GUY CARPENTER

June 2007

Property Reinsurance

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MMC Marsh & McLennan Companies

Innovations

- Side cars
- Select Cat

Top Global Reinsurers: Combined Ratio

	Combined Ratio		
	2005	2006	6 Year Average
Munich Re	111.7	92.6	109.7
Swiss Re	112.3	90.4	104.6
Berkshire Hathaway Re	114.3	70.1	108.9
Hannover Re	112.8	98.4	102.9
Lloyd's	111.8	83.1	103.5
Everest Re	119.4	89.7	102.8
XL Re	127.0	83.4	117.0
Partner Re	115.9	84.6	104.7
Average	**115.6**	**86.5**	**106.8**

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New capital

2006 Reinsurance Marketplace – Capital Raising

- Capital Flows In
  - Capital Raising by Existing Reinsurers ($5.3 billion)

Company	Capital Raised *by Existing Reinsurers (millions)*
Allied World	$ 344
Arch Capital	$ 125
Arch Capital	$ 200
Aspen Re	$ 200
Flagstone	$ 175
Glacier Re	$ 30
MS Frontier	$ 100
Montpelier Re	$ 100
Olympus Re	$ 140
Renaissance Re	$ 300
Scor	$ 501
Swiss Re	$ 1,100
Swiss Re	$ 2,000

Softening reflects supply increases

2006 Reinsurance Marketplace – Capital Raising

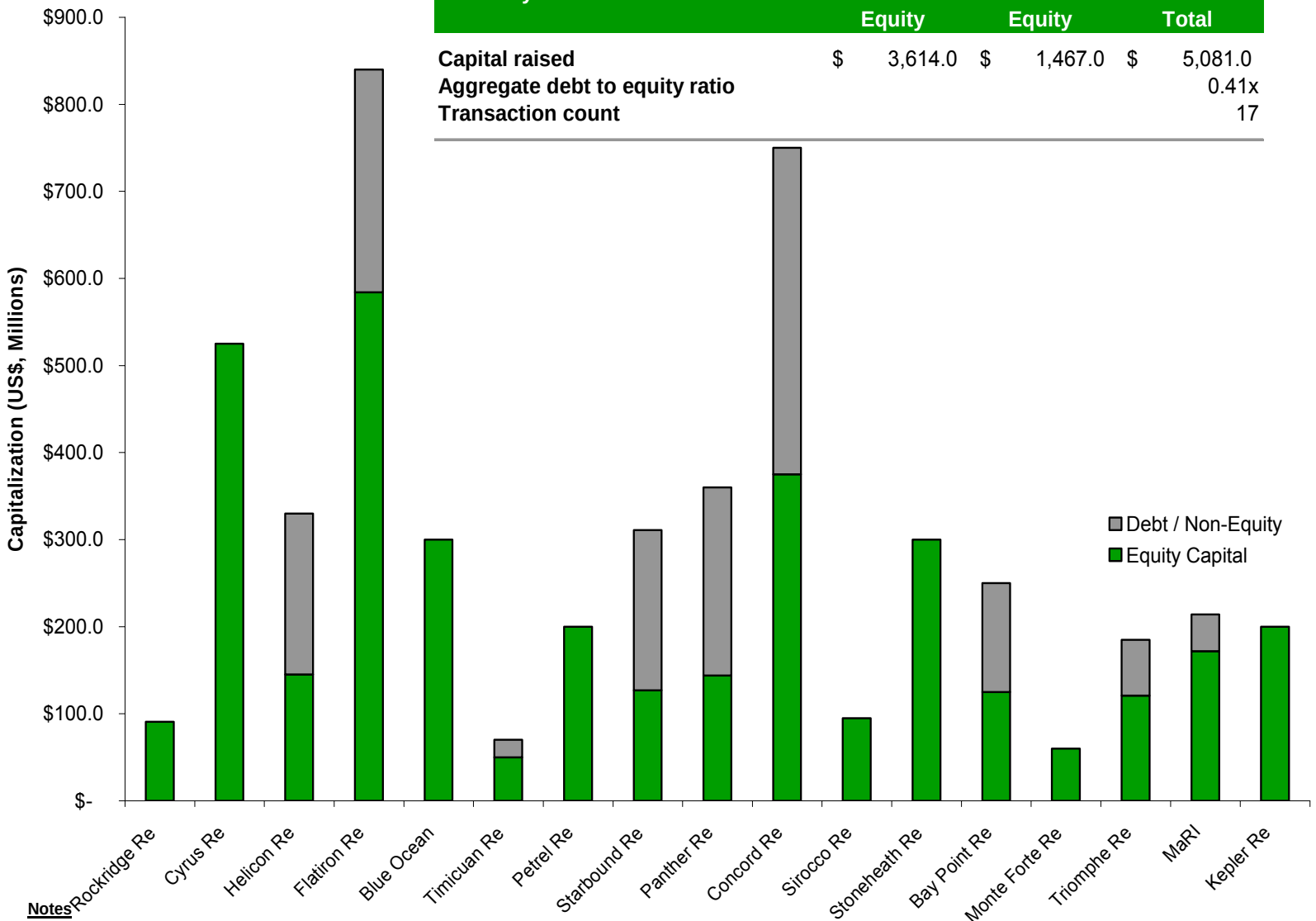
- Capital Flows In
  - Capital Raising by New Ventures

Company	Capital Raised *by New Ventures* ***(million)***
Advent Re	$ 20
Asia Capital Re	$ 620
Aeolus Re	$ 500
Bay Point Re	$ 250
Blue Ocean Re	$ 300
Castle Point	$ 265
Cyrus	$ 525
Concord Re	$ 730
Flatiron	$ 256
Helicon	$ 150
Mont Fort Re	$ 60
New Point Re	$ 250
Norton Re	$ 108
Panther Re	$ 360
Paris Re	$ 1,500
Petrel Re	$ 200
Rockridge Re	$ 91
Sirocco Re	$ 95
Starbound Re	$ 311
Stoneheath Re	$ 350
Syncro	NA
Timicuan Re	$ 70

Softening reflects supply increases

Post-Katrina Sidecars

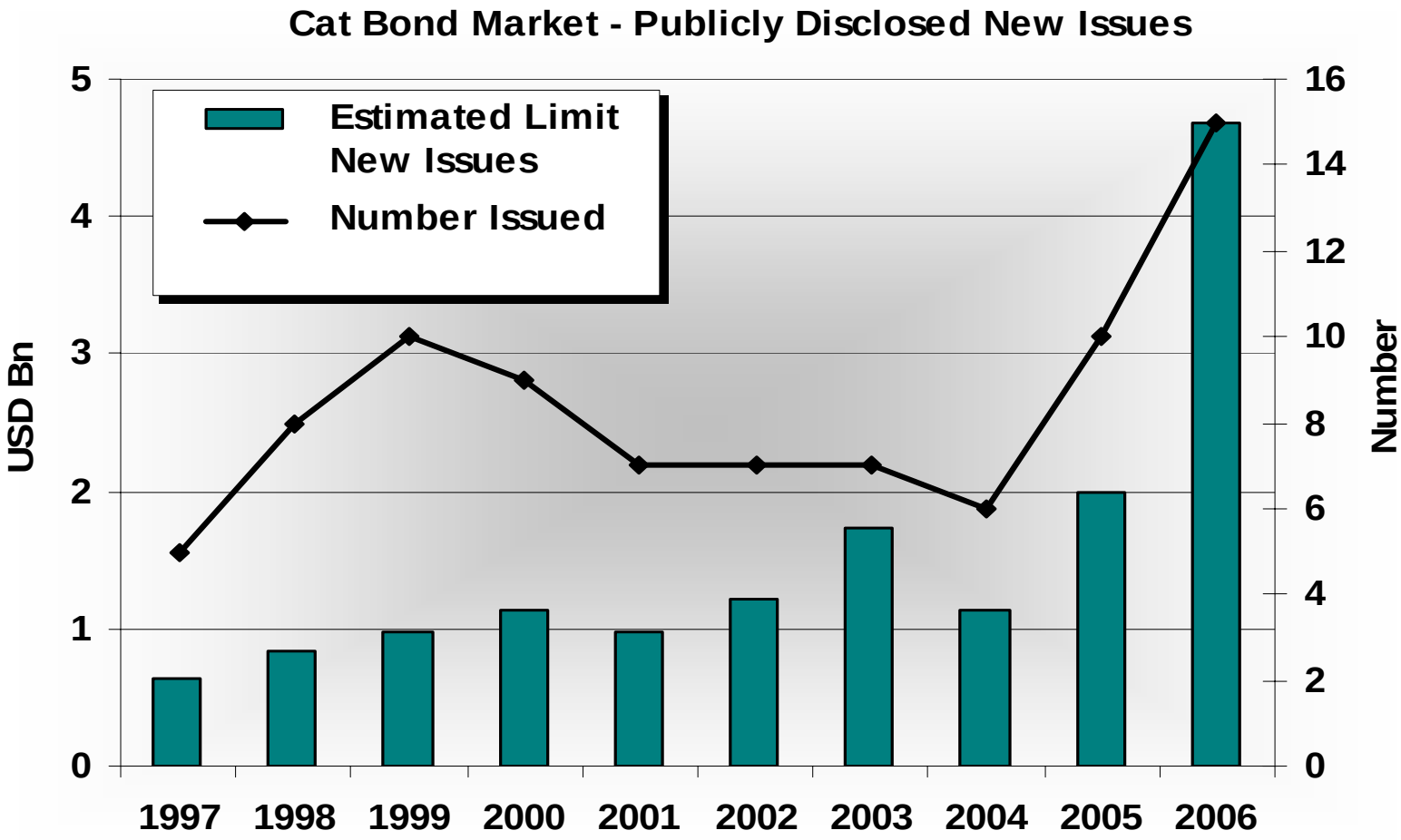
Summary Statistics	Equity	Debt/ Non Equity	Total
Capital raised	$ 3,614.0	$ 1,467.0	$ 5,081.0
Aggregate debt to equity ratio			0.41x
Transaction count			17



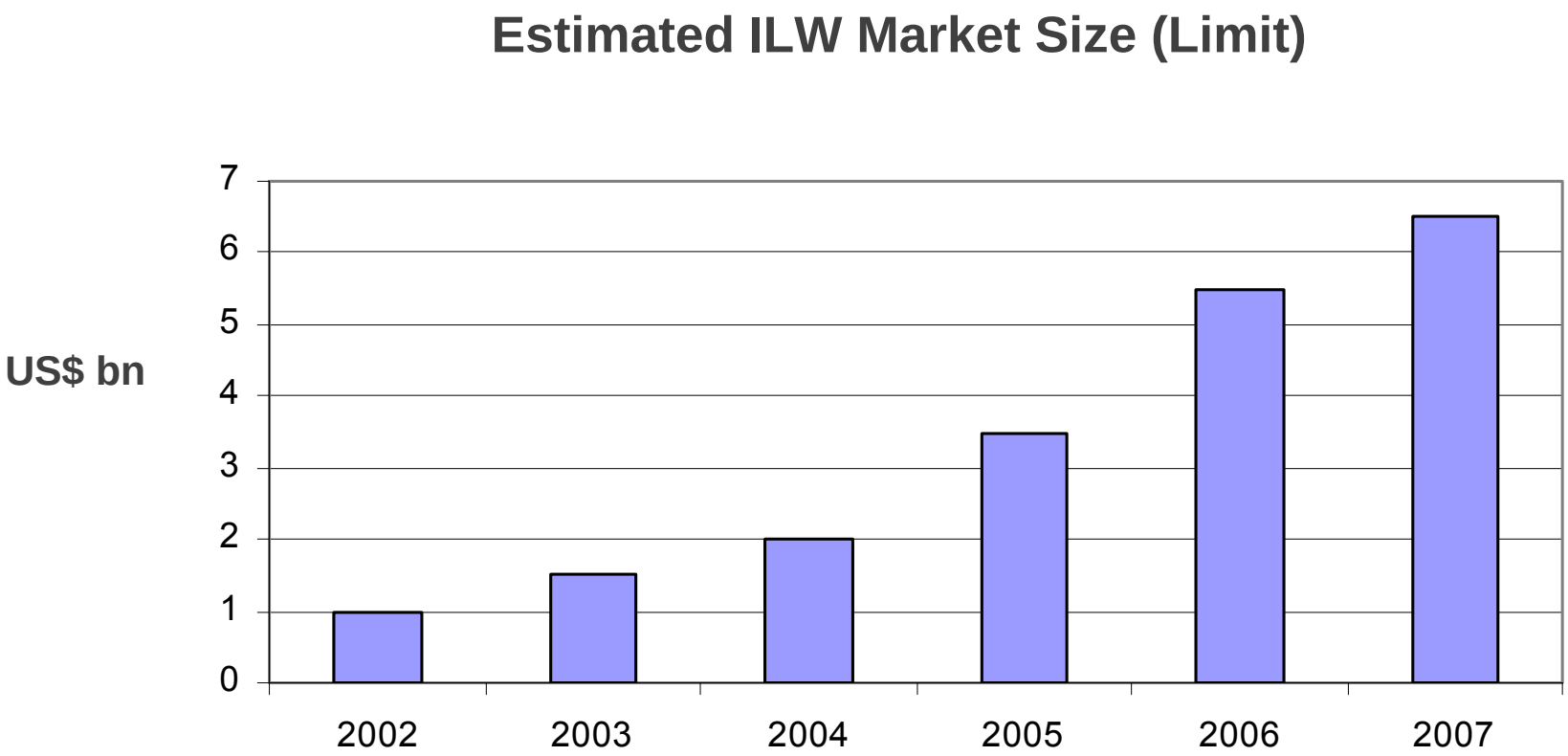
Notes

- Sources: Bear Stearns Equity Research, AM Best & Company, Inc., The Insurance Insider, Guy Carpenter and Company LLC; Broken by equity / non-equity when possible

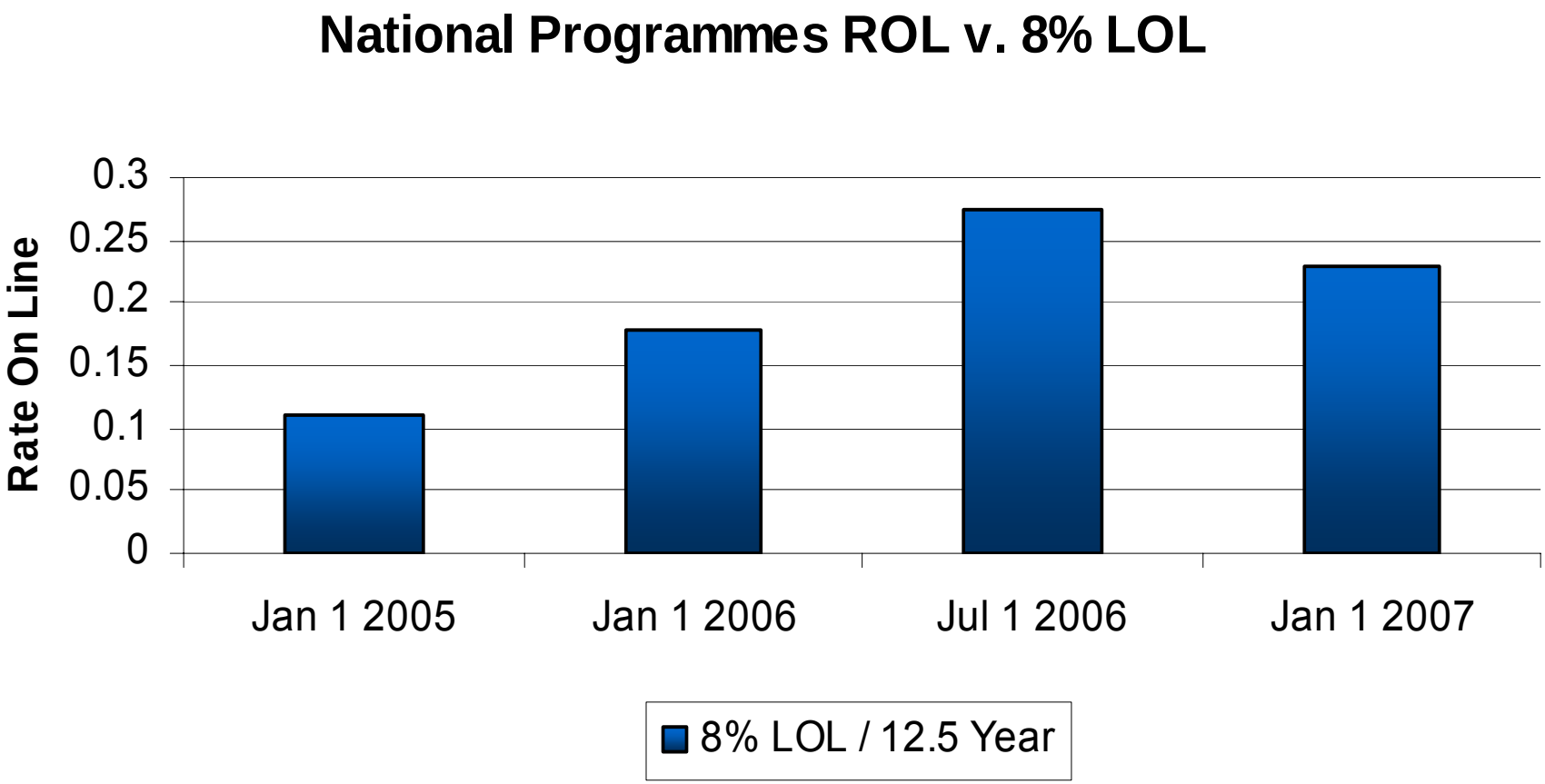
Cat Bond Market – New Issues



ILW Market Size



US Property Cat Pricing
Exposure Adjusted Price Movements



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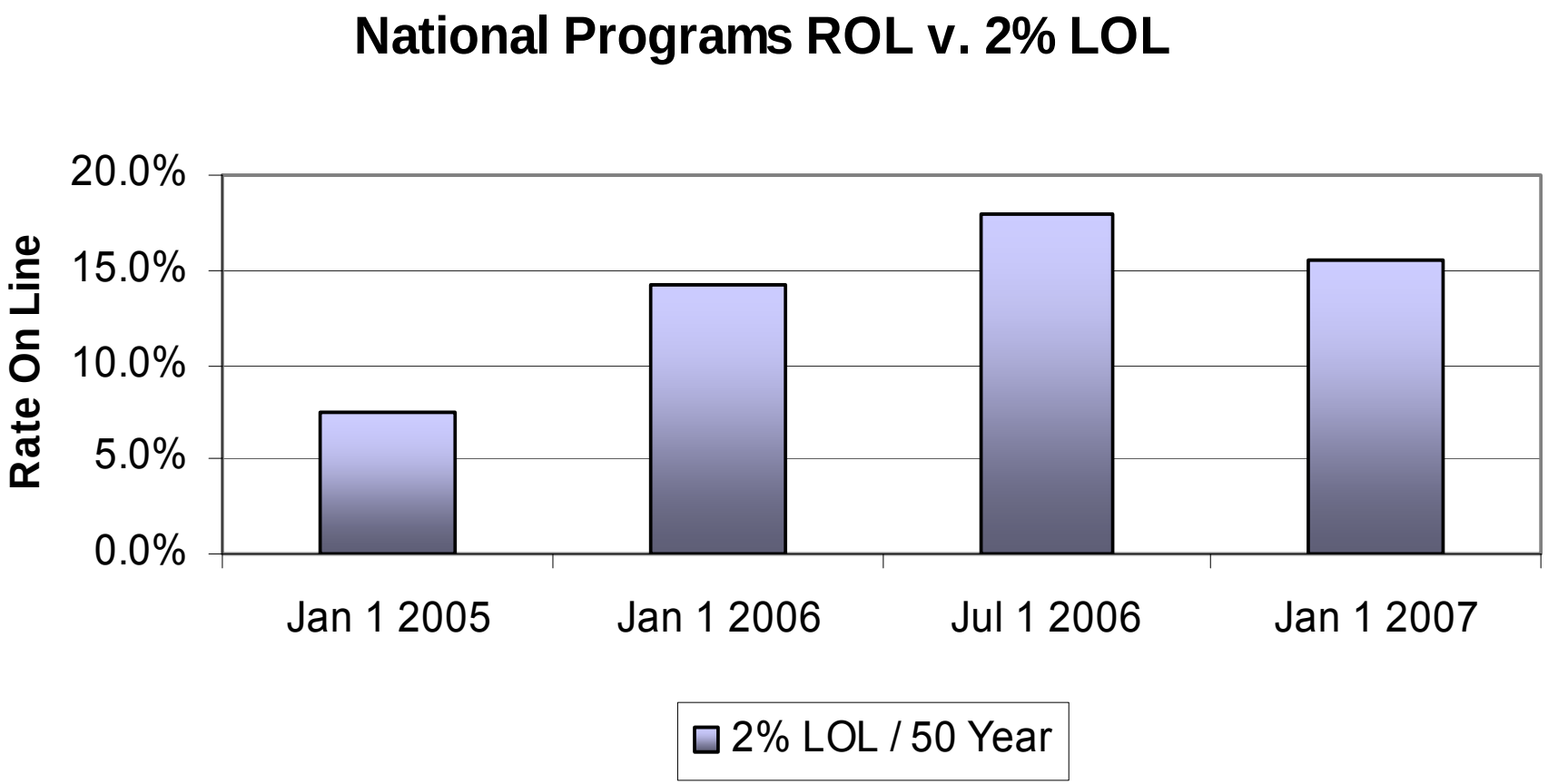

Utility Analysis for Reinsurance programs

- **Choosing among reinsurance programs**
- Assume a utility function for the cedent of U (W, R). Here W is current wealth, and R is risk.
- Departing from prior theory (expected utility and prospect theory), R is included directly in the utility function, to emphasize the choice or tradeoff between price and risk.
- U (W, R) is a positive function of W and a negative function of R.
- Consider a reinsurance policy with price P and change in risk of ΔR.
- If U1 is the Utility after the purchase of the reinsurance contract, then:
- U1 = U1 (W-P, R- ΔR).
- The cedent will purchase the program, if:
- U1 > U.

Utility Analysis (continued)

- We next assume a linear utility function:
- $U = \alpha W - \beta R$, where α and β are greater than zero.
- If $U1 > U$, a little algebra gets us to the condition:
- $\beta \Delta R > \alpha P$, leading to:
- $\Delta R / P > \alpha / \beta$
- In words, a reinsurance program will be purchased if the reduction in risk relative to the price is greater than the ratio α / β, which we can call the risk/price ratio.
- So for a particular client we can look at past purchases and calculate $\Delta R / P$. If we look at N programs, the lowest value gives us an upper bound on α / β.
- By reviewing past programs rejected by the cedent, we can get a lower bound on α / β.
- **We can also derive an industry average, allowing for the firm to adopt "best practices."**

Utility Analysis (Continued)

- **Comparing two programs**.
- Consider two programs, #1 and #2.
- #1 will be preferred to #2 if the utility from #1 (U1) is greater than the utility from #2 (U2).
- Similar algebra as above indicates that #1 will be chosen over #2 if:
- $(\Delta R1 - \Delta R2) / (P1-P2) > \alpha / \beta$.