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The Property Cat Market Is It Predictable?

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Outline

- Thesis
 - Gentle downward slope, interrupted by periodic spikes
- Cat Motivation
- Global & US Market Size
 - Reinsurance
 - Cat Bonds
 - Sidecars
 - Other
- Exogenous Shocks/Spikes
- Pricing Trends
- Jan 2008 Handicapping



Cat Motivation

Contingent Capital: Create Franchise Value

STYLIZED 3-POINT DISTRIBUTION

Annual Probability	Reinsurance		(Cost)/Benefit
	Bare	Purchase	
	(\$Ms)	(\$Ms)	(\$Ms)
	(1)	(2)	(1)-(2)
90%	0.00	7.00	(7.00)
9%	30.00	9.10	20.90
1%	100.00	14.00	86.00
Annl Avg.	3.70	7.26	(3.56)

Cost of Capital = 4.14%

Cat Motivation

ERM Framework: Protect Franchise Value

- Earnings Surprises Destroy Franchise
 - Even if earnings positive and surplus untouched
 - Merrill Lynch: 6% MV write-down = 16.3% MV loss
 - Citigroup: 5.3% MV write-down = 24.5% MV loss

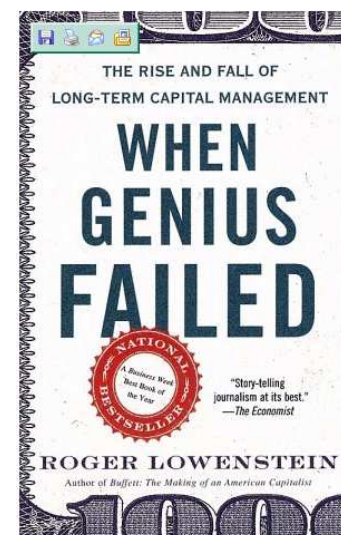
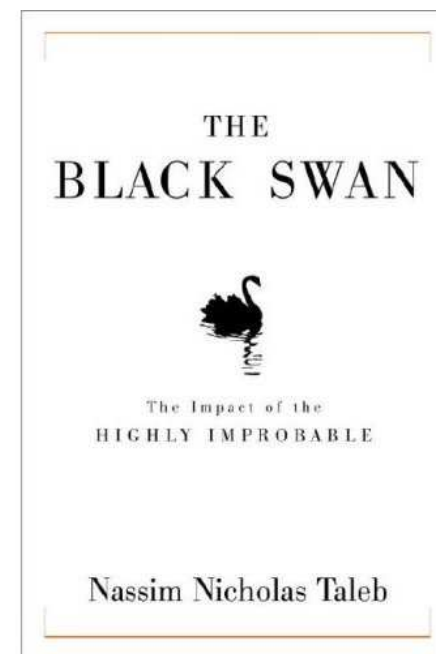
MV – Market Value

- Merrill Lynch Details
 - \$3.4b (6.0%) surprise on Oct 24
 - \$10.6b (18.6%) market value drop through Nov 7
 - \$9.3b (16.3%), adjusting for ^DJI movement
 - Leverage factor of about 2.74
- Citigroup Details
 - Nov 4 \$11b (5.3%) surprise reduced market cap \$51b (24.5%)
 - Leverage factor of 4.63
 - Second surprise gets higher leverage
- What is Your Cat Limit as % of Market Value of Firm?

Motivation

It's the Black Swan

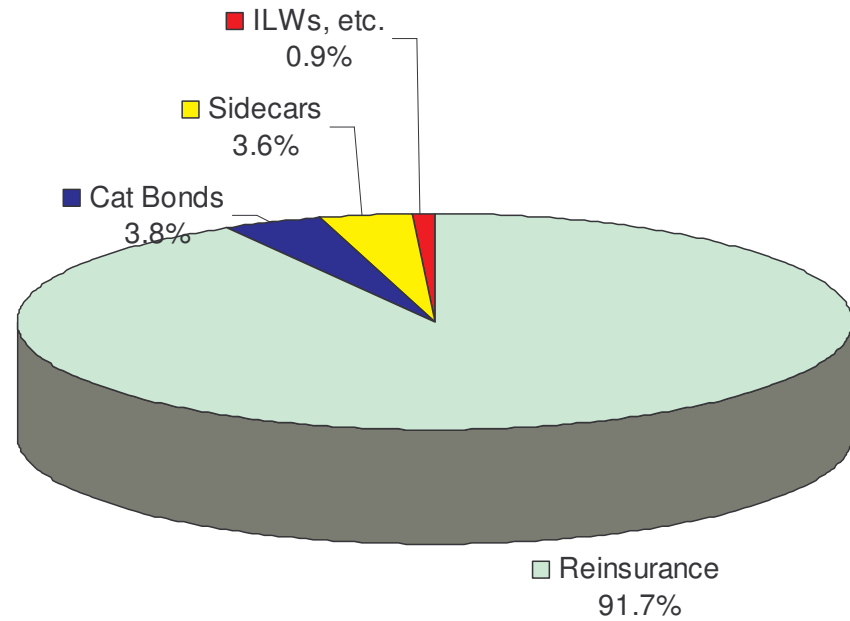
- Quantitative Limitations
 - “We were seeing things that were 25-standard deviation moves, several days in a row. There have been issues in some of the other quantitative spaces. But nothing like what we saw last week.”
 - David Viniar, Goldman Sachs CFO, explaining 27% ytd drop in value of Goldman's flagship Global Alpha fund, quoted in Financial Times, August 13, 2007
 - “. . . someone ought to sneak into his office, sweep away the black feathers, and put a copy of Nassim Taleb's *Fooled by Randomness* on his desk chair. If he and his Goldman quants don't recalibrate their understanding of black swans, the next few months are going to seem an awful lot like Hitchcock's *The Birds*.”
 - Seth Jayson, Motley Fool, August 15, 2007



Worldwide Cat Capacity

Sources of Limit

Source	Approx. Limit	Distrib.
Reinsurance	143b	91.7%
Cat Bonds	5b-6b	3.8%
Sidecars	5.6b	3.6%
ILWs, etc.	Small	0.9%
Total	\$156b	



Global Cat Reinsurance Market

How Big Is It?

Worldwide Property Catastrophe Market

\$11.5B
\$780M

\$28.2B
\$1.6B

\$15.5B
\$802M

\$10.8B
\$495M

\$7.7B
\$335M

\$60B
\$8.4B

\$8.5B
\$468M

Global Cat Market

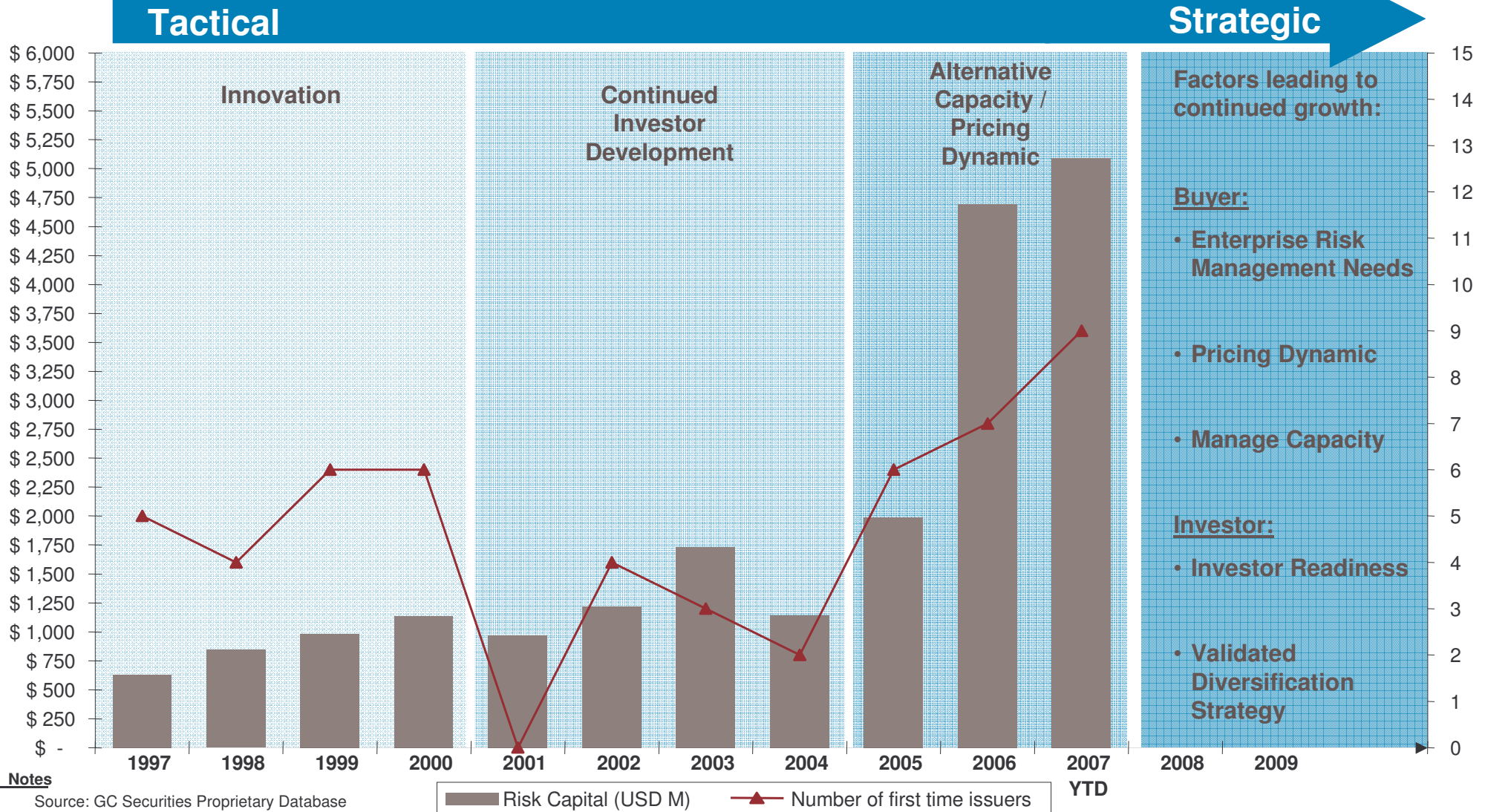
Limit	\$143B
Premium	\$12.9B
ROL	9.0%

US CAT MARKET

	Limit	Premium	ROL
All USA	\$60B	\$8.4B	14.0%
Incl FL	\$40B	\$6.2B	15.5%
FI Only	\$3.4B	\$750M	22.0%

Global Cat Bond Market

Shifting Buyer Rationale



Cat Bond Market

Catastrophe Bond Overview

- Created to facilitate the direct transfer of catastrophe risk from sponsor to investors
 - Developed in the mid 1990's
 - Insurers, reinsurers and corporations can be a sponsor
- The product has significantly evolved since the early days of the market
 - Now a major part of risk management programs

Major Advantages

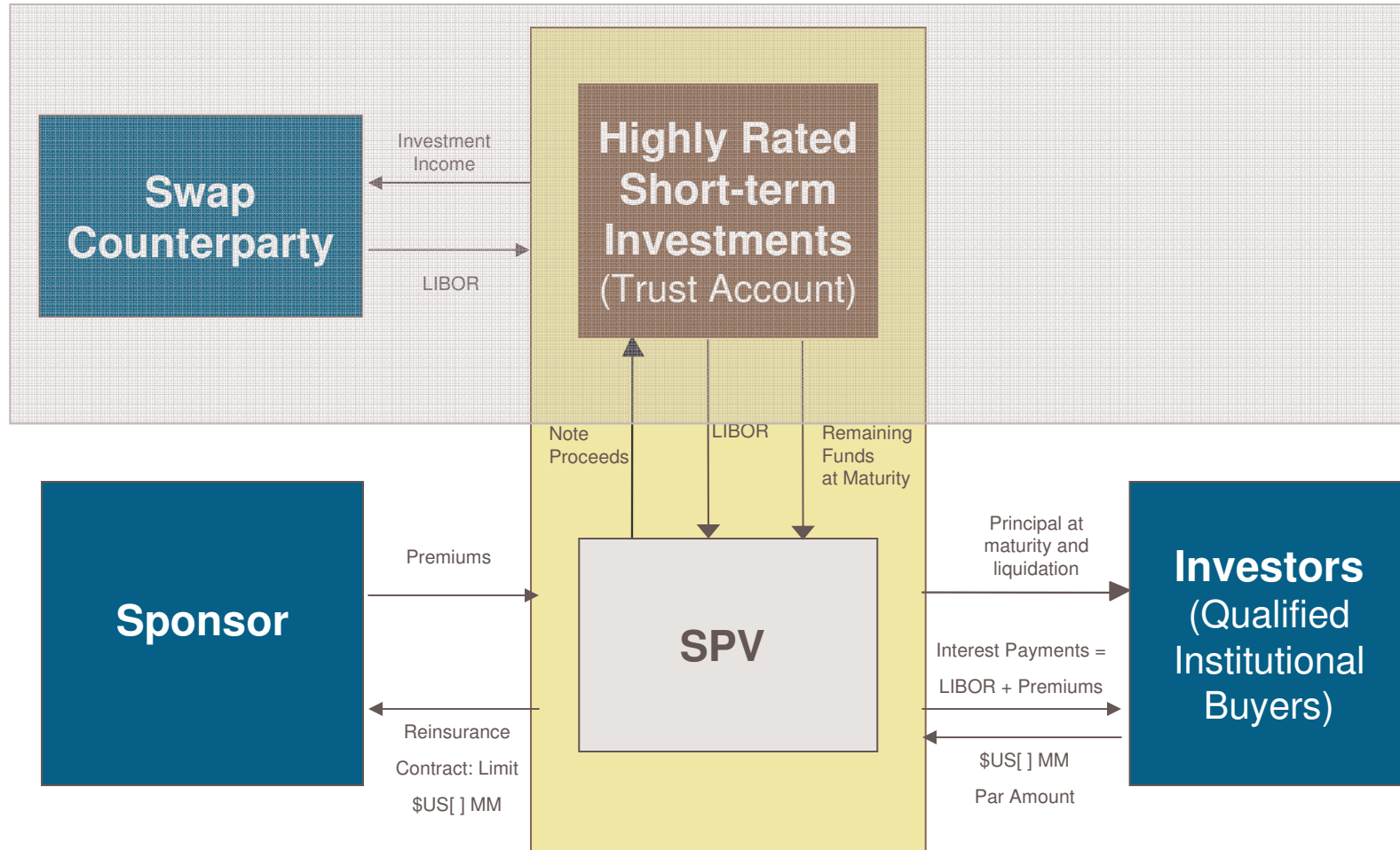
- Eliminates credit concerns with collateralized limit
- Ability to lock-in price and capacity over time
 - Ability to be price “maker,” not “taker”
- Provides new, diversified source of risk capital
- Indemnity, index, parametric and hybrid loss triggers available
 - Indemnity accounts for half of 2007 issuance

Major Concerns

- Basis risk, if not indemnity based
- Pricing versus traditional reinsurance
- Frictional costs
- Investor stability
- Wordings & Covenants

Cat Bond Market

Typical Catastrophe Bond Structure



Sidecar Market

Reinsurer	Capital (\$M)	Affiliation	Line
Flatiron Re	\$ 800	Arch Capital	Property / Marine
Concord Re	\$ 730	Lexington (AIG)	CML property
Cyrus Re	\$ 525	XL Re	Property Cat
Davinci Re	\$ 435	Ren Re / State Farm	Property Cat
Panther Re	\$ 360	Hiscox	Property Cat
Starbound Re II	\$ 342	Ren Re	Property Cat
Olympus / Helicon Re	\$ 333	White Mountains	Property / Marine
Starbound Re	\$ 310	Ren Re	Property Cat
Blue Ocean Re	\$ 300	Montpelier Re	Retro
New Point Re	\$ 250	Harbor Point	Retro
Petrel Re	\$ 200	Validus	Offshore Energy
Triomphe Re	\$ 185	Paris Re	Prop Cat / Risk XS
Bay Point Re	\$ 150	Harbor Point	Property
Mont Fort Re	\$ 143	Flagstone Re	ILW, peak zone
Norton Re	\$ 108	Brit	Retro
Sirocco Re	\$ 95	Lancashire	Offshore Energy
Rockridge Re	\$ 91	Montpelier Re	Short-tail
Spec. Syndicate 6103	\$ 87	MAP Capital	US Cat
Tim Re	\$ 70	Ren Re / State Farm	Property Cat
Mont Gele	\$ 60	Flagstone Re	XOL
MaRI	na	ACE / Marsh	Cat risks
Total	\$ 5.6 B		

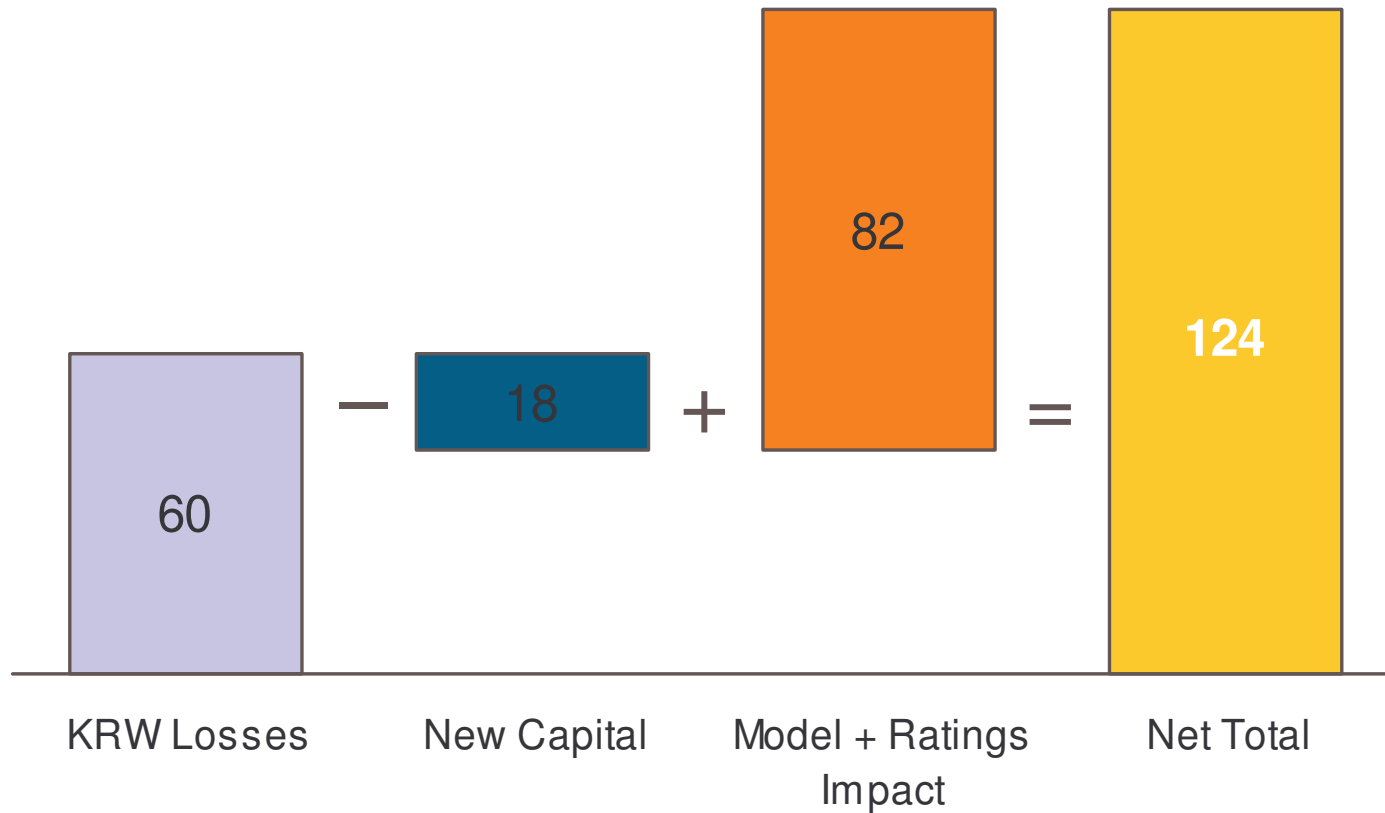
- All short-tail lines
- Not all cat capacity

Exogenous Shocks

Why Did Price Increase in 2006?

INDUSTRY CAPITAL REQUIRED TO SUPPORT NEW RISK LEVEL

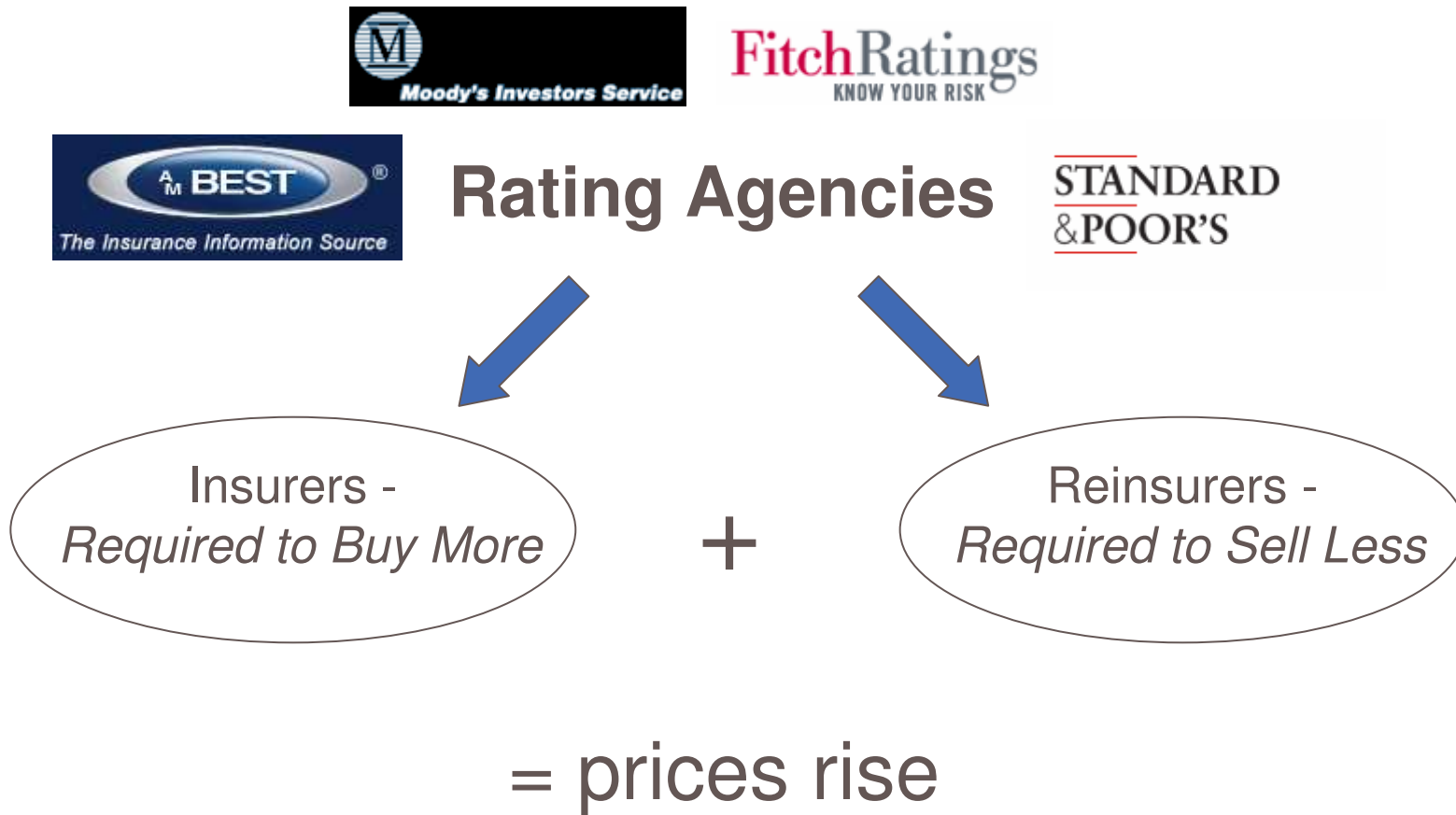
(\$ Billions)



Source: RMS

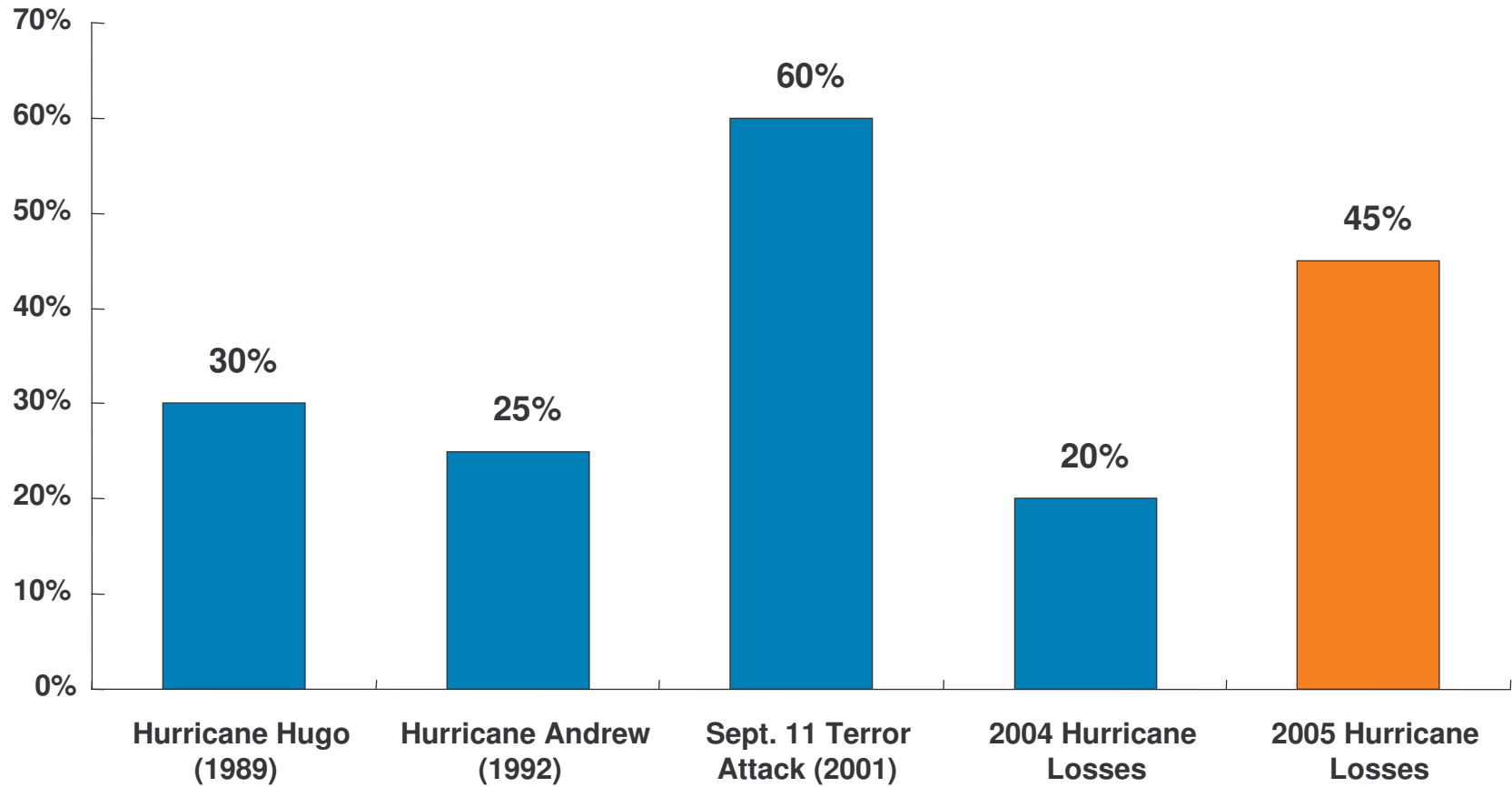
Exogenous Shocks

The Forces of Supply and Demand at Work



Pricing

Reinsurer Share of Recent Losses

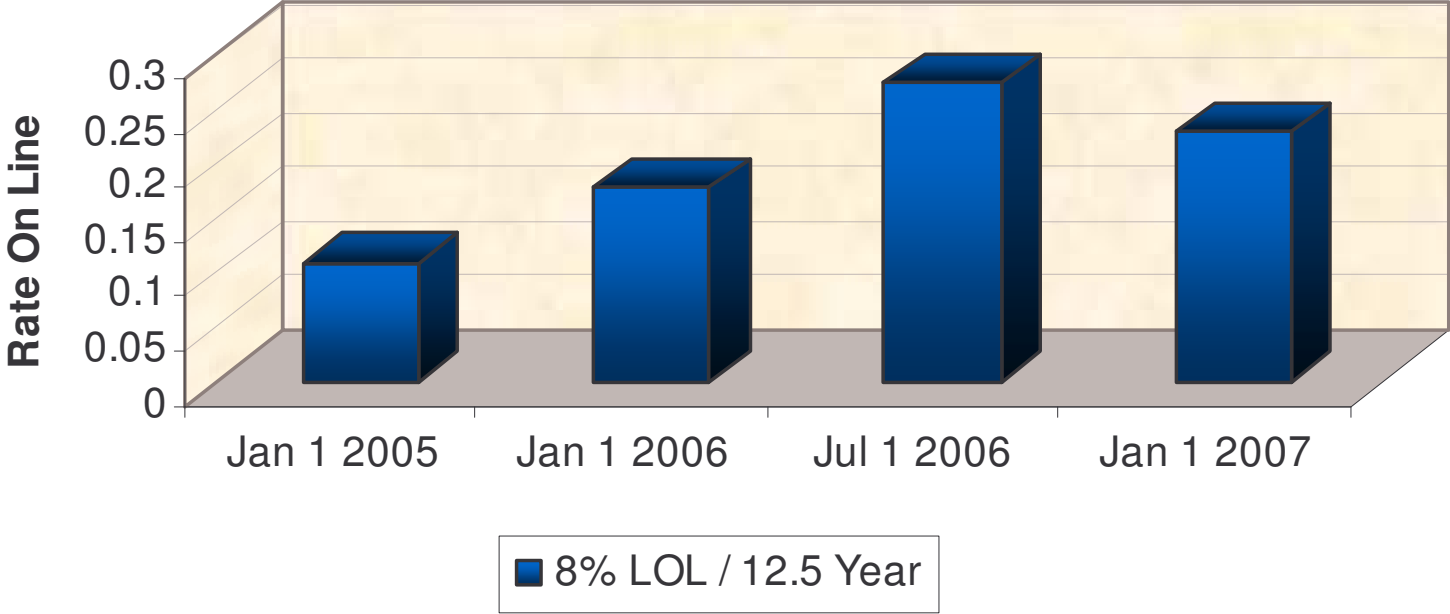


Source: Wharton Risk Center, Disaster Insurance Project; Insurance Information Institute

Note: Excludes losses paid by the FHCF. FHCF payments to insurers are estimated at \$3.85M for 2004 and \$4.5B for 2005

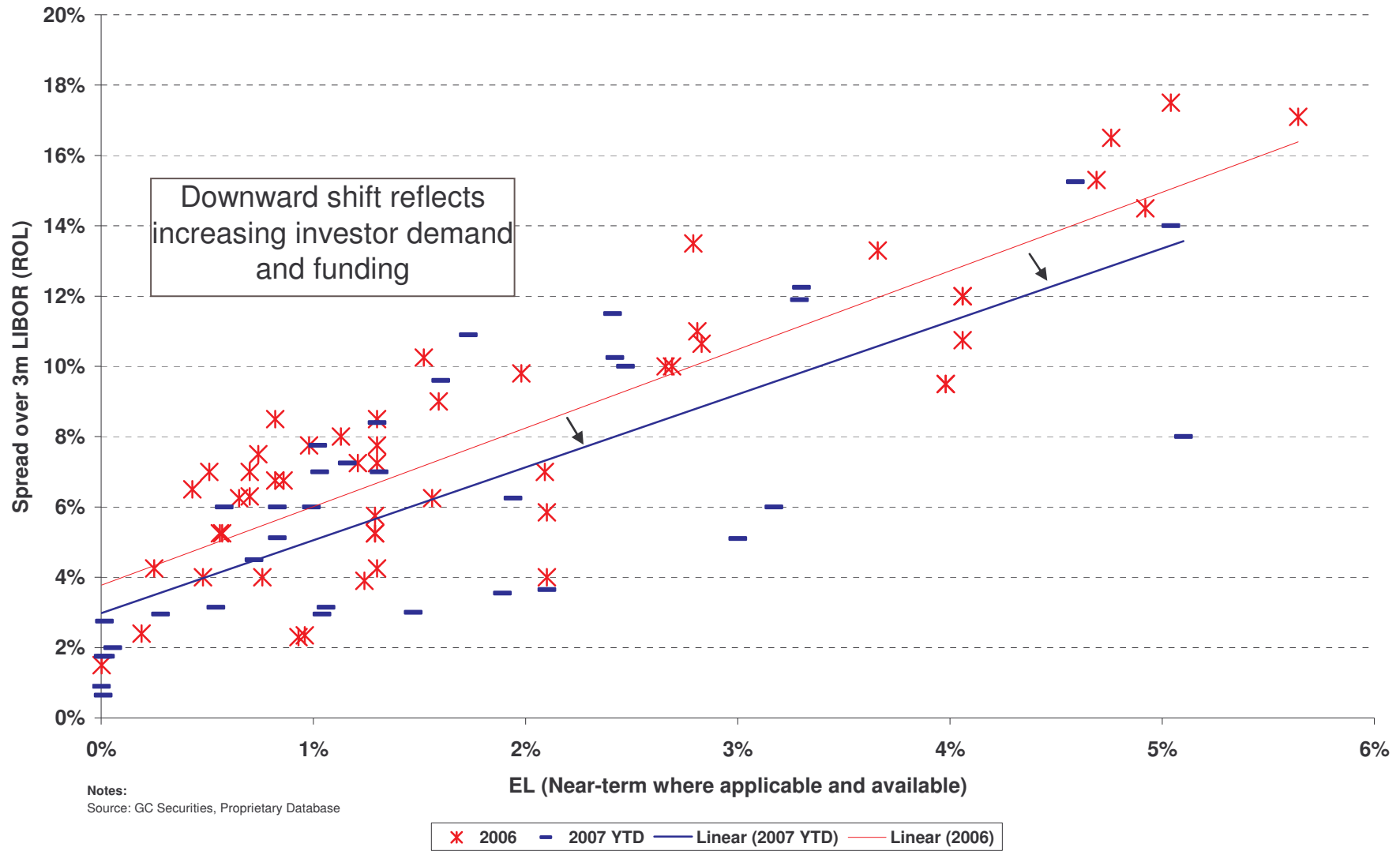
US Property Cat Pricing
Exposure-adjusted Price Change

National Programs ROL v. 8% LOL



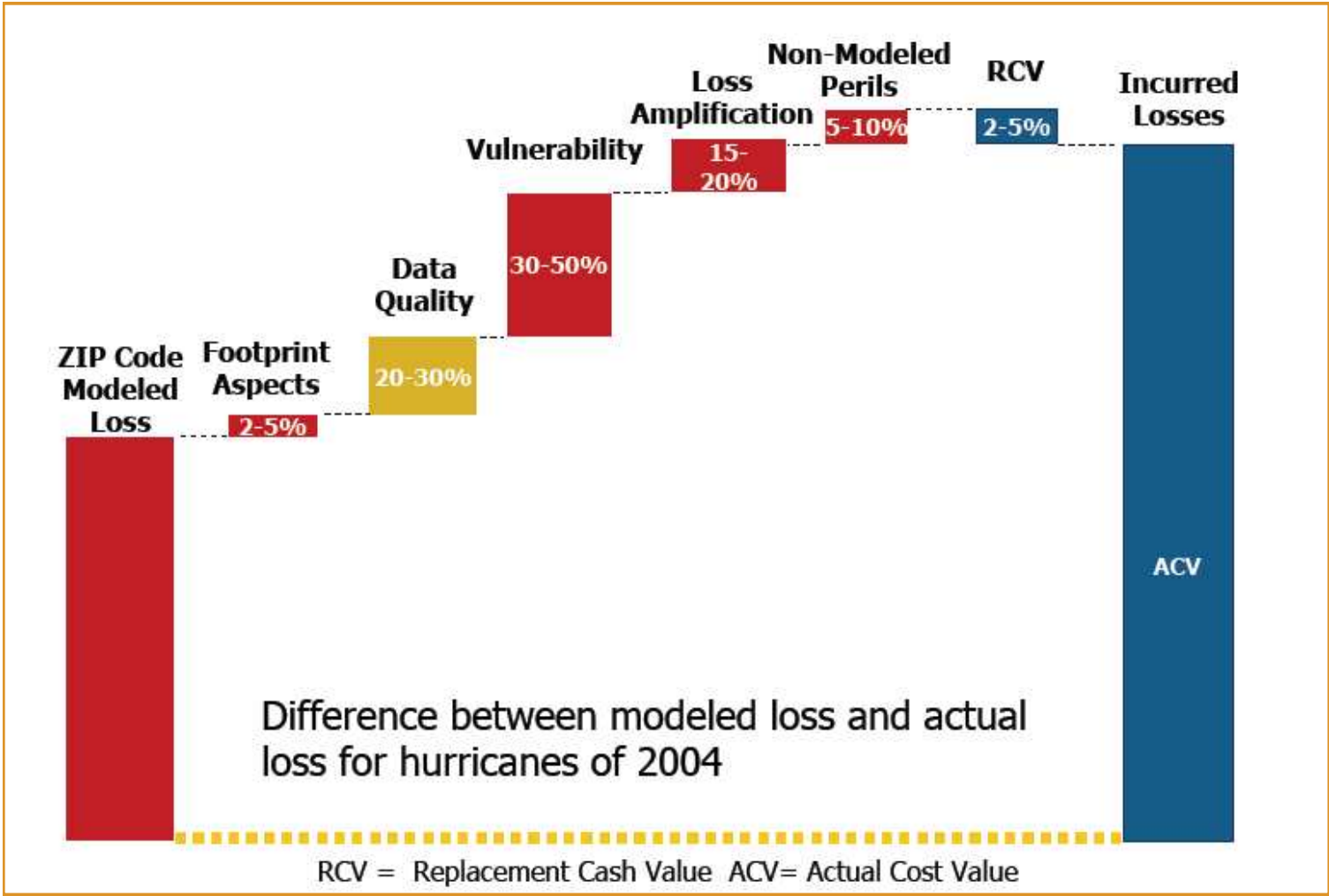
Capital Markets Pricing

2006 and 2007 Activity, All Perils (Provided ROL < 20%, EL < 6%)



Pricing

Modeled Loss Costs ≠ Carried Loss Cost (1)

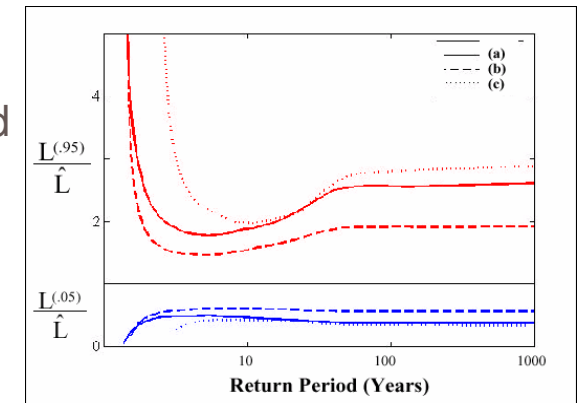


Source: RMS

Pricing

Modeled Loss Costs \neq Carried Loss Cost (2)

- Non-modeled Increments
 - LAE, APD, Manual Policies, Inland Marine, Cargo, Fine Arts
 - Statistical record vs. policy system
 - ITV, inflation, new business
 - Flood, some low level wind
 - Policy reinterpretation, red tagging
- Modeling Uncertainty
 - Sampling error, specification error, non-sampling error, knowledge uncertainty, approximation error¹
 - 90% confidence bound is 50 to 250% of point estimate beyond 1 in 80 return period²





¹ Major, John A., "Uncertainty in Catastrophe Models," *Financing Risk and Reinsurance*, International Risk Management Institute, Feb/Mar 1999.

² Miller, David, "Uncertainty in Hurricane Risk Modeling and Implications for Securitization," *CAS Discussion Papers on Securitization of Risk*, 1999.

Pricing Insurance to Value

Table 1: Comparison of Replacement Values for Representative Properties

	Occupancy	Con- struction	Approx. Gross Area (sq. ft.)	Replacement Value		
				Company Provided Value	AIR Estimate	Ratio
	Hotel	Wood Frame	30,000	\$1,692,702	\$3,509,831	48%
	Retail	Masonry	100,000	\$1,243,816	\$8,484,046	15%

Overall, **nine out of ten** commercial properties analyzed had replacement values less than the amount estimated using a standard engineering-based cost estimation process.

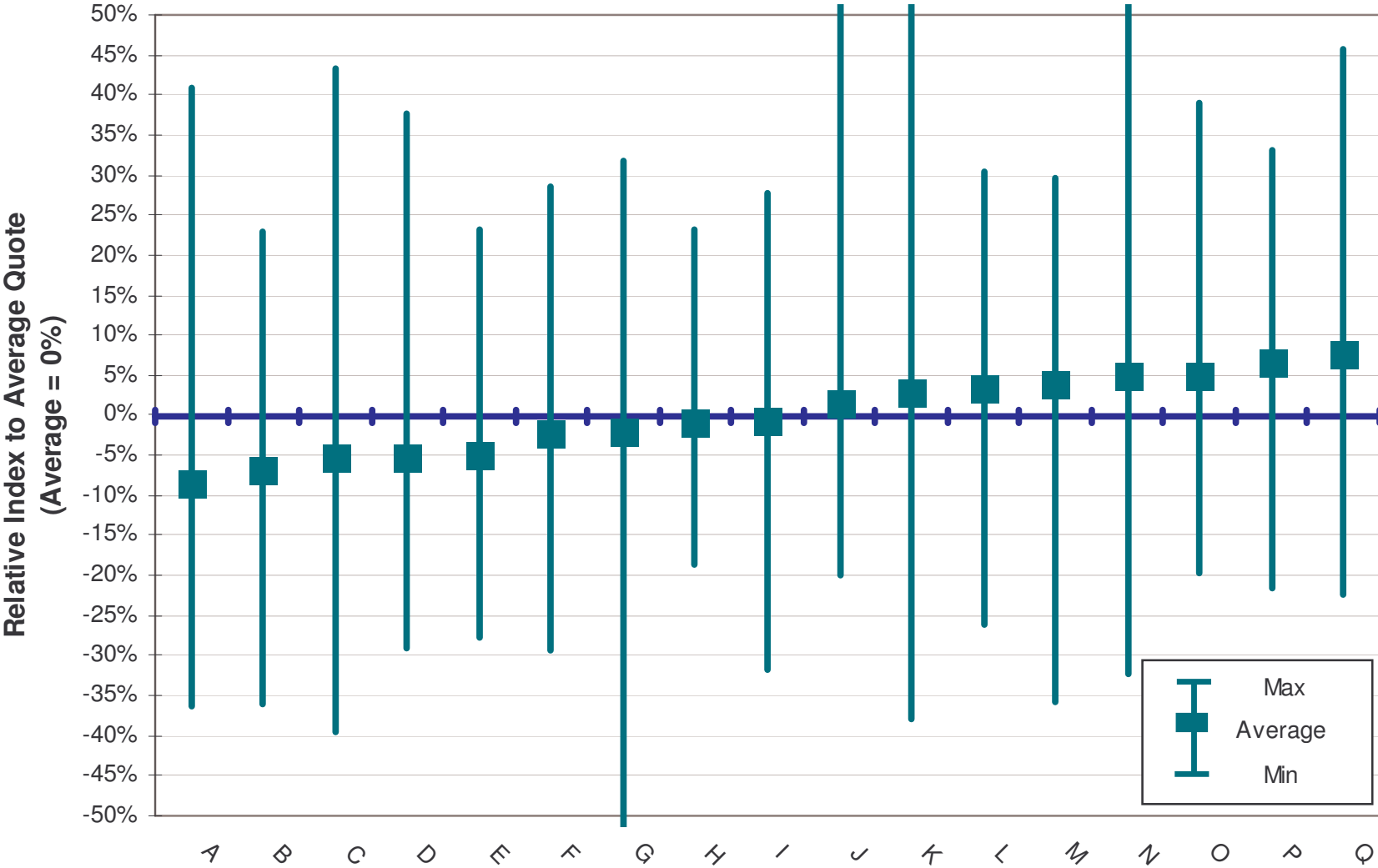
AIR, Nov. 2005

- 58 percent of homes in the U.S. were underinsured last year by an average 21 percent.
 - Marshall & Swift/Boeckh, quoted in USA Today, Nov. 1, 2007
- Model calibration will pick some underinsurance



Quotation Statistics from January 2007

A Heavily Textured Market



2008 Market Projected Changes

- Market Dynamic Changes
 - Earnings ↑, balance sheet ↑, competitors ↑ = Price ↓
 - Many sidecars will disappear or reduce
 - Many announcements already public
 - Opportunistic investors, not reinsurers
 - Capital Markets fungibility compresses price movement
- Individual Treaty Level
 - Price is #1 Insurer Concern
 - Terms & Conditions negotiations at company, not industry, level
 - TRIA renewed
 - Hours clause expansion
 - Assessments
 - Inurings
- Index Products/Cat Bonds supplement in peak zones

Conclusions

Happy Days Returning



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