Risk Based Capital Model – Rating Agency Perspective

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Agenda

- S&P Capital Model
  - Capital Model Development
  - Why update the old model
  - What the model does
- Total Adjusted Capital
- Charges for Required Capital

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S&P Capital Model

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S&P Capital Model

Capital Model Development

- **Old model in existence since 1991 (would give a CAR)**
- **New European model publicly released in 2007 (confidence level for different rating categories)**
  - Updated in May 2008
  - Currently undergoing another review – this will include Asian risk charges
    - The Asian version of the expected to be released some time soon – target before the end of Q2 2010
  - The latest model web-link
    - http://www2.standardandpoors.com/portal/site/sp/en/ap/page.topic/ratings_fs_ins/2,1,5,0,0,0,0,0,0,0,4,0,0,0,0,0.html

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Why Update the Model?

- Part of a global project
- Significant developments in insurance products and practices since last evolution of our model
- Chance to rebase and update some of our charges
- Move to a confidence interval based approach to better reflect different company risk profiles

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S&P Capital Model

What it does do:

✓ Provides a consistent framework to assess capital adequacy

✓ Tool to gain insight into a company's risk profile

✓ Identify potential risk concentrations

✓ Assess quantum and quality of capital

What it does not do:

x Define the rating outcome

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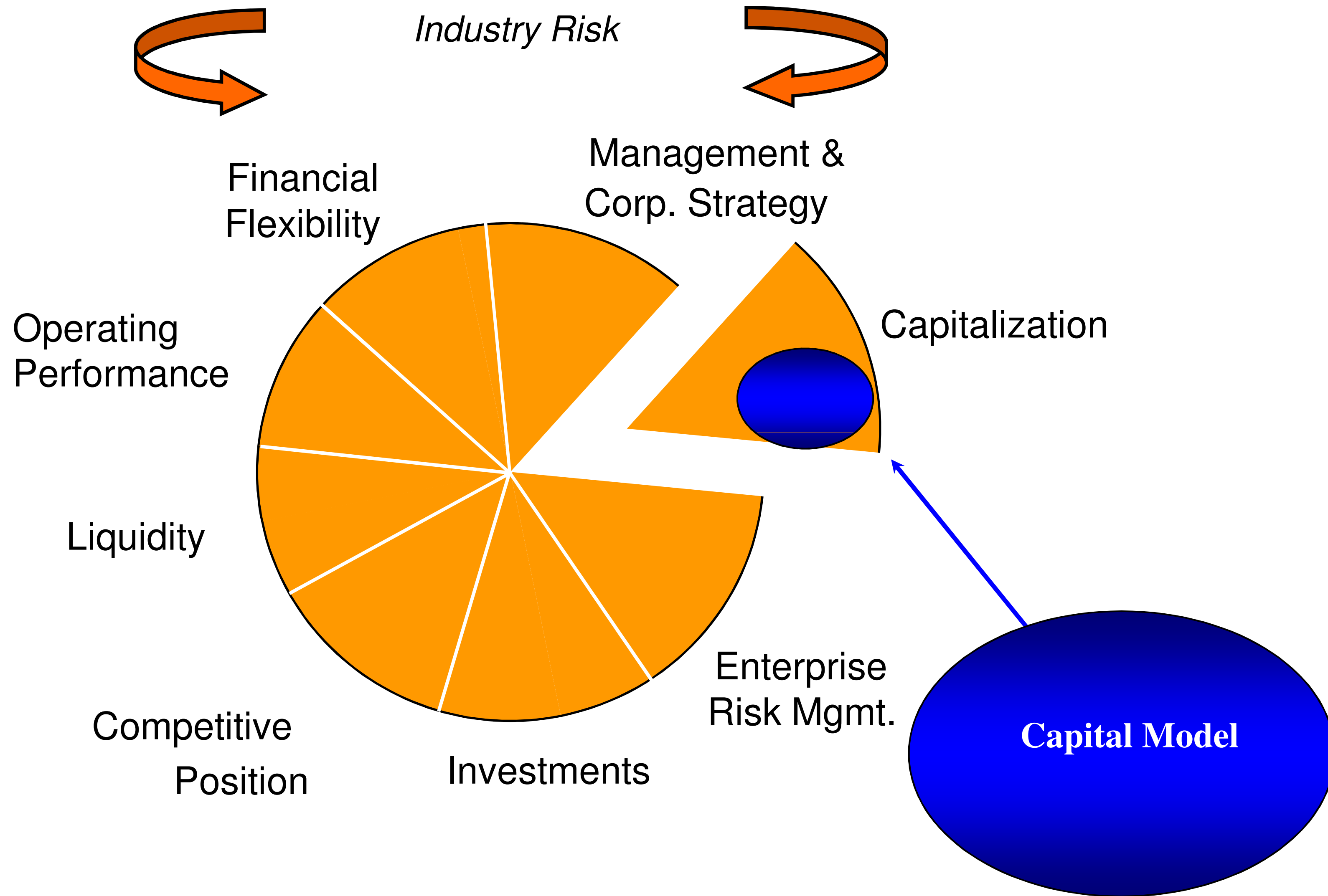
S&P Capital Model



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S&P Capital Model

Key Features

- Globally consistent framework
- A single model with regional factors
- Remains a deterministic, factor-based model
- All charges reviewed and updated
- Data requirements manageable
- Not a substitute for broad-based analysis
- Used in conjunction with ERM evaluation
- Diversification credit given

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Total Adjusted Capital (TAC) & Hybrid Capital

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Total Adjusted Capital & Hybrid Capital

Some Key Points

- Hybrid tolerance limits
- Up to 25% credit for qualifying hybrid plus an additional 10% for Short Dated Mandatory Convertibles
- Recognition of constraints on use of policyholders' capital
- 100% charge for non-consolidated affiliates
- 100% charge for non-life DAC*
- Recognize the emergence of investment income through discounting unearned premium reserves (UPR).

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Total Adjusted Capital

	Reported Shareholders Equity/Policyholder Surplus
Plus	Equity minority interests*
Plus	Equalization / Catastrophe reserves*
Plus	Prudential margins included in reserves
Minus	Proposed shareholder dividends not accrued
Minus	S&P impairment of goodwill
Minus	Other intangible assets
Minus	On-balance sheet unrealized gains/(losses) on life bonds* ** (post tax***)
Plus	Off-b/s unrealized gains/(losses) on investments exc. life bonds*(post tax***)
Minus	Off-balance sheet pension deficits (post tax***)
Minus	On-balance sheet pension surpluses (post tax***)
Plus	Up to 100% of off-balance sheet life VIF (post tax***)
Plus	Property/Casualty loss reserve surpluses/(deficits)
Plus	Property/Casualty loss reserve discount
Plus	Property/Casualty unearned premium reserve discount
Plus/Minus	Analyst adjustments
= ECA	Economic Capital Available

* where not already included in shareholders' equity

** subject to fair value exception

*** where tax effect not disclosed use effective tax rate

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Total Adjusted Capital

Minus	Remaining goodwill after S&P impairment
Minus	Investment in unconsolidated subs, associates and other affiliates
Minus	Investments in own shares/treasury shares
Minus	50% haircut of off-balance sheet VIF (post tax)
Minus	50% haircut of life deferred acquisition costs (post tax)
Minus	100% haircut of property/casualty deferred acquisition costs
Minus	50% haircut of property/casualty loss reserve surpluses
Minus	33% haircut of property/casualty loss reserve discount
Plus	Policyholder capital available to absorb losses
Plus/Minus	Analyst adjustments

= TAC before hybrid capital adjustments

Plus	Hybrid capital (subject to tolerance limits)
Minus	Excess over hybrid capital tolerances

= Total Adjusted Capital

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Hybrid Capital

Quality of Capital Can Be Defined Across A Range:

- Mandatory convertible preference shares (with deferrable coupons) that convert within 3 years
- Mandatory convertible non-deferrable debt that converts within 3 years
- Irredeemable perpetual preference shares
- Callable perpetual preference shares with no step-up
- Perpetual preference shares with step-up
- Perpetual subordinated debt
- Dated subordinated debt with deferrable coupons
- Dated subordinated debt with non-deferrable coupons*

***** Does not qualify for hybrid credit***

Strongest; most common equity-like

Weakest; least common equity-like

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Hybrid Capital

Category	Description	Treatment	Example
I	High Equity-Content (up to 35% of TAC)	Hybrid capital	Short Dated Mandatory convertibles (< 3years)
II	Intermediate Equity Content (Up to 25% of TAC)	Divided into i) Strong ii) Adequate Hybrid capital treatment – subject to terms & conditions	i) Tier 1 ii) Upper Tier II
III	Minimal Equity Content	No hybrid credit. Treated as debt for ratio purposes	Instruments with little or questionable permanence, restricted discretion over payments, or a cost that may become unattractive to the issuer

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Key Changes

Hybrid Ratio

Amended definition of qualifying hybrid……

S&P Qualifying Hybrid

Group Cons. TAC (excluding Hybrid) + Regulatory Qualifying Hybrid Capital

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Asset Risk Charges

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Asset Charges – Equities

Data

- Up to 30 years' monthly MSCI data

Distribution/Method

- Regime switching log normal model
- Absolute goodness-of-fit varied by market

Charges

- Countries grouped into charging bands

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Asset Charges – Equities

	BBB	A	AA	AAA
US, UK, Australia	20%	32%	37%	43%
Japan, Denmark	25%	37%	40%	45%
Germany, France, Canada, HK	30%	43%	47%	53%
Singapore, Czech Republic	40%	52%	56%	62%
Korea, Indonesia, Malaysia, Taiwan	45%	60%	65%	71%
Thailand, Russia	60%	75%	79%	83%

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Asset Charges – Property

Data

- Various property price indices used
- Periods of 5, 10 and 15 years considered

Distribution/Method

- Lognormal distribution assumed

Charges

- Volatilities a blend of results from different periods
- Countries grouped by similar characteristics

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Asset Charges – Property

	BBB	A	AA	AAA
Investment Property	10%	15%	18%	20%
Owner Occupied	15%	22%	25%	28%

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Asset Charges – Credit

Data

- S&P default studies

Distribution/Method

- Normal distribution assumed
- Discounted
- Recovery varied by rating / asset type

Charges

- Grouped by rating and term

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Asset Charges – Credit

BBB	AAA	AA	A	BBB	BB	B	CCC/C	Unrated
<1 year	0.07%	0.07%	0.12%	0.55%	2.00%	9.33%	26.67%	2.00%
1–5 years	0.10%	0.13%	0.39%	1.63%	6.81%	18.12%	29.81%	6.81%
5-10 years	0.31%	0.56%	1.31%	3.35%	11.14%	21.84%	33.39%	11.14%
10-20 years	0.51%	1.03%	1.71%	4.15%	12.78%	23.21%	35.77%	12.78%
>20 years	0.67%	1.27%	2.20%	5.03%	13.79%	24.54%	38.85%	13.79%

AA	AAA	AA	A	BBB	BB	B	CCC/C	Unrated
<1 year	0.10%	0.10%	0.16%	0.73%	2.62%	11.67%	32.74%	2.62%
1–5 years	0.13%	0.18%	0.52%	2.10%	8.48%	22.28%	35.44%	8.48%
5-10 years	0.41%	0.71%	1.76%	4.12%	13.21%	25.82%	38.59%	13.21%
10-20 years	0.63%	1.29%	2.29%	4.98%	14.89%	27.34%	41.57%	14.89%
>20 years	0.79%	1.51%	2.82%	6.13%	16.13%	29.18%	45.59%	16.13%

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ALM Charges

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ALM Charges

Two part charge:

- Interest rate shock for each rating level
- Assumed Duration Mismatch, used as proxy for ALM sensitivities

- Interest rate shocks based on historic interest rate and spread volatility
- Base duration mismatch assumptions determined for each market
- No allowance for other assets (e.g. equities) backing liabilities
- Very simple test, with qualitative credit given in analysis for matching policies, controls, track record, etc
- Reduced charge, below minimum, possible through bespoke portfolio analysis (FPC analysis)

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ALM Charges

UK, US (category 1) *	BBB	A	AA	AAA
Life	1.5%	1.9%	2.1%	2.4%
Nordic (category 4)**				
Life	5.8%	7.7%	8.4%	9.5%

* assumes minimum, one year mismatch
** assumes minimum, four year mismatch

Non-life				
Bond Duration (<1 year)	0.4%	0.5%	0.5%	0.6%
Bond Duration (1-5 years)	2.2%	2.9%	3.2%	3.6%
Bond Duration (5-10 years)	5.5%	7.2%	7.9%	8.9%
Bond Duration (>10 years)	10.9%	14.5%	15.8%	17.8%
Shareholder				
Bond Duration (<1 year)	0.7%	1.0%	1.1%	1.2%
Bond Duration (1-5 years)	4.4%	5.8%	6.3%	7.1%
Bond Duration (5-10 years)	10.9%	14.5%	15.8%	17.8%
Bond Duration (>10 years)	21.9%	28.9%	31.6%	35.6%

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ALM Charges

Life

- Charges applied to assets backing all liabilities carrying investment risk for the insurer:
  - Non-linked, non-participating business/general account life liabilities
  - Non-linked, participating business

Non-life

- Charges assume that the degree of mismatch increases as the term of the backing assets increases

Shareholders’ Funds

- Assets are charged for volatility based on outstanding tenor

Net impact of interest rate shocks calculated

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Liability Risk Charges

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Liability Charges - Life

- Increased granularity of charges by liability type
- Capital requirements reflect exposure to:
  - Longevity
  - Mortality/morbidity
  - Lapsation
  - Expenses
  - Operational risk

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Underwriting Risks: Longevity

- Analysis was carried out of variability of life expectancy in various Western countries over the past 15+ years
- Annuities calculated using appropriate age, sex and discount rate
- Expected change in annuity over 5 year period calculated for each rating level

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Underwriting Risks:

Mortality

To factor in credit for higher levels of in-force diversification, expanded the number of net amount of risk groupings:

- < $1 Bn, $1 – 5 Bn, $5 - 10 Bn, $10 – 50 Bn, $50 –100 Bn, >$100Bn
- Calculated a standard deviation of actual to expected ratios; converted to claim amount volatility and compared that to the net amount at risk.

Other Life Risks

- Simple loading, as a percentage of liabilities, added for lapse, expense and operational risks

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Underwriting Risk: Non-life Pricing Risk

- Determined the second worst industry accident year loss ratio in past 10 years (1994 to 2003), then added an expense ratio.
- Compared with existing capital model charges (derived from worst experience in 10 years to 1993) and blended results to form new charges
- These factors are tailored to regional experience
  - Currently investigating regional adjustments for Asia

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Underwriting Risk: Reserve Volatility

- Adopted a loss development metric (LDM) methodology to determine reserve volatility using last 20 years of loss reserve development data
- The discounted LDM ratios are calculated by line, company, and accident year. A percentile distribution is established to measure adverse scenario loss development.
- These factors are tailored to regional experience
  - Currently investigating regional adjustments for Asia

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Non-Life Reinsurance Charges

- US exposure separated and charged on basis of US statutory lines of business
- Proportional premium charges same as relevant primary charges
- Non-proportional charges have a loading on top of the primary charges, except property, which has no loading but bears a separate catastrophe charge
- Reserve charges remain the same as primary charges

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Catastrophe Capital Charge

The 1/250-year PML

Market Models

- In the Market – reserve requirements at each confidence level have increased due to an assumption of increased frequency and severity – specifically, the short-term catalog of events.

S&P Approach

- Is based on: higher level of confidence (previously 1-in-100) required
- Should include: demand surge, fire following (attached to earthquake and fire policies), sprinkler leakage (if not excluded), storm surge and secondary uncertainty losses.
- Is global: The capital charge covers catastrophe exposures on a global basis, covering the perils: hurricanes (wind), flood (outside the U.S.), earthquake, tornadoes, and hail.

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Catastrophe Capital Charge

“Hard test” for primary insurers in 2007: increasing capital requirements

However, impact will be reduced since:

- Charge will not be geared up for ratings above ‘BBB’
- Charge will be reduced by the tax relief at the effective rate

Two premium offsets:

- Remove the corresponding catastrophe load premium so as not to double-count required capital.
- In addition, to take into account the short-tail nature of property catastrophe risk, the net aggregate 1-in-250-year modeled loss is reduced by 70% of the associated net written premium.

Changes also applied to reinsurers, thereby reducing their Capital requirements especially higher rated insurers with higher tax rates

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