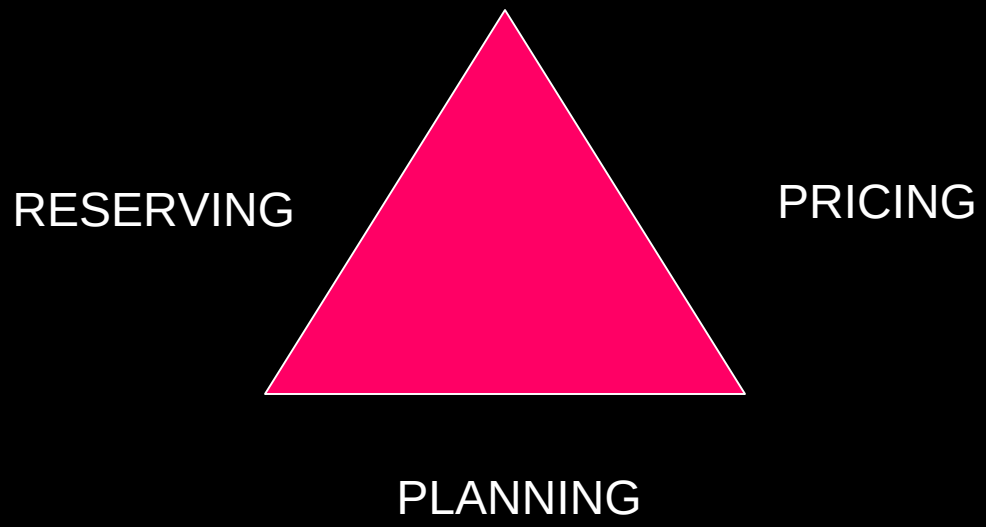
My apologies in advance:

- Formulas will be few
- Approaches do not require excessive computations or mind numbing reasoning
- You may find some assumptions less than “precise” – please feel free to quietly debate among yourselves
- I will focus on what we’ve done, not underlying theory

My Job:

- Planning
- Pricing Oversight
- Reserving
- Strategic Planning/Evaluations
- Reinsurance
- Incentive Compensation (Management/Agents)

The ERM Connection:



Corporate Actuarial Objectives:

- Develop sound economic risk-based analytics supporting operational and strategic planning
- Actionable Analysis is our mantra with KISS sprinkled in for good measure
- We want all management to understand the value added from insights provided

A Little Background:

- Joined a $750 million company growing DWP at 15%, with an Operating Ratio over 100% the prior year, a P/S ratio over 2.25 heading toward 2.5
- Did not need to go looking for Enterprise Risk, it was pretty much on the horizon
- The Good News: Changes in organization, pricing, underwriting and other risk reduction measures were already in the works (or I would not have joined the party)

An Observation:

- Pricing Oversight …in an organization of Product Managers who are pretty sure the company in Mayfield, Ohio still does not have actuaries and if they do, they are locked up in a basement somewhere to prevent harm to otherwise great plans and programs…IS DIFFICULT!

My Boss the CFO:

- More practical knowledge in his pinky than many have above their shoulders
- When I walked in the door, he knew we could operate as high as 104 to 105 and not lose money
- His concern: How do we support desired growth?

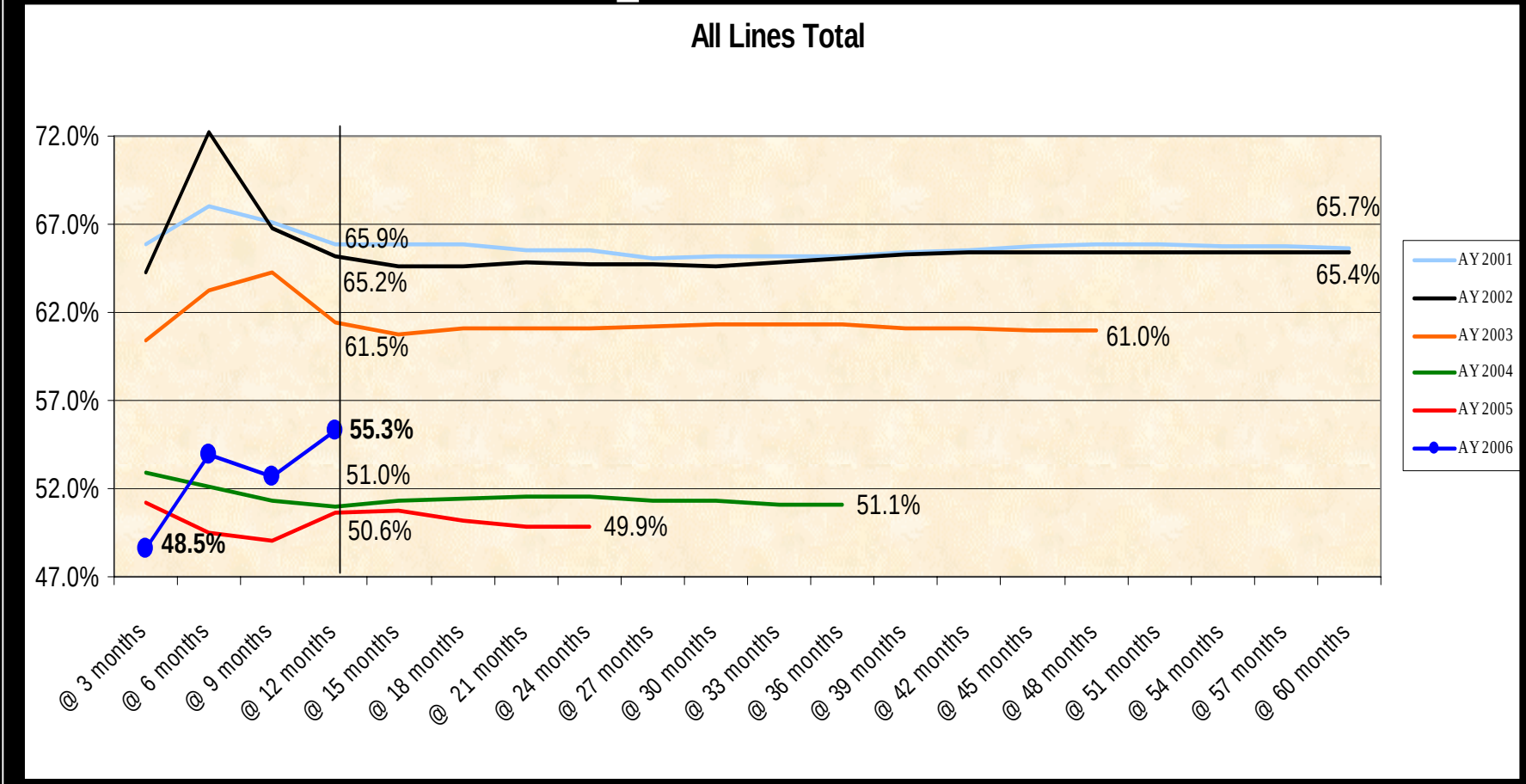
My Boss the CFO:

- He does not really like to talk about surplus allocation in mixed company…it precludes him from being able to tell you what he really thinks about it
- He likes us to book more than the actuarial point estimate for reserves…and so do I based on statistical analysis completed…as opposed to an inherent distrust of actuaries in general

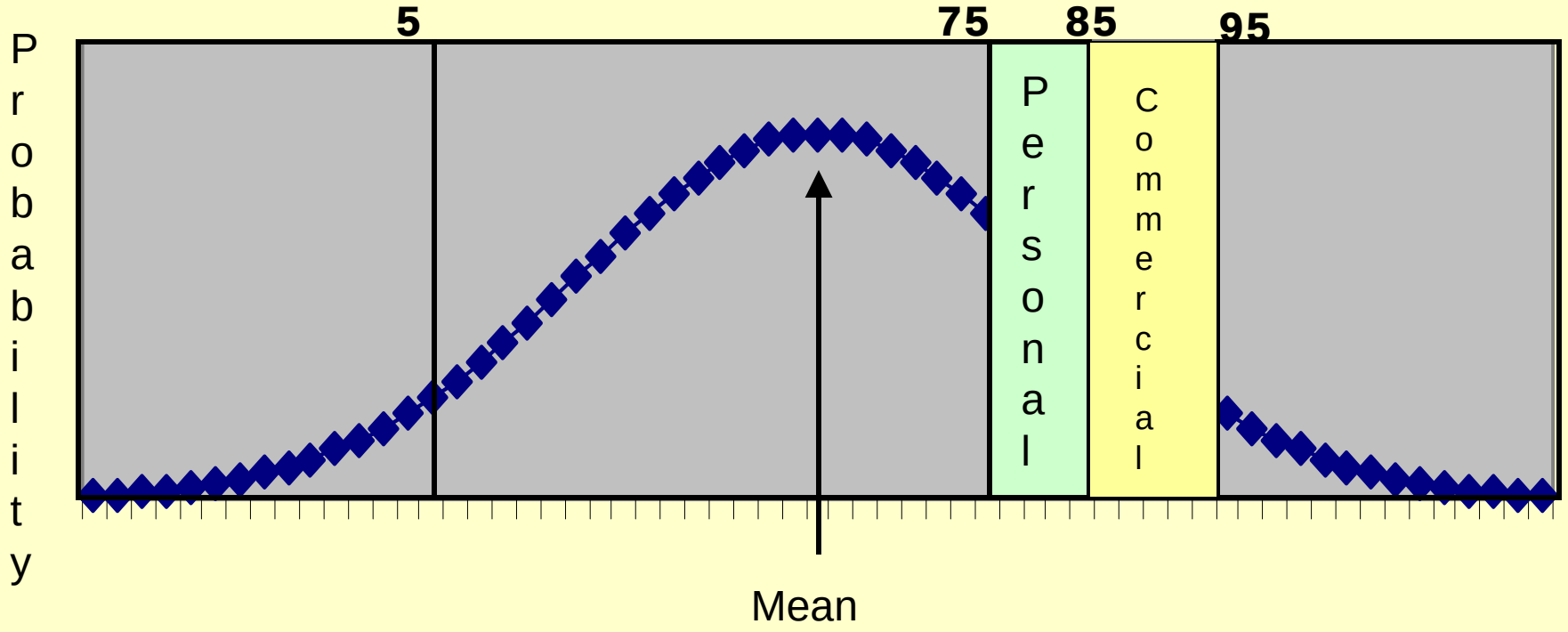
A Reserving Aside:

- Just how good are point estimates?
- When do we have a pretty good estimate of ultimate loss and loss expense?
- Can we help others “sleep at night”?

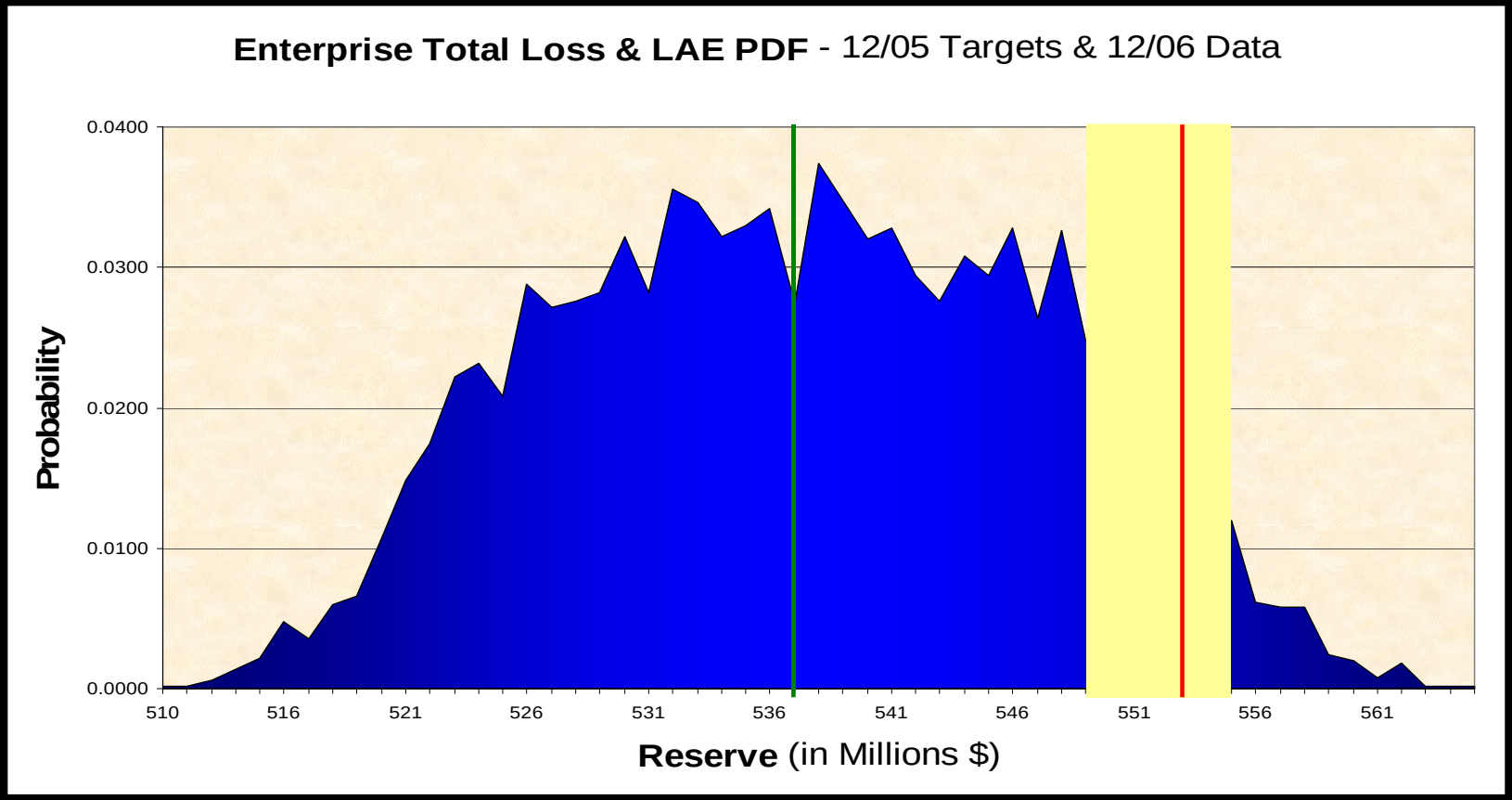
All Lines Graph



Recommended Range

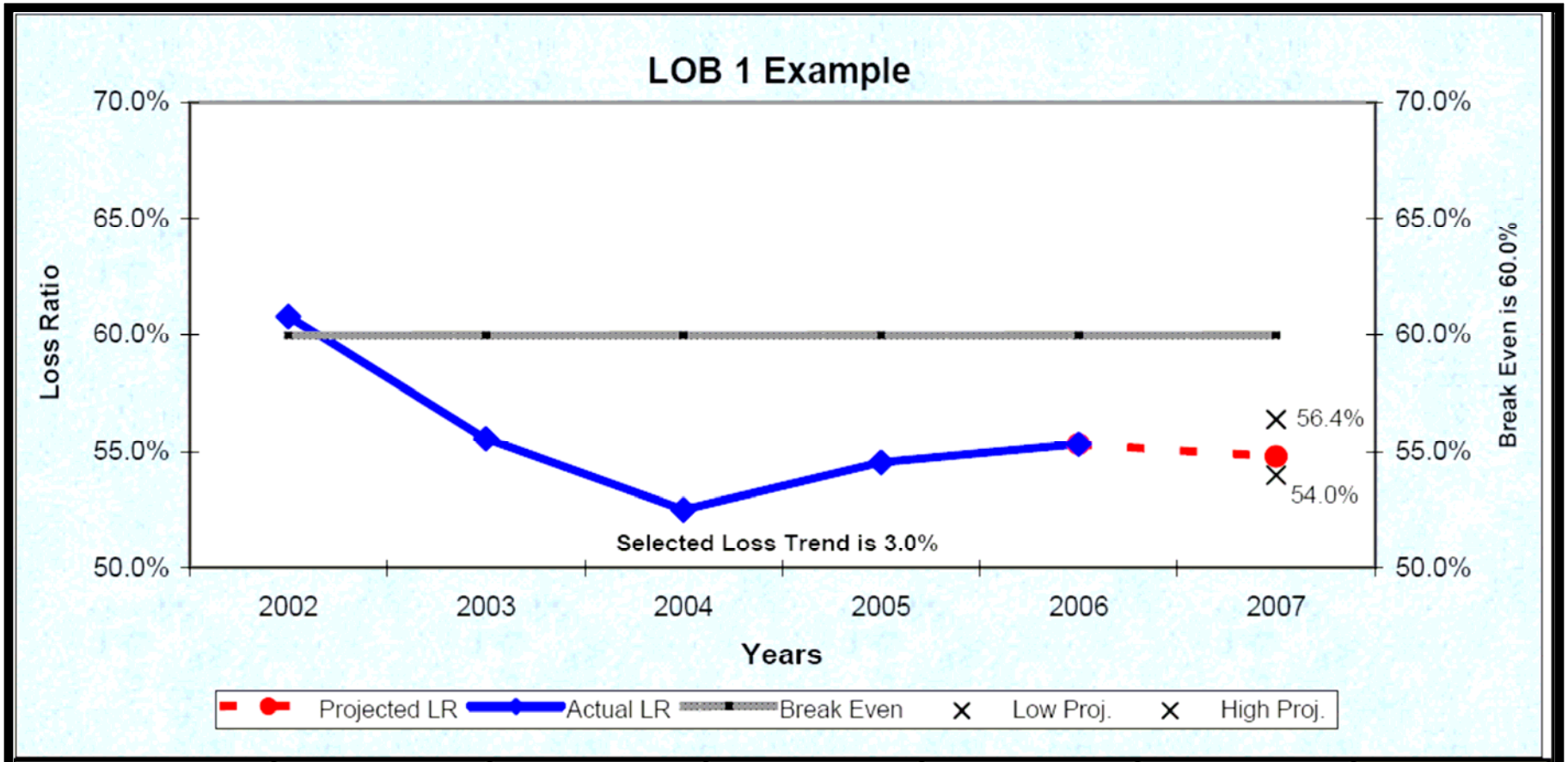


Curt's World of Reserving

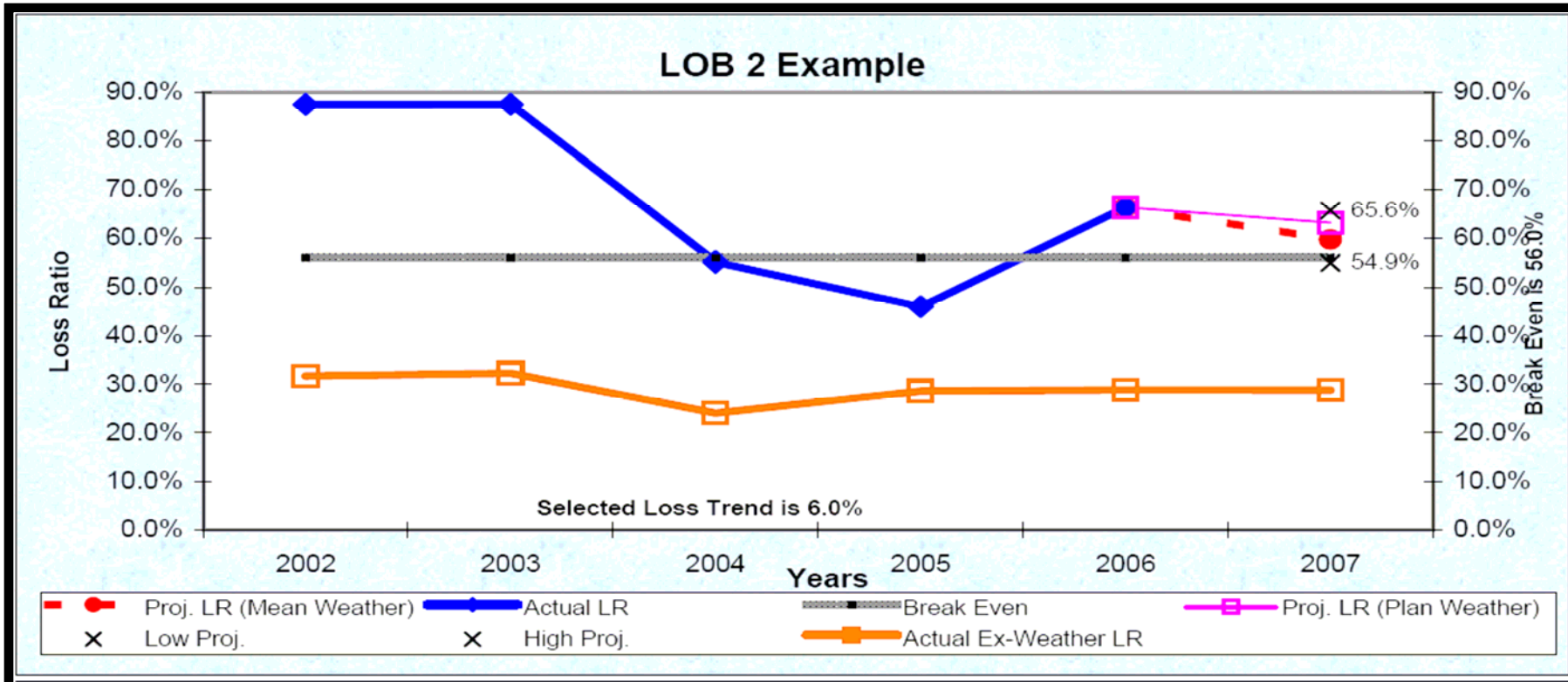


Reserving/Planning/Pricing:

- Reserves Evaluated Quarterly – results shared with CEO, CAO, CFO, Presidents and Product Managers of Personal and Commercial Lines and Claims and Board of Directors
- Face-to-face meetings to discuss reserve adequacy, trends and implications to calendar year results and pricing margins
- Indications done for major lines (PPA, HO)



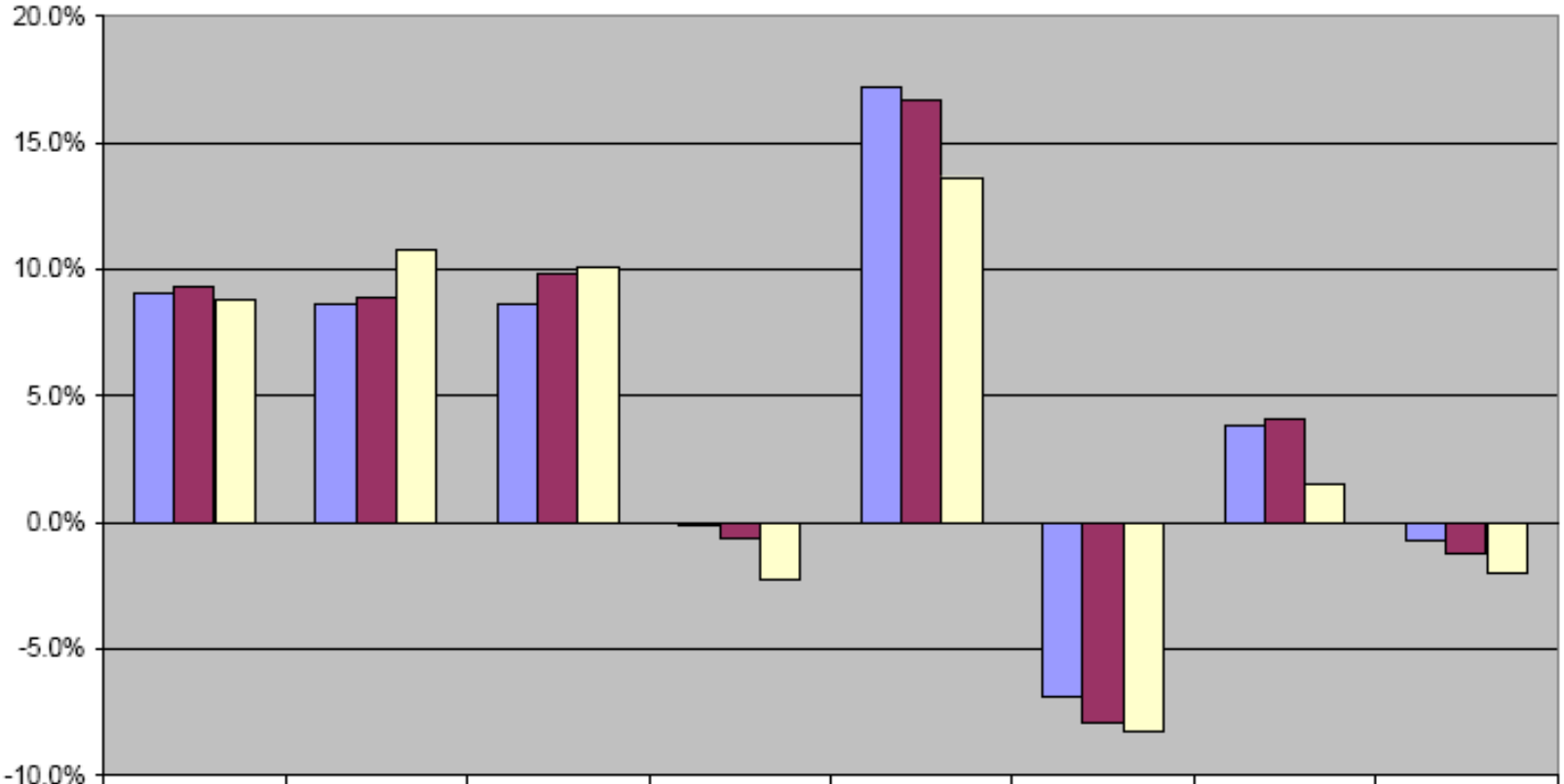
	2002	2003	2004	2005	2006 - ytd	**2007 Proj**
Avg. EP	598	641	651	649	650	**681**
Chg. In Avg. EP	8.9%	7.1%	1.6%	-0.3%	0.1%	**4.8%**
Pure Prem.	364	356	342	354	360	**373**
Chg. In PP	4.8%	-2.1%	-4.0%	3.6%	1.5%	**3.7%**
Chg. In Avg. ERL	-15.0%	7.4%	4.2%	1.4%	0.9%	**2.6%**
Loss Ratio	60.8%	55.6%	52.5%	54.5%	55.3%	**54.8%**
Comb. Ratio	100.8%	95.6%	92.5%	94.5%	95.3%	**94.8%**



	2002	2003	2004	2005	2006 - ytd	**2007 Proj**
Avg. EP	418	491	560	598	598	**634**
Chg. In Avg EP	9.8%	17.3%	14.1%	6.8%	0.0%	**6.1%**
Pure Prem.	366	429	309	275	396	**378**
Chg. In PP	23.2%	17.3%	-28.1%	-11.0%	44.1%	**-4.5%**
Chg. In Avg. ERL	-27.2%	13.7%	16.3%	10.7%	-0.4%	**2.5%**
Loss Ratio (A)	87.5%	87.5%	55.1%	46.0%	66.3%	**59.6%**
Comb. Ratio (A)	131.5%	131.5%	99.1%	90.0%	110.3%	**103.6%**
Loss Ratio (B)						**63.1%**
Comb. Ratio (B)						**107.1%**

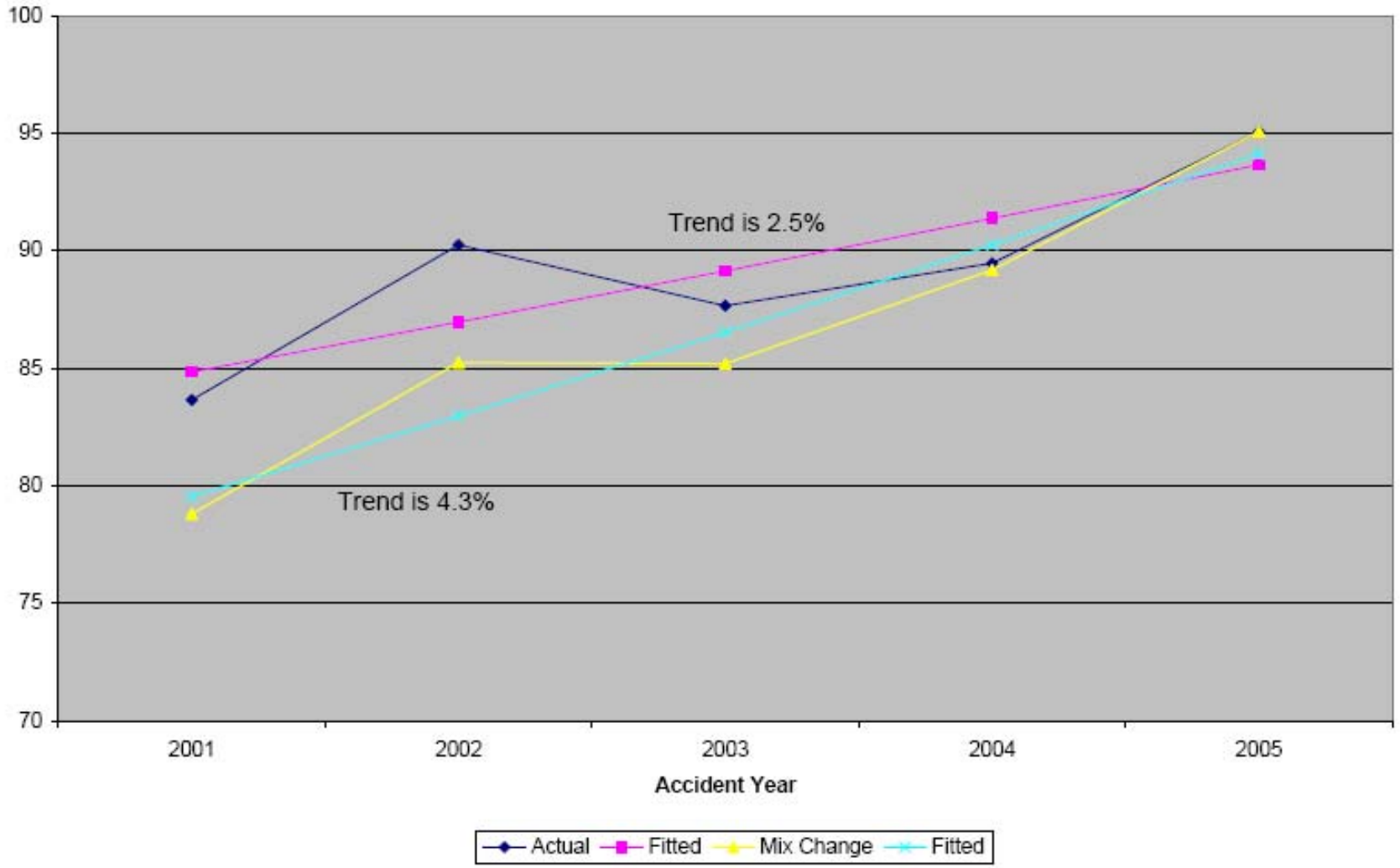
(A) Uses MEAN Weather. (B) Uses PLAN Weather.

LOB Indication Example

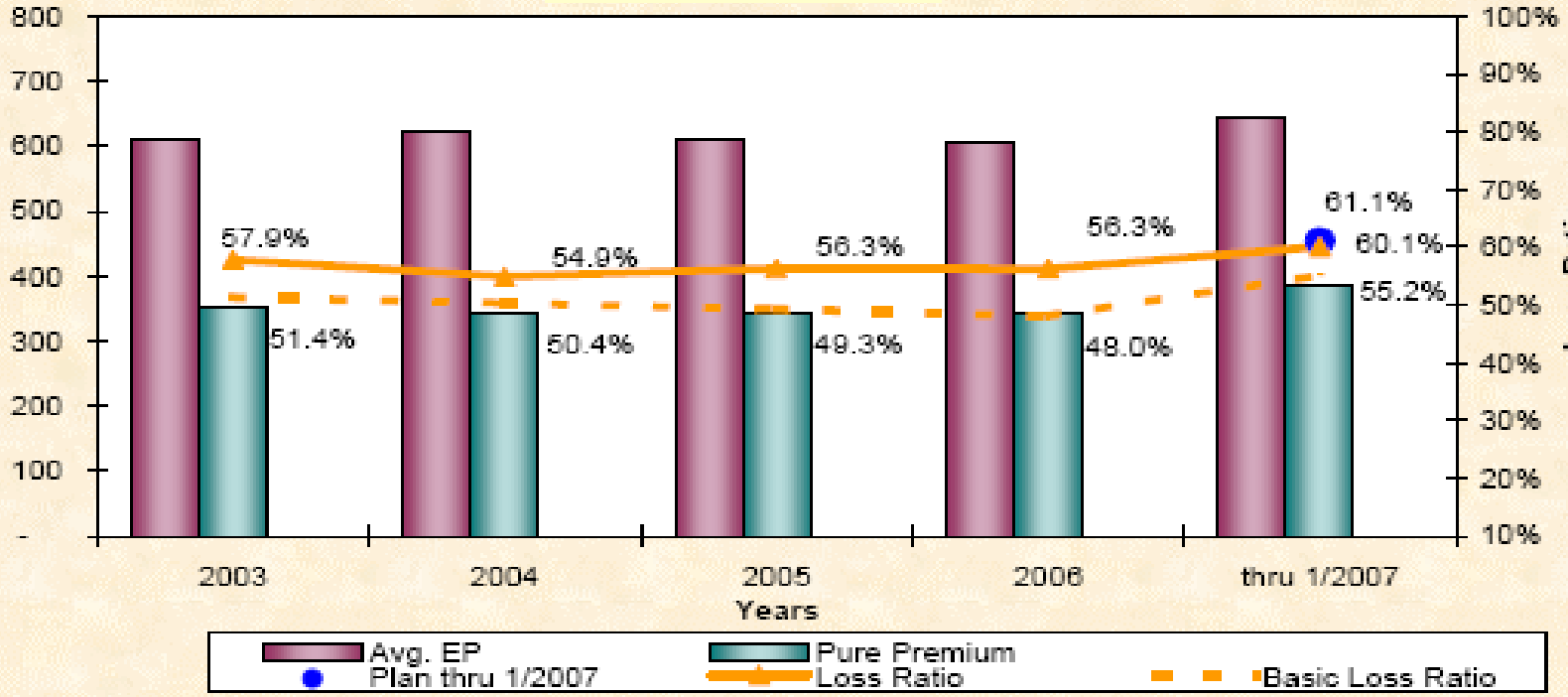


	S1	S2	S3	S4	S5	S6	S7	Total
3-Year Indication	9.1%	8.6%	8.6%	-0.1%	17.2%	-6.9%	3.8%	-0.7%
3-Year 20-30-50	9.3%	8.9%	9.8%	-0.6%	16.7%	-7.9%	4.1%	-1.2%
2-Year Indication	8.8%	10.7%	10.1%	-2.3%	13.7%	-8.2%	1.5%	-2.0%

Mix Adjustment Example



LOB Example



	2003	2004	2005	2006	thru 1/2007	Plan thru 1/2007
Avg. EP	611	622	611	606	645	631
Chg. In Avg. EP		1.7%	-1.7%	-0.9%	6.4%	4.1%
Pure Prem.	354	341	344	341	388	386
Chg. In PP		-3.4%	0.8%	-1.0%	13.7%	13.1%
Loss Ratio	57.9%	54.9%	56.3%	56.3%	60.1%	61.1%
* Basic LR	51.4%	50.4%	49.3%	48.0%	55.2%	
Basic PP	314	313	301	291	356	
Chg. In Basic PP		-0.2%	-3.7%	-3.4%	22.4%	

* Actual weather and large losses are removed

Targeted Combined Ratios:

- A mutual company is limited in ways we can “acquire” capital…pretty much grow it internally
- At the end of the day, we use a RAROC approach…we just do not use the words every day
- We have validated our approach by using the ISO URM model…RORAC…

Targeted Combined Ratios:

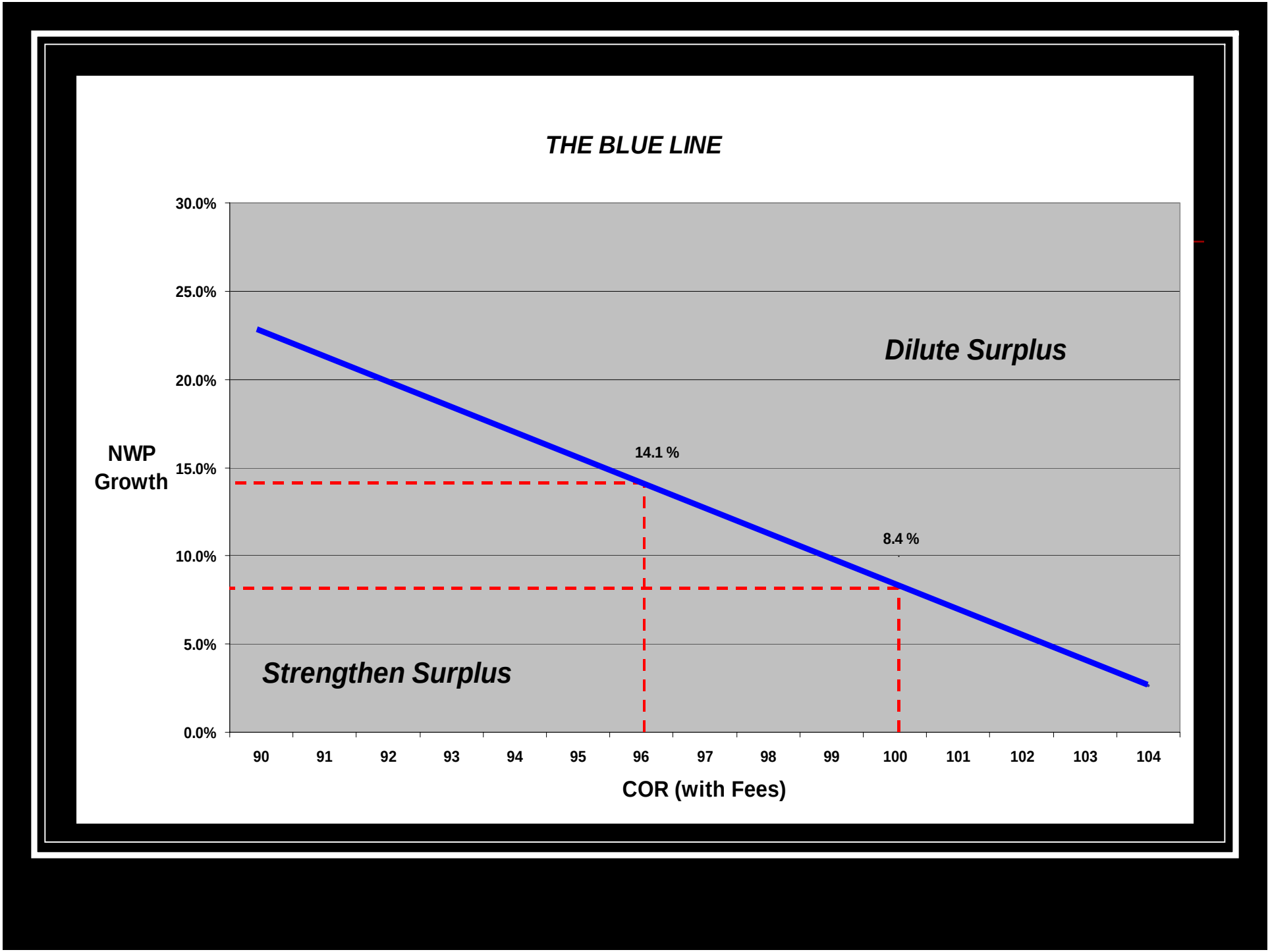
- Simple DCF model
- A formula of sorts:

  Targeted ROE = Long Term Growth Rate

- Must be true to maintain the P/S ratio

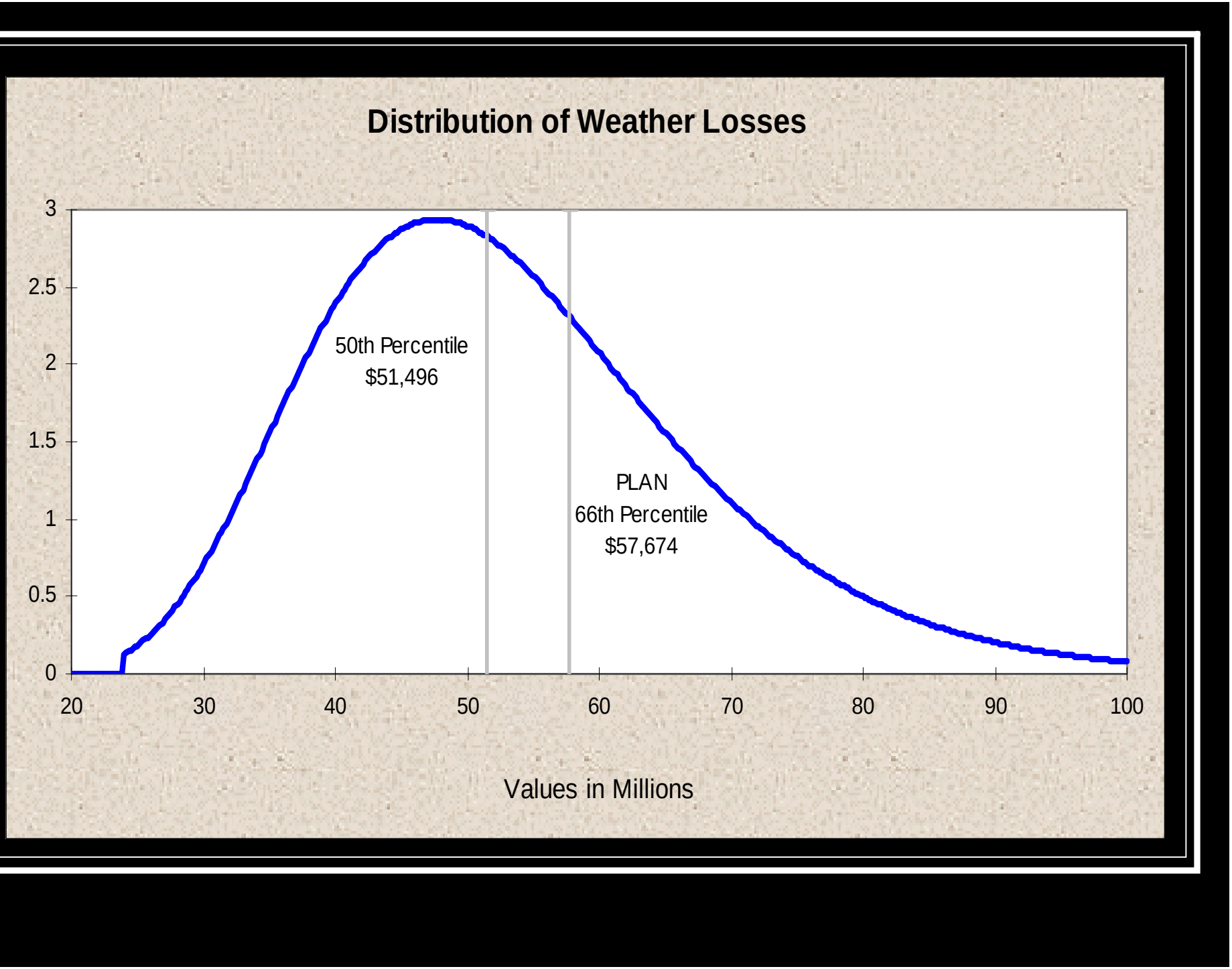
DCF MODEL ILLUSTRATION ONLY

Accident Period Ending		TOTAL	Age in Months: 0	3	6	9	12	24	36	48	60	108
				14.1%	33.9%	57.6%	76.7%	95.7%	97.5%	98.1%	99.3%	100.0%
	Incremental			14.1%	19.8%	23.7%	19.1%	19.0%	1.8%	0.6%	1.2%	0.4%
	Discount Rate		4.0%									
	Sum of Present Values		96.7%	14.0%	19.5%	23.1%	18.5%	17.9%	1.6%	0.5%	1.0%	0.3%
	Und Break Even L&LAE Ratio		67.8%									
LOSSES	Investment Inc % of EP		2.1%									
	Fees (Net write-offs)		1.8%									
	Premium Collection Pattern		20%	20.0%	20.0%	20.0%	20.0%					
	Premium Plus Fees		20%	20.5%	20.5%	20.5%	20.5%					
	Present Value		20%	20.3%	20.2%	20.0%	19.8%					
	Sum of Present Values		100.2%									
PREMIUM	Net Inv Inc % of EP		0.2%									
	Commission	20.9%	20.9%									
	General & Other	8.9%	2.23%	2.23%	2.23%	2.23%						
	Taxes	2.4%	1.20%		1.20%							
	Total Expense	32.2%	24.3%	2.2%	3.4%	2.2%	0.00%					
	Present Value		24.3%	2.2%	3.4%	2.2%	0.00%					
	Sum of Present Values		32.1%									
EXPENSES	Net Inv Inc % of EP		0.1%									
			3.0%									
	Collection Pattern		0.6%	0.6%	0.6%	0.6%	0.6%					
	Present Value		0.6%	0.60%	0.59%	0.59%	0.58%					
	Sum of Present Values		2.95%									
ACHIEVED UNDERWRITING PROFIT			5.4%									


THE BLUE LINE
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
NWP Growth
Dilute Surplus
14.1 %
8.4 %
Strengthen Surplus
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
COR (with Fees)

Pricing Risk Adjustments:

- We focus on the “sweet spot”
- We make adjustments based on selected risk components to increase our probability of hitting it


Distribution of Weather Losses
3
2.5
2
1.5
1
0.5
0
50th Percentile
$51,496
PLAN
66th Percentile
$57,674
20
30
40
50
60
70
80
90
100
Values in Millions

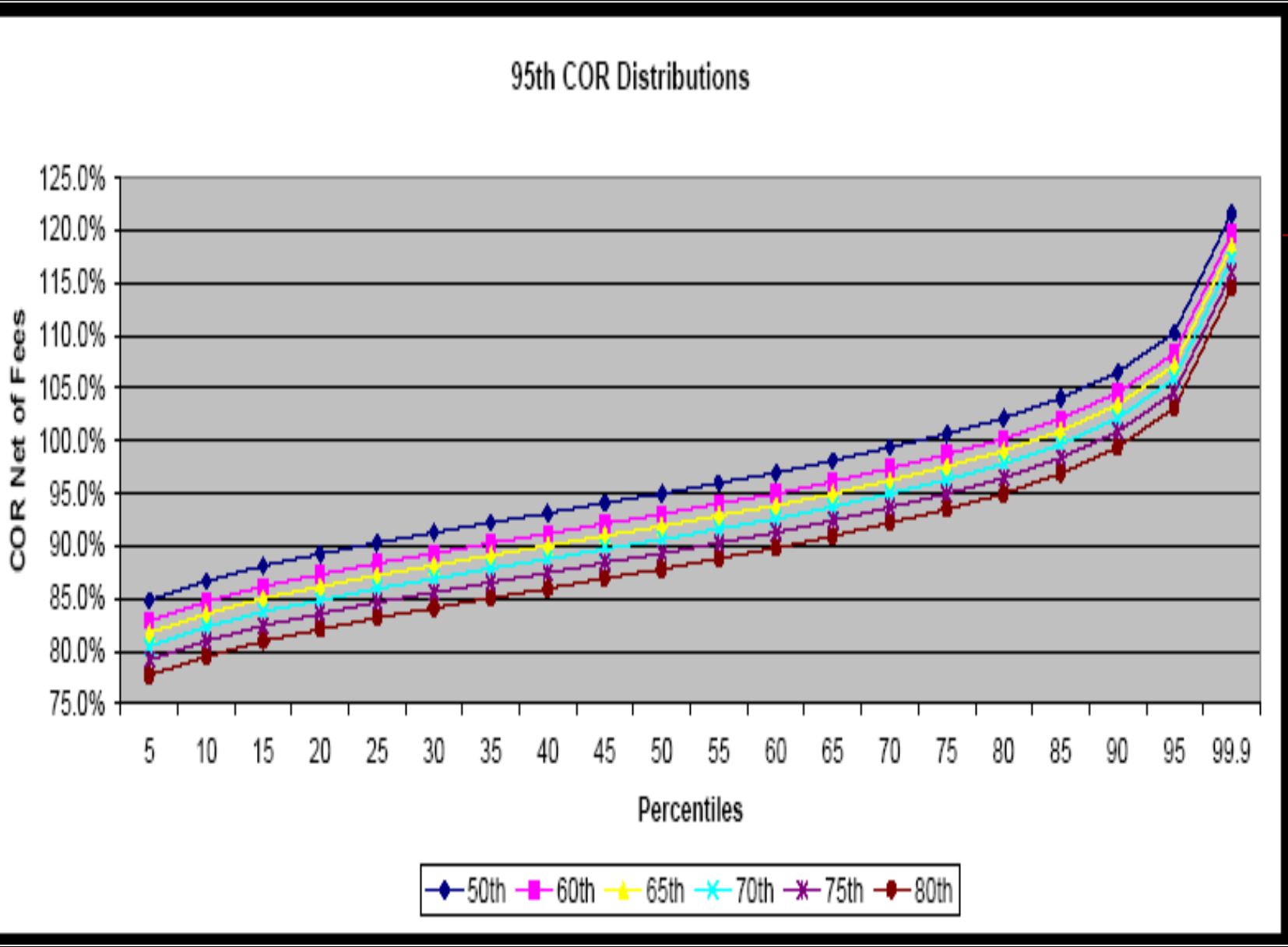
Targeted Combined Ratio Before Adjustment

Combined Ratio	Weather Ratio	Percentile Distribution	Underwriting Return
94.0%	27.8%	49%	8.5%
95.0%	28.9%	54%	7.5%
96.0%	29.9%	59%	6.5%
97.0%	30.9%	64%	5.5%
100.0%	33.9%	76%	2.5%
103.0%	36.9%	85%	-0.5%
106.0%	39.9%	91%	-3.5%
110.5%	44.4%	96%	-8.0%
113.5%	47.4%	98%	-11.0%
116.5%	50.4%	99%	-14.0%
		-T	0.81%
		O	7.4%
		RCR	9

Risk Adjusted Targeted Combined Ratio

Combined Ratio	Weather Ratio	Percentile Distribution	Underwriting Return
89.0%	27.8%	49%	13.5%
92.0%	30.9%	64%	10.5%
95.0%	33.9%	76%	7.5%
98.0%	36.9%	85%	4.5%
101.0%	39.9%	91%	1.5%
102.5%	41.4%	93%	0.0%
105.5%	44.4%	96%	-3.0%
108.5%	47.4%	98%	-6.0%
111.5%	50.4%	99%	-9.0%
114.4%	53.3%	100%	-11.9%
		-T	0.29%
		O	12.4%
		RCR	43

Selected Weather Percentitle	95 COR Percentile					
	50th	60th	65th	70th	75th	80th
5	84.9%	82.9%	81.8%	80.5%	79.2%	77.7%
10	86.7%	84.7%	83.6%	82.3%	81.0%	79.5%
15	88.2%	86.2%	85.0%	83.8%	82.5%	81.0%
20	89.3%	87.3%	86.1%	84.9%	83.6%	82.1%
25	90.4%	88.4%	87.2%	86.0%	84.7%	83.2%
30	91.3%	89.3%	88.2%	86.9%	85.6%	84.1%
35	92.3%	90.3%	89.1%	87.9%	86.6%	85.1%
40	93.1%	91.2%	90.0%	88.8%	87.5%	86.0%
45	94.1%	92.2%	91.0%	89.8%	88.4%	87.0%
50	95.0%	93.0%	91.9%	90.6%	89.3%	87.8%
55	96.0%	94.1%	92.9%	91.7%	90.4%	88.9%
60	97.0%	95.0%	93.9%	92.6%	91.3%	89.8%
65	98.1%	96.1%	95.0%	93.7%	92.4%	91.0%
70	99.4%	97.4%	96.3%	95.0%	93.7%	92.2%
75	100.7%	98.7%	97.6%	96.3%	95.0%	93.5%
80	102.2%	100.2%	99.0%	97.8%	96.5%	95.0%
85	104.1%	102.1%	101.0%	99.7%	98.4%	96.9%
90	106.5%	104.6%	103.4%	102.2%	100.9%	99.4%
95	110.3%	108.3%	107.2%	105.9%	104.6%	103.1%
99.9	121.6%	119.7%	118.5%	117.3%	115.9%	114.5%


95th COR Distributions
COR Net of Fees
125.0%
120.0%
115.0%
110.0%
105.0%
100.0%
95.0%
90.0%
85.0%
80.0%
75.0%
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
99.9
Percentiles
50th
60th
65th
70th
75th
80th

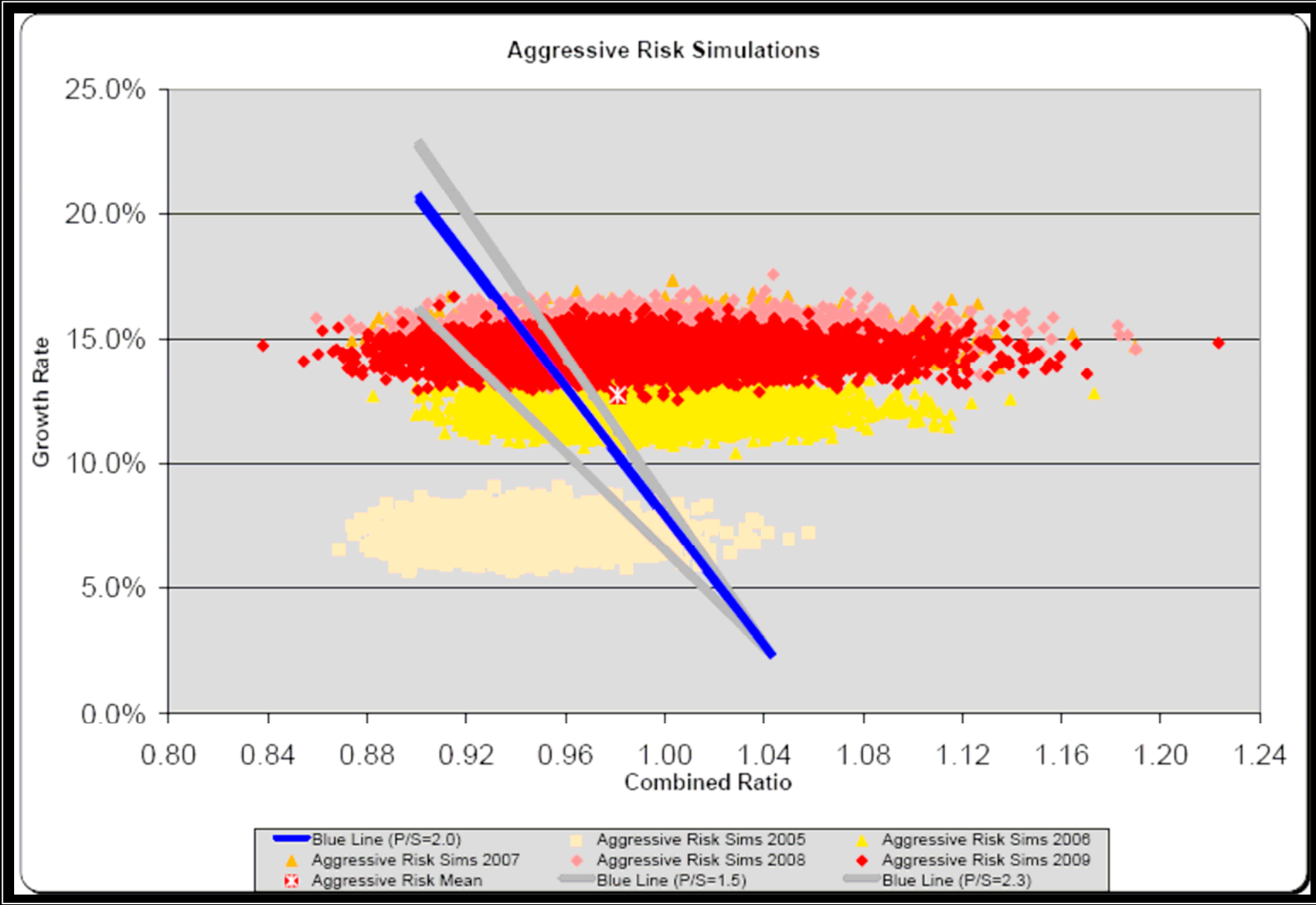
Example of Risk Adjusted Pricing (RAROC)

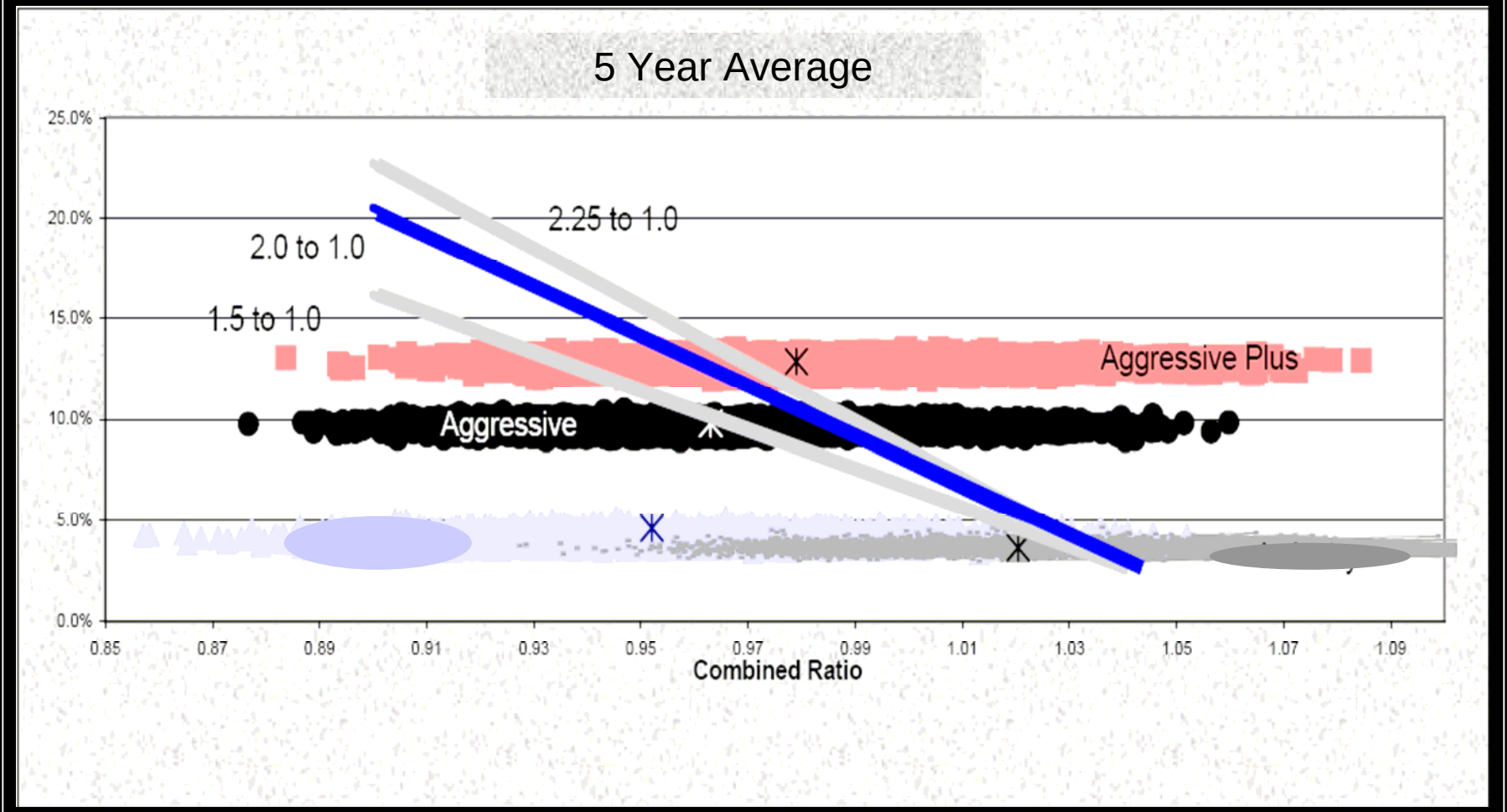
	CW	S1	S2	S3	S4	S5	S6
Mean (allocated)	$ 53,428	$ 5,752	$ 2,402	$ 3,181	$ 5,521	$ 28,303	$ 3,605
Stdev	$ 14,961	$ 1,797	$ 742	$ 1,107	$ 3,142	$ 8,481	$ 1,827
Minimum	$ 23,917	$ 2,534	$ 1,048	$ 1,149	$ 1,431	$ 14,692	$ 1,264
Coef. Of Variation	28.0%	31.2%	30.9%	34.8%	56.9%	30.0%	50.7%
50th percentile	$ 51,496	$ 5,488	$ 2,321	$ 2,927	$ 4,675	$ 27,310	$ 3,180
75th percentile	$ 61,960	$ 6,740	$ 2,839	$ 3,695	$ 6,718	$ 33,198	$ 4,390
2006 EP	$ 182,887	$ 18,024	$ 7,376	$ 12,968	$ 17,322	$ 97,396	$ 14,527
50th Perc Weather LR	28.2%	30.4%	31.5%	22.6%	27.0%	28.0%	21.9%
75th Perc Weather LR	33.9%	37.4%	38.5%	28.5%	38.8%	34.1%	30.2%
Difference	5.7%	6.9%	7.0%	5.9%	11.8%	6.0%	8.3%
Implied Average COR	91.3%	90.1%	90.0%	91.1%	85.2%	91.0%	88.7%

Model Income Statements:

- Perform sensitivity analysis based on possible scenarios
- Model investments separately from P&C
- Use results to gauge where we want to place our “bets”

	ILLUSTRATION ONLY						
	2004	2005	2006	2007	2008	2009	5 Yr Ave
Premiums Written Direct	1,054,209	1,117,068	1,220,312	1,355,235	1,507,695	1,682,398	
DWP Growth Rate	3.7%	6.0%	9.2%	11.1%	11.2%	11.6%	9.8%
Premiums Earned	1,005,472	1,058,870	1,145,286	1,263,909	1,410,170	1,573,571	
Losses Incurred	521,065	585,503	683,806	759,830	849,789	950,335	
Loss Adjustment Expense	99,362	102,769	110,295	121,684	135,724	151,418	
Total Expenses	403,907	425,359	457,578	501,748	551,781	608,541	
Gain from Underwriting	80,500	48,007	3,902	2,331	8,600	14,695	
Net Investment Income	48,308	52,988	59,152	65,189	71,252	78,035	
Gain Transferred to Surplus	92,075	75,626	49,912	52,564	61,526	71,139	
Beginning Surplus	443,553	544,854	629,539	689,497	753,064	826,529	
Ending Surplus	544,854	629,539	689,497	753,064	826,529	910,646	
NPW/SURPLUS RATIO	1.87	1.72	1.71	1.74	1.77	1.79	1.75
ROS	22.8%	15.5%	9.5%	9.2%	9.8%	10.2%	10.8%
COR With Fee Income	90.4%	93.4%	97.2%	97.4%	97.0%	96.7%	96.3%


Aggressive Risk Simulations
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Growth Rate
0.80
0.84
0.88
0.92
0.96
1.00
1.04
1.08
1.12
1.16
1.20
1.24
Combined Ratio
Blue Line (P/S=2.0)
Aggressive Risk Sims 2005
Aggressive Risk Sims 2006
Aggressive Risk Sims 2007
Aggressive Risk Sims 2008
Aggressive Risk Sims 2009
Aggressive Risk Mean
Blue Line (P/S=1.5)
Blue Line (P/S=2.3)


5 Year Average
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
2.25 to 1.0
2.0 to 1.0
1.5 to 1.0
Aggressive Plus
Aggressive
0.85
0.87
0.89
0.91
0.93
0.95
0.97
0.99
1.01
1.03
1.05
1.07
1.09
Combined Ratio

At The End Of The Day:

- Modeling is great fun and a significant part of what we do…
- Presentation of results/concepts impact how the message is received
- “The proof is in the pudding…”

Performance Summary

	DWP		Combined Ratio		Surplus	P/S Ratio
		% Chg		Pt Chg		
1998	$ 621		103.1%		$ 314	1.98
1999	$ 624	0.5%	101.0%	-2.1	$ 367	1.70
2000	$ 660	5.8%	109.6%	8.6	$ 334	1.98
2001	$ 757	14.7%	104.1%	-5.5	$ 361	2.10
2002	$ 900	18.9%	102.1%	-2.0	$ 367	2.45
2003	$ 1,016	12.9%	98.1%	-4.0	$ 443	2.29
2004	$ 1,040	2.4%	92.1%	-6.0	$ 529	1.97
2005	$ 1,056	1.5%	92.6%	0.5	$ 615	1.72
2006	$ 1,113	5.4%	95.8%	3.2	$ 697	1.60
Six Year Average:		9.3%	97.5%			

The ERM Connection: