產險業對自然災害之因應與對策

中央再保險股份有限公司

財產再保業務本部 林正彥

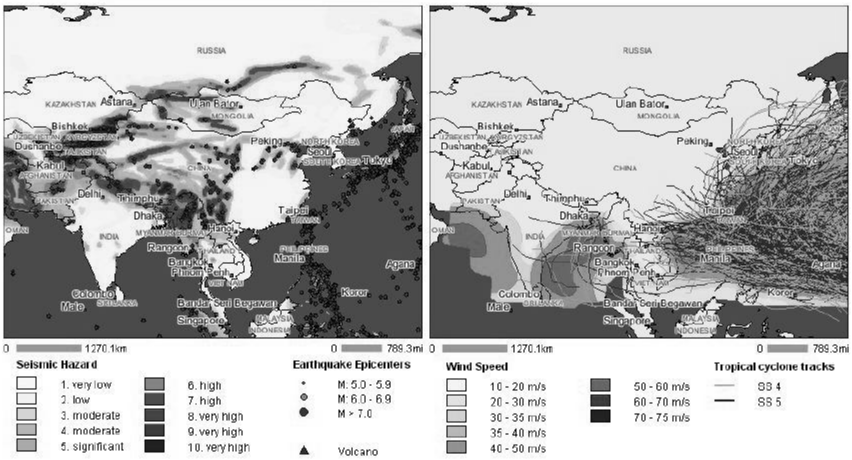
2013.3.27.

天然災害類型(Natural Perils)

Forces of nature; no human intervention

- Cave-in
- Collapse
- Drought
- Earthquake
- Evaporation
- Erosion
- Fire of natural origin
- Flood
- Hail
- Humidity extremes
- Ice
- Landslide/ mudslide
- Lightning
- Meteros
- Mildew
- Mold
- Perils of the air (such as icing and clear-air turbulence)
- Perils of the sea (such as icebergs, waves, sandbars, and reefs)
- Rot
- Rust
- Sand storm
- Temperature extremes
- Tides
- Tidal waves
- Uncontrollable vegetation
- Vermin
- Volcanic eruption
- Water
- Weeds
- Wind (tornado, hurricane, typhoon, and tempest)

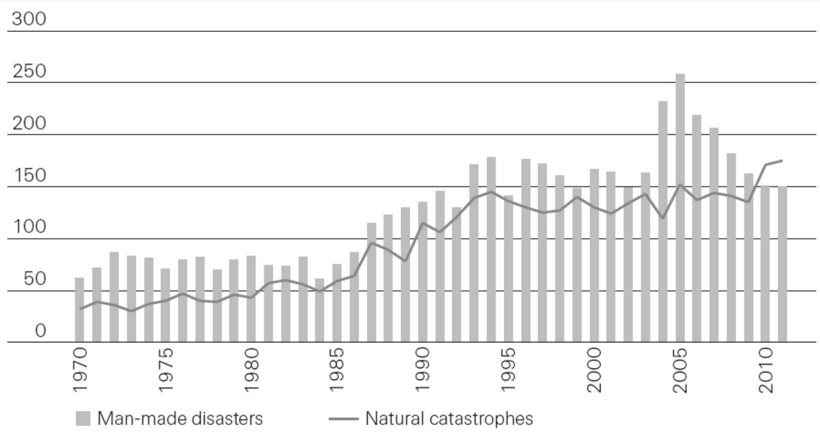
F6 | EARTHQUAKE AND TYPHOON EXPOSURE MAP, CHINA



- Guy Carpenter Asia Pacific Catastrophe Report:, 2012.10

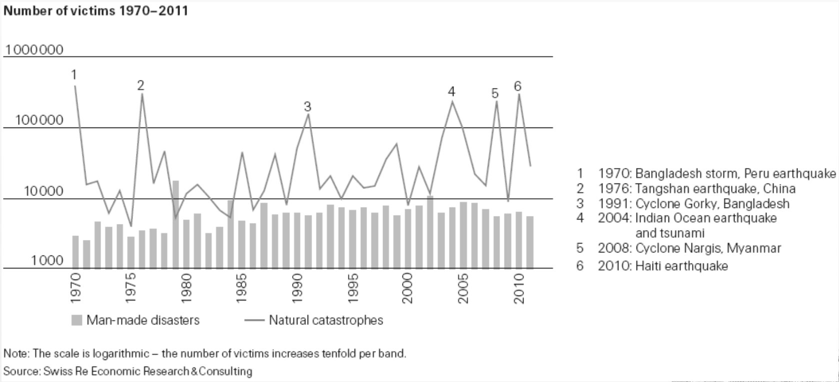
全球重大天災次數逐年統計

Number of events 1970–2011

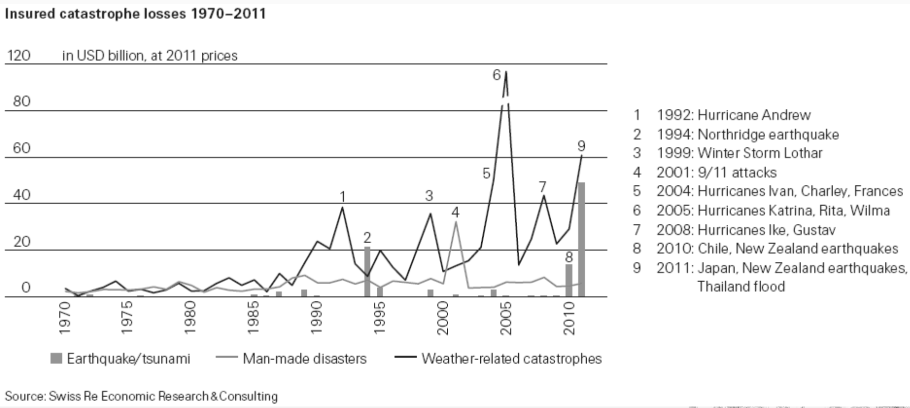


Source: Swiss Re Economic Research & Consulting

全球重大天災災損統計(死亡人數)



全球重大天災災損統計(保險理賠)



天然災害的特性

- 無法預測災害發生時間點、地點、破壞力強度、次數等
- 波及廣大地區範圍、造成大量災損事件
- 損害程度難預測
- 受災環境因素難以事前深入瞭解及控制
- 不同行業有不同損害特性
- 受成本效益限制，事前災害損害防阻僅能針對預定可接受之災害強度。
- 難以運用風險管理技術明確定義自留風險額度
- 災後調整風險管理策略

天然災害會造成跨多險種之累積風險

- 火險
- 工程險
- 水險
- 傷害險
- 車險
- 責任險

亞洲2011年重大天災回顧與省思

- 日本東北大地震
- 泰國水災

產險業天然災害累積風險評估

Cat Modeling
Summary

- Cat models are developing in Taiwan therefore caution must be taken with regard to their results in reinsurance program design.
- **''ALL CAT MODELS ARE WRONG BUT SOME ARE USEFUL''**
- **''Do not believe the cat models too much but do not believe them too little either''**
- **Better quality data and underwriting information will influence cat model results and reinsurance pricing**
- Guy Carpenter advocates that insurance companies review the results of multiple models when considering their program design.
- In territories where modelling is still new we suggest a cautious approach and consider not only return time events but specific scenario losses and compare results with old fashioned methodology.

GUY CARPENTER

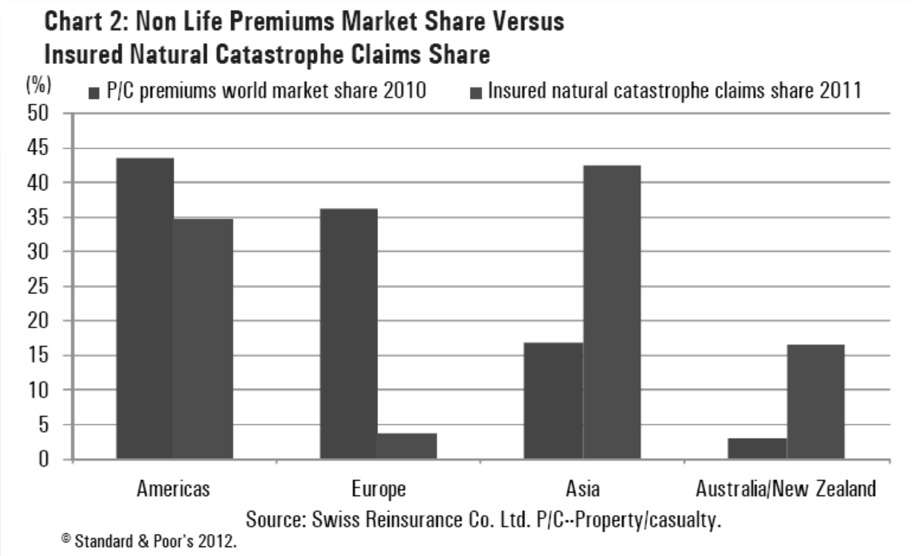


Chart 2: Non Life Premiums Market Share Versus Insured Natural Catastrophe Claims Share
(%)
P/C premiums world market share 2010
Insured natural catastrophe claims share 2011
50
45
40
35
30
25
20
15
10
5
0
Americas
Europe
Asia
Australia/New Zealand
Source: Swiss Reinsurance Co. Ltd. P/C--Property/casualty.
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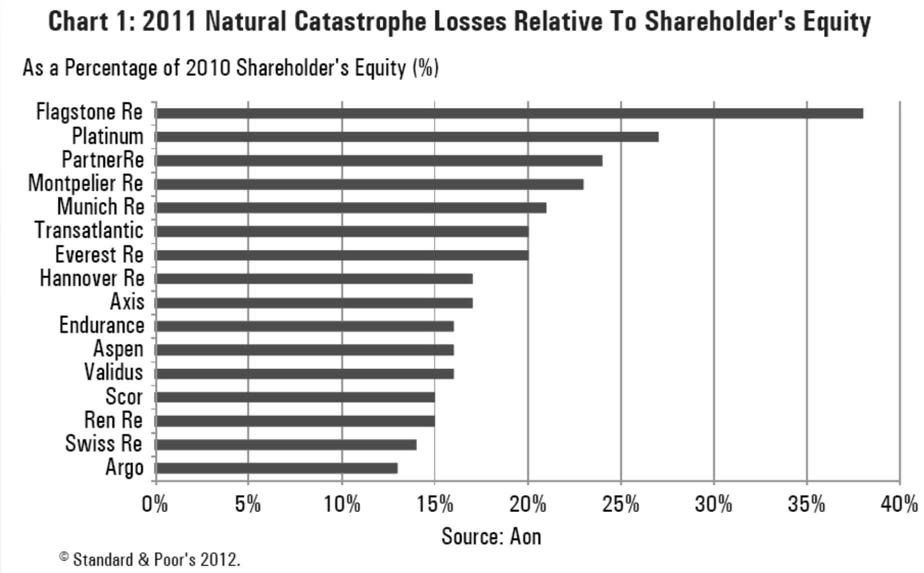
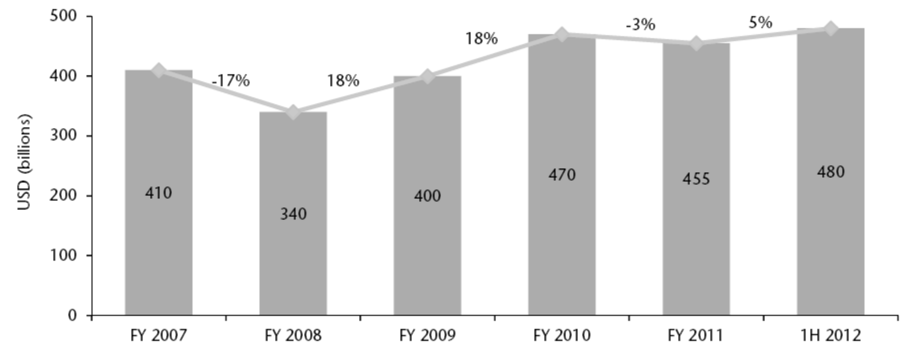


Chart 1: 2011 Natural Catastrophe Losses Relative To Shareholder's Equity
As a Percentage of 2010 Shareholder's Equity (%)
Flagstone Re
Platinum
PartnerRe
Montpelier Re
Munich Re
Transatlantic
Everest Re
Hannover Re
Axis
Endurance
Aspen
Validus
Scor
Ren Re
Swiss Re
Argo
0%
5%
10%
15%
20%
25%
30%
35%
40%
Source: Aon
© Standard & Poor's 2012.

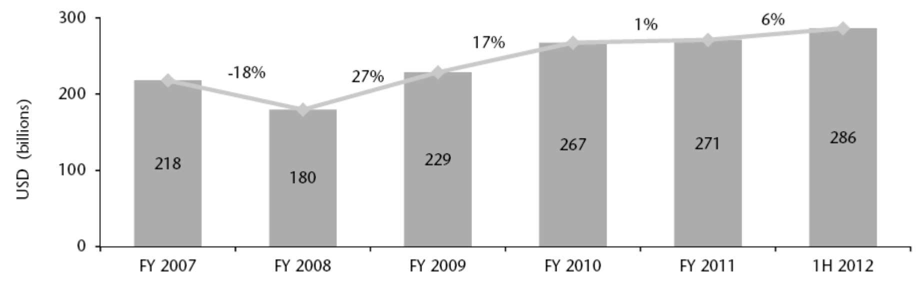
全球主要再保人資本變化

Exhibit 1: Global Reinsurer Capital

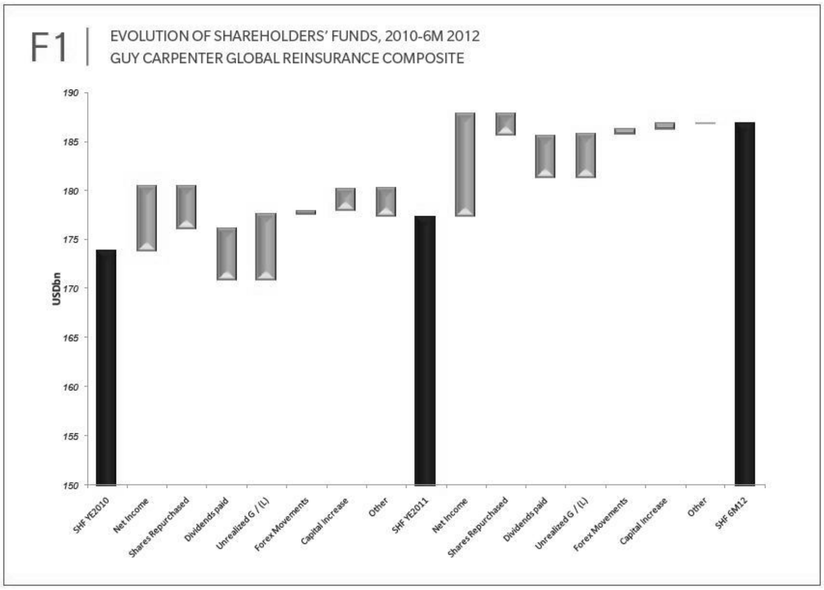


Source: Company reports, Aon Benfield Analytics

Exhibit 2: ABA Shareholders' Funds



Source: Company reports, Aon Benfield Market Analysis



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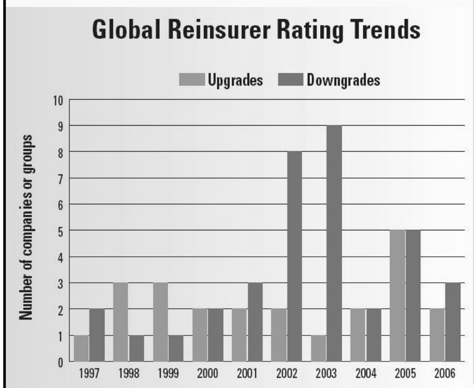
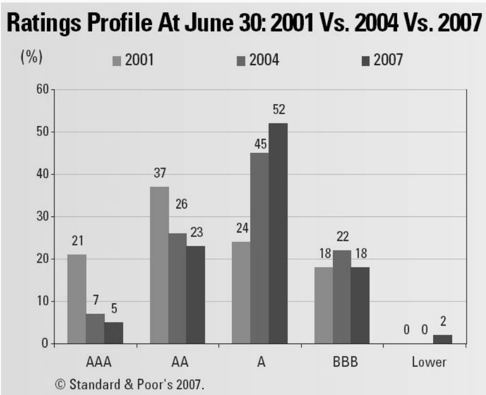
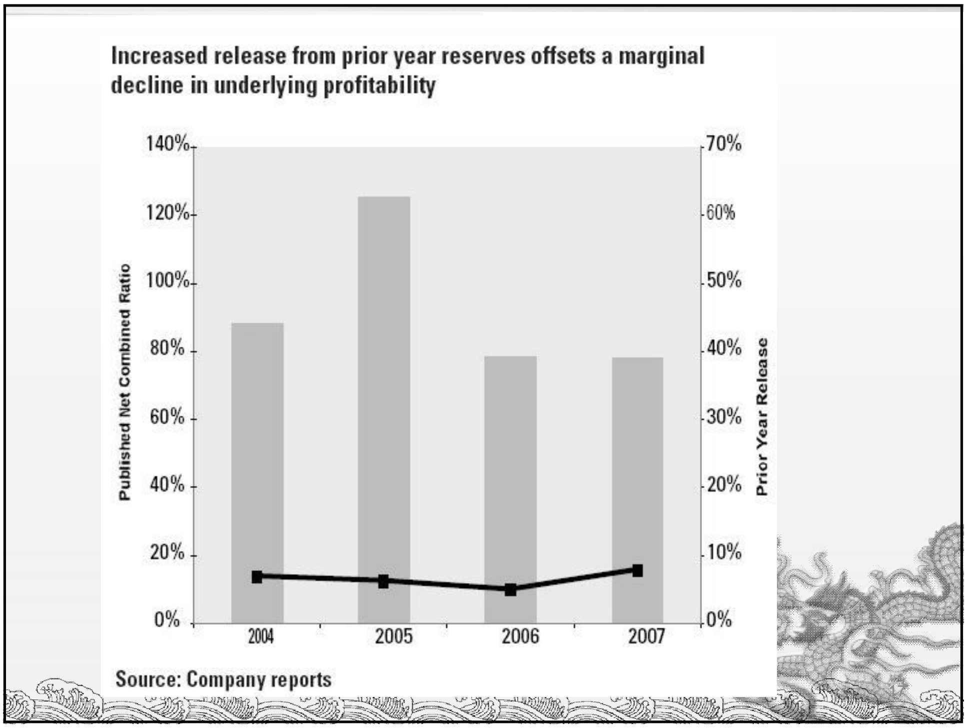
再保人信評更動







Increased release from prior year reserves offsets a marginal decline in underlying profitability
Published Net Combined Ratio
Prior Year Release
140%
120%
100%
80%
60%
40%
20%
0%
70%
60%
50%
40%
30%
20%
10%
0%
2004
2005
2006
2007
Source: Company reports

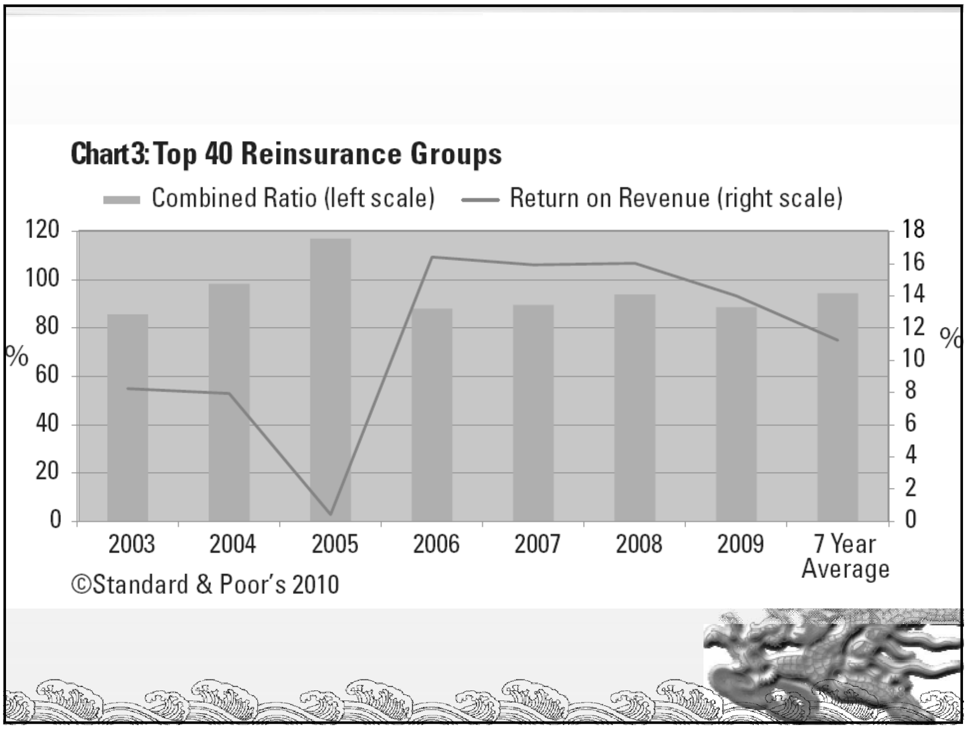
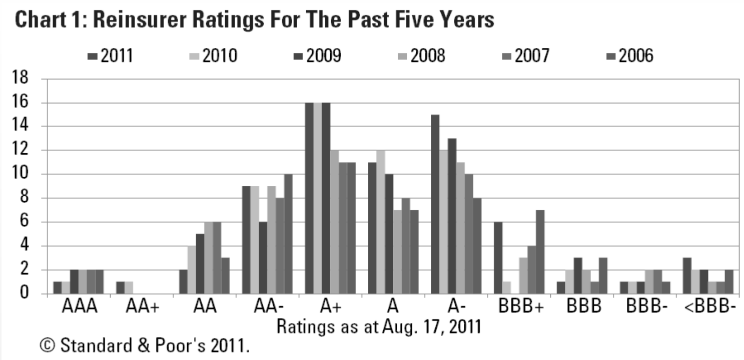
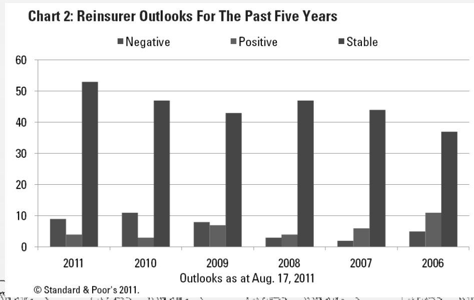


Chart3: Top 40 Reinsurance Groups
Combined Ratio (left scale)
Return on Revenue (right scale)
%
120
100
80
60
40
20
0
18
16
14
12
10
8
6
4
2
0
%
2003
2004
2005
2006
2007
2008
2009
7 Year Average
©Standard & Poor's 2010





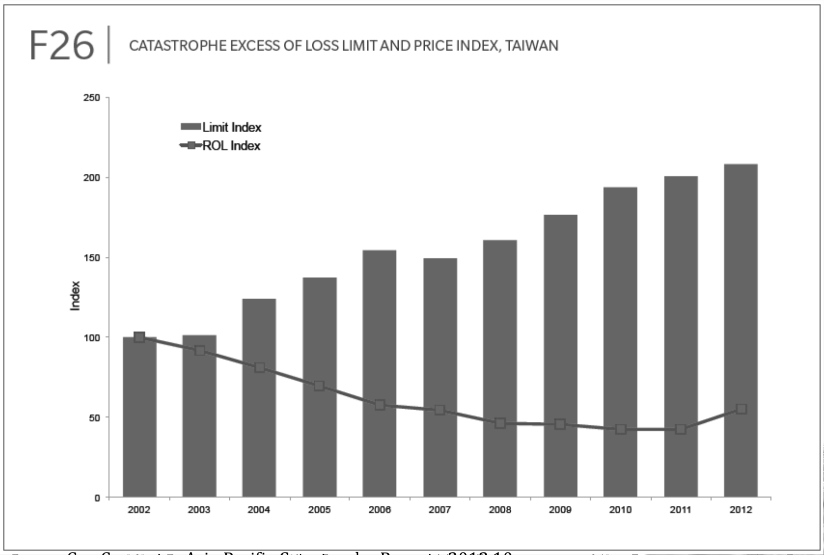
產險業天災累積風險之評估

- 依公司內外部風險偏好決定災源強度及發生次數
- 評估潛在累積風險之險種及計算累積量
  - 預估模組之選用、計算評估及結果選用
  - 無模組時之評估計算
- 以再保險分散風險之完整性及可靠度
- 因應自留累積風險之公司資本適足性
- 規劃公司未來方向

承受業務所需資本之計算

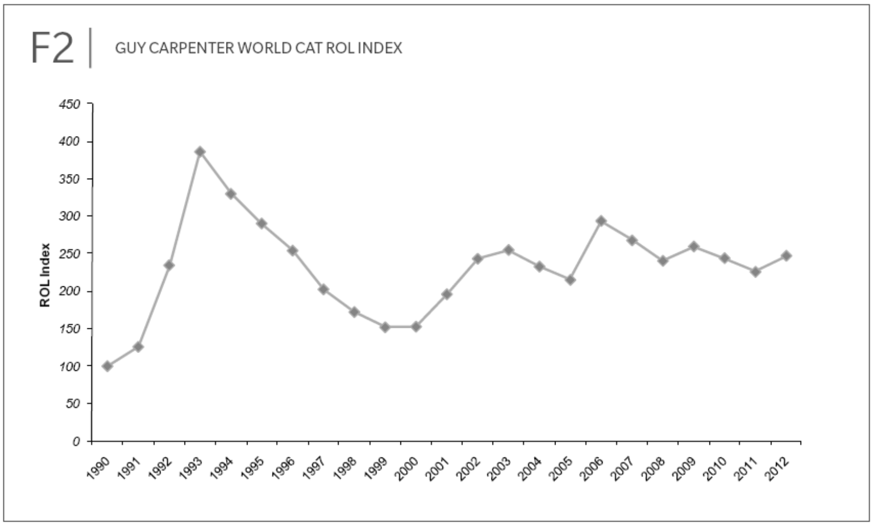
- 資本需求類別
  - 最大巨災自留累積損失之資本適足度分析
  - 保險局檢查報表之風險資本(RBC)
  - Solvency II之清償資本(Solvency Capital Requirement)標準評估法
  - 信評公司之風險適足資本需求模組(Capital adequacy model)
  - 自行研發之內部模組(Internal Model)計算VaR (Value at Risk)
- 困難及問題
  - 再保之信用風險及所需資本分派
  - 現金價值之計算(現金流及準備金)
    - 對最終核保結果之影響，會造成VaR值計算偏差
    - 可運用資金貢獻度
  - 可運用資金之市場風險及資本分派
  - 搭配其他險種業務之效益或成本
  - 不同險種間之風險減低或加成效應
  - 非比例業務之內部模組方法
  - 巨額賠款支出可能造成流動性風險

台灣產險業天災非比例分出趨勢



- Guy Carpenter Asia Pacific Catastrophe Report, 2012.10

全球天災再保費率趨勢



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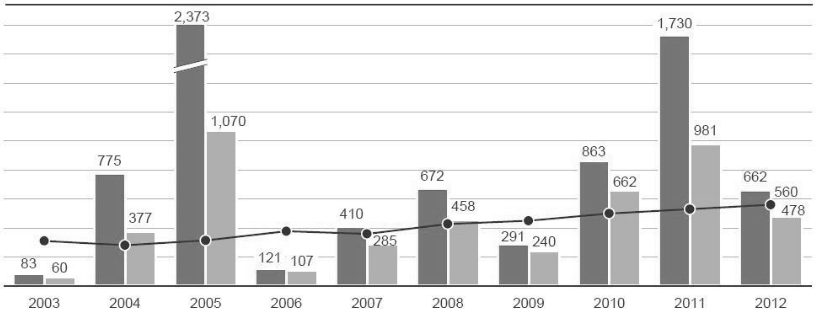
Major losses 2012 below our expectation

Natural and man-made catastrophe losses[1] in m. EUR



Natural and man-made catastrophe losses in % of non-life premium[2]

2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1 %	10 %	34 %	2 %	8 %	13 %	5 %	14 %	25 %	9 %
1 %	7 %	20 %	2 %	6 %	11 %	5 %	12 %	16 %	7 %

Gross — Net — Expected net catastrophe losses

1) Natural catastrophes and other major losses in excess of EUR 10 m. gross (until 31 December 2011: in excess of EUR 5 m. gross)
2) 2003 - 2006 adjusted to new segmentation

hannover re

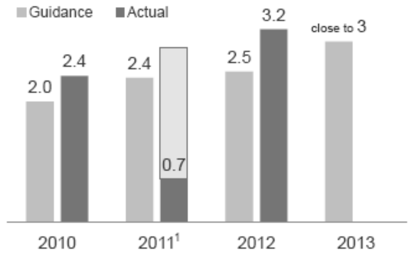
Delivering on our promise – Strong position for successful business development

Munich RE

Focus on mastering industry challenges …

Managing the low-yield environment	Active capital management	Strengthening operational profitability

… to deliver on our promise €bn



Main drivers of future earnings growth

Reinsurance – Solid profitability

Non-life: Expansion of know-how-intensive business, active portfolio and cycle management and strong reserving position

Life: Producing steady results above market average – focused approach paying off

Primary insurance – Delivering on plan

Life: Proactive management of back book and launch of less interest-rate-prone products

International: Back to normal

Group: Streamlining sales organisation

Munich Health – Consolidation

Fixing problems in US primary – building on solid foundation to develop other business

Despite decreasing earnings contribution from investments, Munich Re paving the way for continuously improving net income

[1] Upper bar: Assuming normal nat cat claims based on 8.5% budget.

新興風險

- 隕石衝擊
- 類SARS流行性疾病
- 太陽黑子電磁風暴

Q & A