

UNEP FI North American Taskforce Event – Managing Climate Change Risks: The Case of Cat Bonds

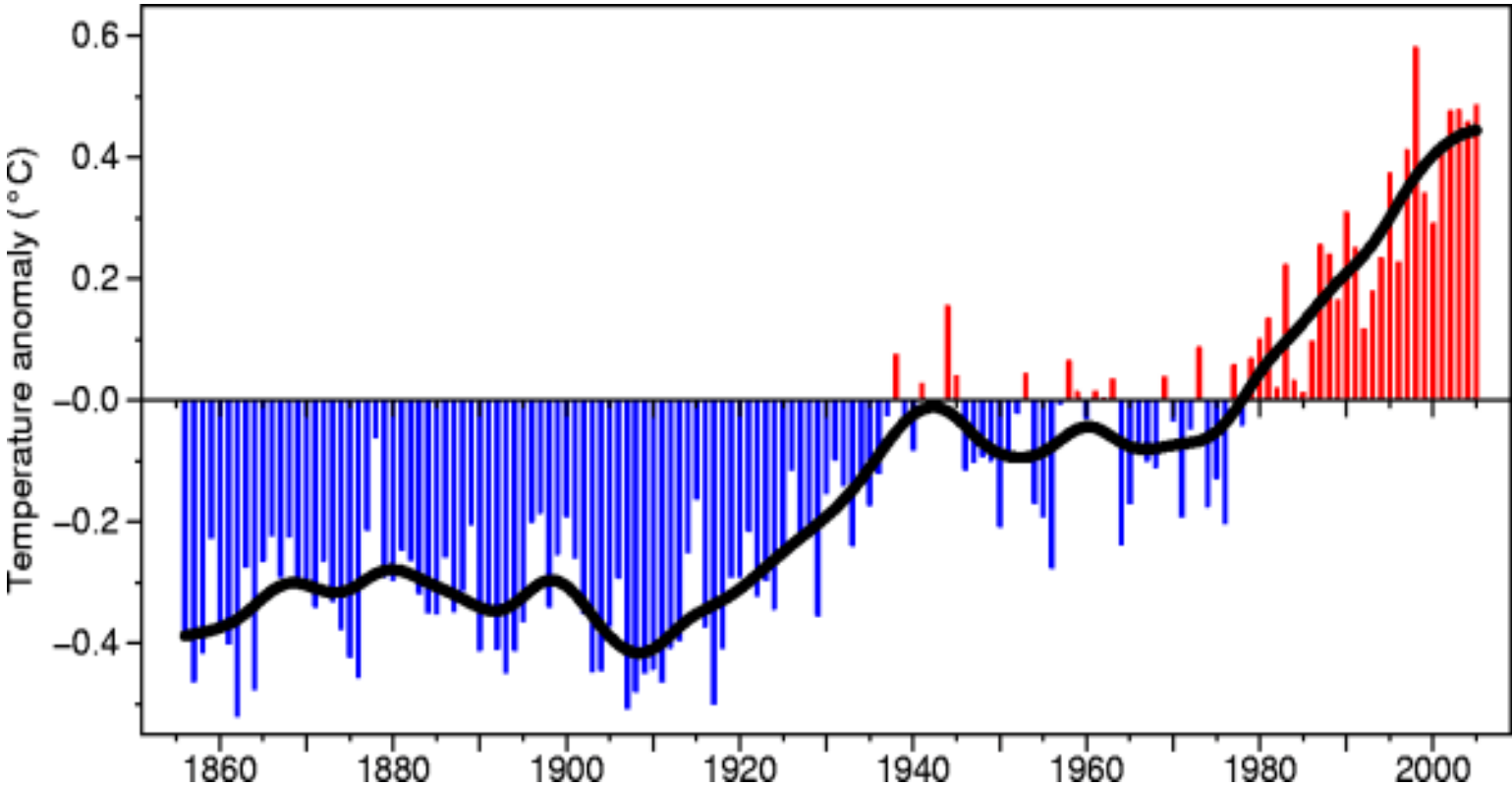
New York, October 23, 2006



MACM
Munich Re Group



Climate Change is a Fact



2005:
+0,47°C
above the
1961-1990
annual
mean.

Source: CRU, UK (2006), compilation acc. to WMO



Greenhouse gases



Air and sea temperature



Humidity



Sea level



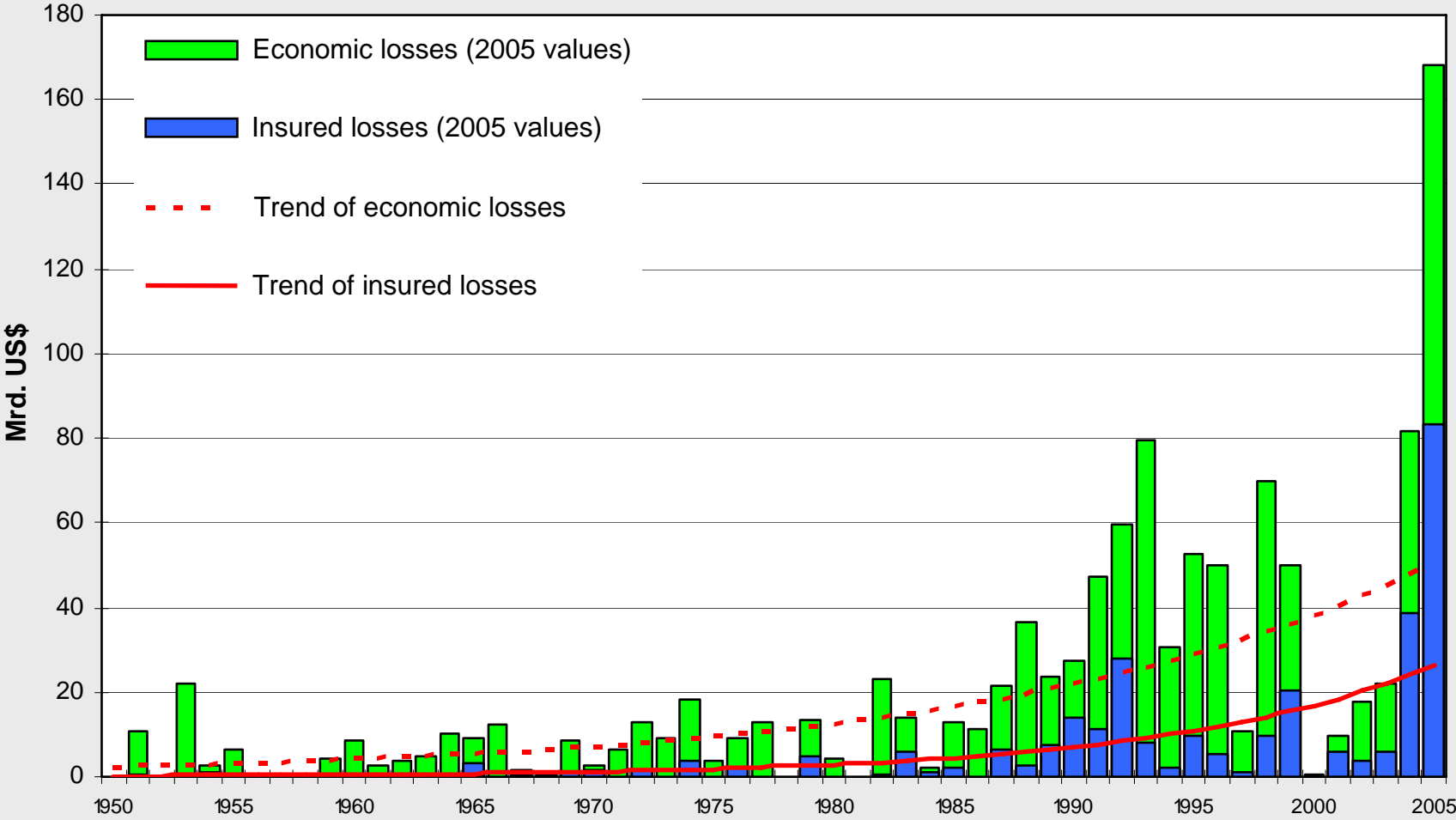
More extreme weather events

- Wind, hail, rain
- Drought

Important:

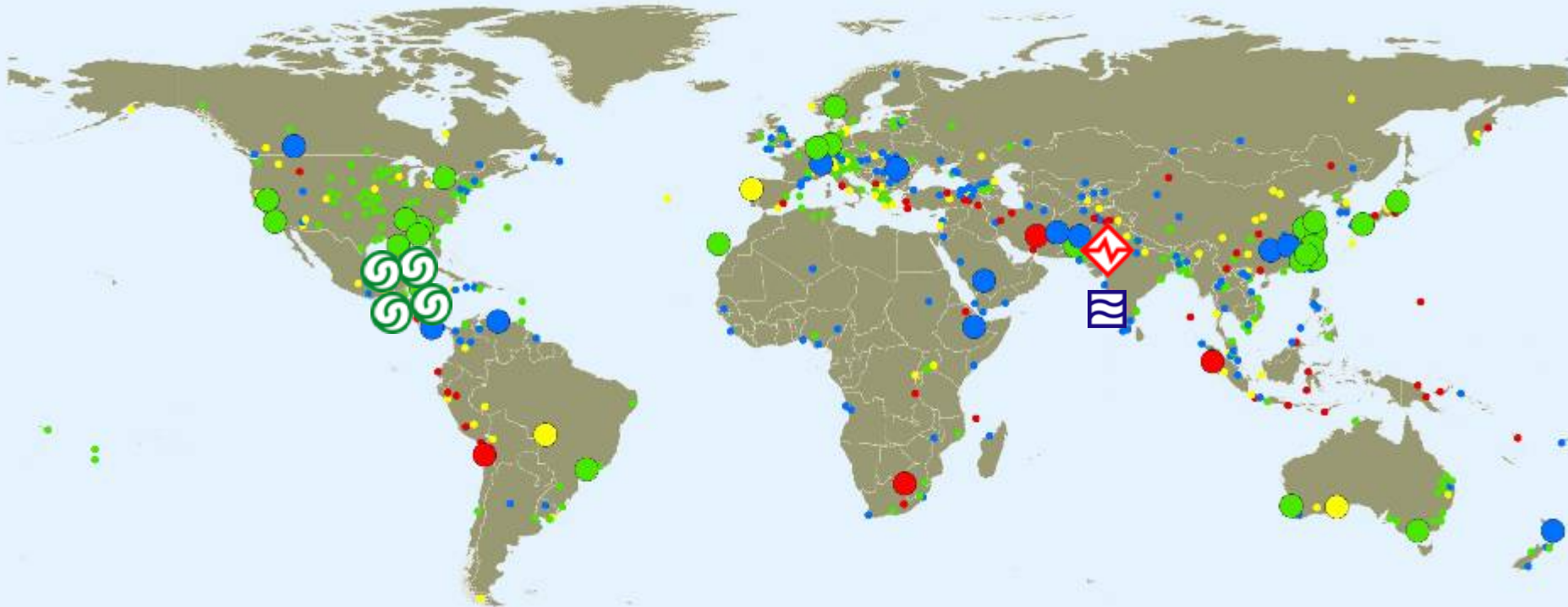
- More frequent events
- Stronger events

Great Weather Disasters 1950 – 2005







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World Map of Natural Catastrophes 2005



2005: 650 natural catastrophes

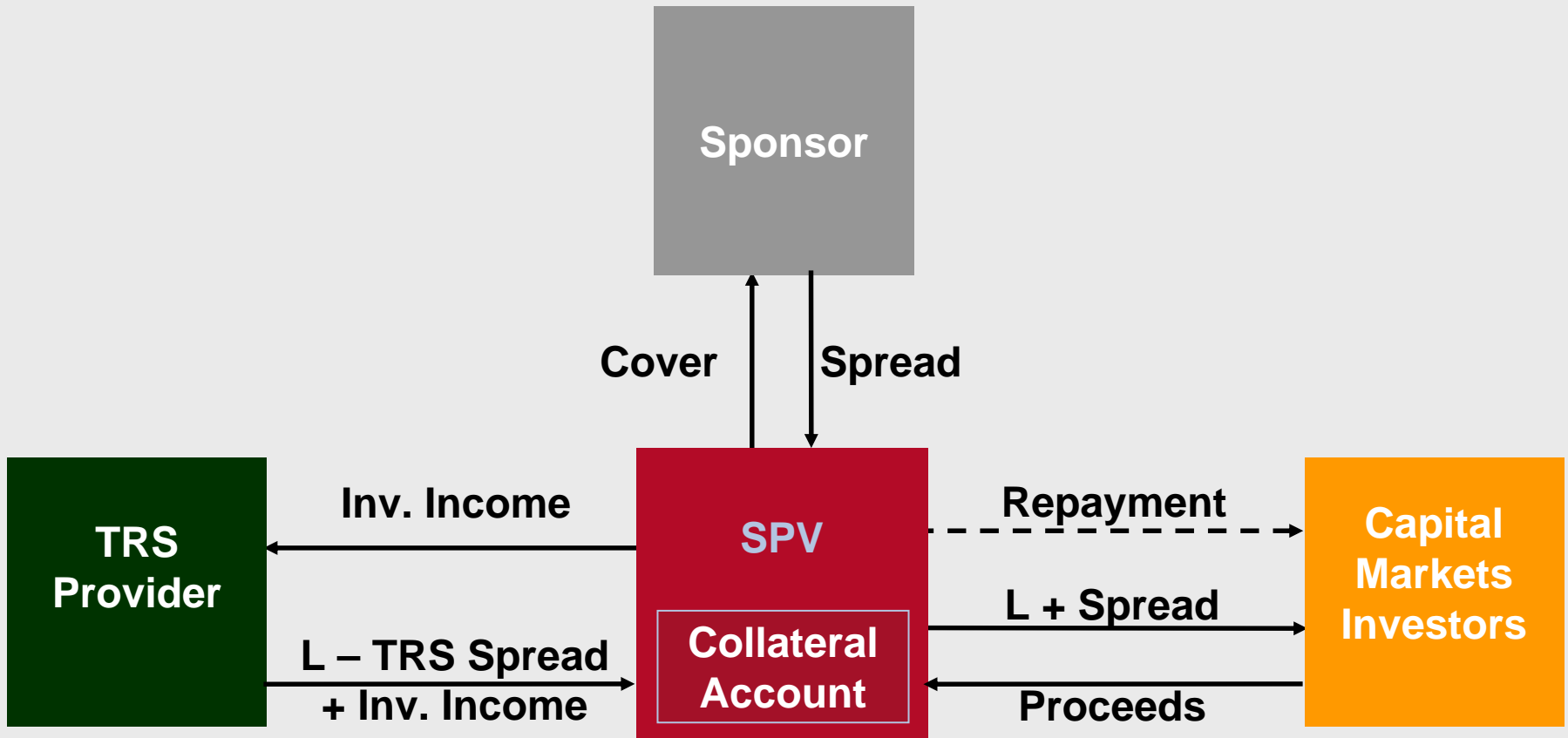
- Major natural catastrophe
- Great natural catastrophe

-  ● Earthquake, tsunami, volcanic eruption
-  ● Windstorm
-  ● Flood
-  ● Temperature extremes (i.e. heat wave, forest fire), Mass movements (i.e. avalanche, landslide)

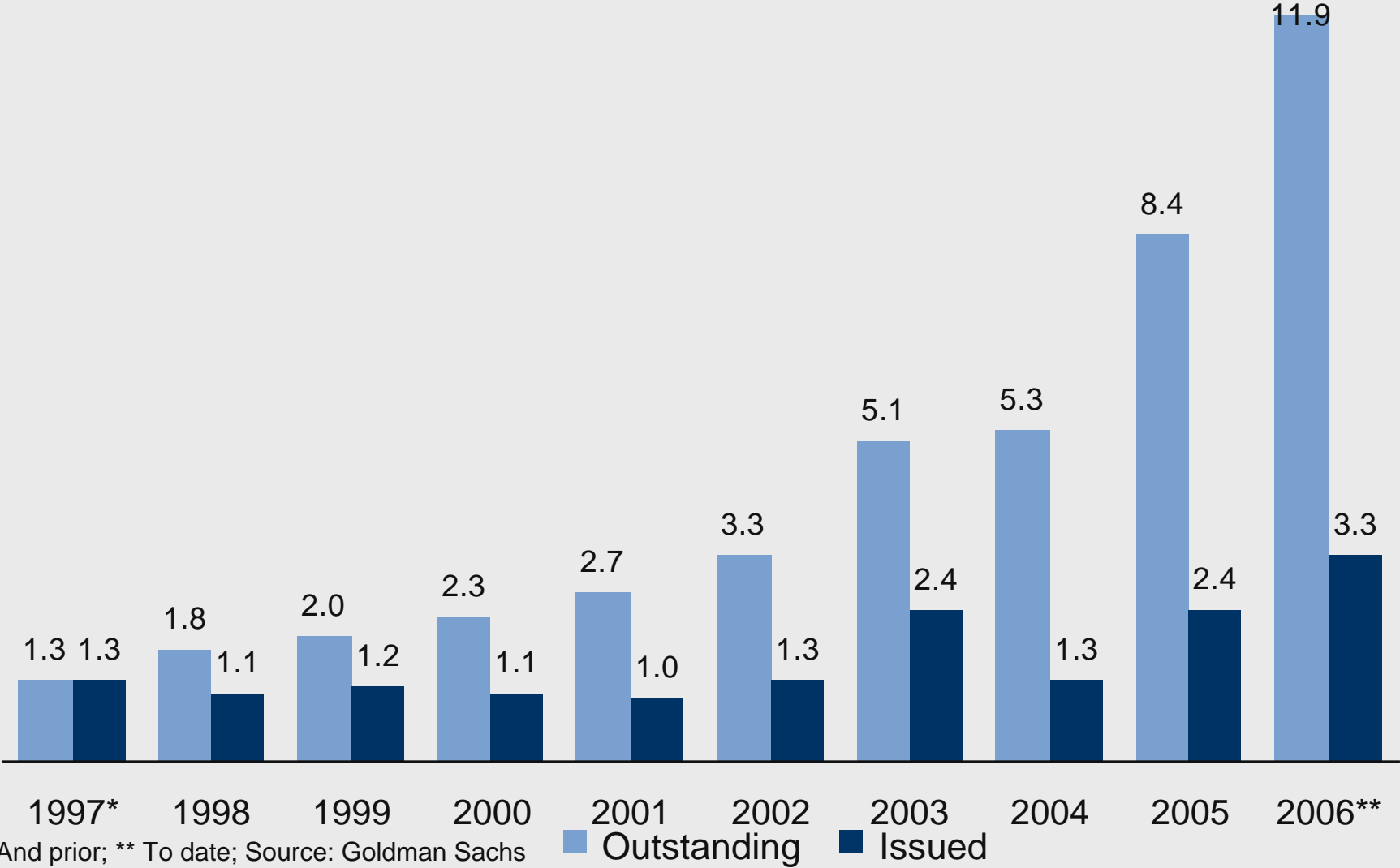
How to Prepare for Increasing Cat Risks?

- Development of new risk models considering climate change
- Adequate pricing
- Substantial deductibles, based on the respective exposure
- Loss prevention
- Exclusion of certain hazards
- Exclusion of particularly exposed areas
- Private-public partnership
- Cat Bonds

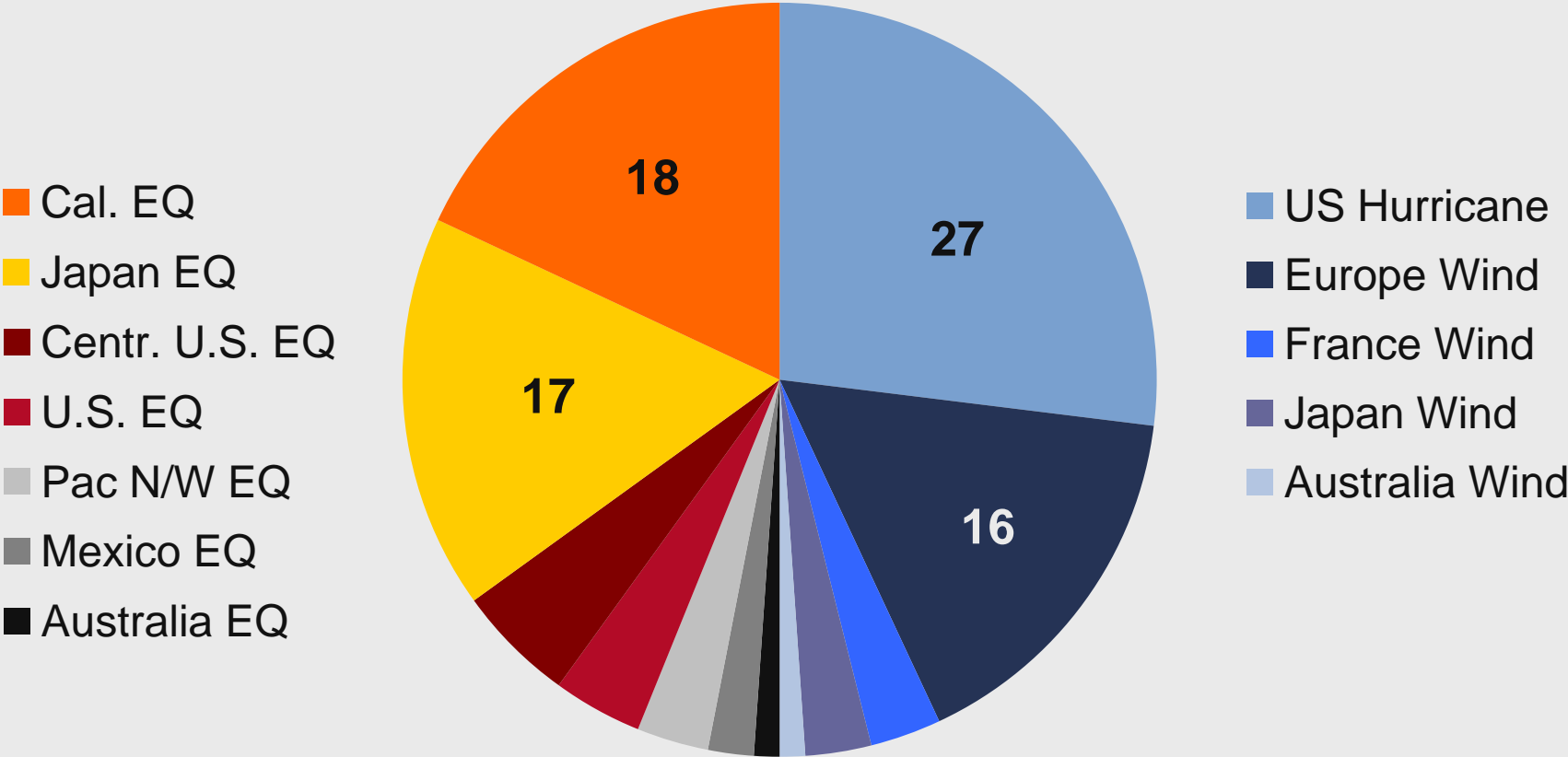
Transaction Structure



Outstanding Volume and Issuance per Year

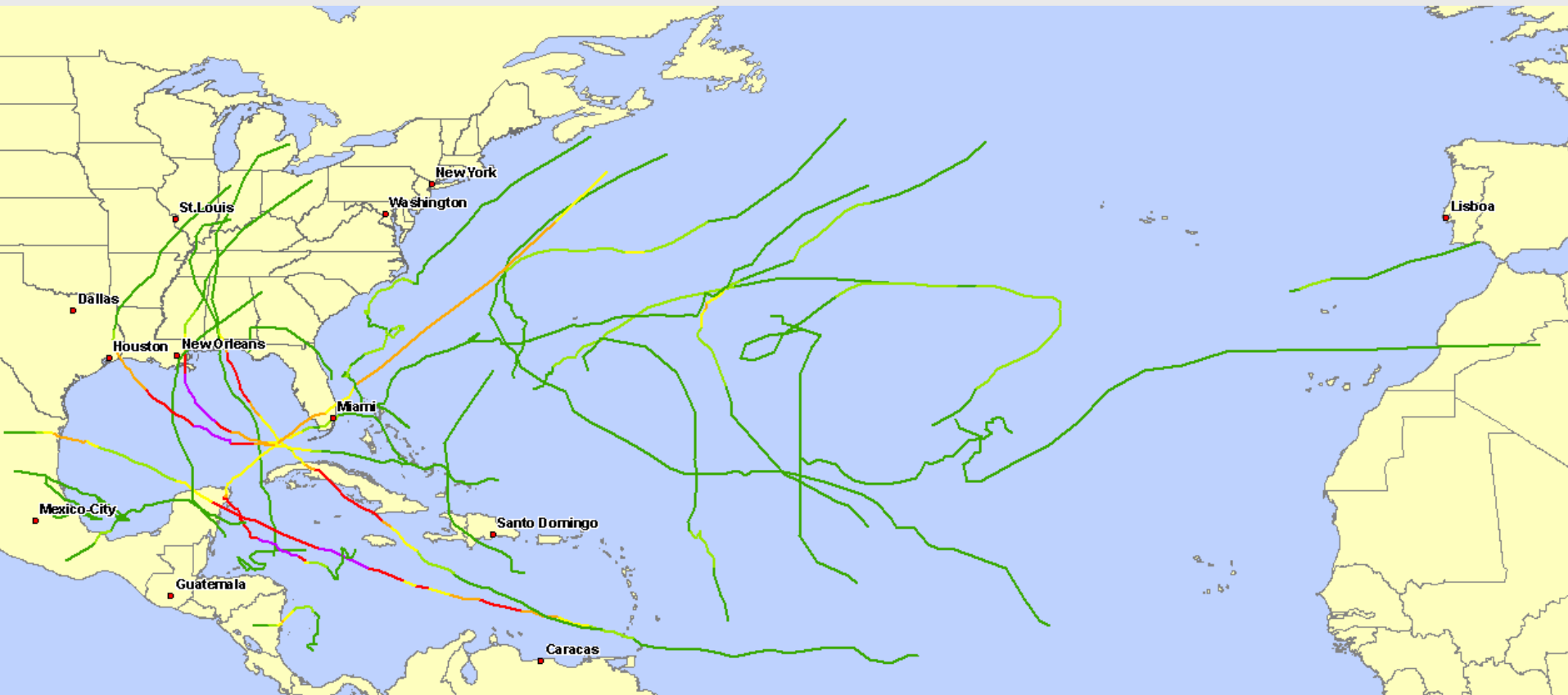


Nat Cat Risks Transferred to Capital Markets



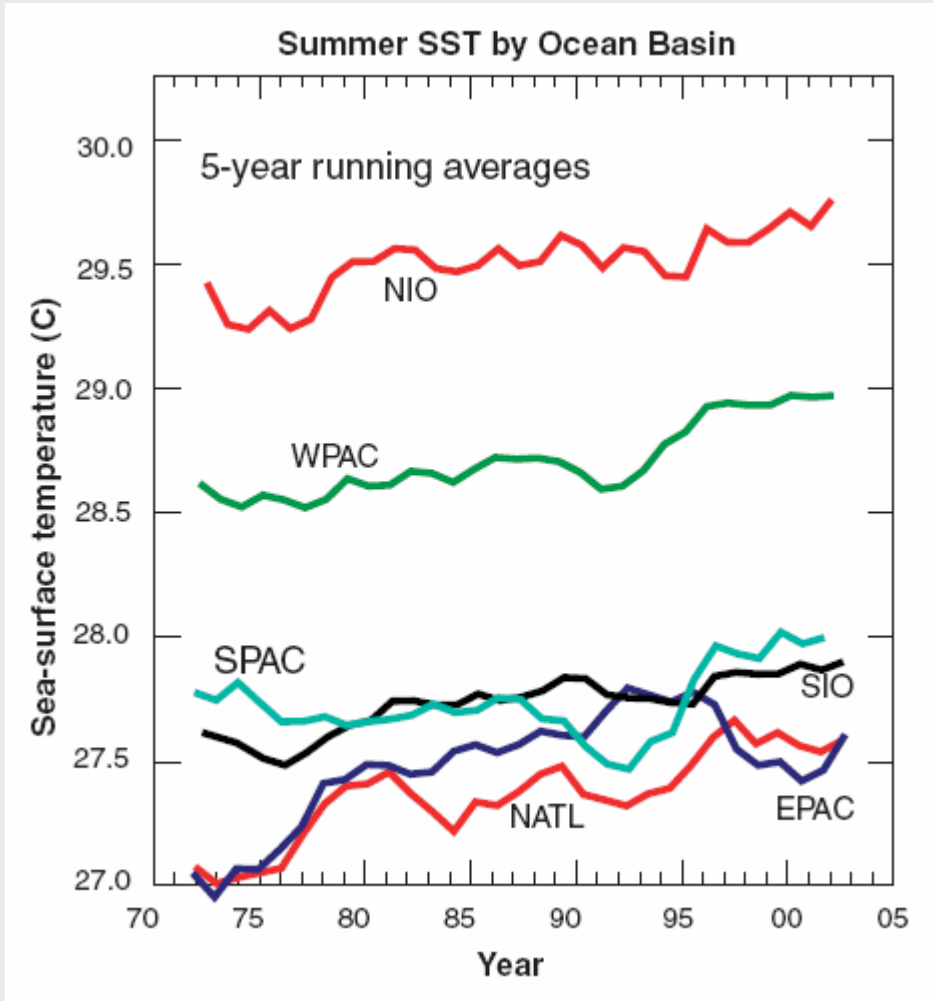
2005 – A Year of Weather Extremes

- Never before since the beginning of records (1850) have so many named tropical storms occurred in the North Atlantic basin in one season: 27, of which 15 with hurricane strength*



* Old absolute record 21 in 1933, resp. 12 in 1969.

Changes in the Sea Surface Temperature



NATL: North Atlantic

WPAC: West Pacific

SPAC: South Pacific

EPAC: East Pacific

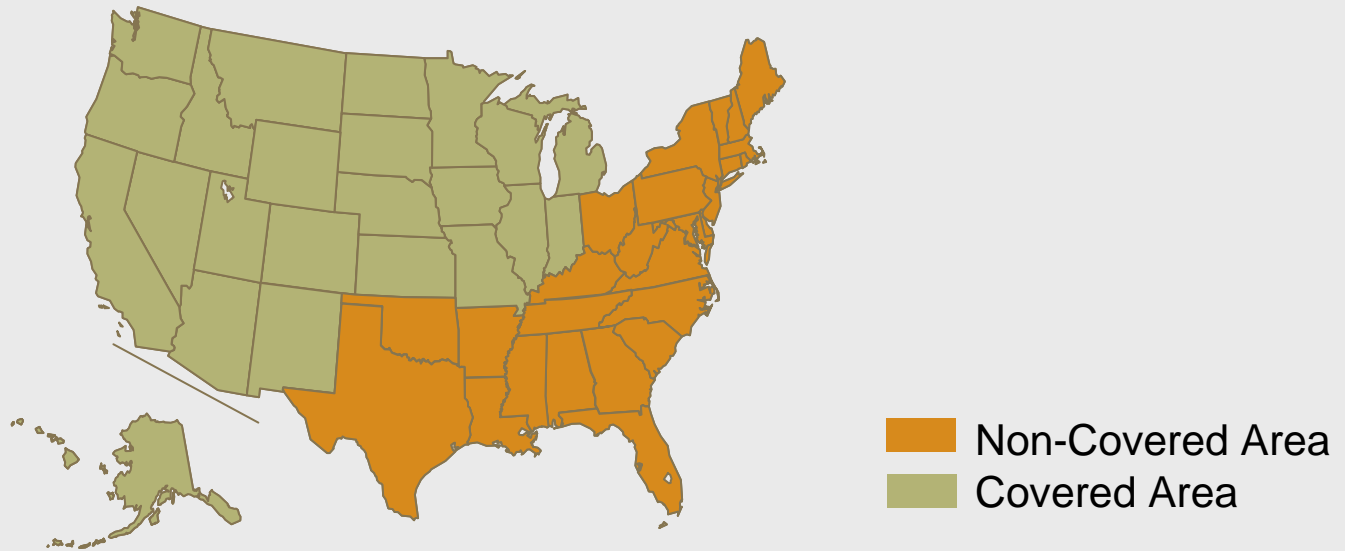
NIO: Northern Indian

SIO: Southern Indian

Source: Webster et al. (2005), Science Vol. 309.

Industry Exposure – Region / Coverage Type

	Florida	N.E.	Texas	Gulf	S.E.	Mid-Atlantic	Inland State	Total
Resi	1,222	3,406	1,356	722	1,602	1,329	3,271	12,907
Comm	1,343	4,314	1,668	836	1,569	1,181	3,225	14,137
Mobile	43	19	37	36	63	13	69	279
Auto	124	241	176	91	177	106	313	1,227
Total	2,732	7,980	3,236	1,685	3,411	2,628	6,878	28,549



Source: AIR Worldwide; Insured Industry Portfolio; in USD bn

Hurricane Frequency Sensitivity Analysis I

Class Notes	Base Case		
	P(A)	E(L)	P(E)

Class Notes	Sensitivity Case		
	P(A)	E(L)	P(E)

A	1.97	1.79	1.60
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A	2.97	2.69	2.46
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B	2.59	2.28	1.98
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B	3.77	3.33	2.97
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C	3.34	3.02	2.61
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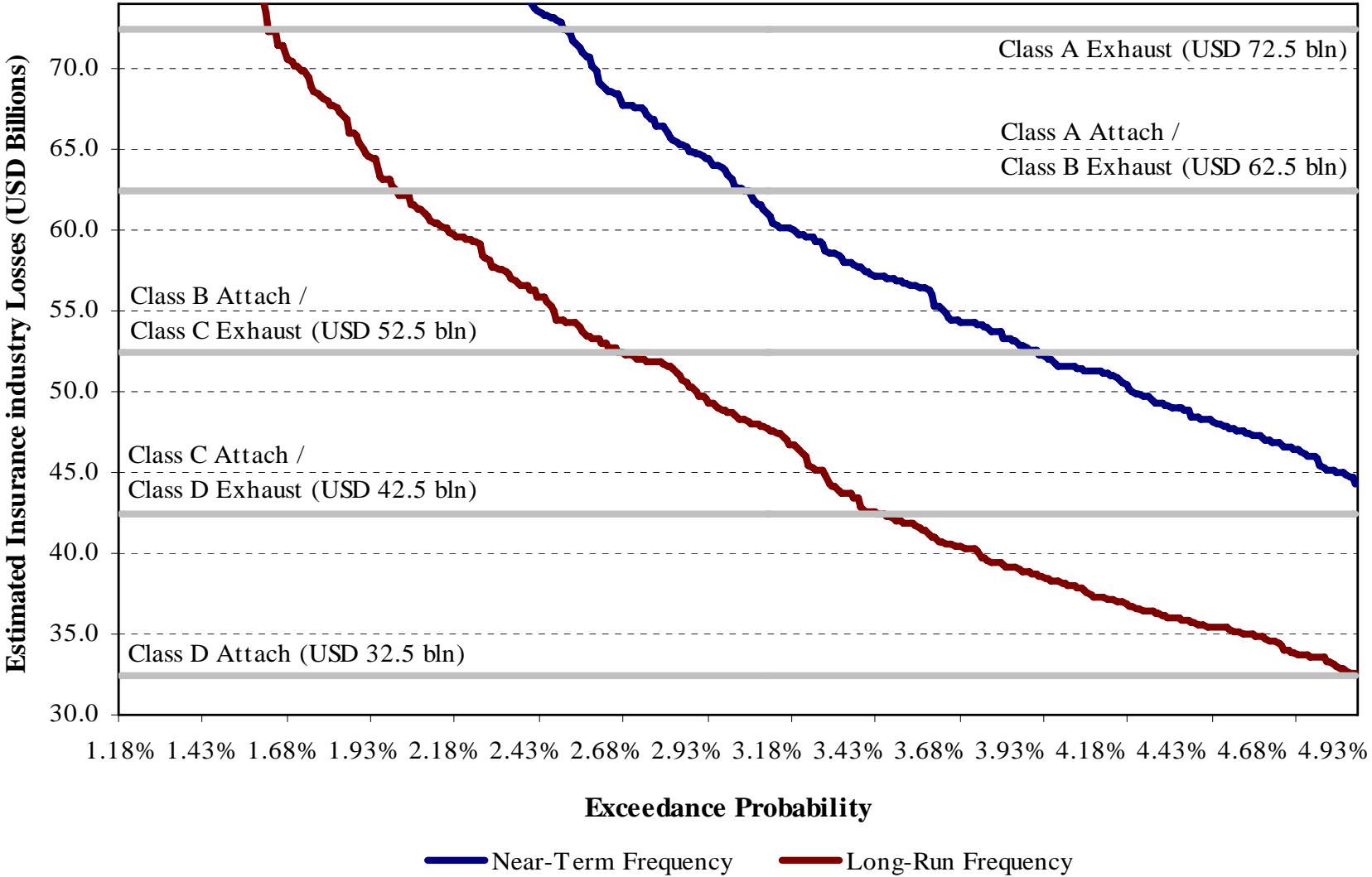
C	4.92	4.34	3.79
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D	4.65	3.97	3.35
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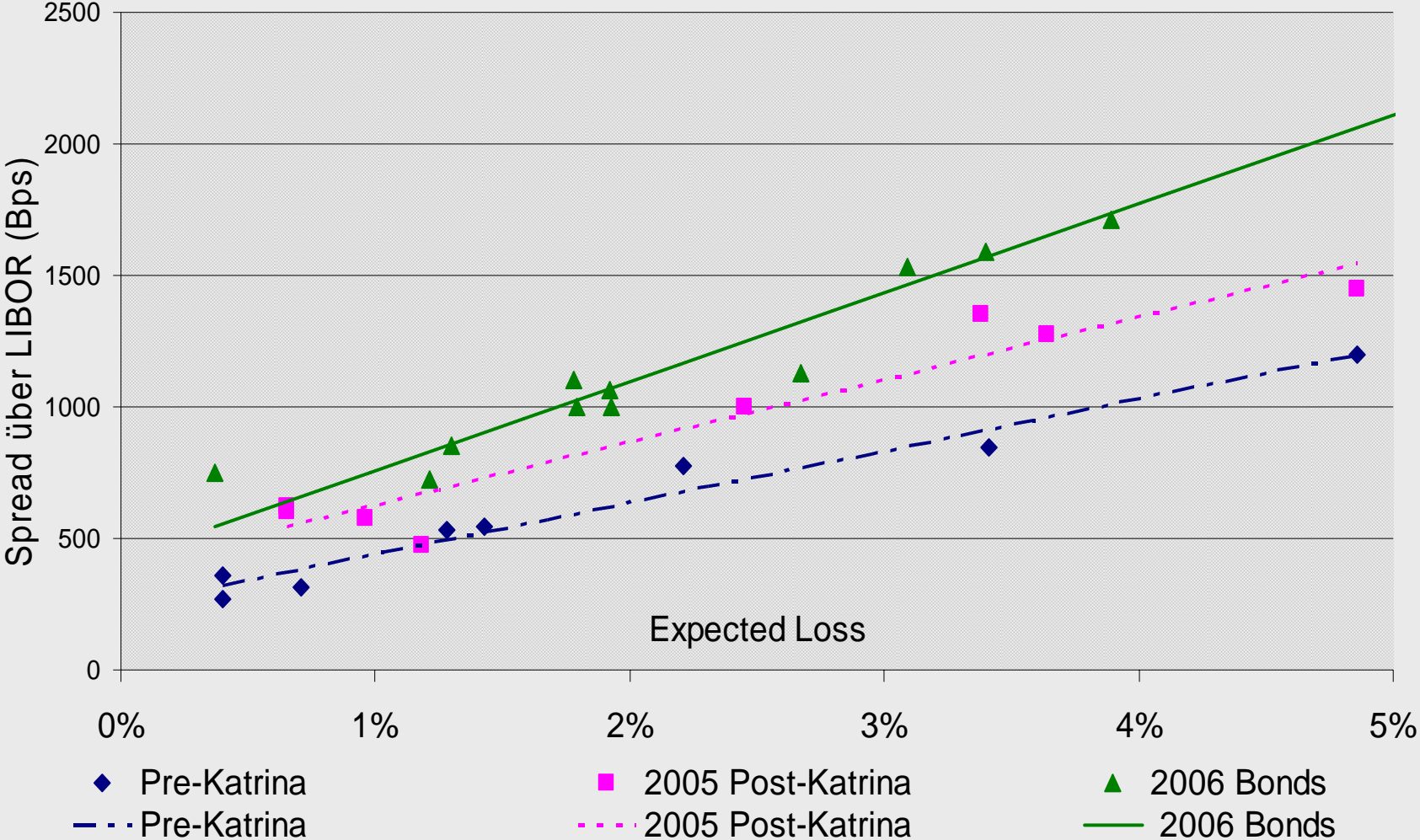
D	6.76	5.81	4.96
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All numbers in %

Hurricane Frequency Sensitivity Analysis II



Hurricane Cat Bond Pricing





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