

D&O Pricing Approaches and Market Update

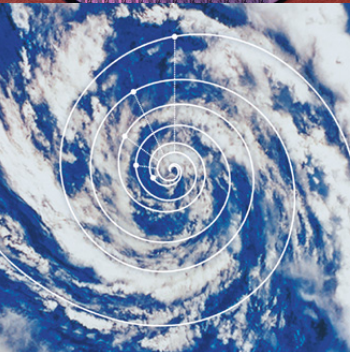
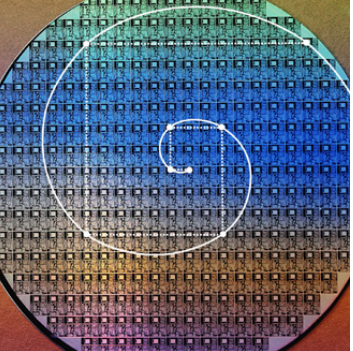
Kevin Rooney, Endurance

Nicholas L. Durant, Guy Carpenter & Co

Vagif Amstislavskiy, Zurich North America

Agenda

- **Introductory Comments / Background**
- **Reinsurer Perspective**
- **Insurer Perspective**
- **Reinsurance Broker Perspective**
- **Conclusion – Q&A**

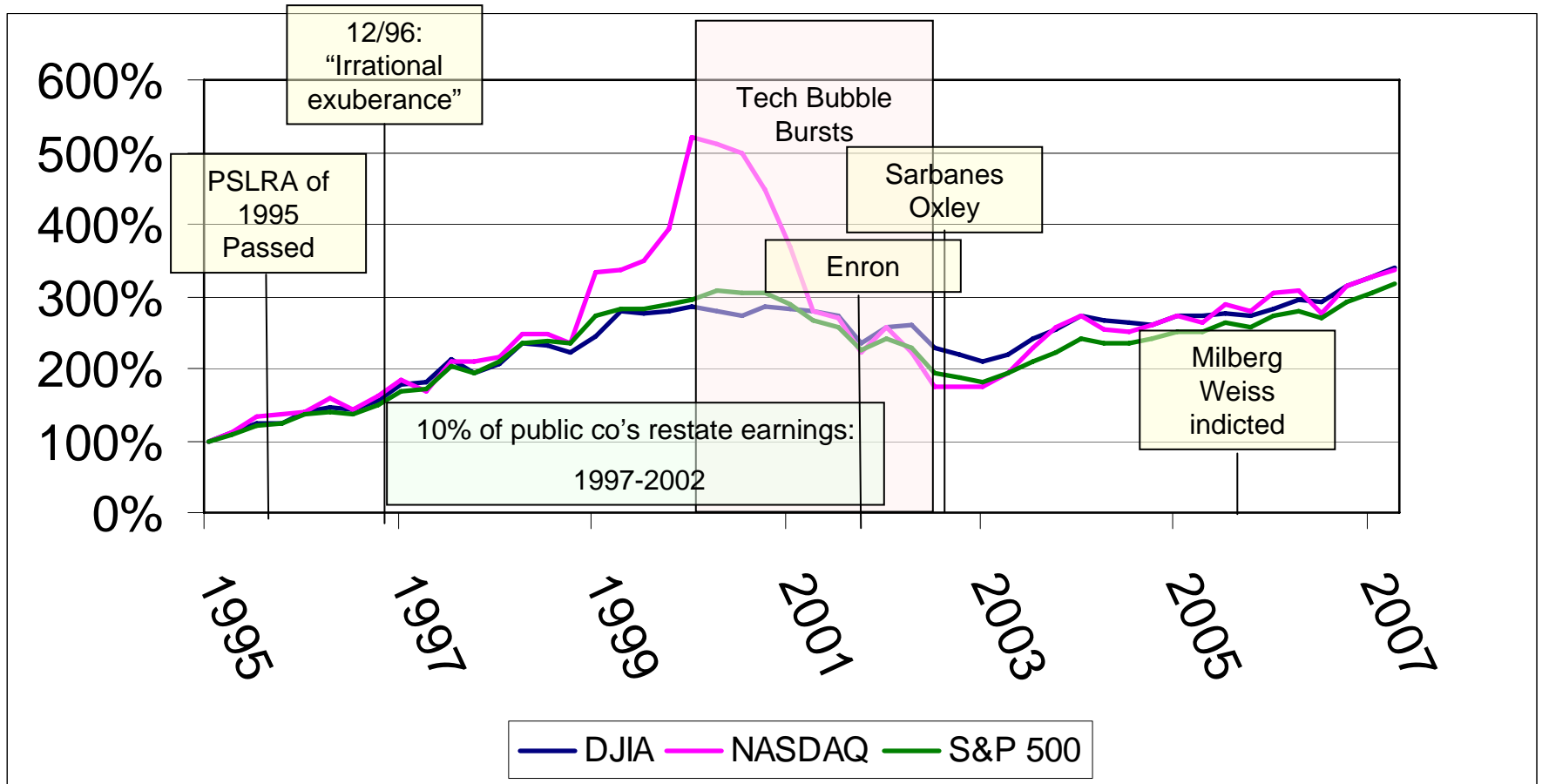


Endurance

Historical Background

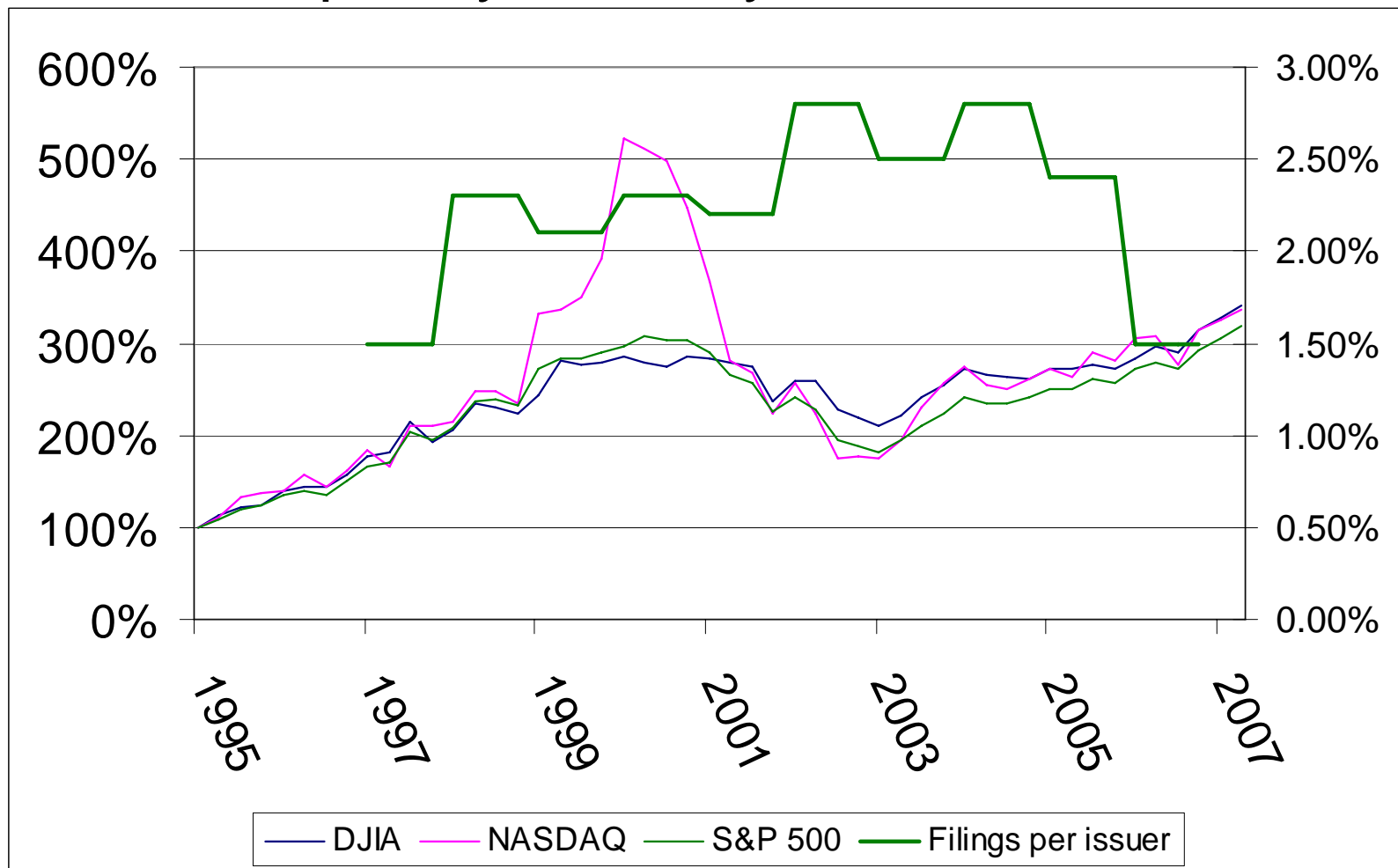
CARe Meeting
May 8, 2007
Kevin Rooney

Background: Environment



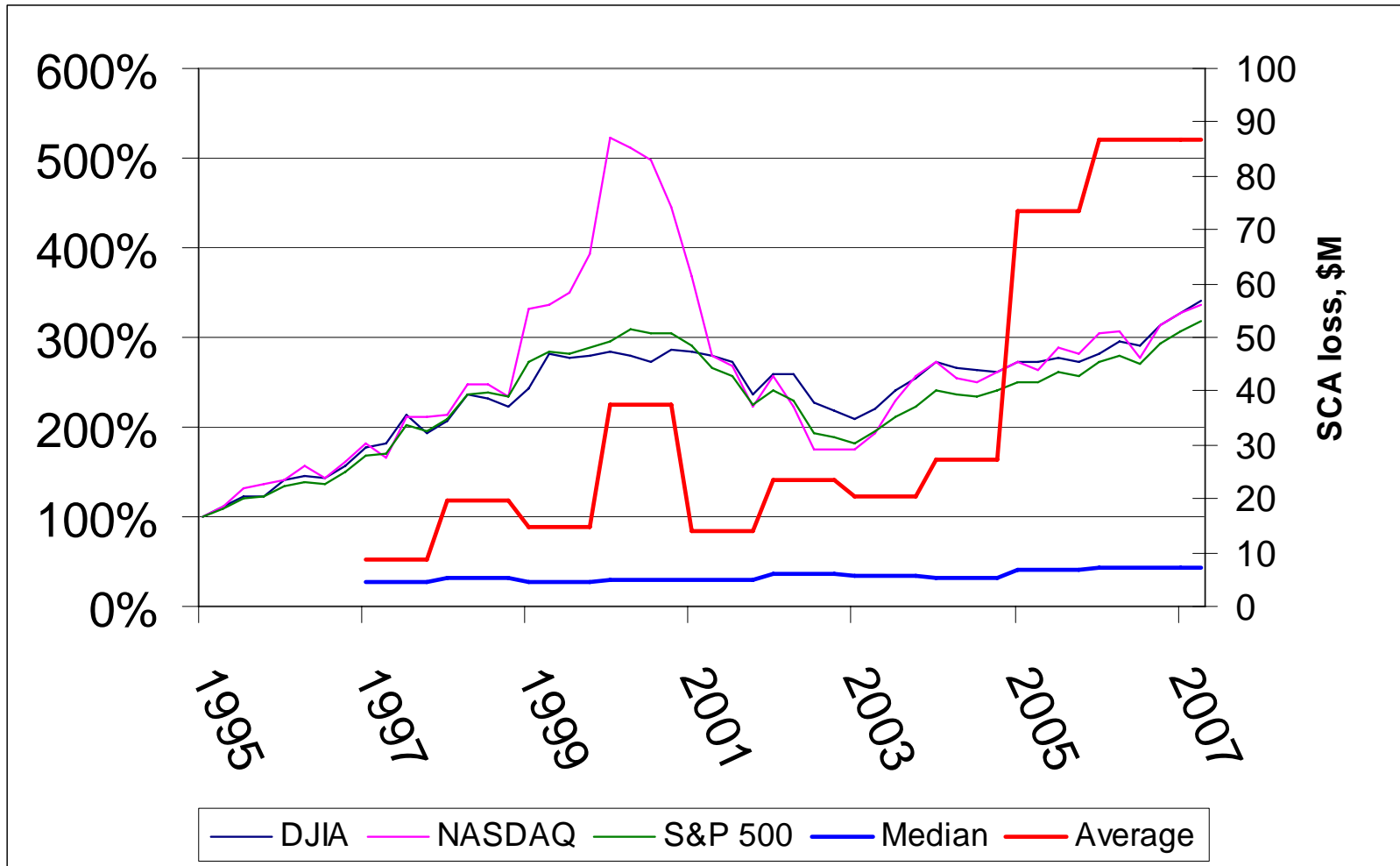
Background: Environment

- SCA Frequency – steady, down last 18 mo



Background: Environment

- SCA Severity up



Background: Environment

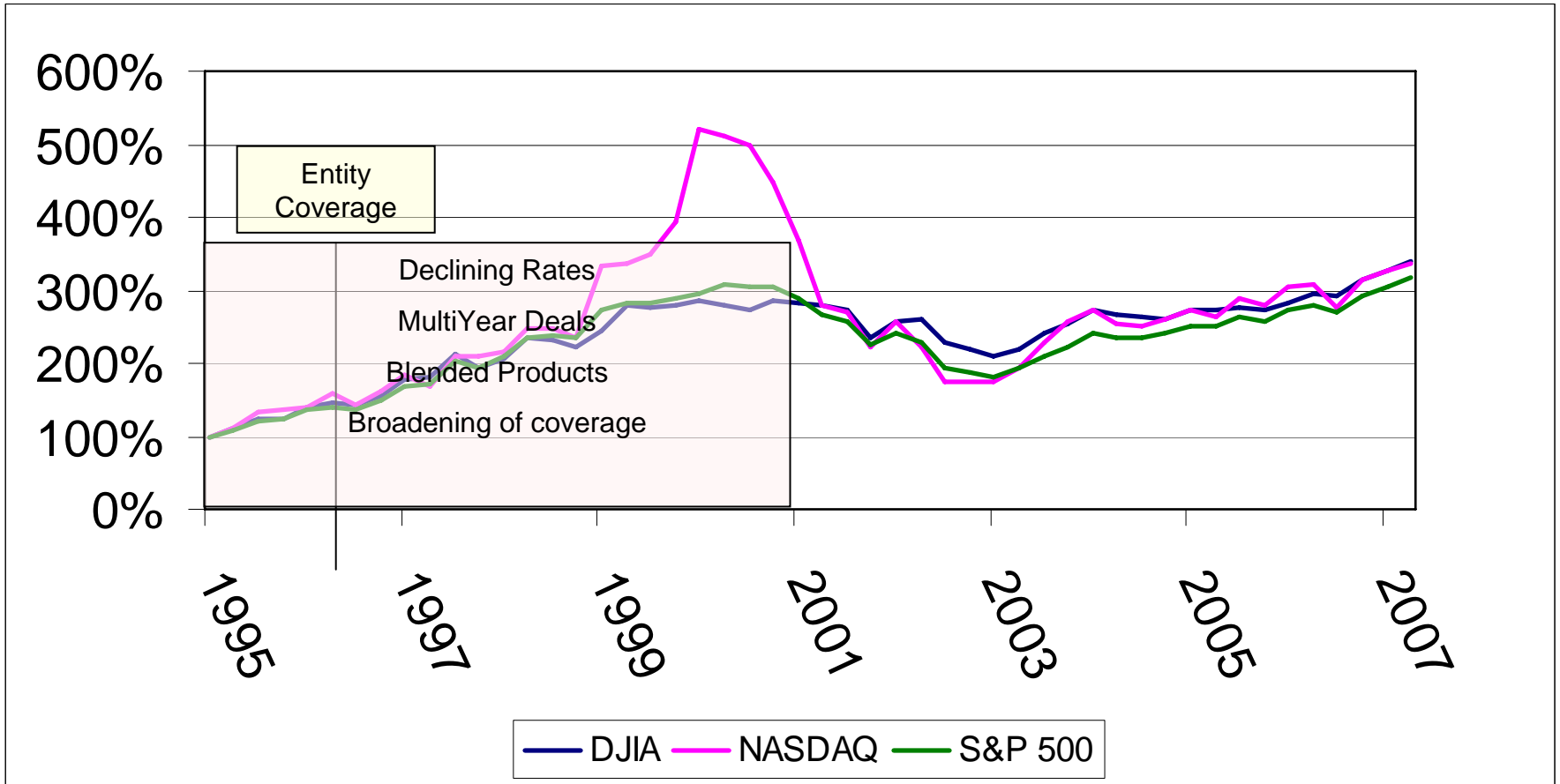
- Many Environmental Events

- PSLRA, SarBox
- Tech bubble, restatements,
- major accounting scandals – Enron/Worldcom
- Milberg Weiss, Dura

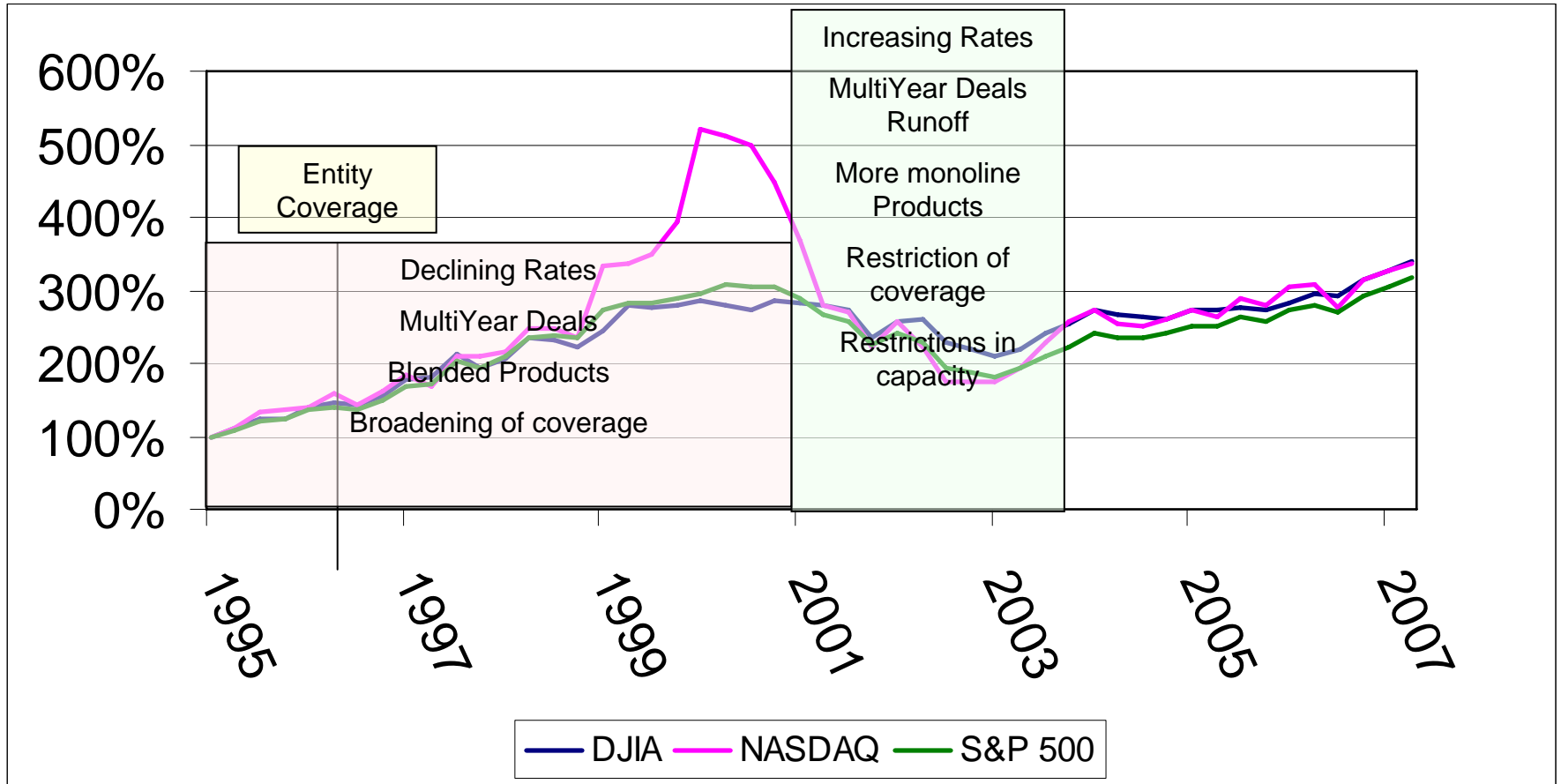
- Federal SCAs

- Frequency: steady, down last 18 mo
- Severity:
 - Median settlement: held steady, now rising ltd avg sev
 - Average settlement: rising fast xs layer sev
 - Layered severity trend in excess layers: huge

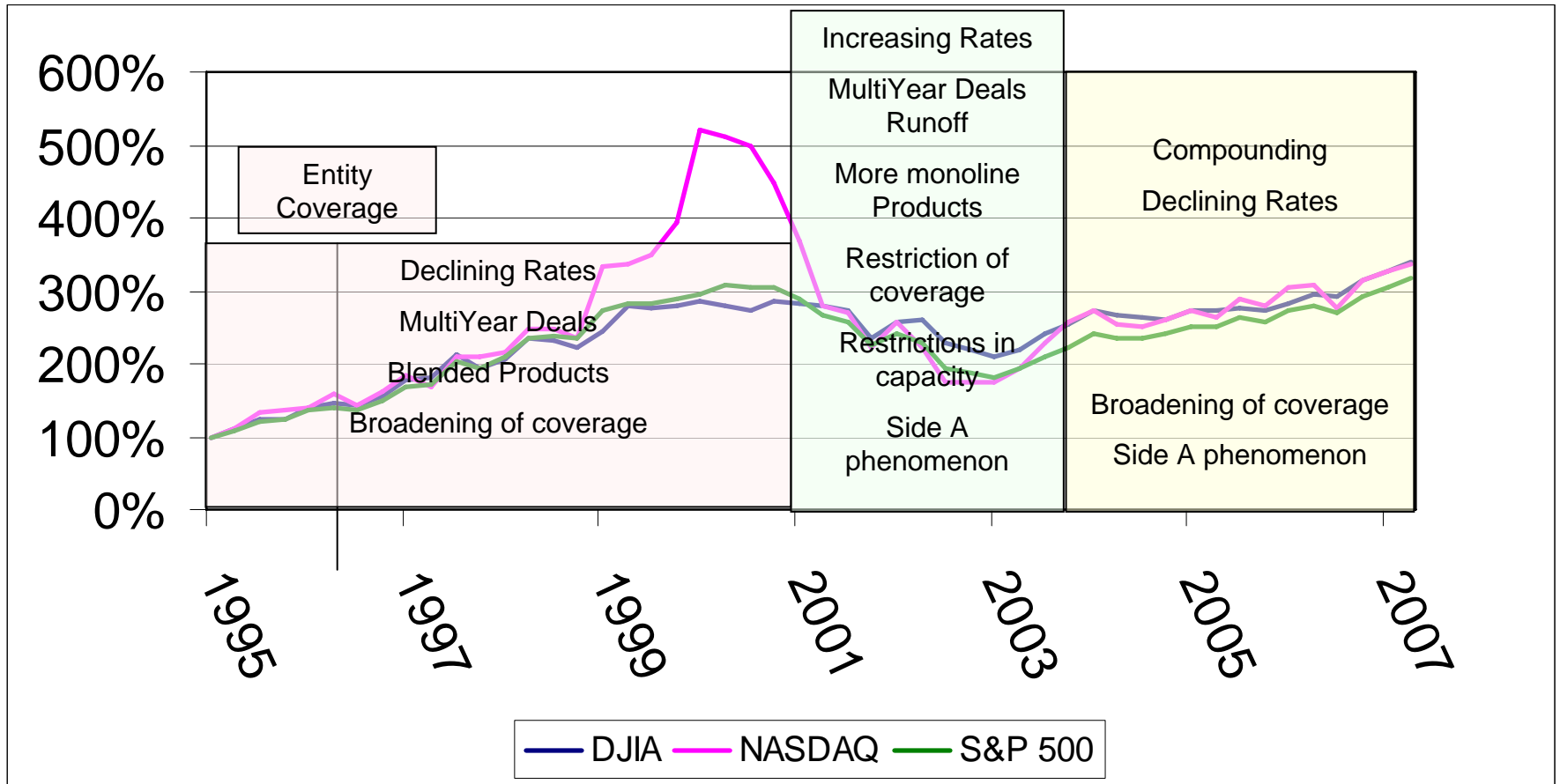
Background: Insurance



Background: Insurance

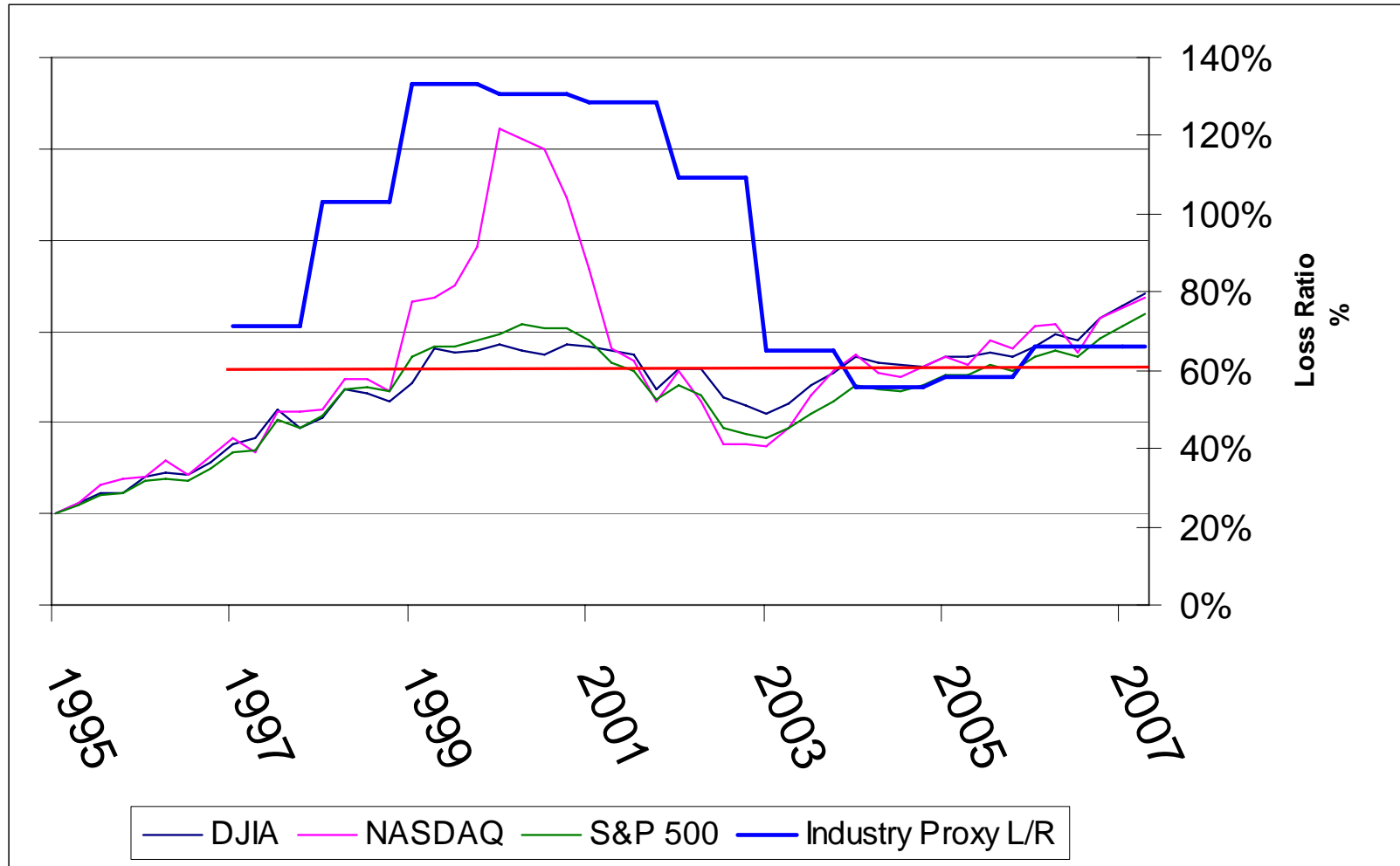


Background: Insurance

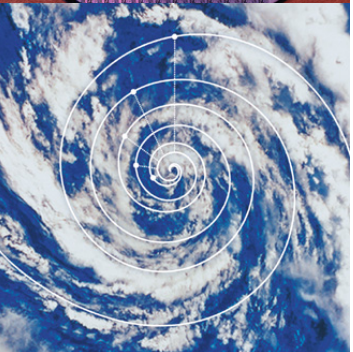
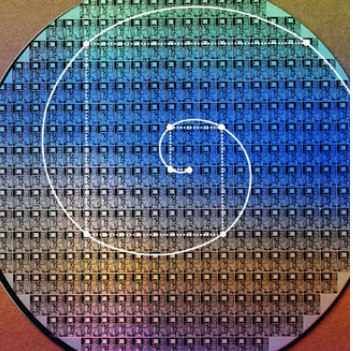


Background: Insurance

Other Liability CM Loss Ratios



Sch. P direct loss ratios summarized for 5 companies with substantial books of D&O Liability



Endurance

Reinsurer's Perspective

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Major Takeaways from above

- Visceral reaction
 - Don't want to go through that again
- Over-reliance on experience vs. exposure
- D&O Rating largely de-linked from data (reality)
- Rating methodology was an “enabler.”
- R/I's often beholden to client view

Avoid same mistake

- Develop technical benchmarking / rating
 - Develop independent view of rate adequacy
 - Evaluate co's process
 - Re-rate bordereau
 - Rational / objective comparison
 - Time series
 - SCA and public co. data are public
 - Frequency
 - Severity
 - Meaningful exposure base – mkt cap (& others)

Reinsurers Perspective

Frequency varies by Market Cap

Market Cap Size	Est SCA Frequency
< \$1 Bil.	<2.0%
\$1 Bil. < \$5 Bil.	3%
\$5 Bil. < \$10 Bil.	4%
\$10 Bil. < \$25 Bil.	5%
\$25 Bil. < \$50 Bil.	7.25%
\$ 50 Bil. < \$100 Bil.	7.5%

Chart shown illustrative only

Severity

- We will limit our attention to SCA severity
- Severity also varies by market cap.
 - Publicly available data includes:
 - Stanford
 - Institutional Shareholder Services
 - Advisen
- Defense Costs
 - Harder to determine – Data not as readily available.

Reinsurers Perspective

Severity varies by Market Cap

Market Cap Size	Avg. SCA Severity
< \$1 Bil.	7M
\$1 Bil. < \$5 Bil.	22M
\$5 Bil. < \$10 Bil.	70M
\$10 Bil. < \$25 Bil.	120M
\$25 Bil. < \$50 Bil.	250M
\$ 50 Bil. < \$100 Bil.	310M

Chart shown illustrative only

Potential Variables

- Credit Rating
- Stock Volatility
- Distance from IPO
- Class

Other considerations

- Non SCA
 - Derivatives
 - bankruptcy
 - opt-outs
 - etc.
- ALAE
- Dismissals, & ALAE to dismissal
- Margin
- etc.

Layering Factors vs. ILFs

- Layering Factors - fixed percentage of preceding layer (m.p. implication)
- ILFs typically imply percentages increase with succeeding layers
- Severity variation by market cap implies percentages should increase as market cap increases.

Layering Factors vs. ILFs – Example

- very large company, \$50 million primary
- Market layered the excess using a 0.8 layering factor.
- ILF approach would imply 0.88, 0.886, 0.892, 0.898, 0.912 for successive layers
- Methods produce dramatically different outcomes for the top layer (as a % of the 1st)
 - ILF layering: 0.57
 - Industry layering using .80 factor: 0.33
 - using a .70 factor, drops to: 0.17

Recurring Non-Recurring

- IPO Laddering (2001)
- Analyst Cases (2002)
- Mutual Fund Cases (2002)
- Insurance Industry /Spitzer Cases (2004)
- Stock Options Backdating (2006)
- ??????? (2007)

Reinsurer's Perspective

- Want to avoid past mistakes
- Exposure rate – anchored in data
- Independent view
- Public data (see Stanford Law, ISS, S&P,...)
- Challenges
 - dynamic parameters
 - Risk selection
 - Portfolio vs. individual risk

D&O Pricing Model

The Zurich Way

Vagif Amstilavskiy
Vice President and Actuary
Zurich Specialties

CARe Seminar
May 2007

Agenda

- **Old way of pricing D&O**
- **Zurich's new model**
- **Additional research**
- **Transparency and customer value**

“Old way” of D&O pricing

- **Assets** were the exposure base.
 - *Decrease in assets would lead to a decrease in D&O insurance.*
- **Excess Layers** were priced as a percentage of the premium for the underlying layer.
 - *\$10m xs \$10m should be cheaper than the primary \$10m.*

Fundamental assumption: implied option

When we sell a D&O policy we sell an implied option to **shareholders**

- *Company is purchaser*
- *D&Os are the insureds*
- *Shareholders are the beneficiaries*

The option implies:

If the company's stock falls, a shareholder *may* recover *some portion* of that loss. *The trigger and payout are uncertain, but it is still an option.*

D&O pricing model

- Built upon work done with securities database and S&P database
- It is financial rather than insurance based
- Has its origin in financial option pricing (Black Scholes)
- Implemented 1/1/2003: Generated a comprehensive database which includes insurance as well as financial statistics

D&O pricing model main tenets

Based on five modules:

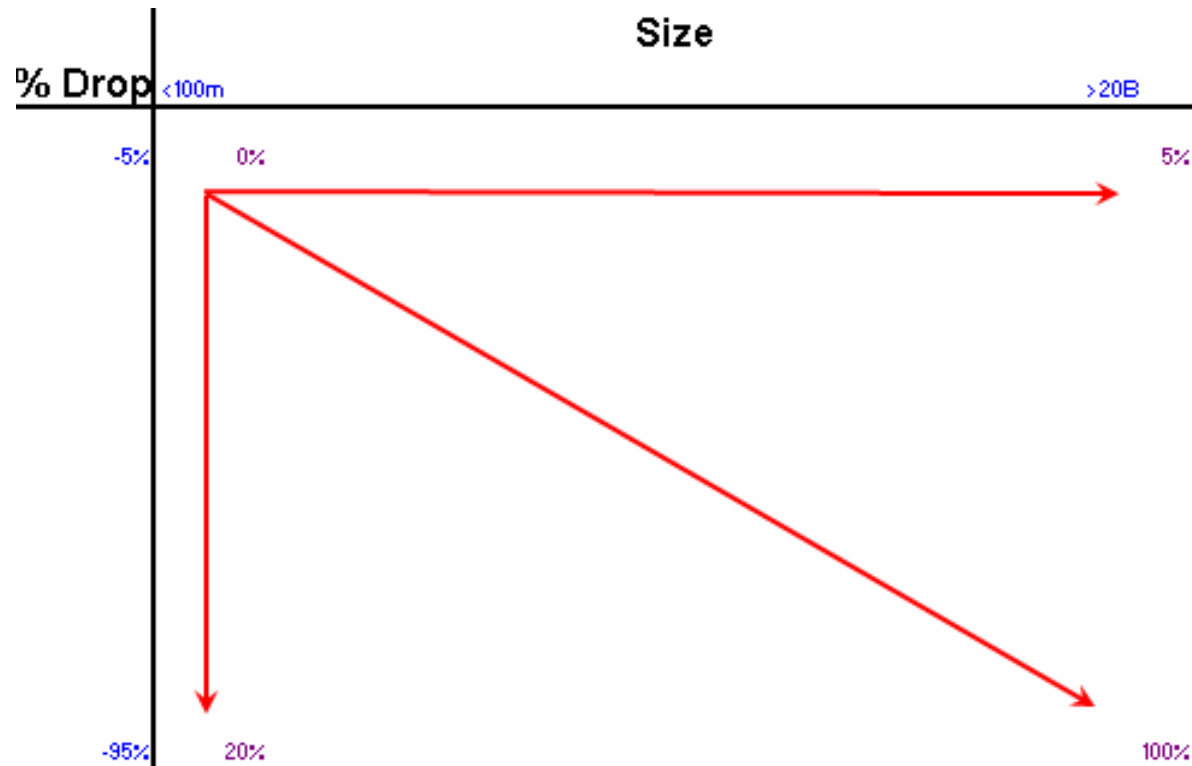
1. Volatility of the stock determines the distribution of the future stock prices.
2. Size of the company along with percent drop in the stock price determines the probability of a claim.
3. Amount of market cap lost determines the amount of recovery.
4. Probability of financial distress (bankruptcy) affects market cap at risk and likelihood of a claim.
5. Recent history (last 18 months) affects the likelihood of a claim.

Decision-making algorithm

Although the math is complex, the concept is simple, intuitive and easily explainable (transparent):

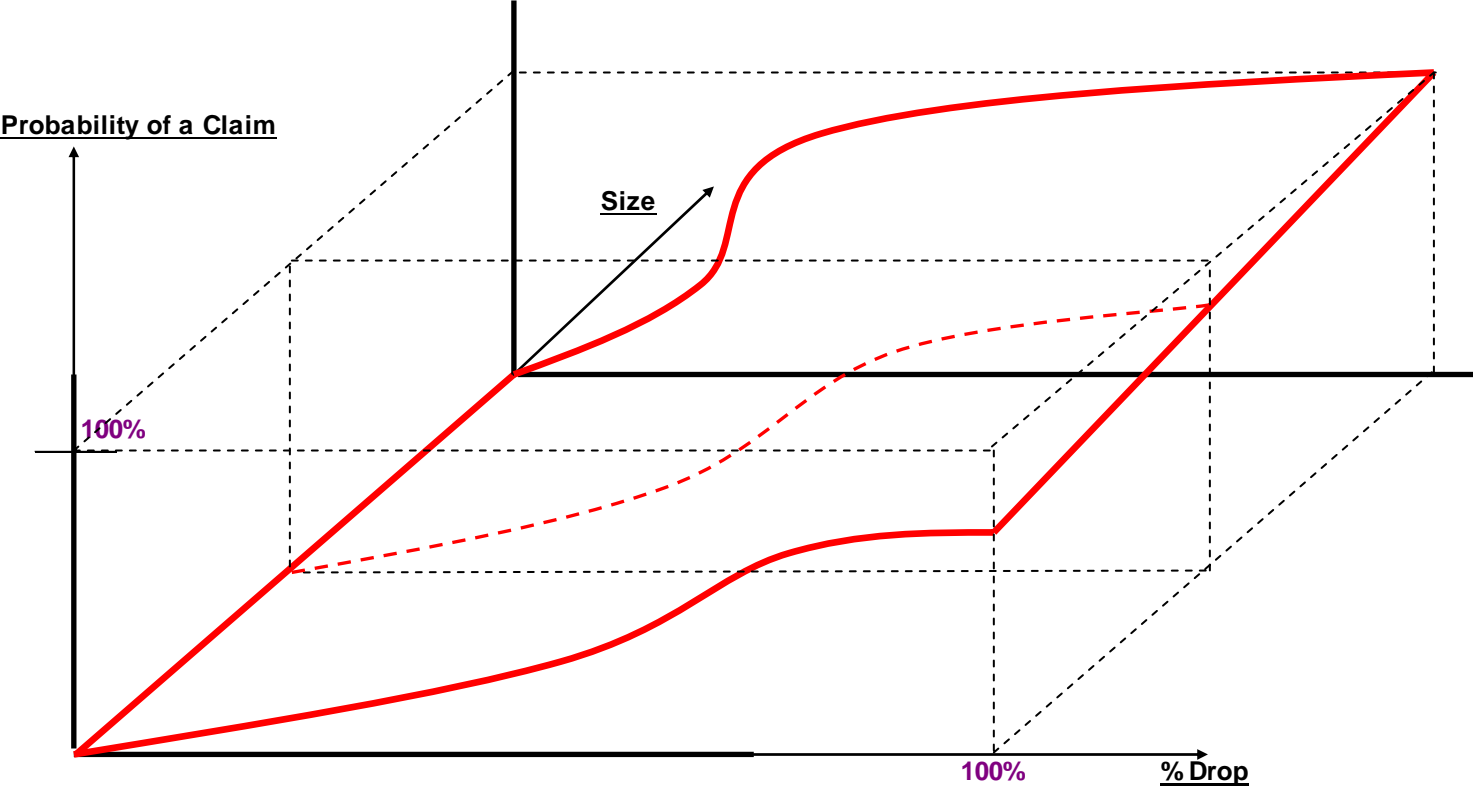
1. For a given **size** (market cap) – the lower the stock **volatility**, the lower the price
2. For a given stock **volatility** – the lower the **market cap** the lower the price
3. Companies that **made money** over the last 18 months will be charged less than those that **lost money**.
4. Companies with **weaker financials** will be charged more than those with **stronger financials** (bankruptcy adjustment).

Probability of SEC claim: the concept



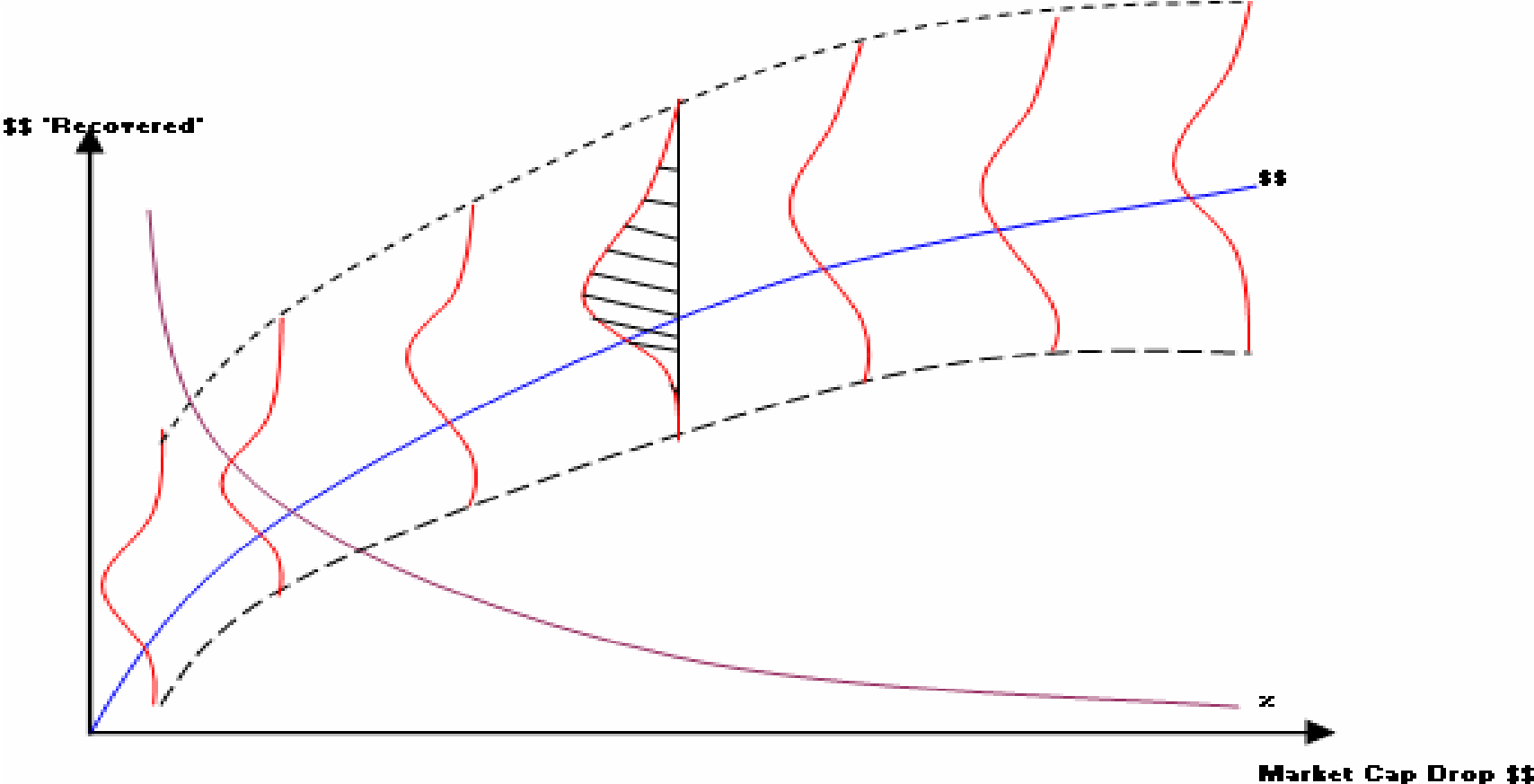
Class action frequency plain

We prefer smaller and less volatile companies



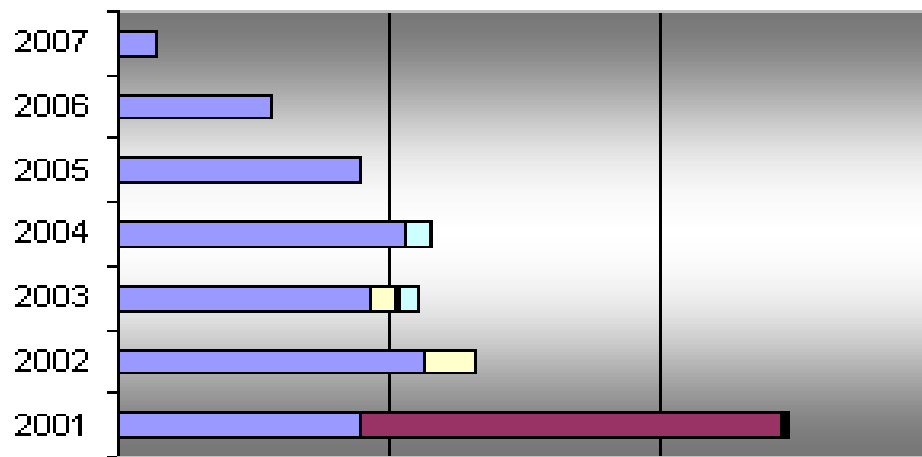
Class action recovery surface

Recovery is proportional to the drop in market cap



Securities class action highlights

Securities Class Action Litigation by Type of Lawsuit

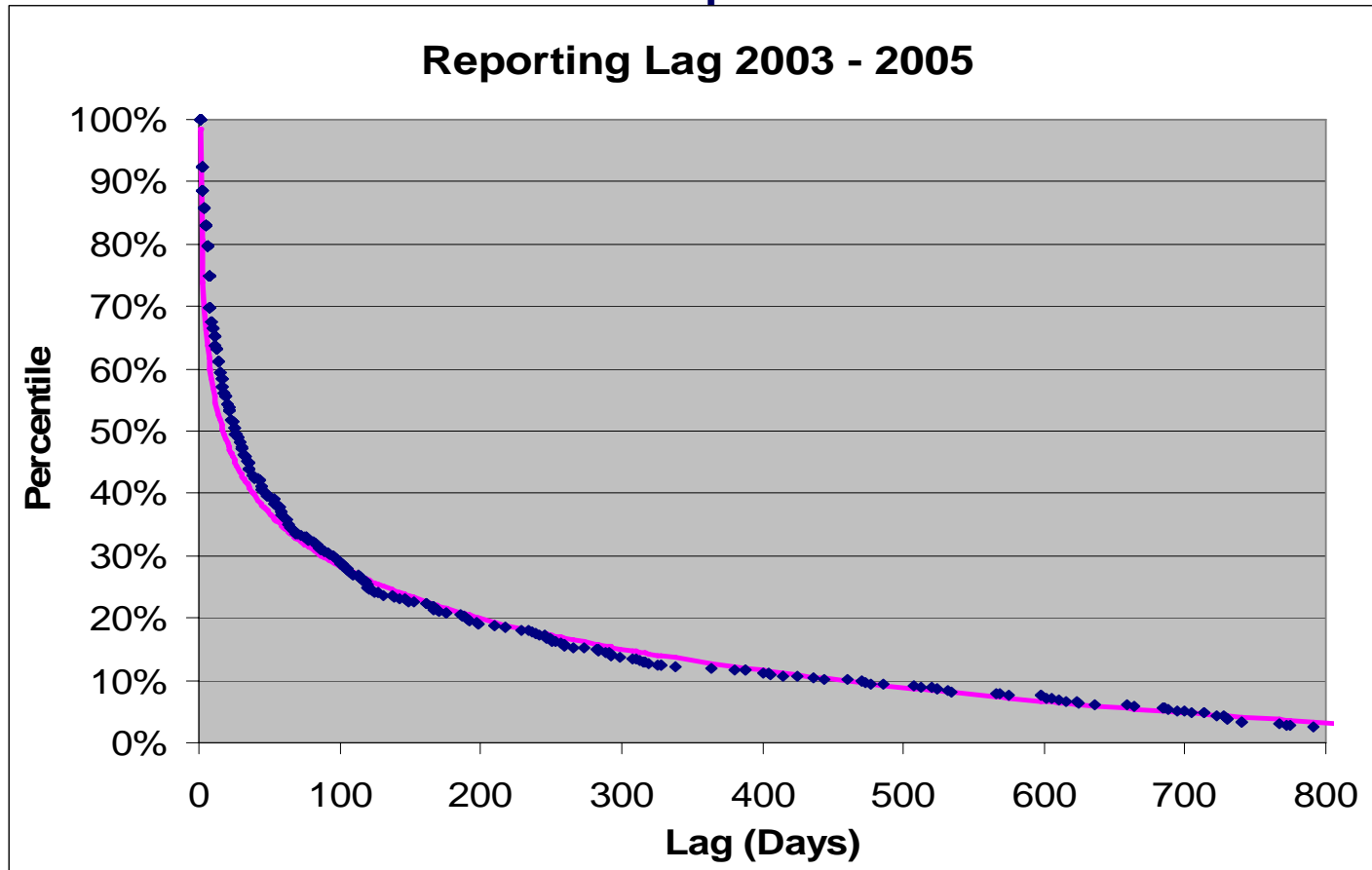


	2001	2002	2003	2004	2005	2006	2007
■ Mutual Fund	1	-	18	21	4	2	2
■ Analyst	5	40	19	1	-	-	-
■ IPO Allocation	312	1	-	-	-	-	-
■ Classic	179	226	187	211	178	113	29

Chart provided by Stanford Securities Class Action Clearinghouse

Overall data 2003-2005

This is a fast reporting line: 50 percent of the claims are reported within a month after the end of the class action period.



Note: Observations were capped at 1000 and those of 0 were changed to 1.

Some pricing examples

	Assets	Market Cap	Type of Industry	Rating	Technical Price
Company A	\$18 B	\$9.8 B	Electric Services	BBB+	\$780,000
Company B	\$21 B	\$9.5 B	Electric Services	BBB+	\$1,600,000
Company C	\$9.4 B	\$9.3 B	Semiconductors	B+	\$2,700,000
Company D	\$1.9 B	\$8.6 B	Semiconductors	B+	\$3,300,000

Pricing is for a primary \$25M limit D&O policy excess of a \$5M SIR

Some pricing examples

Company A and Company B had similar market cap

but...

the volatility of Company B's stock was almost double that of Company A.

Some pricing examples

Equity for Company D is $1/5$ that of Company C;

Volatility for Company D is 50 percent higher than for Company C;

and...

Company C lost 15 percent of its market value in the last two months.

Pros and cons of pricing model

Advantages

- Provides an **objective** measure of the potential exposure.
- Rewards **correct** underwriting **decisions**.
- Allows us to **monitor new business**.
- Provides for **superior risk selection**
- Provides **unique reporting** capabilities
- Used as a portfolio management tool
- Increases **transparency**

Disadvantages

- Brokers...

Additional research

- CFRA, Audit Integrity, Corporate Library
- Board score
- Institutional investors
- Bankruptcy
- M&A activity
- Short position
- D&O index

Bankruptcy procedure

- Based on a study from Harvard University
- Utilizes a similar methodology: option pricing
- Uses a similar set of assumptions and parameters:
 - Volatility – equity vs. assets
 - Market value – equity vs. assets

Bankruptcy procedure

We prefer financially strong companies:

Likelihood of financial distress increases market cap at risk.

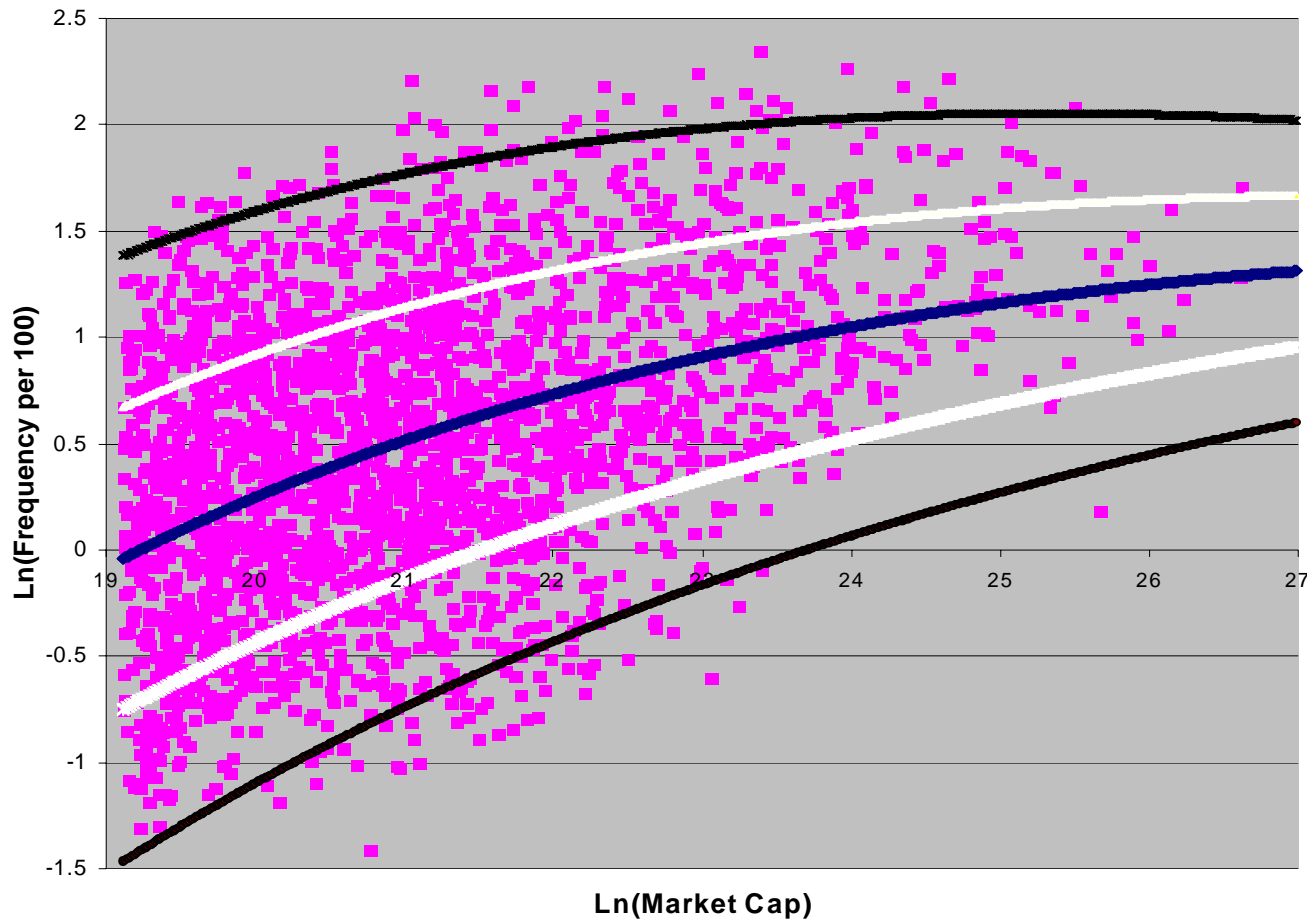
1. Bond holders may participate in a class action suit
2. Outstanding debt may be considered damages

Fundamentally, our bankruptcy procedure evaluates the relationship between the leverage ratio (assets/ equity) and assets volatility. **We calculate and utilize MV of Assets and Equity, not BV.**

D&O Indexing Study -

Exhibit 2

Ln(Actual and Predicted Frequency based on Max Volatility) vs. Ln(Market Cap)

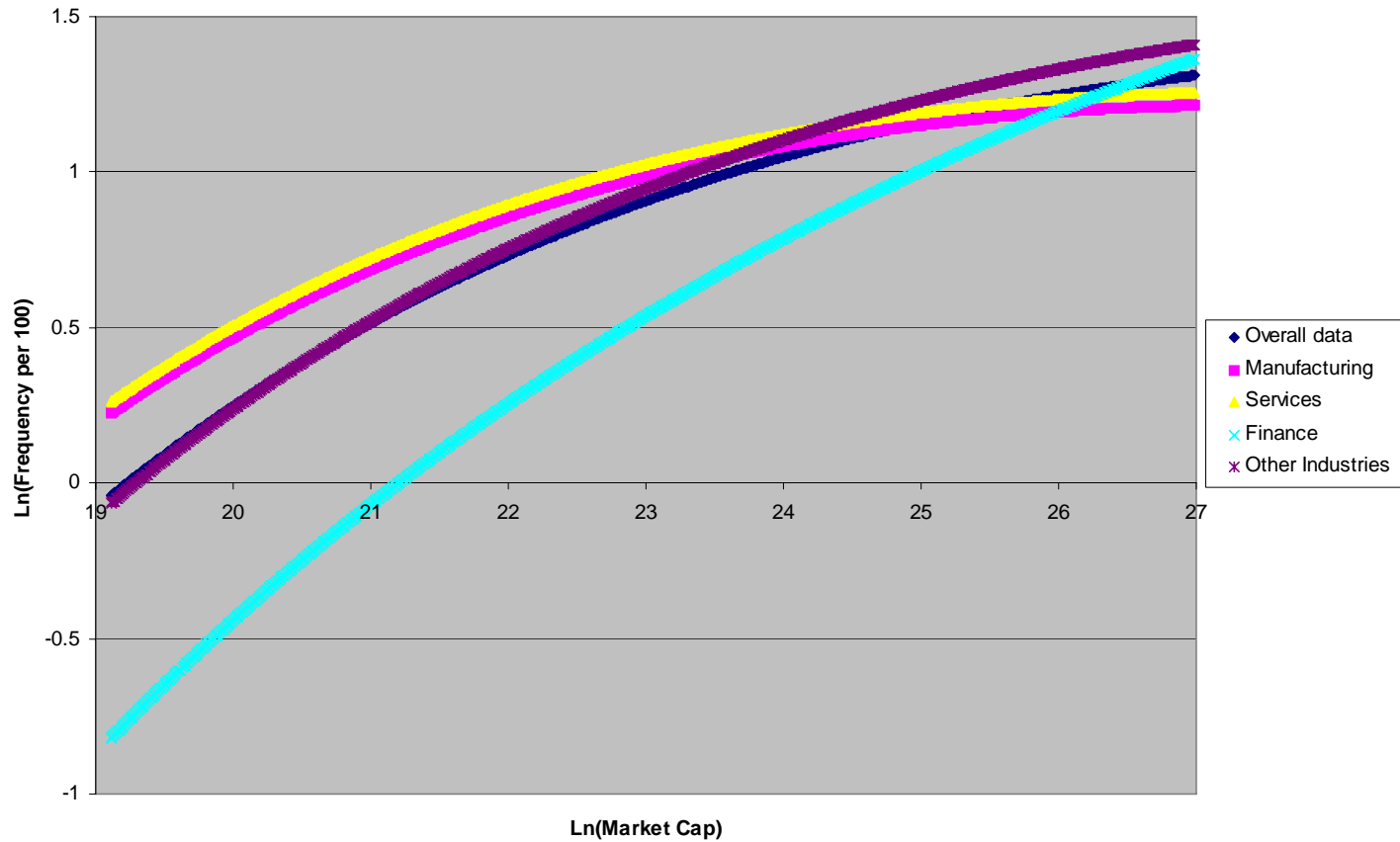


There is an Efficient Frontier in terms of Size-Volatility distribution.

D&O indexing study

Exhibit 7

Ln(Expected Frequency) vs. Ln(Market Cap based on Max Volatility) by Industry



GUY CARPENTER

May 8, 2007

The Broker's Perspective

Reinsurance Broker Perspective

- Even a reinsurance broker can give you a reasonable range of D&O ULR's for the last two accident years
- “Best in Class” more important in soft market than hard
- Attachment point is meaningful

Negatives	Positives
<ul style="list-style-type: none">■ Continued rate softening<ul style="list-style-type: none">–What is the right price? = “I’ll know it when I see my incurred loss ratio in 5 years”■ Dow 13,000 = higher potential damages■ Expansion of coverage■ Increased derivative frequency■ Continued systemic losses = here to stay	<ul style="list-style-type: none">■ Reduced securities class action frequency■ Case law developments■ Claims made form and single year policies = faster corrections■ Increased investment yields■ No E&O coverage for bulge bracket investment banks■ Large net positions

D&O Reinsurance Capacity Comparison

Top Ten Professional Liability Writers

Company	U.S. Professional Liability Premium	2007 R/I Capacity	2004 R/I Capacity
A	4,000,000,000	-	-
B	2,000,000,000	-	10,000,000
C	1,400,000,000	7,500,000	20,000,000
D	1,200,000,000	8,000,000	15,000,000
E	700,000,000	10,000,000	20,000,000
F	700,000,000	12,000,000	15,000,000
G	500,000,000	5,000,000	12,500,000
H	500,000,000	5,000,000	15,000,000
I	400,000,000	2,500,000	7,500,000
J	400,000,000	12,500,000	15,000,000
		62,500,000	130,000,000

>50% reduction over 2004

Lies, Damn Lies, Statistics

- Average 2006 settlement is \$34m¹ (+37% annual trend)
 - Includes all shareholder recoveries, even those recovered from third parties
 - Only non-zero settlements, i.e., no dismissals
 - Dismissals average 30% of filings
 - Does not contemplate insured loss, e.g. Cendant \$3.2b settlement vs. < \$200m D&O program
 - Includes amounts uninsurable
 - Fines, non-cash amounts (options, warrants)
 - Relates back to multiple accident years
- Full disclosure
 - Excludes partial Enron settlement and other complete settlements over \$1 billion (AOL Time Warner, Royal Ahold NV, and Nortel Networks)
 - Does not include defense costs = rising

1. Foster, Todd et al. "Recent Trends in Shareholder Class Action Litigation: Filings Plummet, Settlements Soar," January 2007.

LEAD[®] Model Overview

LEAD[®] D&O Model Overview

Log of Market Value

Exchange

Commercial

- Annual Volatility (T)
- Daily Dollar Volume (T, T²)
- Industry Group
- Days Sales Outstanding (T²)
- **Net Inc. Before Extras** (T^{MV})
- 3 Year Sales Growth (T)
- Gross Margin Growth (T^{MV})
- Tot. Debt as a % of Tot. Equity
- **Share Volume** (T)
- Accrual Decile

Financial Institutions

- Short Interest
- **Gross Margin Growth** (T)
- Net Income Before Extraordinary Items (T²)

Small Technology

- Annual Volatility (T)
- One-Year Change in Institutional Ownership (T²)
- # of 5% Owners
- **% of Shares Held by 5% Owners**
- Shares Held by Insiders
- Number of Institutional Shareholders
- **Shares Outstanding** (T)
- **Book Value** (T)

Non-US

- # of Institutions holding shares
- Net Acquisitions

- Frequency/Severity model for companies with U.S. SEC exposure
- Looked at over 75 variables in four categories
 - Issuer characteristics
 - Financial statement items
 - Ownership
 - Trading characteristics
- Regression-based
 - All variables significant at a 95% confidence level
- Fifth version released in 2005
 - International (ADR and foreign US listed) model
 - Transformed variables

T=Transformed

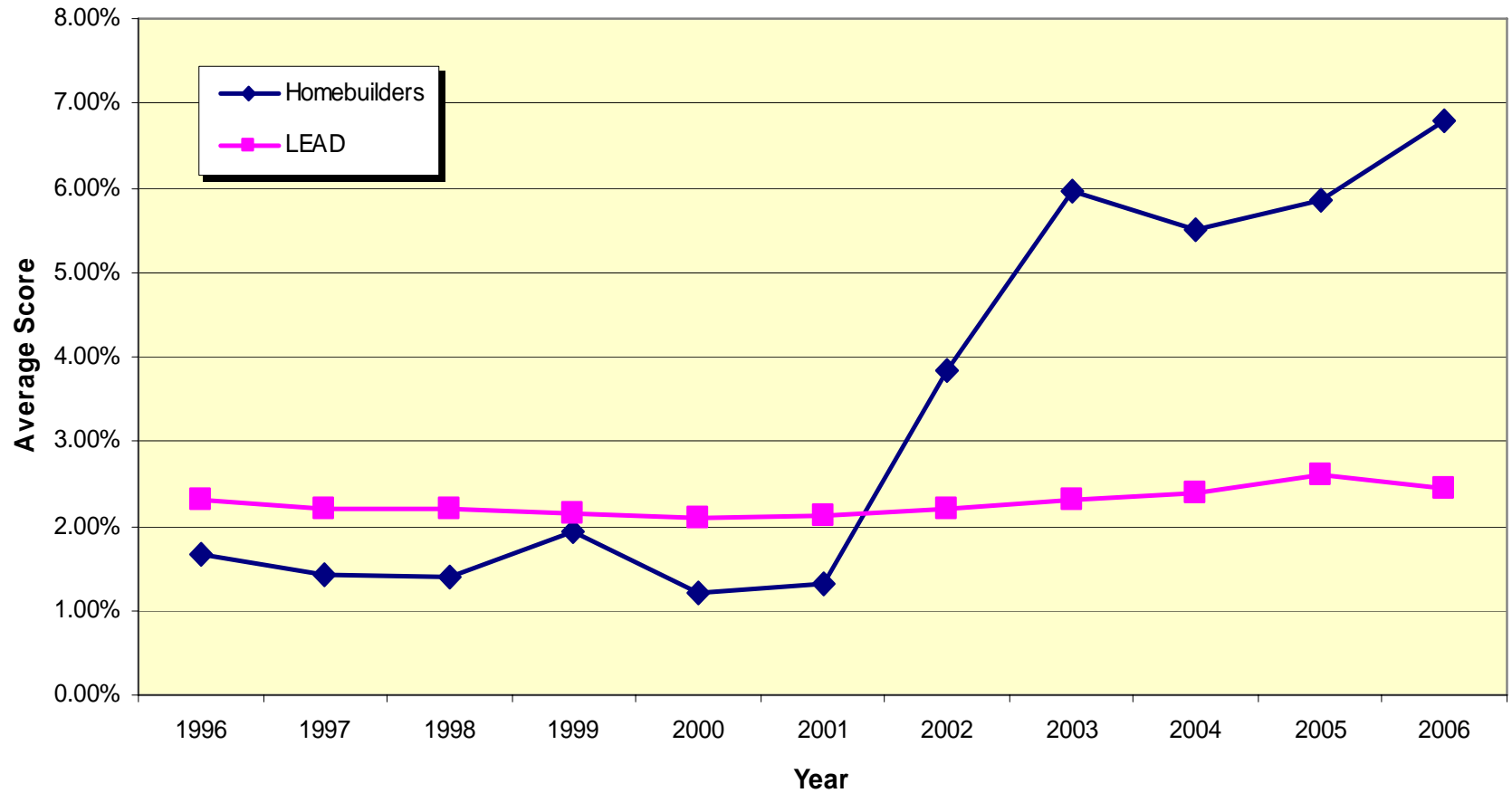
T^{MV} = Transformed, Interacted with Market Value

T² = Transformed, Squared

■ = Negative Coefficient

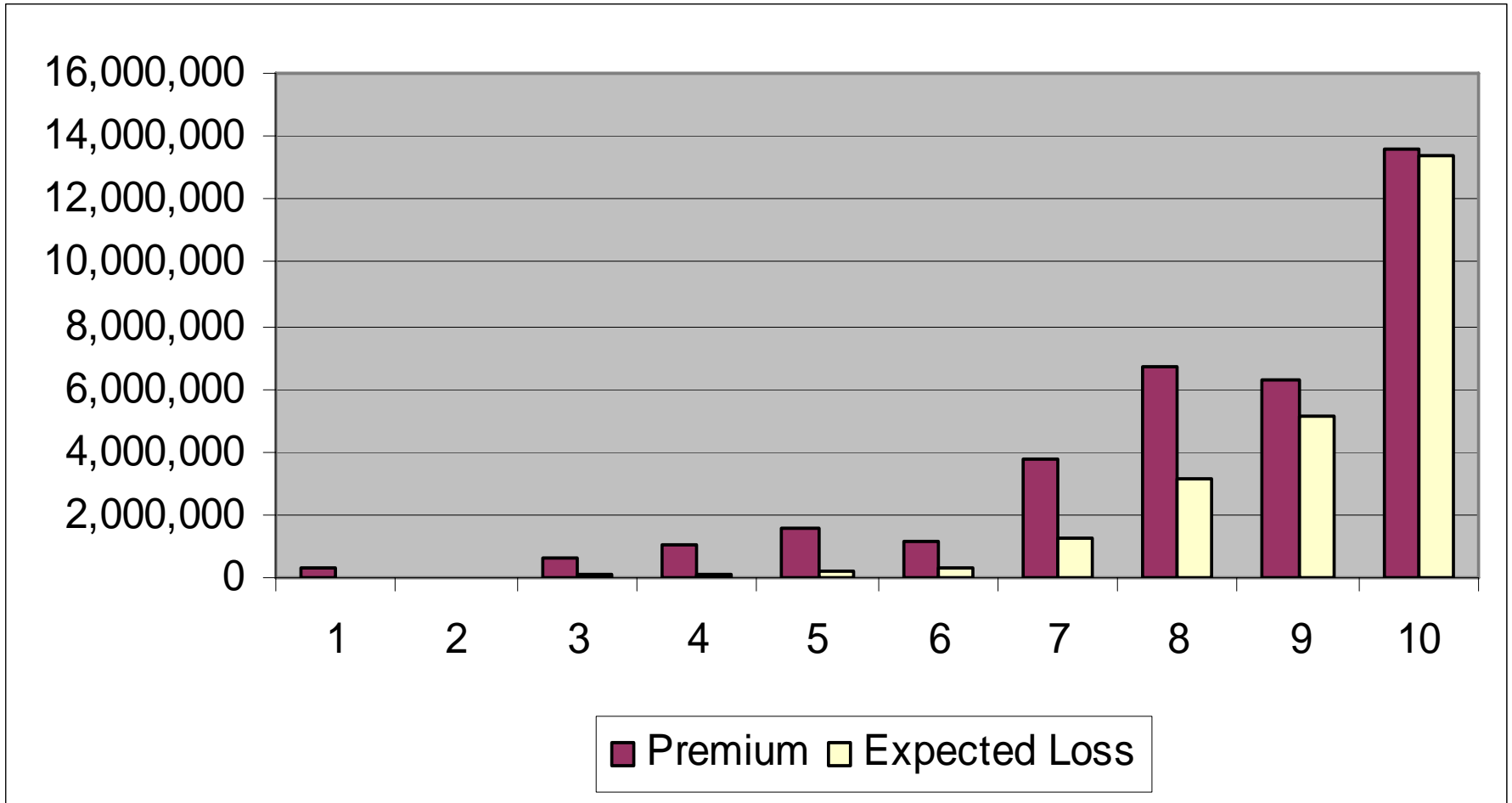
Tracking Systemic Risk

Homebuilders vs. All Companies



LEAD[®] D&O Modeling Results

Decile Analysis



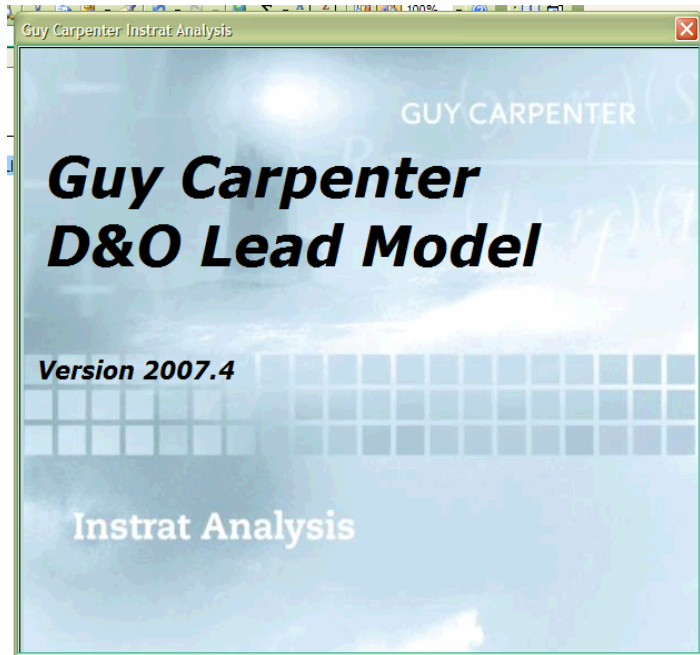
LEAD[®] D&O Modeling Results

Market Share Analysis

Economic Sector	# of Companies	Expected Sector Frequency
Commercial Services	331	7.96
Communications	201	5.38
Consumer Durables	257	8.37
Consumer Non-Durables	281	9.29
Consumer Services	450	12.67
Distribution Services	120	4.49
Electronic Technology	847	23.86
Energy Minerals	236	6.37
Finance	1,399	20.93
Health Services	216	10.77
Health Technology	778	22.24
Industrial Services	240	8.32
Miscellaneous	56	0.32
Non-Energy Minerals	241	6.67
Process Industries	266	5.52
Producer Manufacturing	421	6.30
Retail Trade	259	10.88
Technology Services	531	14.43
Transportation	148	3.75
Utilities	153	6.37
Total	7,431	194.90

Insureds	Expected Frequency	Market Share
5	0.15	1.51%
5	0.11	2.49%
8	0.56	3.11%
4	0.26	1.42%
6	0.39	1.33%
5	0.37	4.17%
53	2.78	6.26%
3	0.13	1.27%
6	0.22	0.43%
2	0.15	0.93%
16	0.79	2.06%
5	0.39	2.08%
0	0.00	0.00%
8	0.39	3.32%
5	0.08	1.88%
8	0.11	1.90%
9	0.51	3.47%
12	0.83	2.26%
4	0.05	2.70%
3	0.11	1.96%
167	8.39	2.23%

LEAD[®] D&O Model



Microsoft Excel - LEAD_TrialVersion_April23.xls

File Edit View Insert Format Tools Data **Lead** Window Help

MS Sans Serif 10 B I U

B1 fx

1 2 3 4 5 6

A B C D E F G H I J K L M N O

User Inputs

TICKER	Pct1	LIMIT1	ATT1	GWP1	Pct 2	LIMIT2	ATT2	GWP2	Limit	Total GWP	Prem Per Mil
AAC	1	1,000,000	500,000	1,000,000	1	1000000	500000	1000000	2000000	2000000	1000000
AAA	1	1,000,000	500,000	1,000,000	1	1000000	500000	1000000	2000000	2000000	1000000

Lead menu options:

- User Options
- Individual Insured
- Import Portfolio File
- Save Portfolio File
- Portfolio Mode
 - Create Summary Exhibits
 - Create Graphs
 - Create Both

D&O Pricing Approaches and Market Update

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