

Perspectives on the Financial Crisis and P&C Enterprise Risk Management

Paul J. Kneuer, FCAS
CAS Spring Meeting
New Orleans

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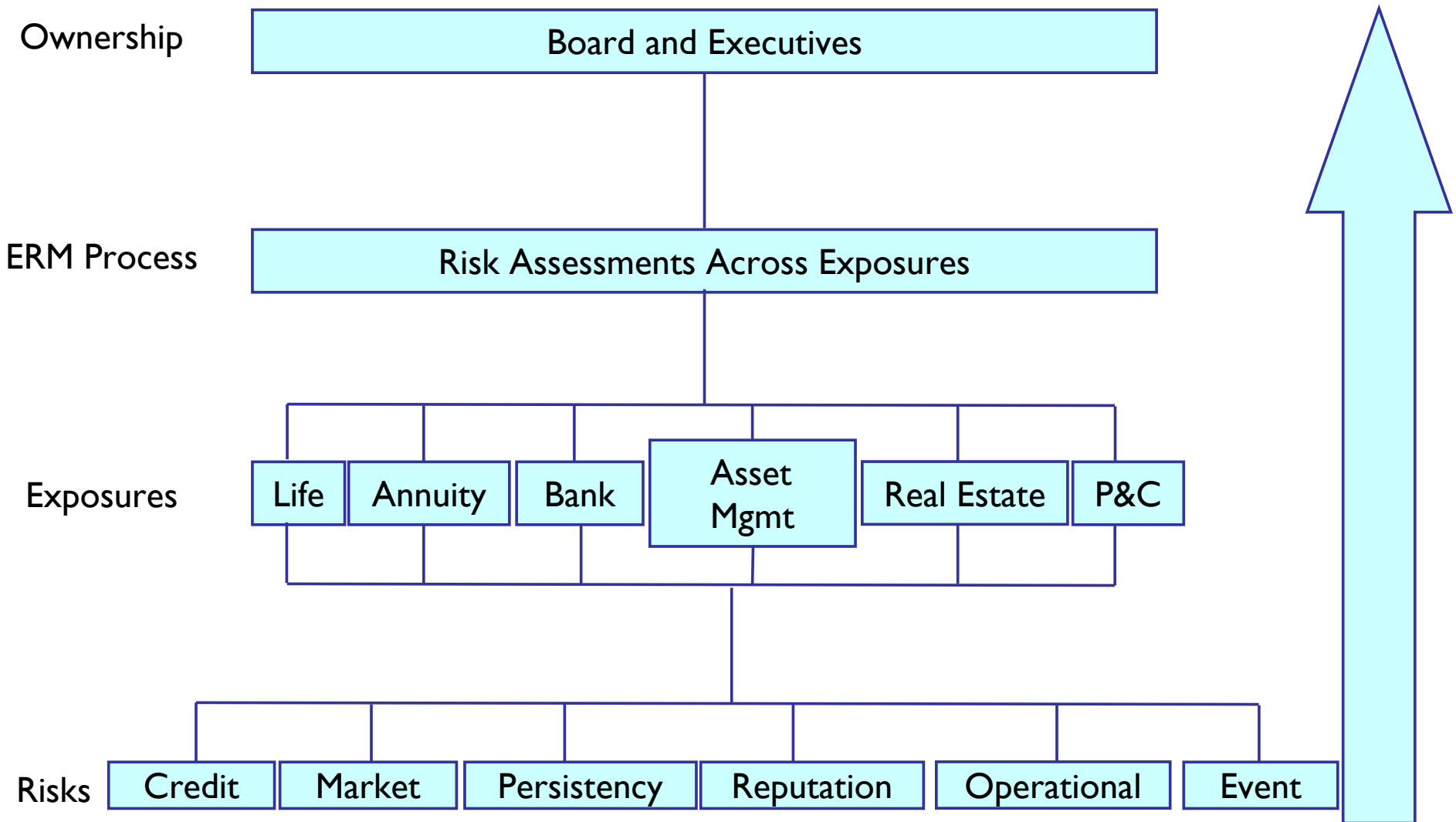
May 4th – 6th, 2009

Observations

- What ERM looks like
- ERM: how did we get here?
 - *Some ideas that look similar, but aren't*
- The crisis: what were the problems?
 - *Some ideas that look different, but aren't*
- P&C context
- Some thoughts on going forward

What ERM Looks Like

Take Cross-Silo Views



What ERM Looks Like

Two Families of Practice

Who?

US
P&C
One Business

EU
Bancassurance
Multi-business

What?

Process
Controls

Cat

Capital standard

Descriptive

Position
Measures

C3/ALM

Risk of ruin

Prescriptive

What ERM Looks Like

- ERM can address a firm's risk of ruin
- A common measure, VAR, is measured in dollars
- Banks use a daily timeframe
- Recent sample from a global institution

What ERM Looks Like

Recent Sample from a Global Institution

I-in-250 Year Risks as % of Capital	Current	Prior	Peak Daily Values:	
	Year end	Year end	Highest	Lowest
Interest rate risk	17.0%	8.5%	21.7%	5.8%
Equity price risk	8.8%	3.5%	14.0%	3.7%
Foreign exchange risk	1.9%	0.9%	2.8%	0.9%
Commodity risk	2.3%	1.1%	2.8%	0.7%
Diversification benefit	-8.1%	-4.4%	-14.0%	-2.7%
Percent of Capital Exposed	21.9%	9.5%	27.4%	8.5%

Notes:

Percent of latest year-end capital

For consistency with insurance reporting, daily figures restated as 1-in-250 year exceedence levels

Original results are simulations by reporting company, based on historical price volatility

Implied risk of ruin is 0.06% per year

What ERM Looks Like

VAR is Counted in Dollars

I-in-250 Year Exceedence Amounts	Current	Prior	Peak Daily Values:	
	Year end	Year end	Highest	Lowest
Interest rate risk	\$ 3,817	\$ 1,909	\$ 4,891	\$ 1,312
Equity price risk	1,988	795	3,141	835
Foreign exchange risk	437	199	636	199
Commodity risk	517	239	636	159
Diversification benefit	(1,829)	(994)	(3,141)	(596)
Value at Risk	\$ 4,931	\$ 2,147	\$ 6,164	\$ 1,909

Notes:

\$ Millions

Year end capital was \$22,490 Million

To convert from daily to 250-year results, assumed Pareto with $q = 1.25$, daily "random walk".

What ERM Looks Like

Banks Use a Daily Timeframe

I-in-100 Daily Value at Risk	Current	Prior	Peak Daily Values:	
	Year end	Year end	Highest	Lowest
Interest rate risk	\$ 96	\$ 48	\$ 123	\$ 33
Equity price risk	50	20	79	21
Foreign exchange risk	11	5	16	5
Commodity risk	13	6	16	4
Diversification benefit	(46)	(25)	(79)	(15)
Value at Risk	\$ 124	\$ 54	\$ 155	\$ 48

\$ Millions

Source:

*Lehman Brothers Holdings, inc. 2007 10-K
MD&A, page 71: "Risk Management"*

What ERM Looks Like

Use of Economic Capital to Make Business Decisions

- Calculate VAR, RBC or BCAR, etc. contributions from individual operations
- Compute marginal capital and marginal profit by operation
- Rank operations on profit/capital
- “Grow the winners.”

ERM: How Did We Get Here?

Some Ideas that Look Similar, But Aren't

- Basel Accords
- COSO
- VAR

ERM: How Did We Get Here?

Some Ideas that Look Similar, But Aren't

- Basel Accords – Internal measurements
- COSO – Public company governance of risk
- VAR – Business unit roll ups

The Crisis: What Were the Problems?

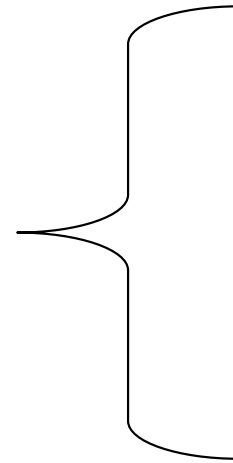
Some Ideas that Look Different, But Aren't

- Model specification risk
- Non-independence
- Market “Bubbles”
- “Black Swans”

The Crisis: What Were the Problems?

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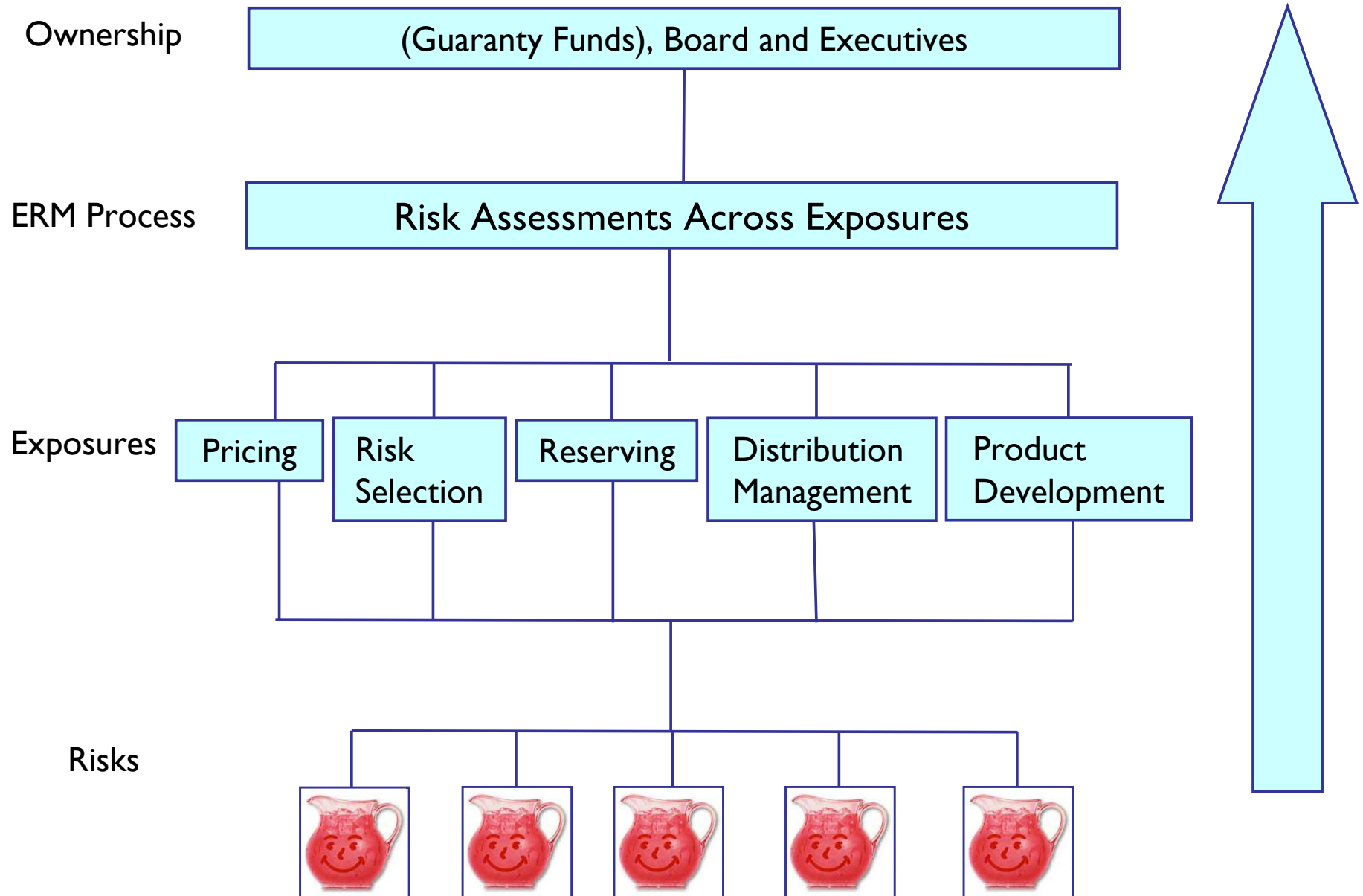


Since not i.i.d.,
aggregate result isn't
anything like a
normal.

“Extremistan”

- “Driving through the back window” ($f' = -f$)
- Industry and company both have reaction lags
- Under-reserving forces bad pricing, risk selection, distribution management and planning
- The cycle killed off more P&C companies than Cats, credit, operational failures and ALM combined

Silos That Matter in P&C



Looking Forward

Economic capital models:

- Understate the risk of ruin, but do give a floor measure
- Are objective
- Can provide a relative measure inside a company

But:

- Need to reflect a wider view of risk: Cycles or bubbles

Charges for Cycles in Risk Models

If $f' = -f$, cycle response is a sine function. Risk level is:

$$R(t) = a(1 + \cos(bt+c))$$

a = amplitude (observed, guessed)

b = period (guessed)

c = time since last trough (observed)

$$\text{Risk Charge} = dR/db = a(1 - \sin(bt+c)) \cdot b$$

Risk charge for cycles should reflect both your estimate of the amplitude (a) and how long you think the period is (b).

For Comments or Questions:

Paul Kneuer

www.holborn.com

212-797-2285

SOA/CAS call paper:

<http://www.soa.org/library/essays/rm-essay-2008.pdf>

Holborn Whitepaper:

<http://www.holborn.com/holborn/newsCreditTroublesandtheReinsuranceMarket.html>