



The Actuarial Profession
making financial sense of the future

GIRO Conference and Exhibition 2012

Juggling uncertainty: the actuary's part to play



20/09/2012



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making financial sense of the future

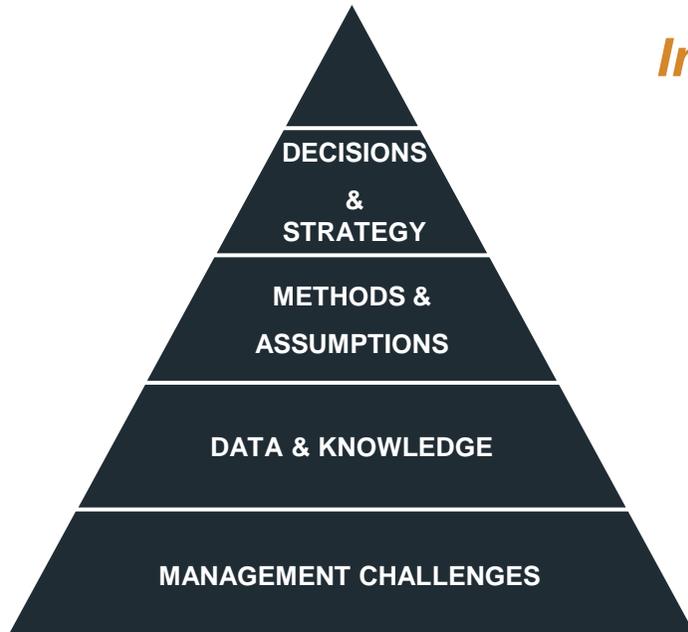
GIRO Conference and Exhibition 2012

Growth markets, their exposure to catastrophe risk and challenges to modelling

Dr. Sebastian Rath

Growth markets, their exposure to catastrophe risk and challenges to modelling

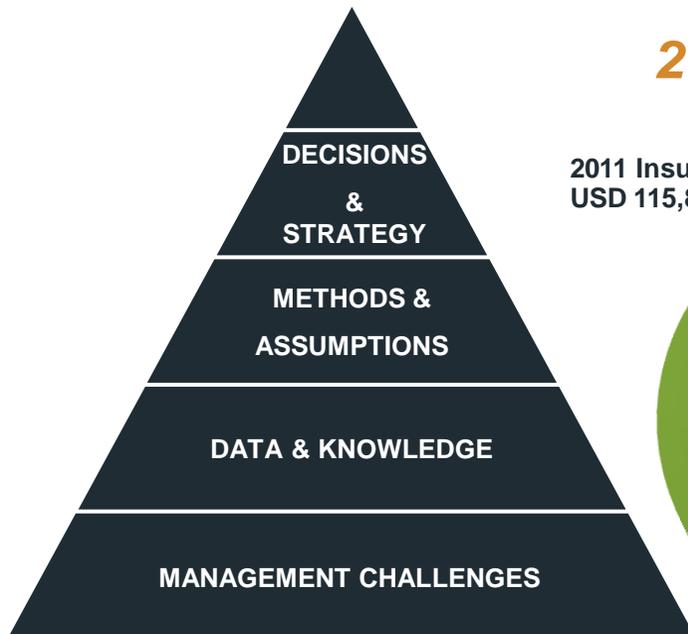
Agenda



Insurance growth markets in a globalising world call for both identification and modelling of new risks.

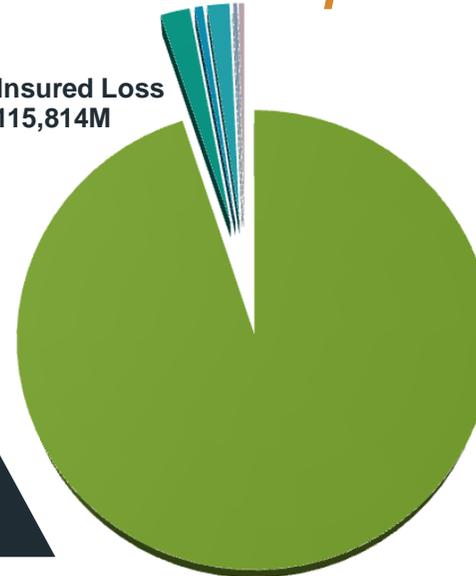
Growth markets, their exposure to catastrophe risk and challenges to modelling

Agenda



2011 loss experience

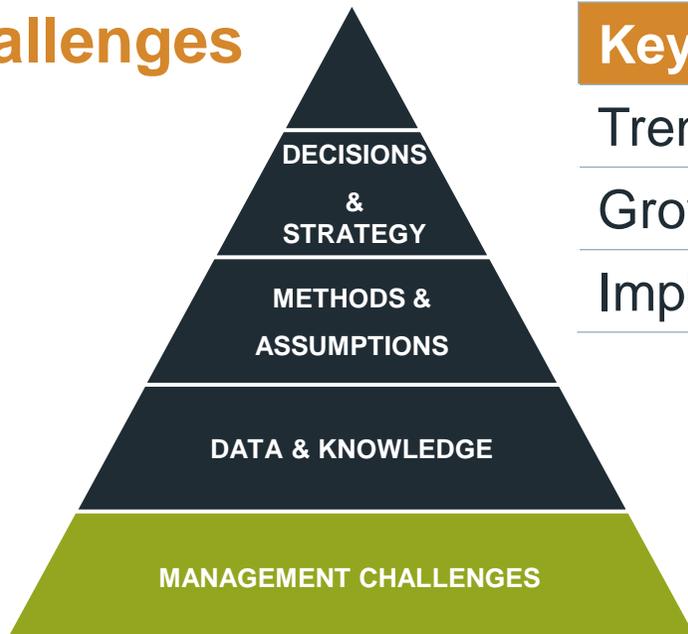
2011 Insured Loss
USD 115,814M



- Nat Cat (95%)
- Man Made (2.1%)
- Aviation (0.6%)
- Maritime (1.6%)
- Rail (0%)
- Mining (0.3%)
- Collapse (0%)
- Misc (0.4%)

Growth markets, their exposure to catastrophe risk and challenges to modelling

Management challenges



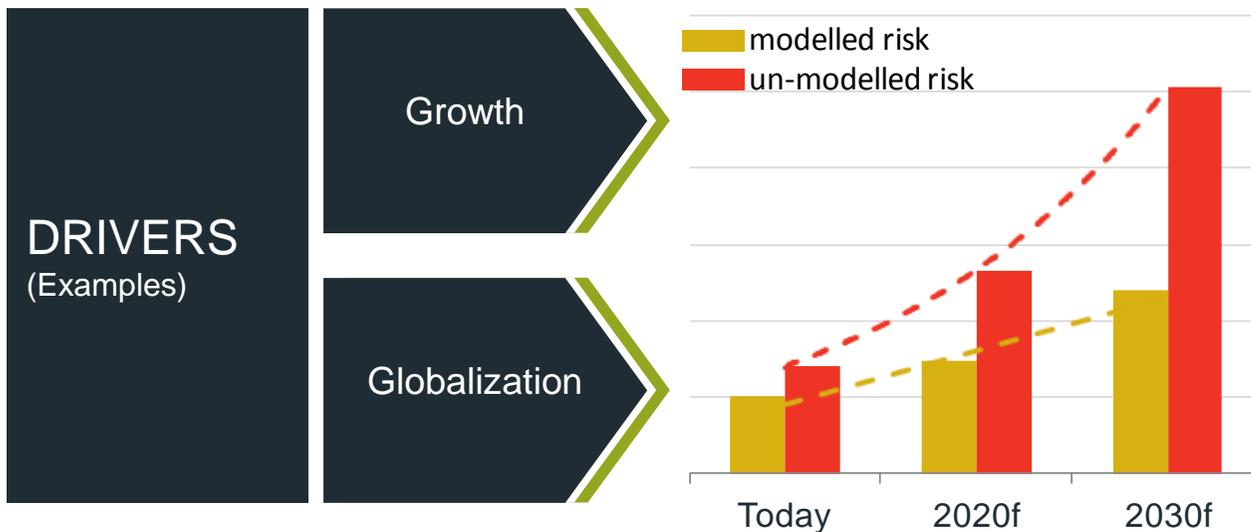
Key challenges for the next years are

Trends	drivers, opportunity and cost
Growth	change, governance
Implications	ratings, investor community

Management challenges

1. Models responding to trends

The never ending challenge of catching-up with reality



Globalisation Effect

Both, the pace of demographic trends in the emerging markets and the continuing trend to further integrated global markets will lead to an increasing gap in un-modelled risks.

Those risks are regional, with distinct risk profiles. They will remain diverse until more unified insurance products will have established.

Management challenges

2. Models responding to growth and change

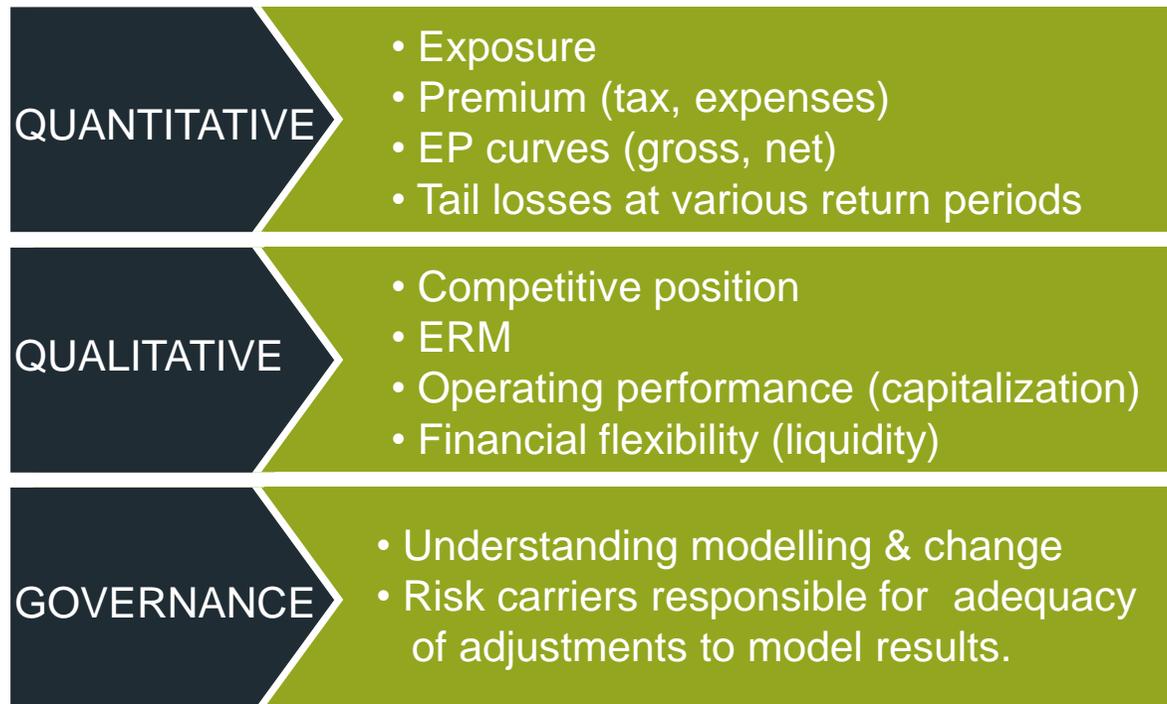
Growth and change are both challenges. In emerging markets they require quantification of new, evolving risks. The Model Governance and the Model Change Policy, face challenges:



Management challenges

2. Models responding to growth and change

Model changes may affect, amongst others, the overall level of risk, capital requirements and a risk carrier's rating. Aspects that rating agencies use are:



Emerging Market Risk

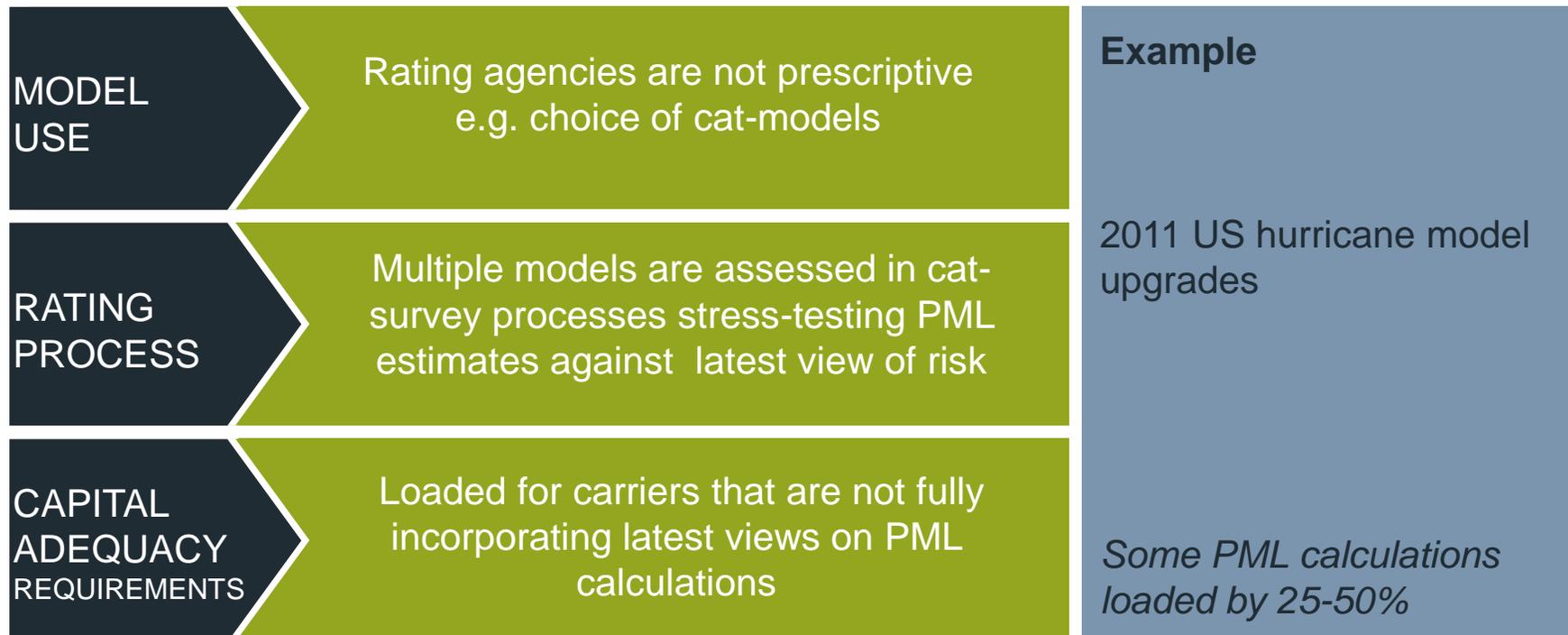
Recognized as significant and most challenging aspect of tail risk modelling as catastrophe event may cause shocks

Katrina 2005 *RI sector downgraded as a whole*
Thailand 2011 *Selective downgrades of over-exposed carriers*

Management challenges

2. Models responding to growth and change

Model changes may affect, amongst others, the overall level of risk, capital requirements and a risk carrier's rating. Aspects that rating agencies use for catastrophe risk specifically are:



Management challenges

3. Models responding to trends

Capital modelling for emerging market risks will reflect the balance of opportunities, risk and cost.

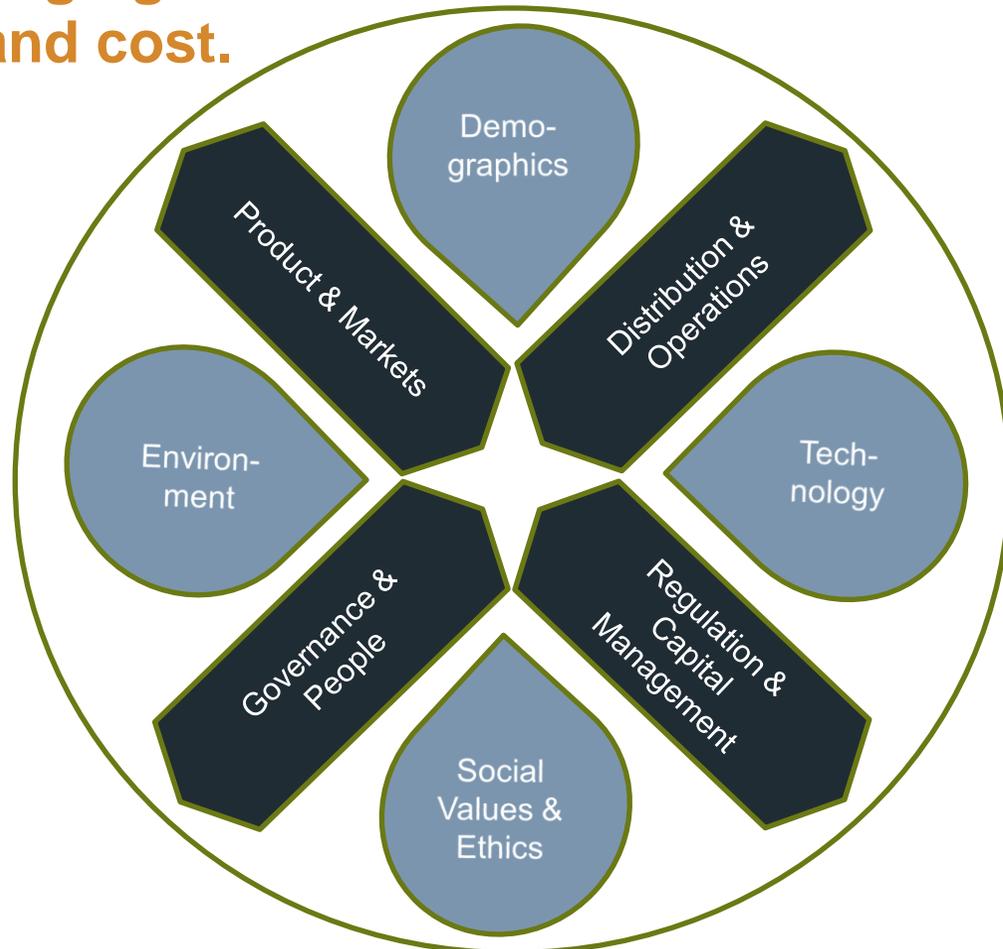
- risk is transient
- so are opportunities and modelling requirements
- leveraging strategic advantages and competing regulatory regimes
- commercializing market insights and liberalisation
- access new distribution channels or leverage existing ones
- shape global products for the regional demographic trends

Management challenges

3. Implications for models

Capital modelling for emerging market risks will reflect the balance of opportunities, risk and cost.

Megatrends and components of the insurance business model



Management challenges

3. Implications for models

Capital modelling for emerging market risks will reflect the balance of opportunities, risk and cost.

POPULATION

Insurance demand in cities increases

- Business models aging faster than customer preferences
- Commoditized products, competition by price
- Regional diversity of risk profiles

GOVERNANCE

Integration into diverse markets

- Risk of shareholder dissent
- Perception of green-washing
- Loss of talent

TECHNOLOGY

More web based application

- Customer relationship increasingly transactional and commoditized
- Consistency and market presence

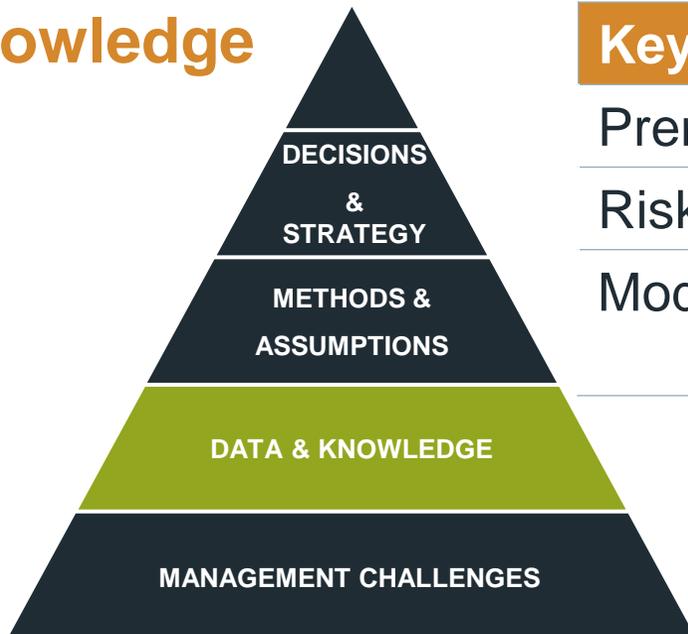
Emerging Markets

Opportunity Attract investors with transparent profit numbers, explained diversification, risk adjusted returns, cash generation and dividends. Demonstrate future relevance.

Risk Higher cost of capital. Uncertain risk profile in new market.

Growth markets, their exposure to catastrophe risk and challenges to modelling

Data & Knowledge



Key challenges for the next years are

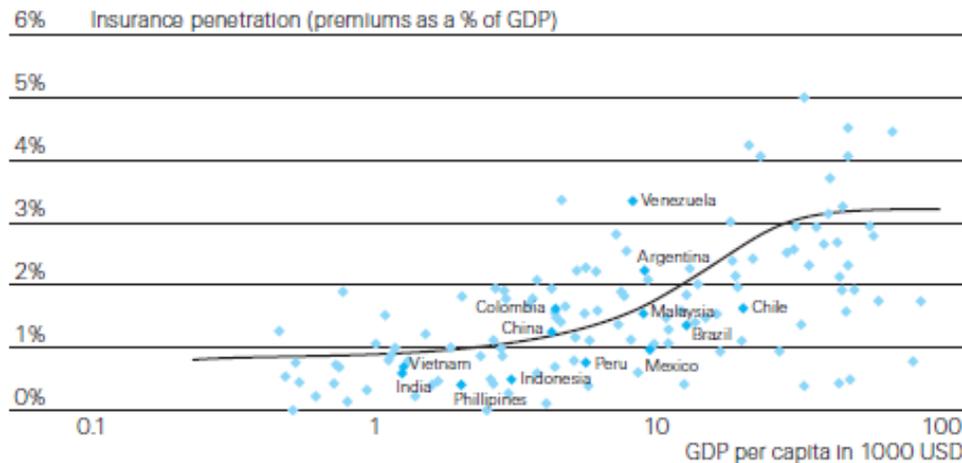
Premium	growth markets, opportunities
Risk	learning, trends, monitoring
Modeling	granularity, inherent uncertainty, appropriateness

Data in Growth Markets

1. Premium Growth

Insurance Penetration > Global > GI > 2010

The 2010 S-curve for non-life insurance



Source: Swiss Re Economic Research & Consulting

- The choice of new target markets is non-trivial
- Large global risk carriers may afford a strategy to pursue growth in most emerging markets at the same time
- Medium and smaller risk carriers require a more targeted approach

Martin Senn, CEO, Zurich Financial Services

FT, August 27, 2012

We are not picking any of the particular countries out, but look for global diversification.

We are seeking to expand in the Middle East ..., Asia Pacific and Africa.

Data in Growth Markets

1. Premium Growth

Premium Growth Trends > Global > GI > 2010-12 > high level



Two key drivers: Financial Crisis & Cat

- Slow growth, high unemployment, lower income
- Natural disasters driving regional real growth in non-life insurance premiums

Impact

- GI premium growth generally weaker than Life with the exception of cat affected areas
- Low or negative real premium growth in a majority of countries
- Constrained demand for workers' compensation; Strong competition for motor insurance

The future global insurance market is more strategic, maintaining and modelling current and future trends.

Data in Growth Markets

1. Premium Growth

Premium Growth Trends > Global > GI > 2010-12 > granular

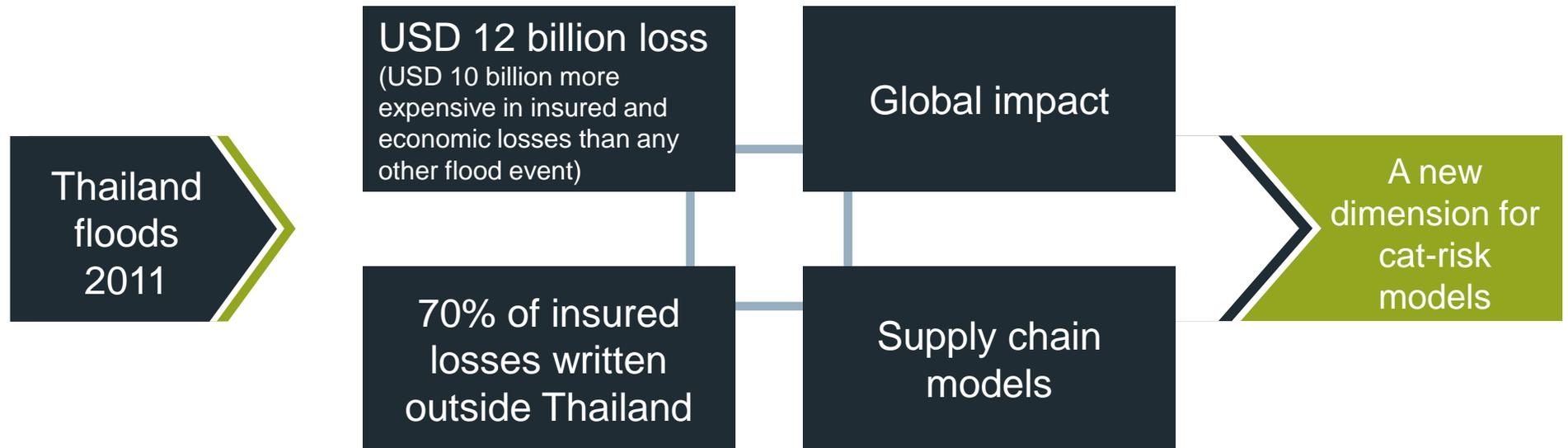


- **Chile (post cat):** 14.7% growth post 27/02/2010 earthquake for earthquake and motor insurances.
- **EU (recession):** Driven by macro-economy. Slow growth for commercial business.
 - **Ireland:** Capacity withdrawn, e.g. professional indemnity insurance.
 - **Czech Republic:** increased competition in motor market.
 - **Slovak market:** Declining premium in motor and property insurance; Motor in a long-term adverse situation.
 - **Slovenian market:** increases in assistance insurance and credit insurance.

Risk carriers of all sizes will assess underwriting strategy more frequently using information at macro and regional levels.

Data in Growth Markets

2. We keep learning about risk

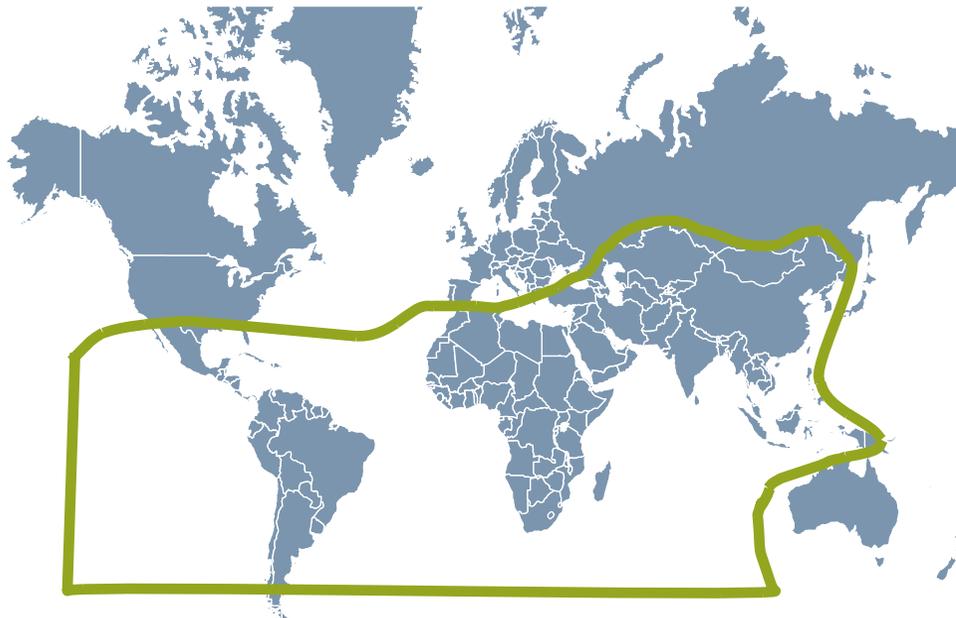


The traditional approach of modelling *local exposure*, *local hazard* and *local vulnerability* to assess the *localized financial risk* requires a *new dimension in a globalised world: the global connectivity of local business and the impact of its interruption*.

Data in Growth Markets

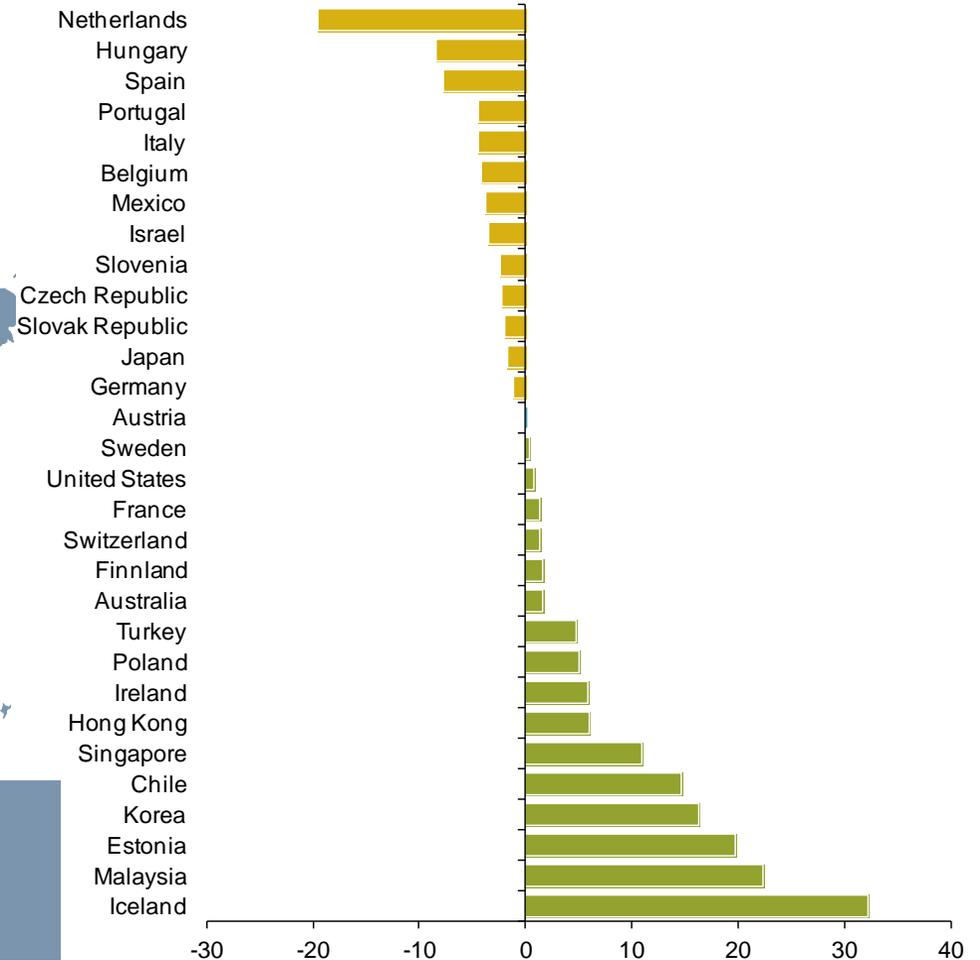
3. Inherent uncertainty

Premium Growth Trends > EM?



Emerging Markets (EM) growth outpaces that of the Developed Markets (DM).

Annual Real Gross Premium Growth (%) [GI]

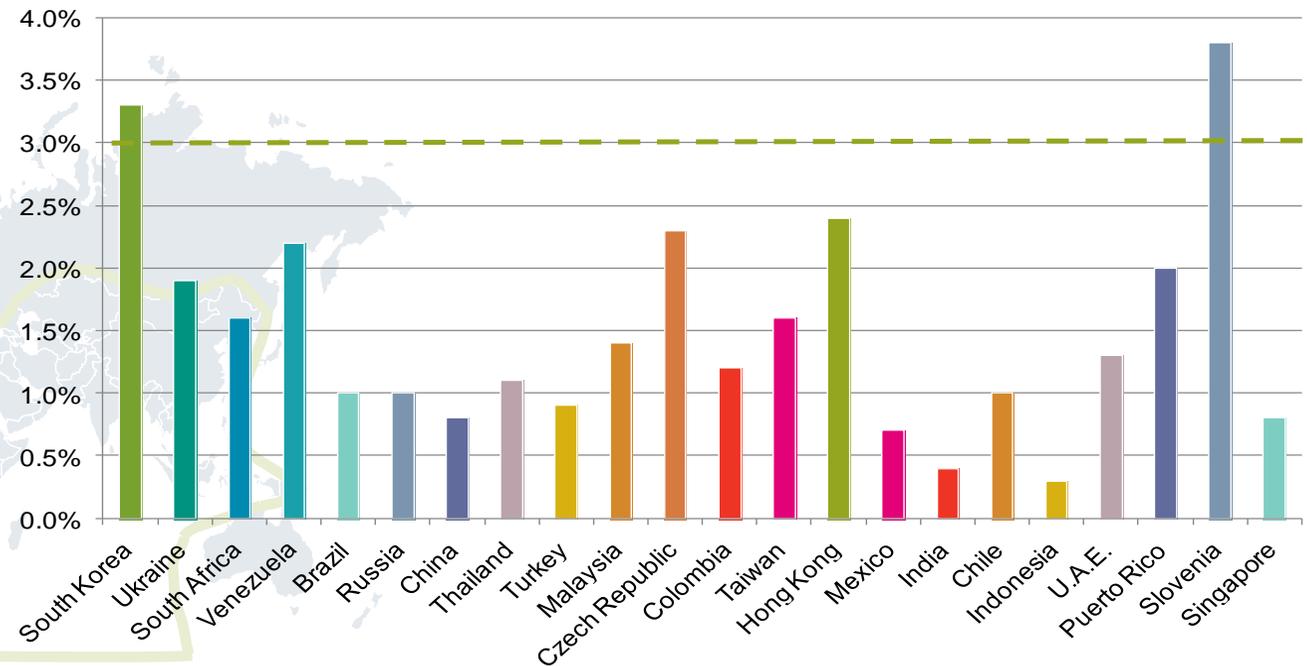


Data in Growth Markets

3. Inherent uncertainty

'Premium/GDP' > Global (EM) > 2011

'Premium/GDP'-Ratio (Growth Markets)



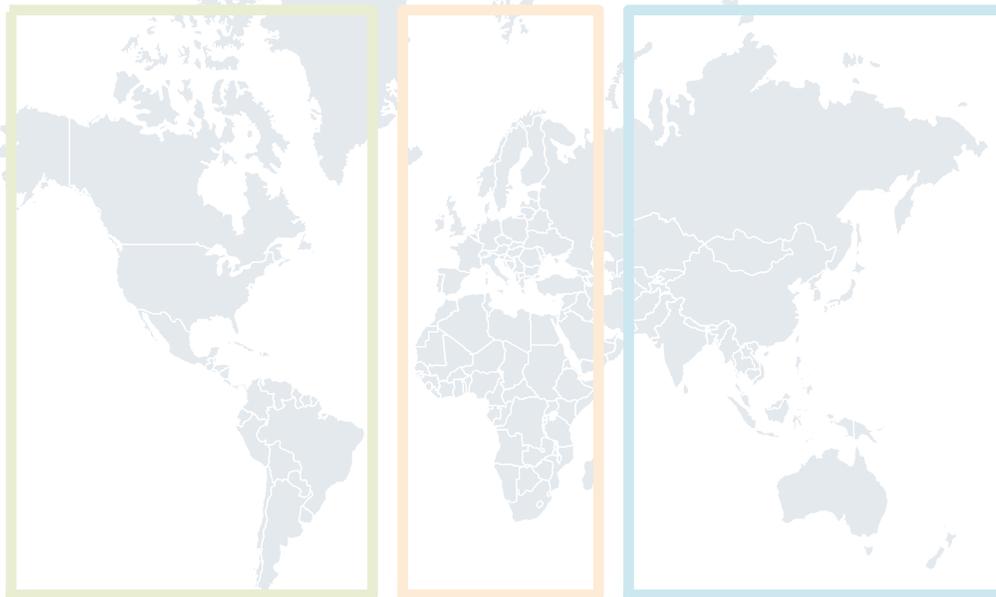
- DMs have ratios of about 3%.
- EMs with growth potential as their GDP grows.

Data in Growth Markets

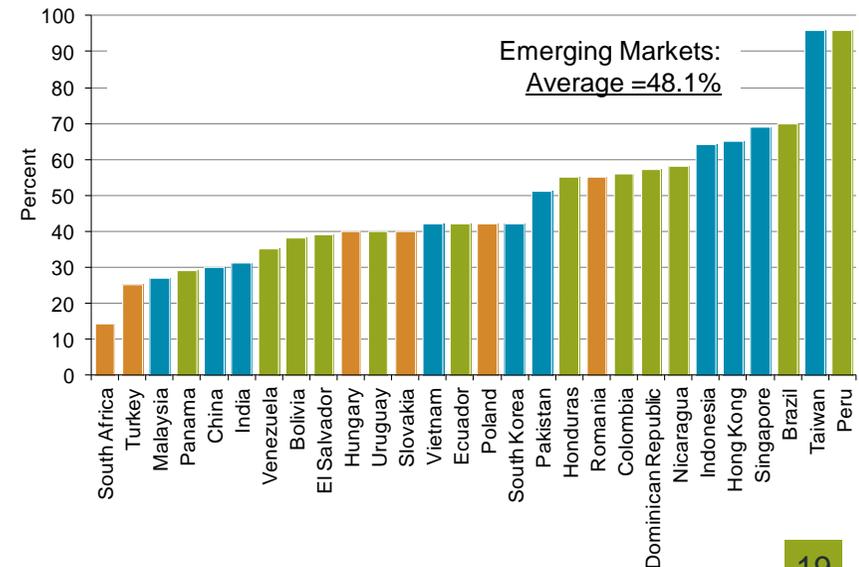
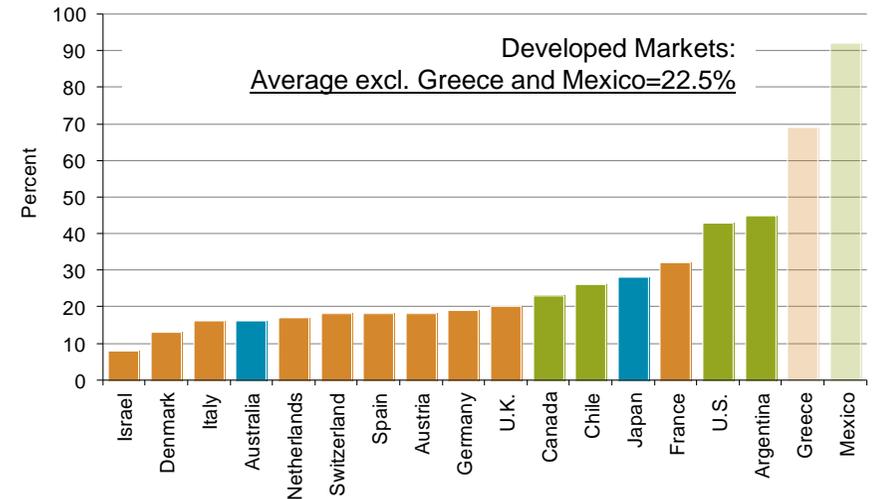
3. Inherent uncertainty

GLR Variation > Global > Property

“Coefficient of Variation of Gross Loss Ratio”



- ➔ Property insurance risk in Greece and Mexico does not behave as in other developed markets.
- ➔ More volatility in emerging markets (x2).

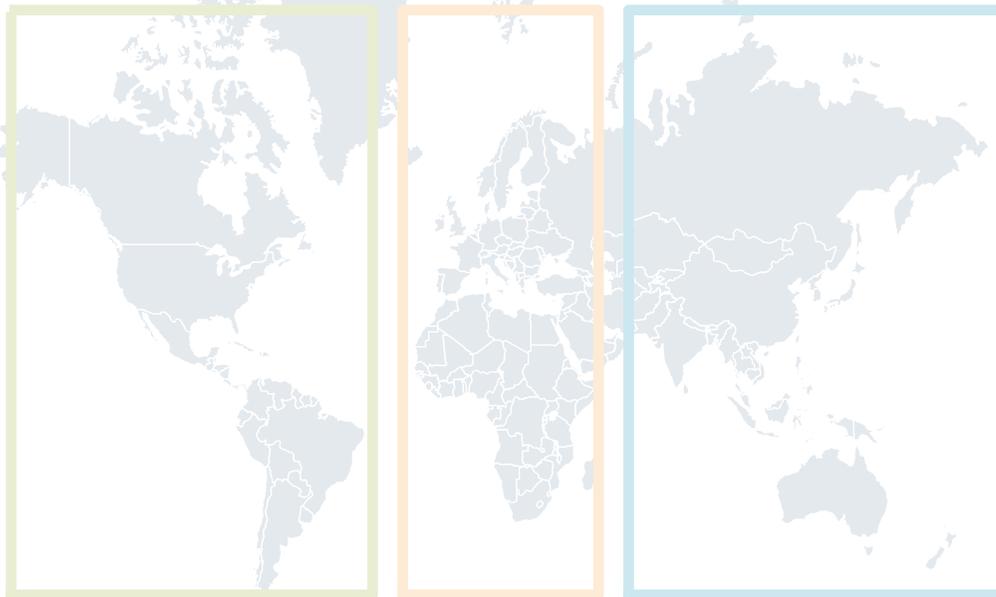


Data in Growth Markets

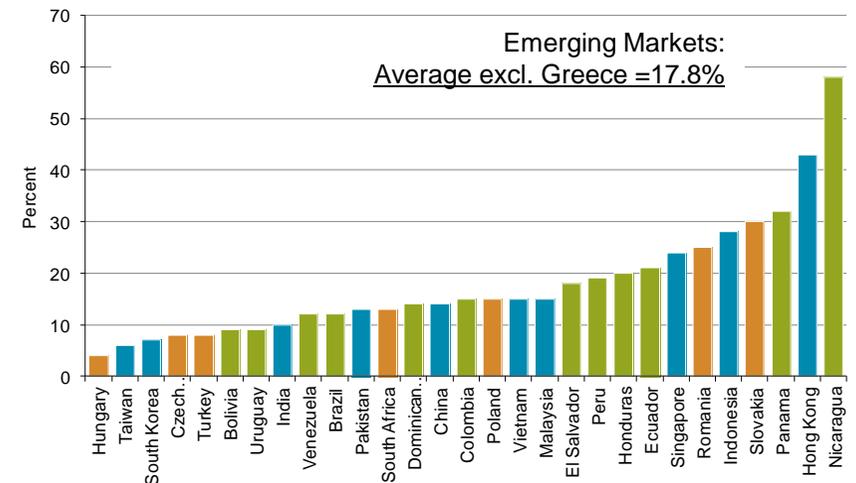
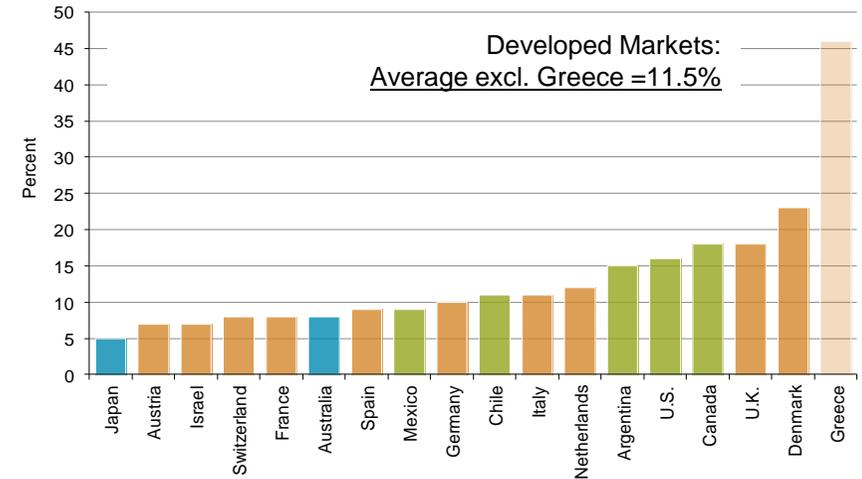
3. Inherent uncertainty

GLR Variation > Global > Motor

“Coefficient of Variation of Gross Loss Ratio”



- Motor insurance risk in Greece exceeds other developed markets (at pre-2012 crisis levels).
- More volatility in emerging markets (x1.5).



Data in Growth Markets

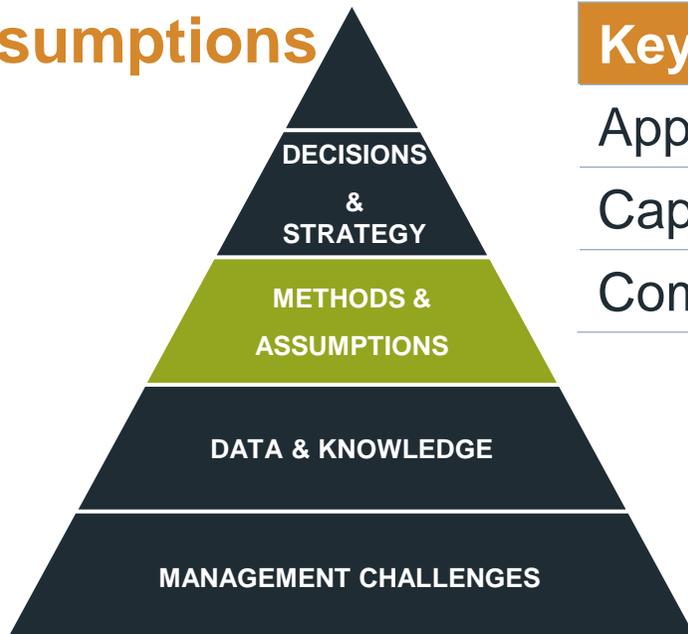
3. Inherent uncertainty

Key messages



Growth markets, their exposure to catastrophe risk and challenges to modelling

Methods & Assumptions



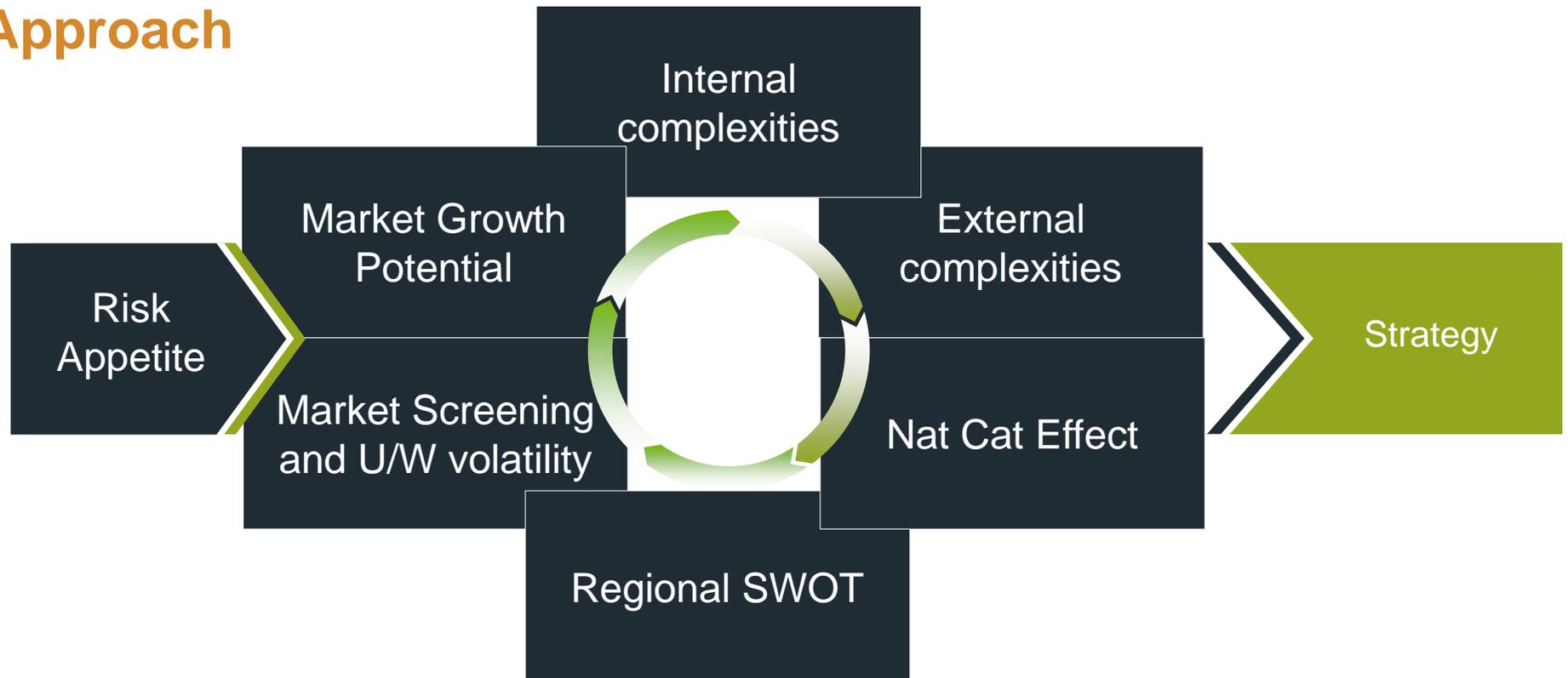
Key challenges for the next years are

Approach	risk appetite, performance
Capital Model	controlling risk & growth
Communication	use test & ORSA

Data in Growth Markets

1. Risk appetite and performance

Approach



Data in Growth Markets

1. Risk appetite and performance

Underwriting Volatility > Americas

“Coefficient of Variation of Loss Ratio”



Performance screening requires detailed information by LoB together with frequent, reliable and consistent updates.

U/W volatility	Motor	Property	Accident & Health	Fidelity & Surety
Americas				
Argentina	15%	45%	53%	176%
Bolivia	9%	38%	15%	
Brazil	12%	70%	42%	
Canada	18%	23%	41%	117%
Chile	11%	26%	44%	66%
Colombia	15%	56%	15%	76%
Dominican Republic	14%	57%	92%	64%
Ecuador	21%	42%	52%	184%
El Salvador	18%	39%	17%	96%
Honduras	20%	55%	5%	200%
Mexico	9%	92%	43%	
Nicaragua	58%	58%	80%	149%
Panama	32%	29%	21%	118%
Peru	19%	96%	8%	75%
Uruguay	9%	40%		
U.S.	16%	43%	53%	69%
Venezuela	12%	35%	21%	159%

Data in Growth Markets

1. Risk appetite and performance

Market Potential > Americas

“GDP growth” for EM



Performance forecasts require detailed data together with hindcast assessments increasing reliability and consistency.

Market growth (GDP)	2010	2011	2012 f	2013 f
Americas				
Argentina	9.2%	8.9%	3.6%	3.5%
Bolivia				
Brazil	7.5%	2.7%	3.3%	4.4%
Canada				
Chile	5.2%	6.0%	4.3%	4.9%
Colombia	4.3%	5.8%	4.9%	4.7%
Dominican Republic				
Ecuador				
El Salvador				
Honduras				
Mexico	5.5%	3.9%	3.4%	3.4%
Nicaragua				
Panama				
Peru	8.8%	6.9%	5.2%	5.7%
Uruguay				
U.S.				
Venezuela	-0.2%	4.2%	4.2%	1.4%

Data in Growth Markets

1. Risk appetite and performance

Volatility in Market Risk > Global

INTERNAL CONSTRAINTS

- Legacy models constrain rapid responses
- Limited research, forecasting & analytics
- Unexpected level of volatility undermines board level confidence.

EXTERNAL COMPLEXITY

- Unique set of challenges: Interplay of regulatory uncertainty with market risk, liquidity risk, credit and counterparty risk.

Volatility in times of a perfect storm ...

The clash of sovereign debt crisis and regulatory uncertainty drives volatility for risk carriers.

Additional pressure arises from perceptual and reputational risk.

Impact on cost base and capital investment decisions.

Data in Growth Markets

1. Risk appetite and performance

Regional SWOT > APAC > Vietnam, Thailand, South Korea, Taiwan

STRENGTH

- GI penetration rising
- Market patently open to foreign multi-nationals with access to global capital
- Developed regulatory regime
- GI market well diversified away from motor insurance

OPPORTUNITIES

- GI market emerging from period in which most lines contracted
- Expected growth in commercial lines as economies expand

WEAKNESS

- Number of larger companies are still cartel like companies with close links to governments
- Investment strategies complex (lack of large and liquid markets for suitably long-dated fixed income securities)
- Local GI carriers lack competition, scale and pricing power.

THREATS

- Market volatility
- Regulation and investment restrictions
- Growth potential constrained by GDP growth rate
- Substantive Nat-Cat Risk
- Political risk with potential to limit economic growth

Development trends (2008-2015)

Premium income increasing in small markets, e.g. in Vietnam more than Thailand.

Market penetration for medium sized markets increasing, e.g. more for South Korea than Taiwan.

Data in Growth Markets

1. Risk appetite and performance

Nat Cat Effect > Risks

- Climate change may substantially increase insured losses.
- It may threaten the investment performance on which risk carriers rely to meet liabilities.

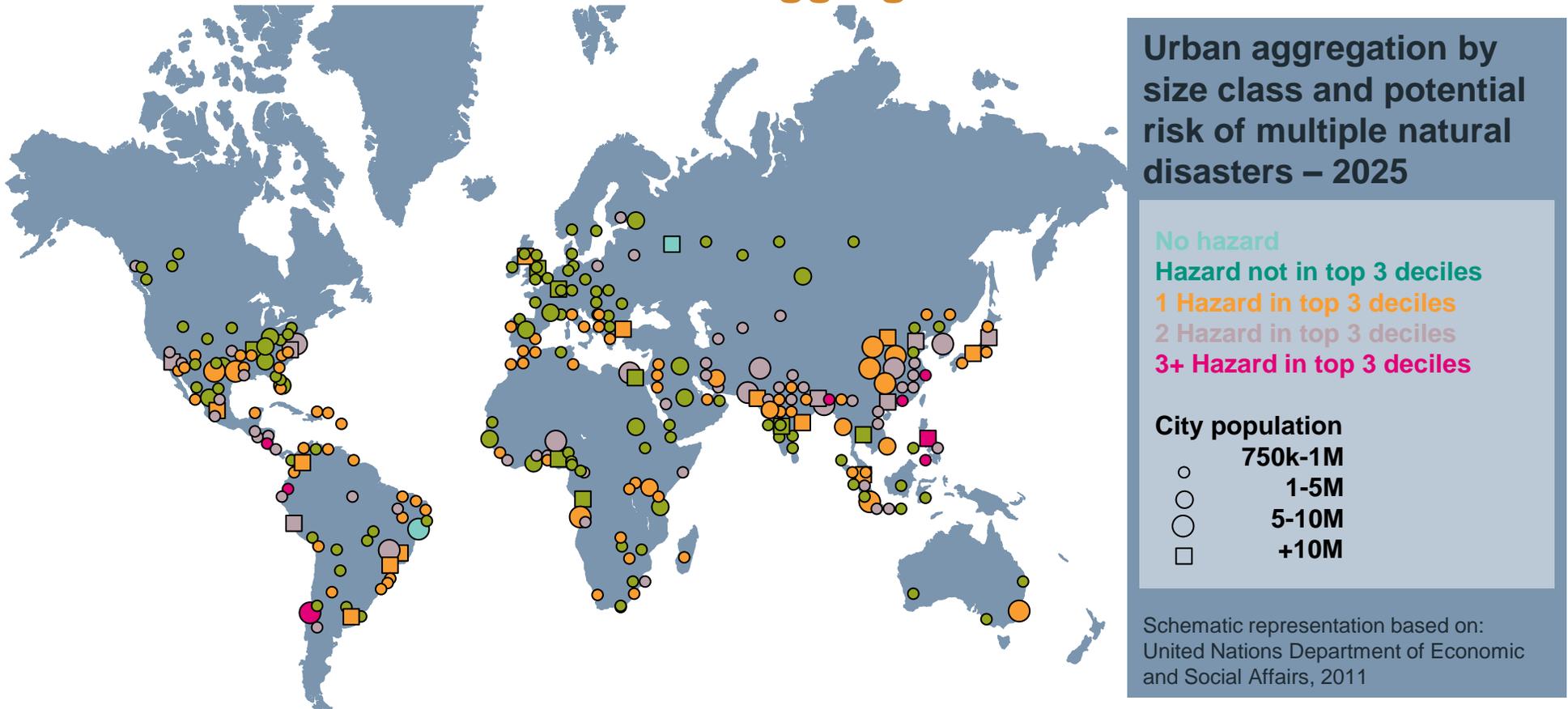
Nat Cat Effect > Opportunities

- Protecting crop yields.
- Low correlation products.
- GDP growth drives demand for LoBs such as property, health and business interruption.

Data in Growth Markets

1. Risk appetite and performance

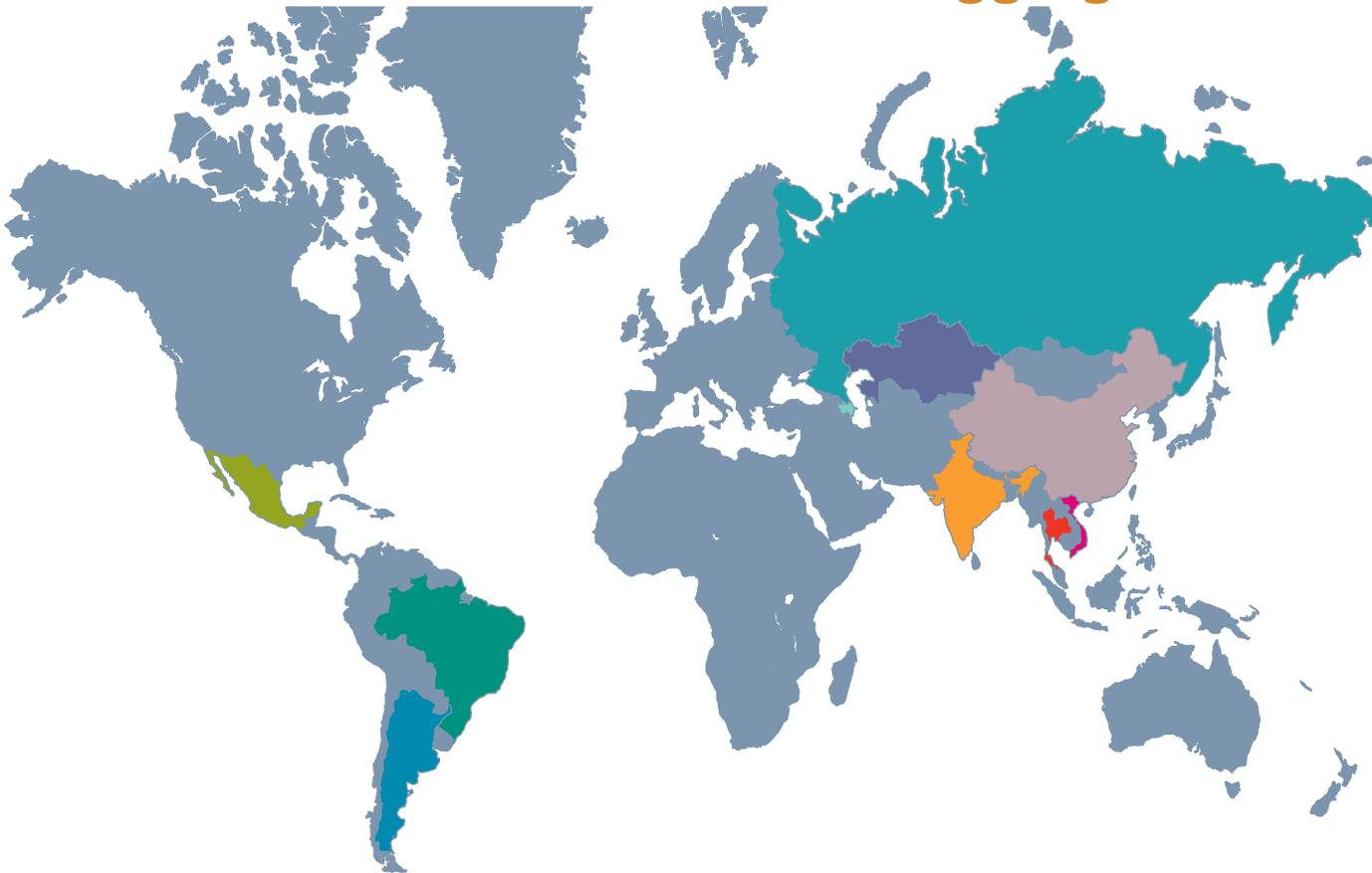
Nat Cat Effect > Focus on risk aggregation for un-modelled risk



Data in Growth Markets

1. Risk appetite and performance

Nat Cat Effect > Focus on risk aggregation for un-modelled risk



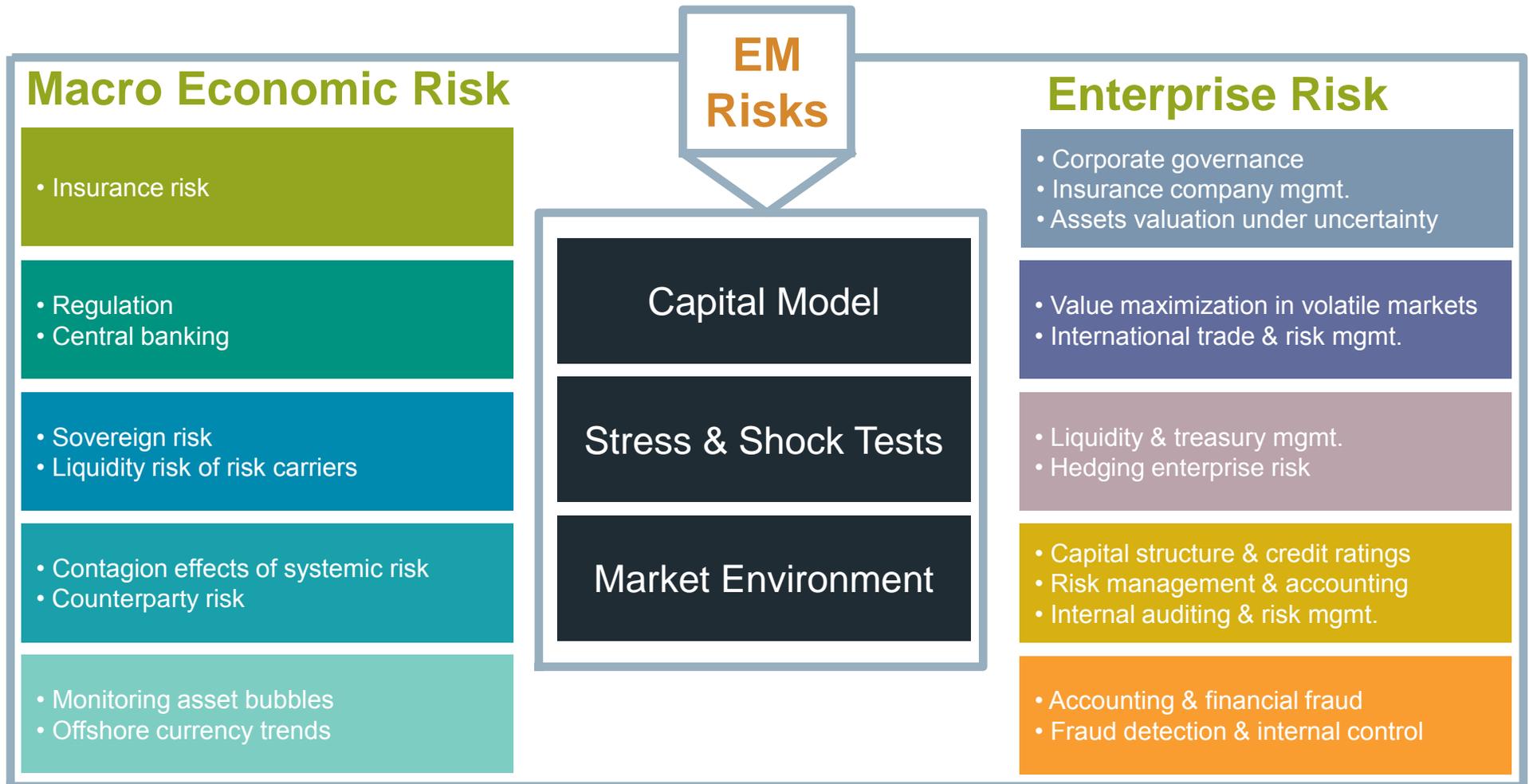
Top 10 Emerging Market Flood Hotspots - today

- Mexico
- Brazil
- Argentina
- Russia
- Azerbaijan
- Kazakhstan
- China
- India
- Thailand
- Vietnam

Based on: Swiss Re, 2012

Methods and Assumptions for Growth Markets

2. Controlling Risk and Growth



Methods and Assumptions for Growth Markets

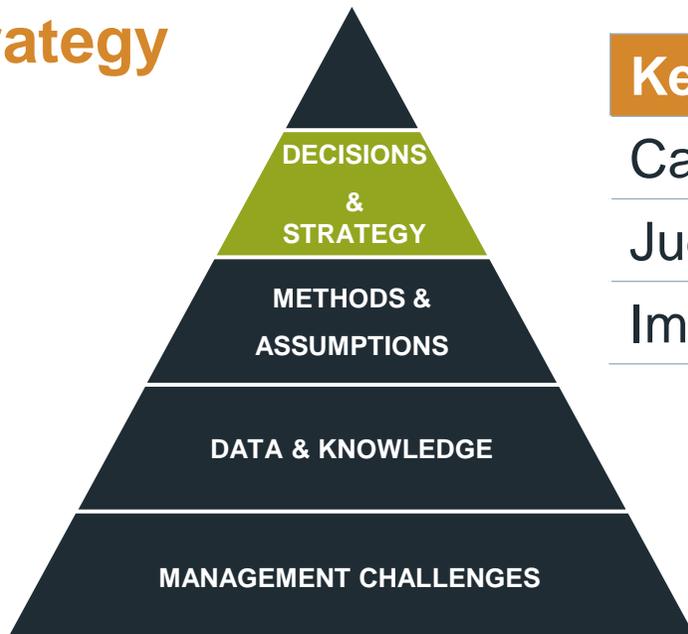
3. Communication of Risk

ORSA Effect

- More transparency
- Higher degree of comparability
- More awareness around risk identification and monitoring process adequacy
- Frameworks emphasizing actionable risk management processes
- Considerable degree of evidence around risk management performance internally and externally

Growth markets, their exposure to catastrophe risk and challenges to modelling

Decisions & Strategy



Key challenges for the next years are

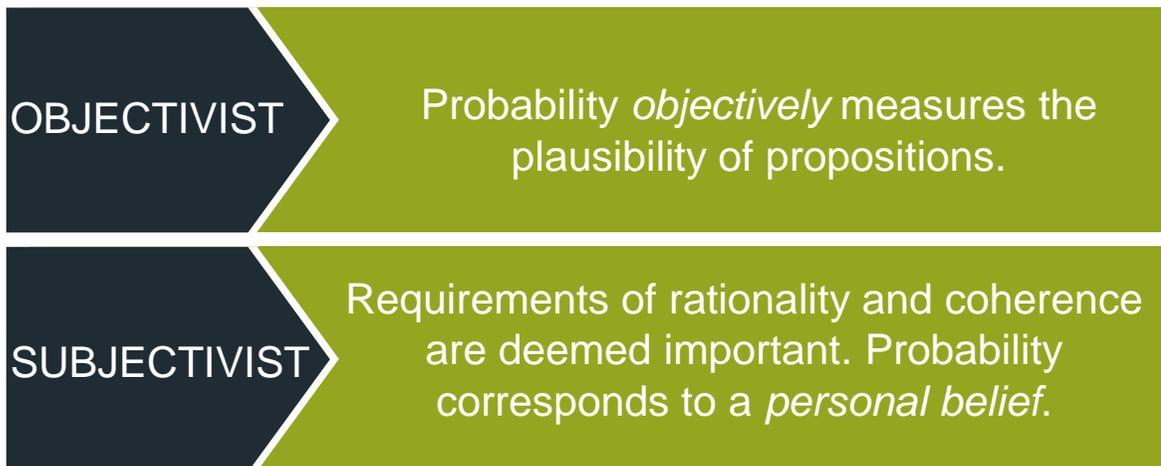
Capital Model	Decision support
Judgment	Execution & simplicity
Implementation	Target operating model

Decision and Strategy

1. Decision Modelling

Complex decision support modelling only informs judgement

- Models, such as Bayesian ones, can inform on the basis of a set of known information and assumed probabilities.
- Reasoning uses propositions whose truth or falsity is yet uncertain. Initial probabilities are updated in the light of new, relevant data.



Expert Judgement challenges two interpretations of the 'probability' concept

Variants of Bayesian probability (objective or subjective) differ in interpretation and construction of the prior probability.

Decision and Strategy

2. Execution

Simplicity enables execution

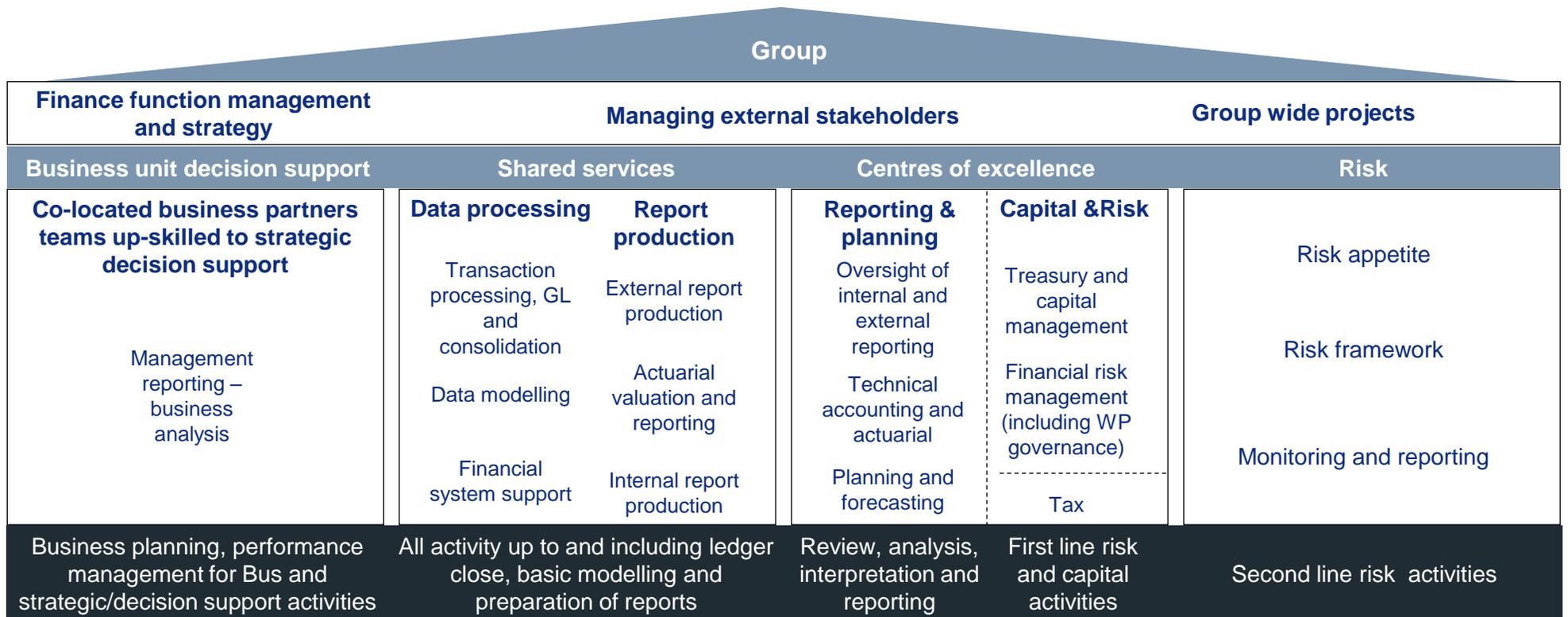


- Identify the market
- Develop sourcing opportunities
- Decide form of investment & control
- Consider operating model from tax perspective
- Identify & approach potential targets & partners
- Building & validating business plan
- Location & site assessment

Decision and Strategy

3. Target Operating Model

Target operating model flexibility supports implementation



Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenter.

