

## **GIRO Conference and Exhibition 2012**

### Juggling uncertainty: the actuary's part to play

20/09/2012



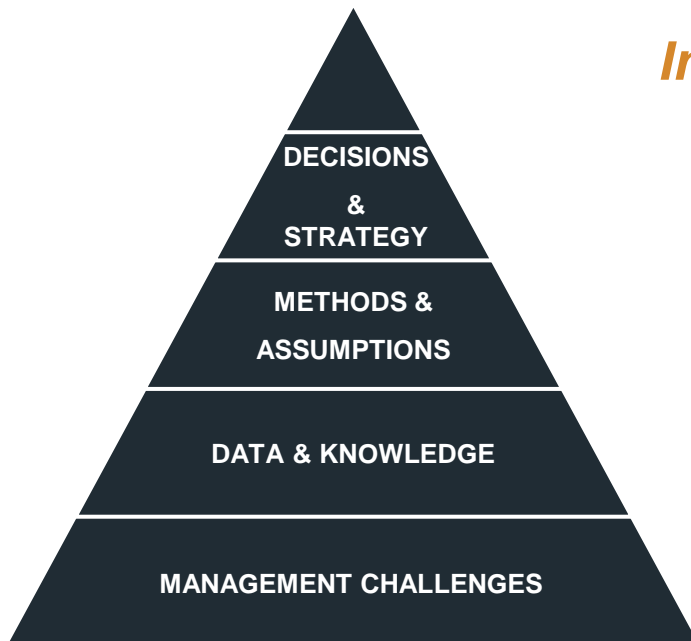
## **GIRO Conference and Exhibition 2012**

# **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

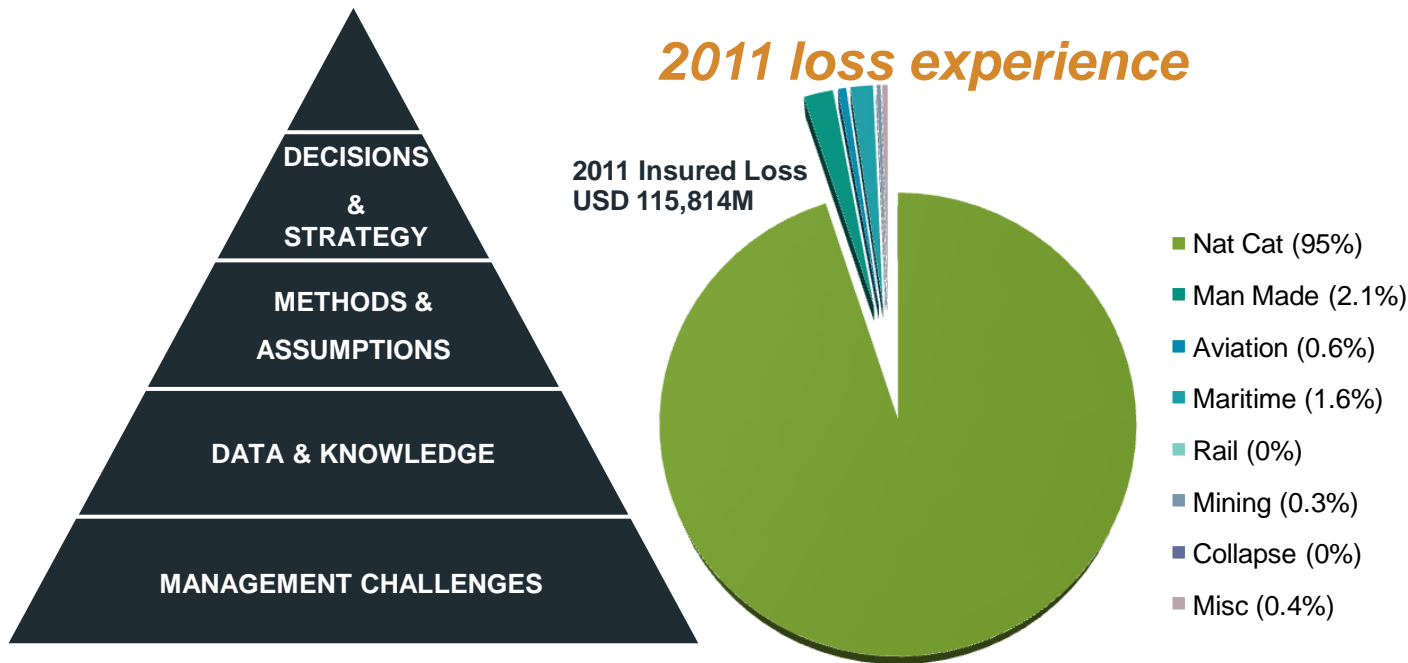
## Agenda



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

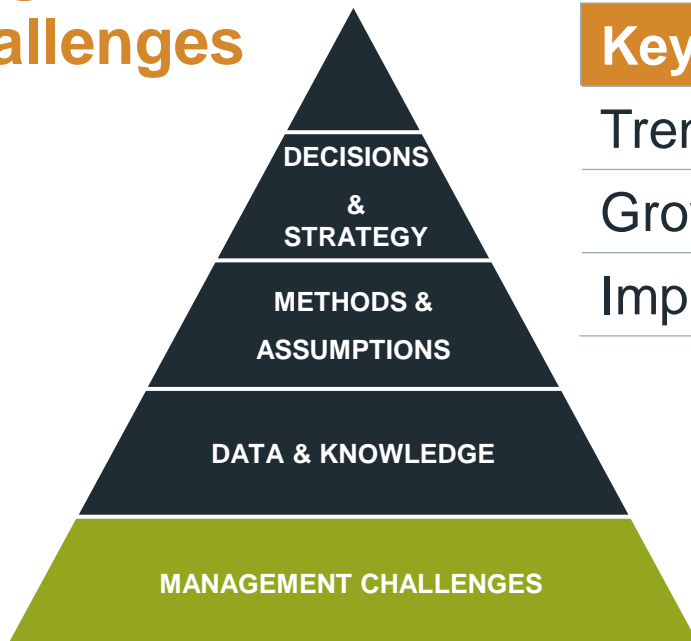
# Growth markets, their exposure to catastrophe risk and challenges to modelling

## Agenda



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

## Management challenges



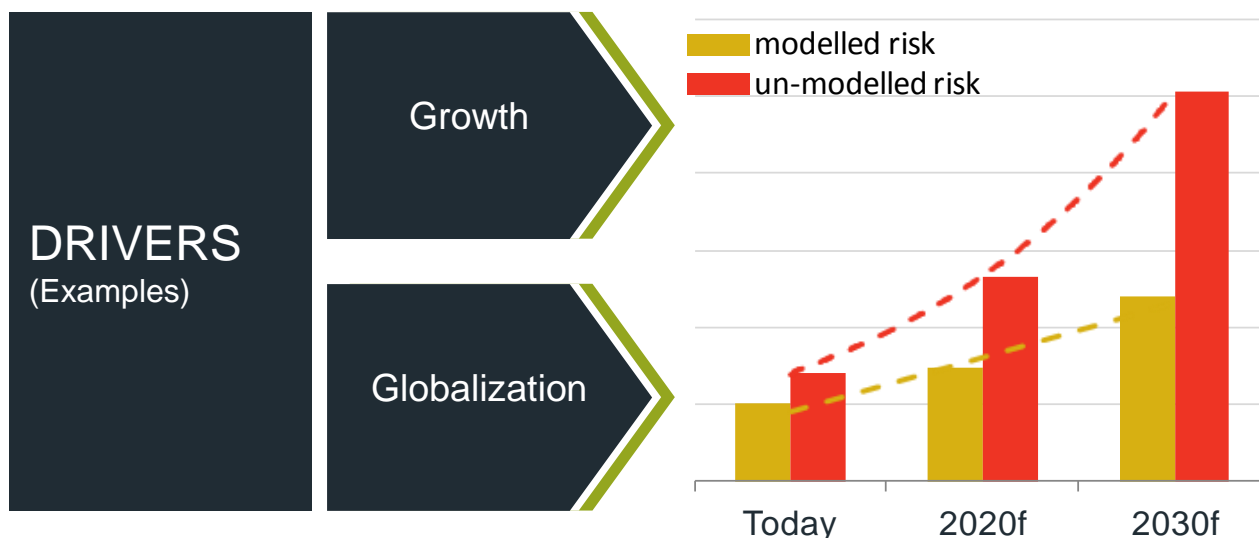
### Key challenges for the next years are

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

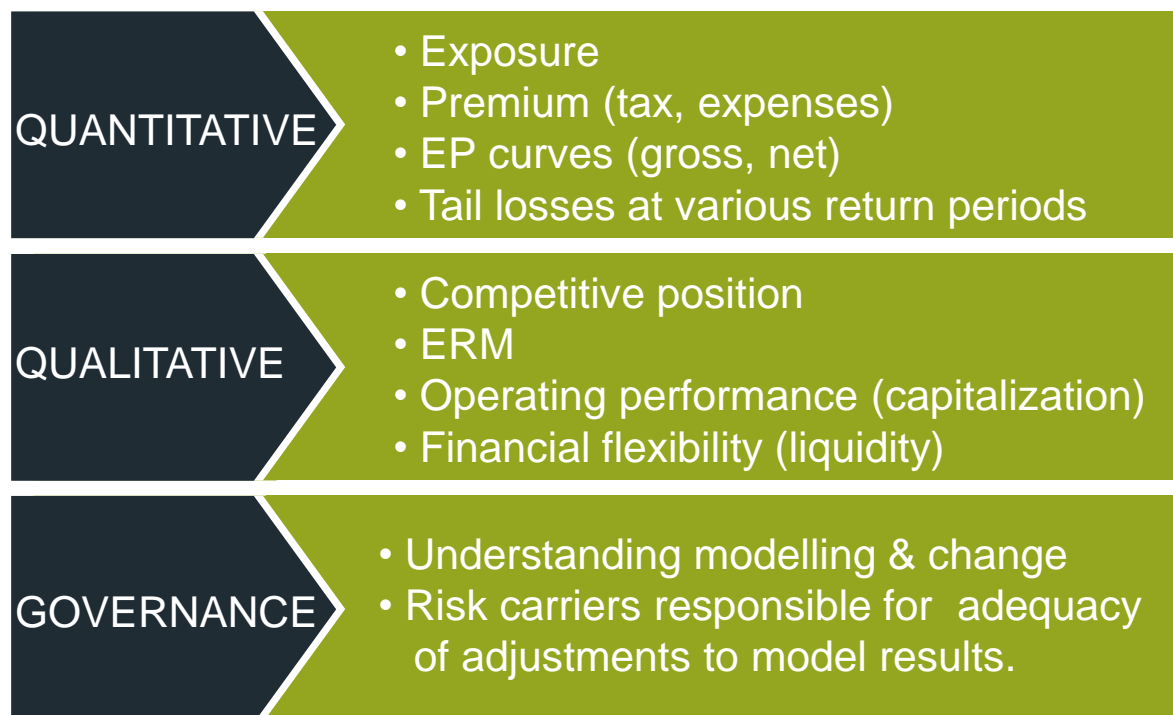
**Growth and change are both challenges. In emerging markets they require quantification of new, evolving risks. The Model Governance and the Model Change Policy, face challenges:**

Governance & Process	<ul style="list-style-type: none"><li>• process management around modelling and change</li><li>• clarity and transparency</li></ul>
Model change & Sources	<ul style="list-style-type: none"><li>• well defined, clear rationale</li><li>• clear identification</li></ul>
Type of Change & SCR impact	<ul style="list-style-type: none"><li>• differentiation</li><li>• materiality of changes</li></ul>
Communication & Action	<ul style="list-style-type: none"><li>• Communication at Risk Carrier, Regulator, Rating</li><li>• Validation and Testing, RI purchase, capital impact</li></ul>

# 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

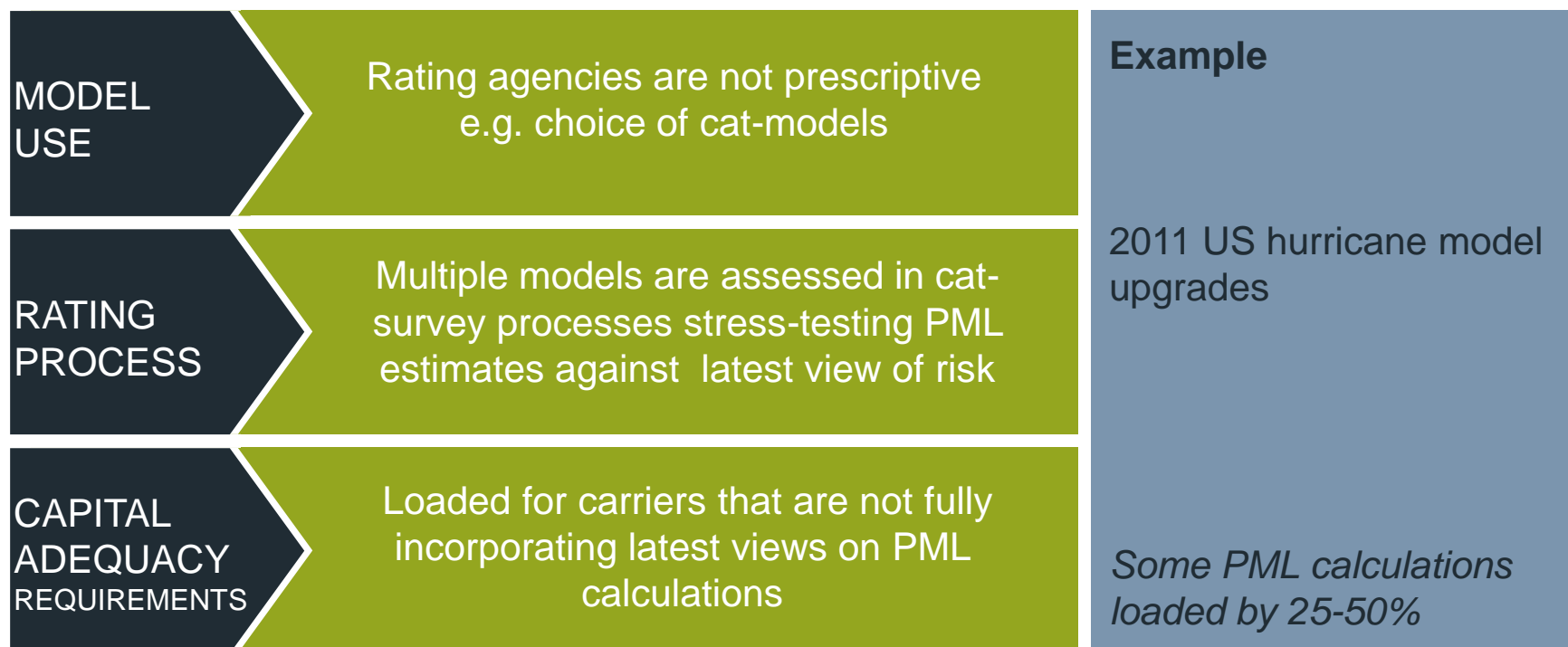
Recognized as significant and most challenging aspect of tail risk modelling as catastrophe event may cause shocks

**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:**



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# Management challenges

## 3. Models responding to trends

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

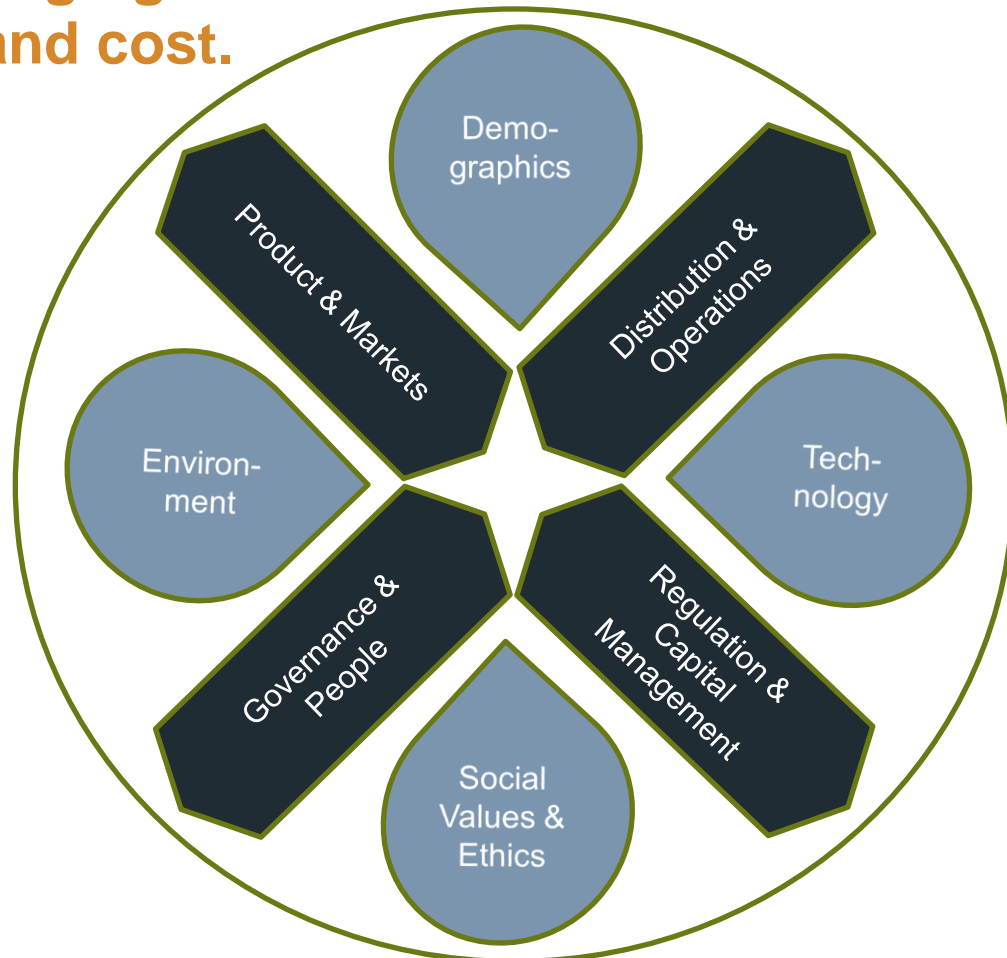
- risk is transient
- so are opportunities and modelling requirements
- leveraging strategic advantages and competing regulatory regimes
- commercializing market insights and liberalisation
- access new distribution channels or leverage existing ones
- shape global products for the regional demographic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

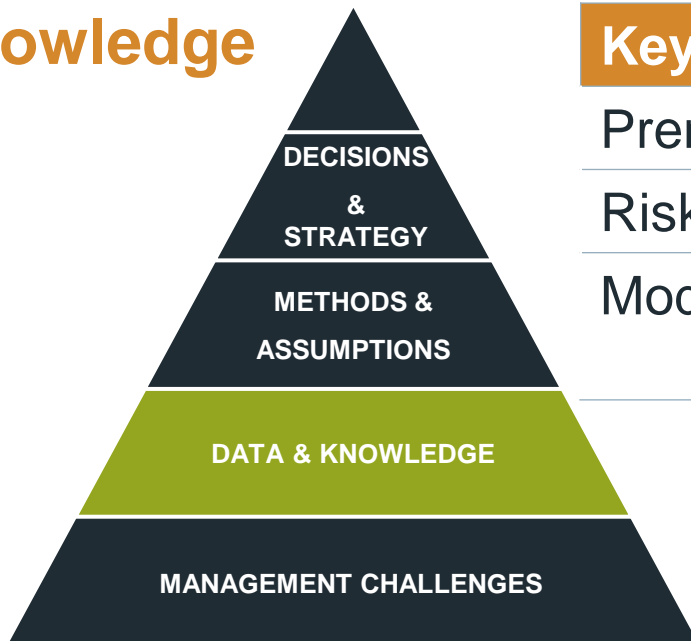
### Emerging Markets

**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

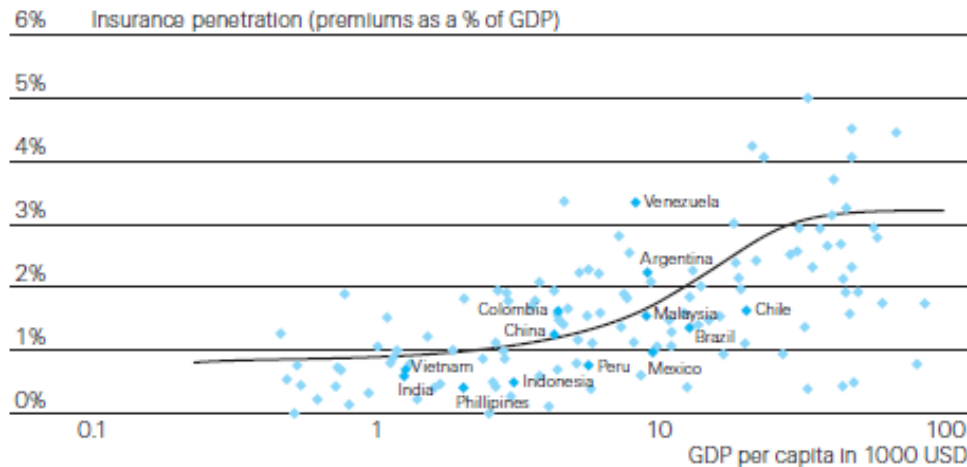
Premium	growth markets, opportunities
Risk	learning, trends, monitoring
Modeling	granularity, inherent uncertainty, appropriateness

# 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

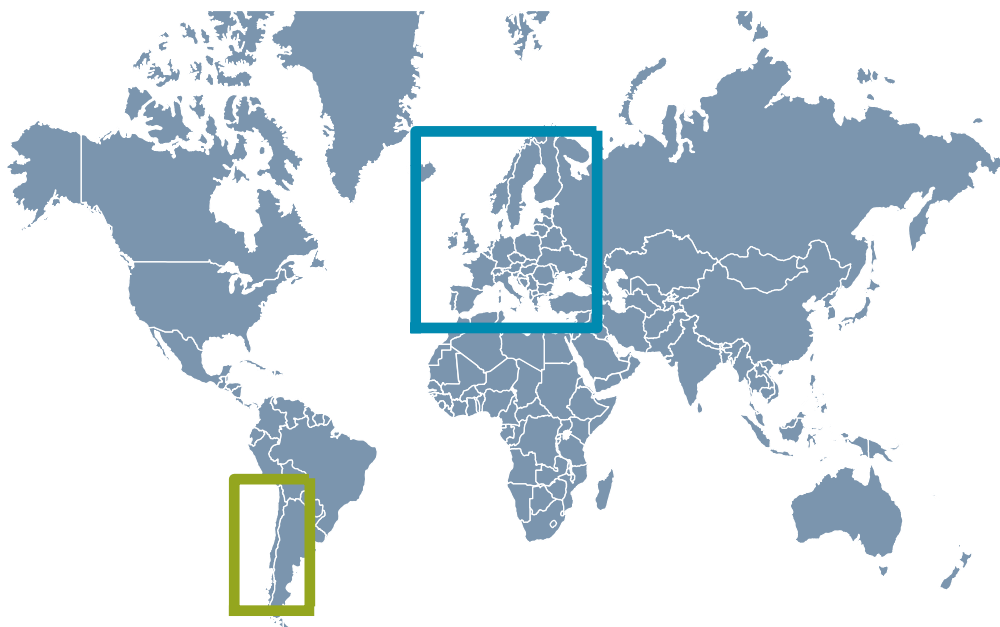
- GI premium growth generally weaker than Life with the exception of cat affected areas
- Low or negative real premium growth in a majority of countries
- Constrained demand for workers' compensation; Strong competition for motor insurance

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

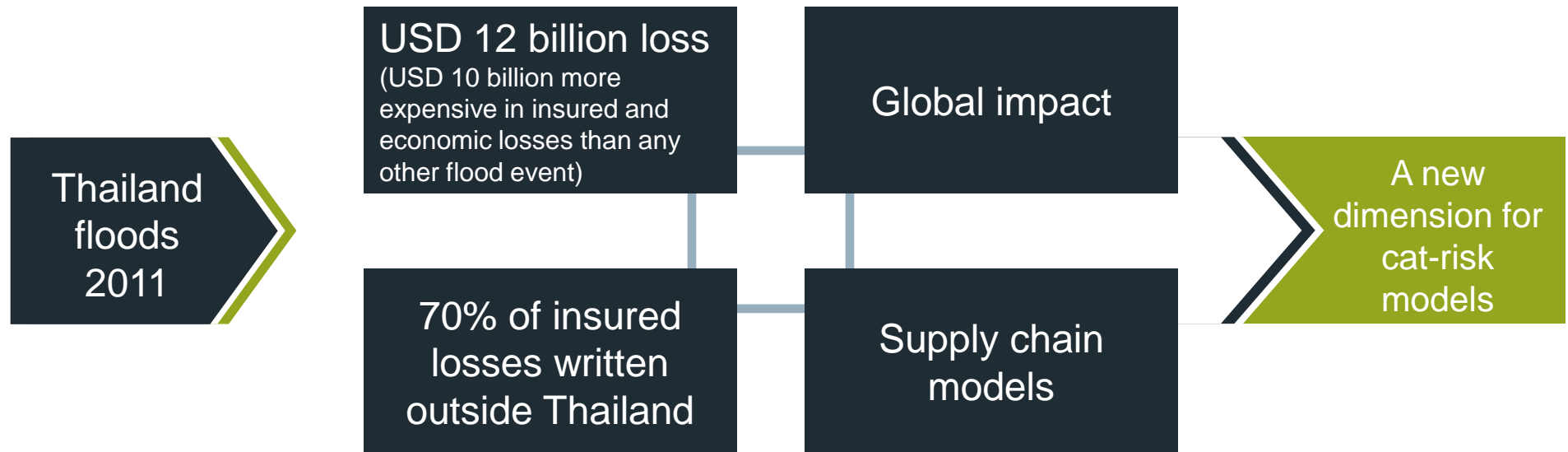


- **Chile (post cat):** 14.7% growth post 27/02/2010 earthquake for earthquake and motor insurances.
- **EU (recession):** Driven by macro-economy. Slow growth for commercial business.
  - **Ireland:** Capacity withdrawn, e.g. professional indemnity insurance.
  - **Czech Republic:** increased competition 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

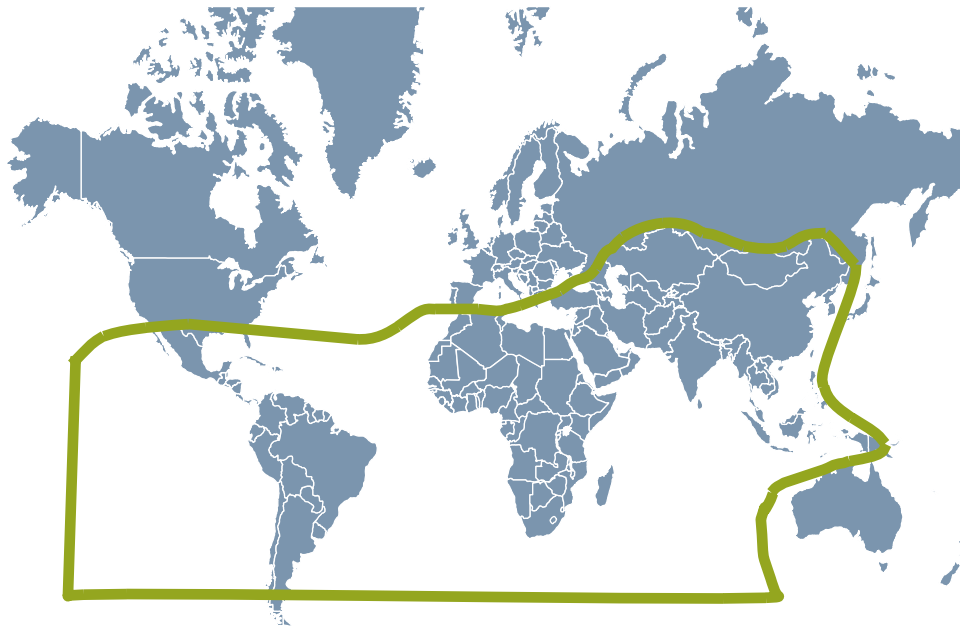


The traditional approach of modelling *local exposure*, *local hazard* and *local vulnerability* to assess the *localized financial risk* requires a *new dimension in a globalised world: the global connectivity of local business and the impact of its interruption*.

# Data in Growth Markets

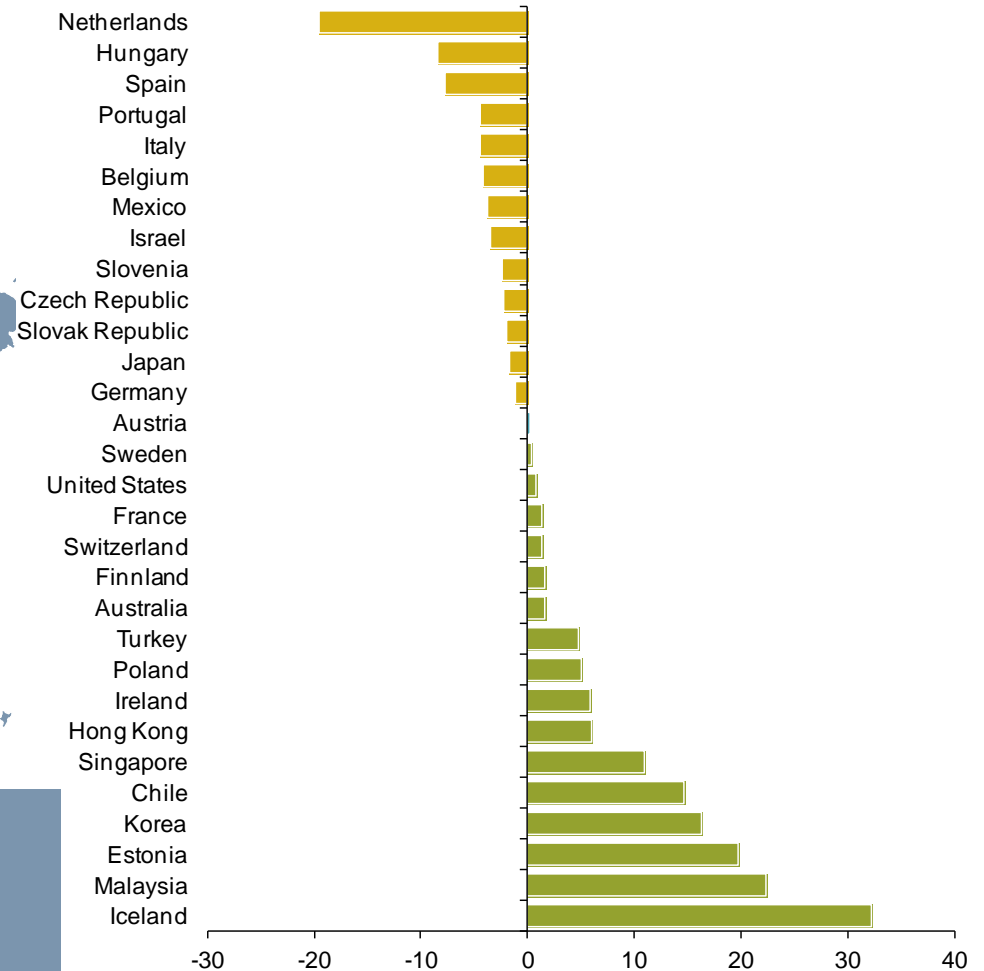
## 3. Inherent uncertainty

### Premium Growth Trends > EM?



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

Annual Real Gross Premium Growth (%) [GI]

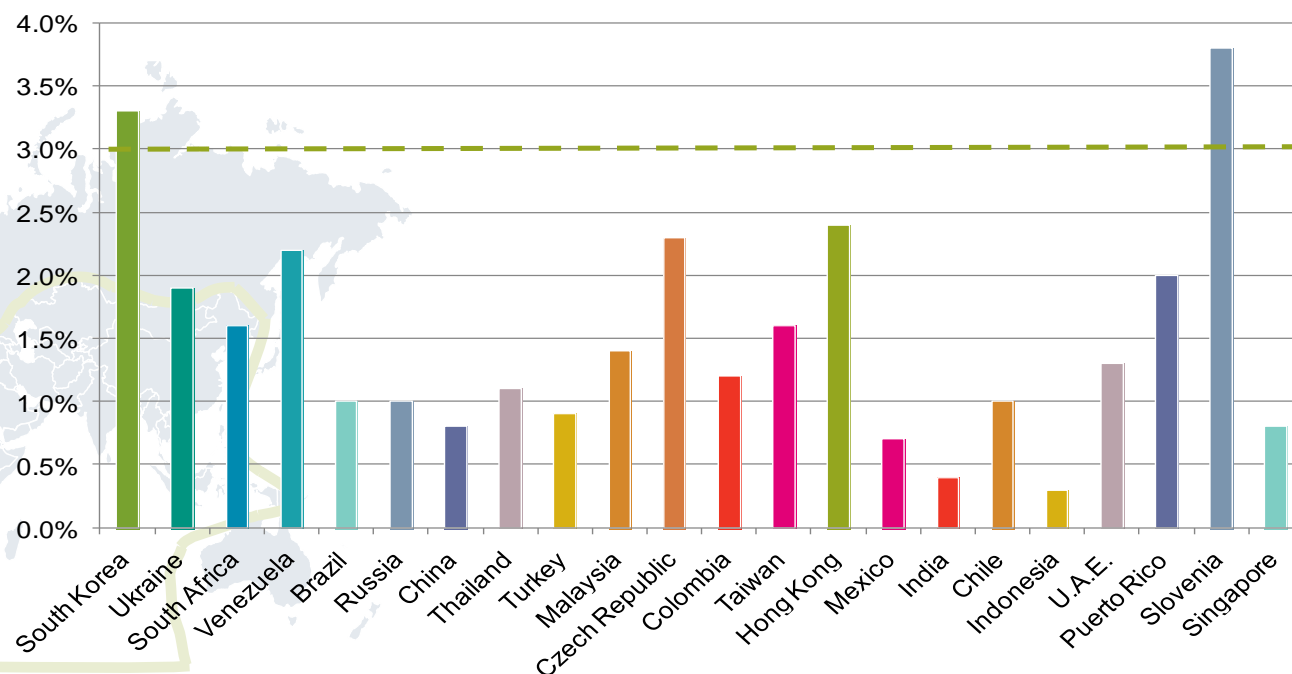


# Data in Growth Markets

## 3. Inherent uncertainty

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

**'Premium/GDP'-Ratio (Growth Markets)**



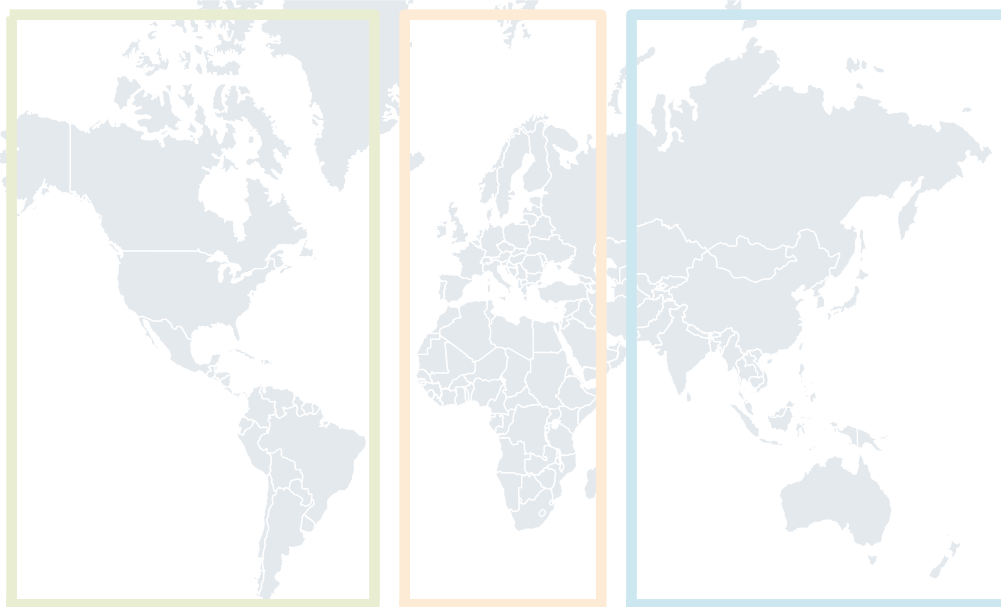
- ➔ DMs have ratios of about **3%**.
- ➔ EMs with growth potential as their GDP grows.

# Data in Growth Markets

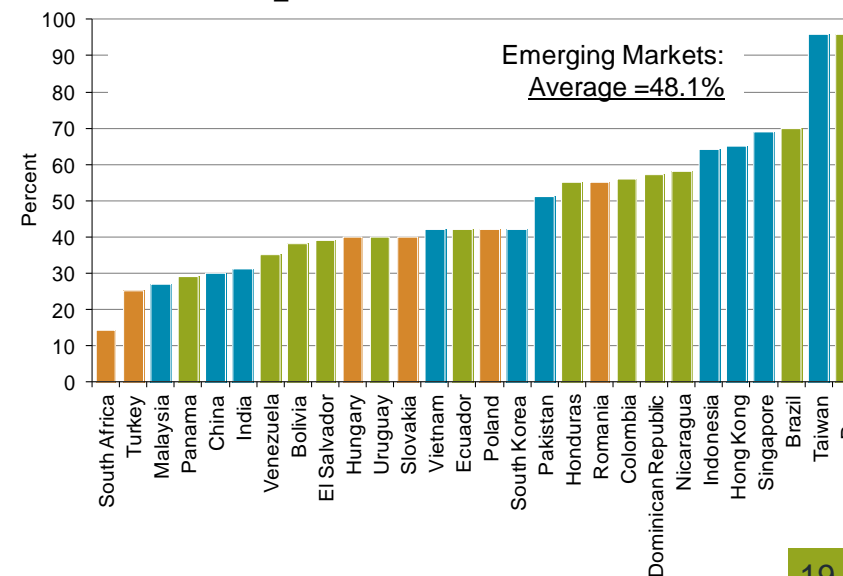
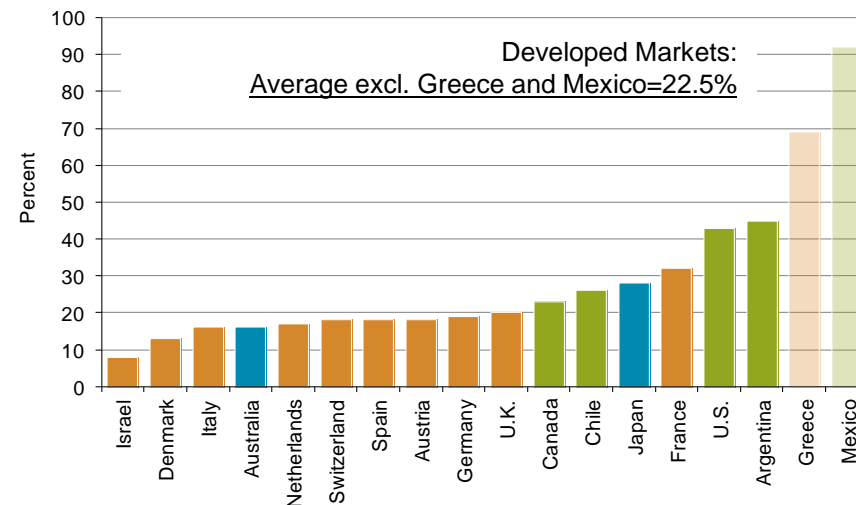
## 3. Inherent uncertainty

### 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).

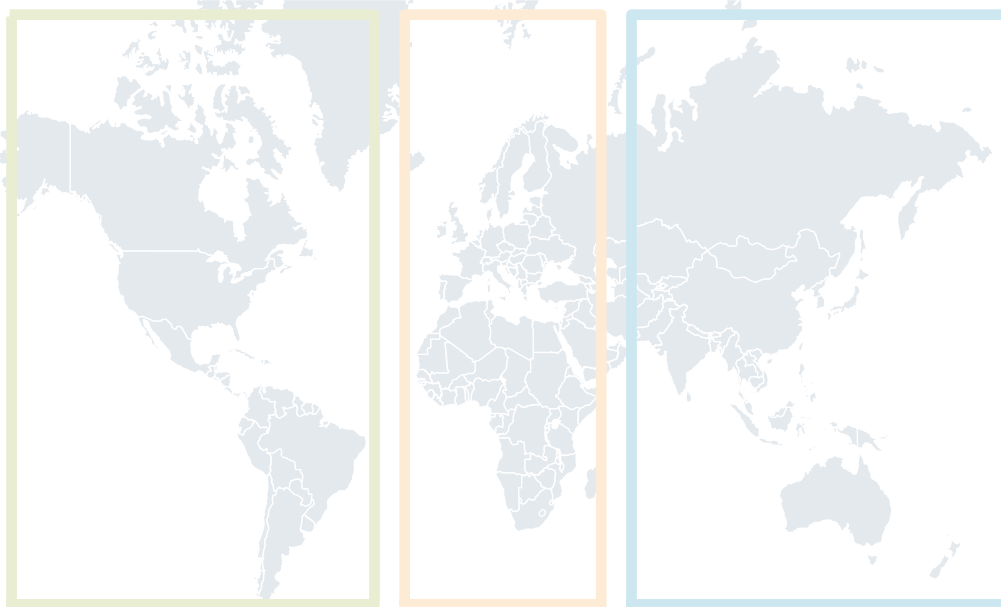


# Data in Growth Markets

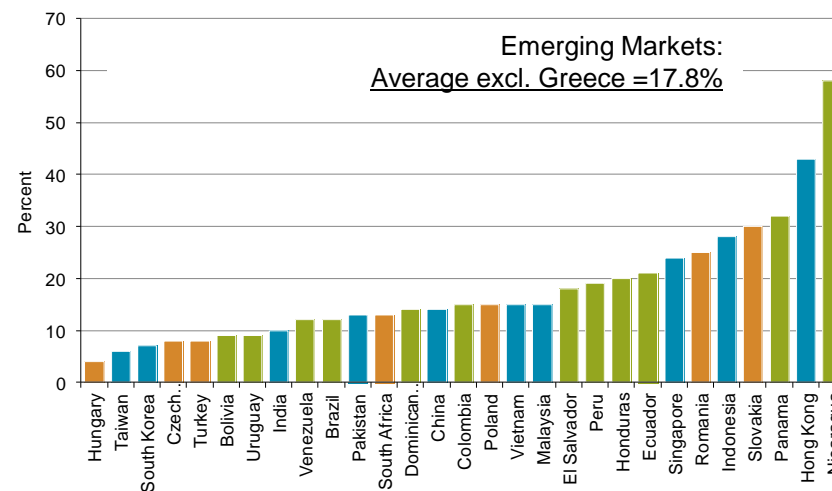
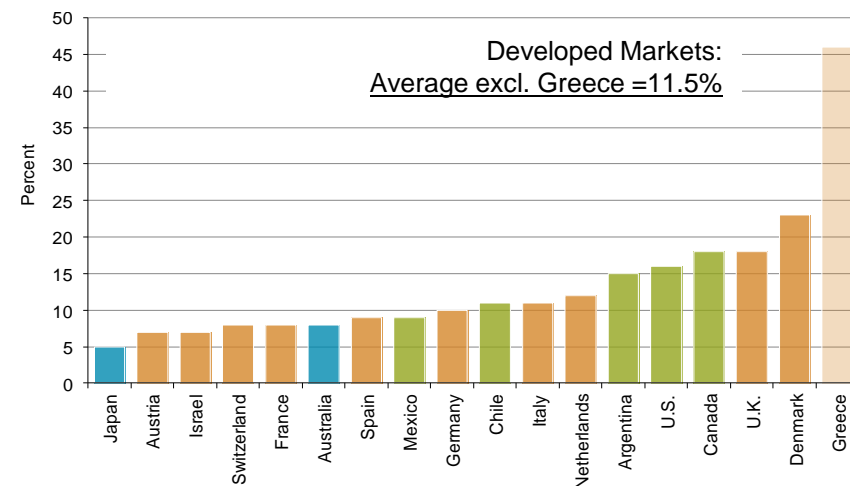
## 3. Inherent uncertainty

**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

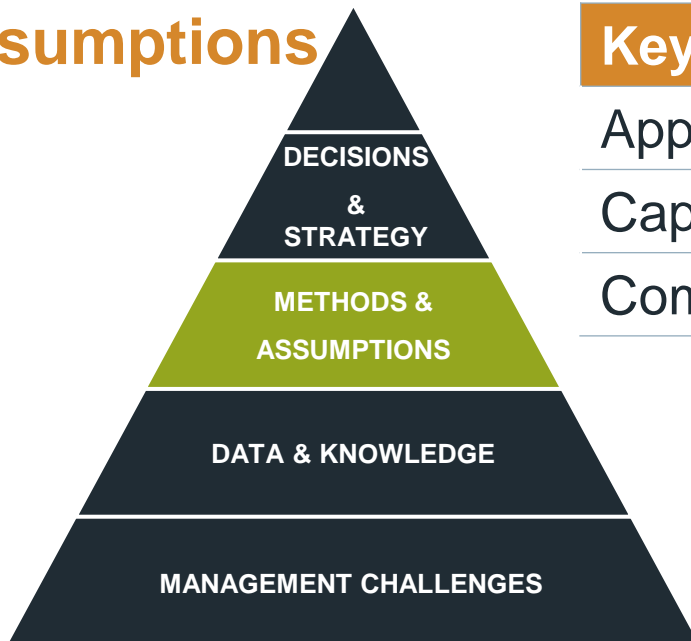
## 3. Inherent uncertainty

### Key messages



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

## Methods & Assumptions



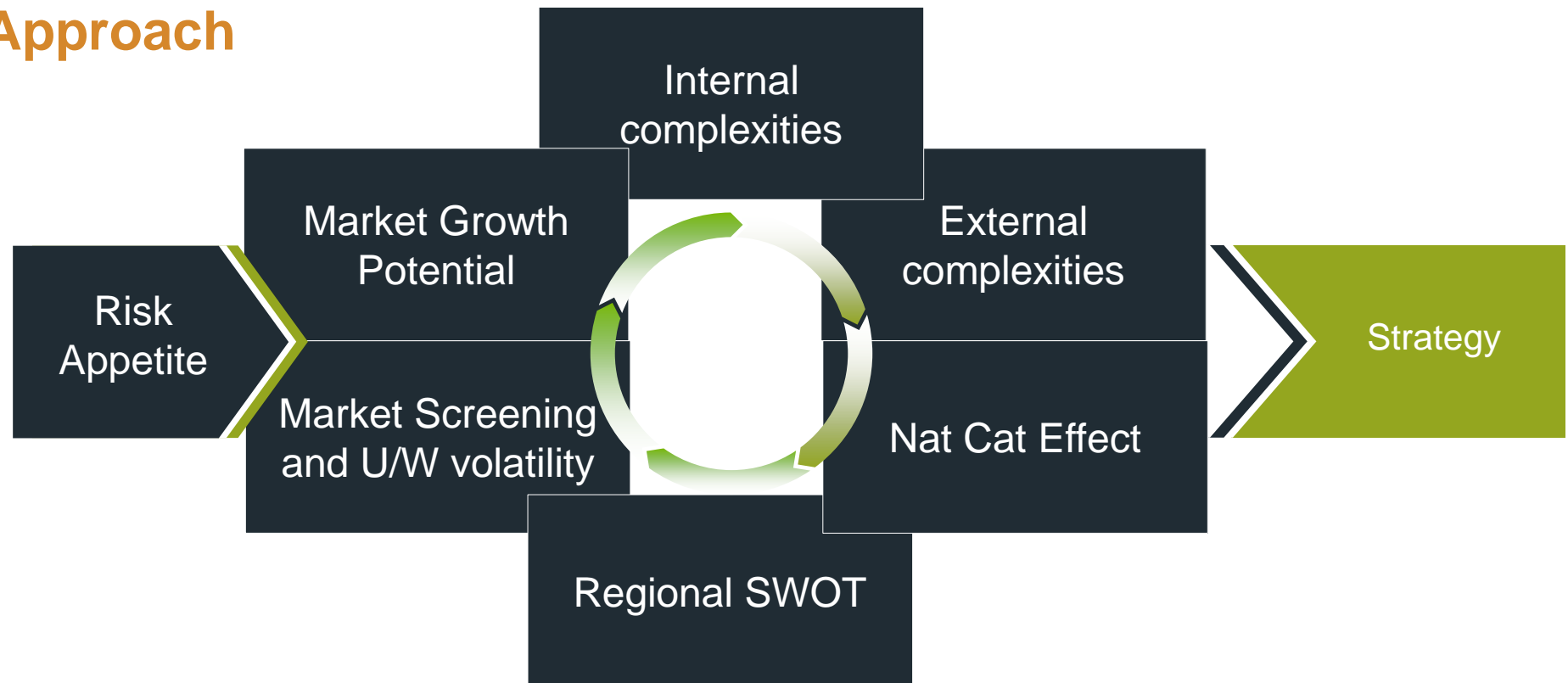
### Key challenges for the next years are

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

# Data in Growth Markets

## 1. Risk appetite and performance

### Approach

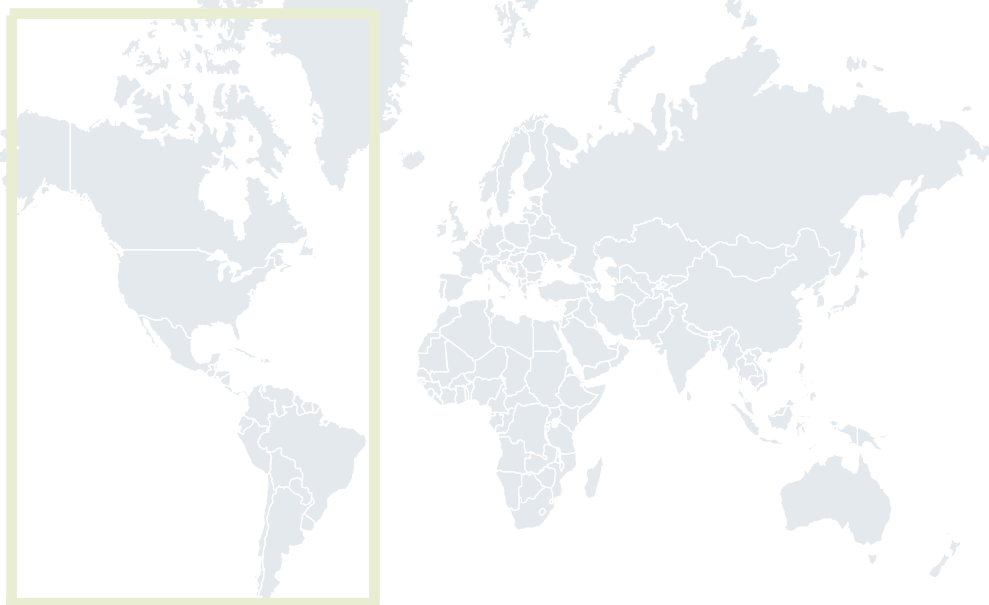


# Data in Growth Markets

## 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
<b>Americas</b>				
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
<b>Americas</b>				
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.

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# Data in Growth Markets

## 1. Risk appetite and performance

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### 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.

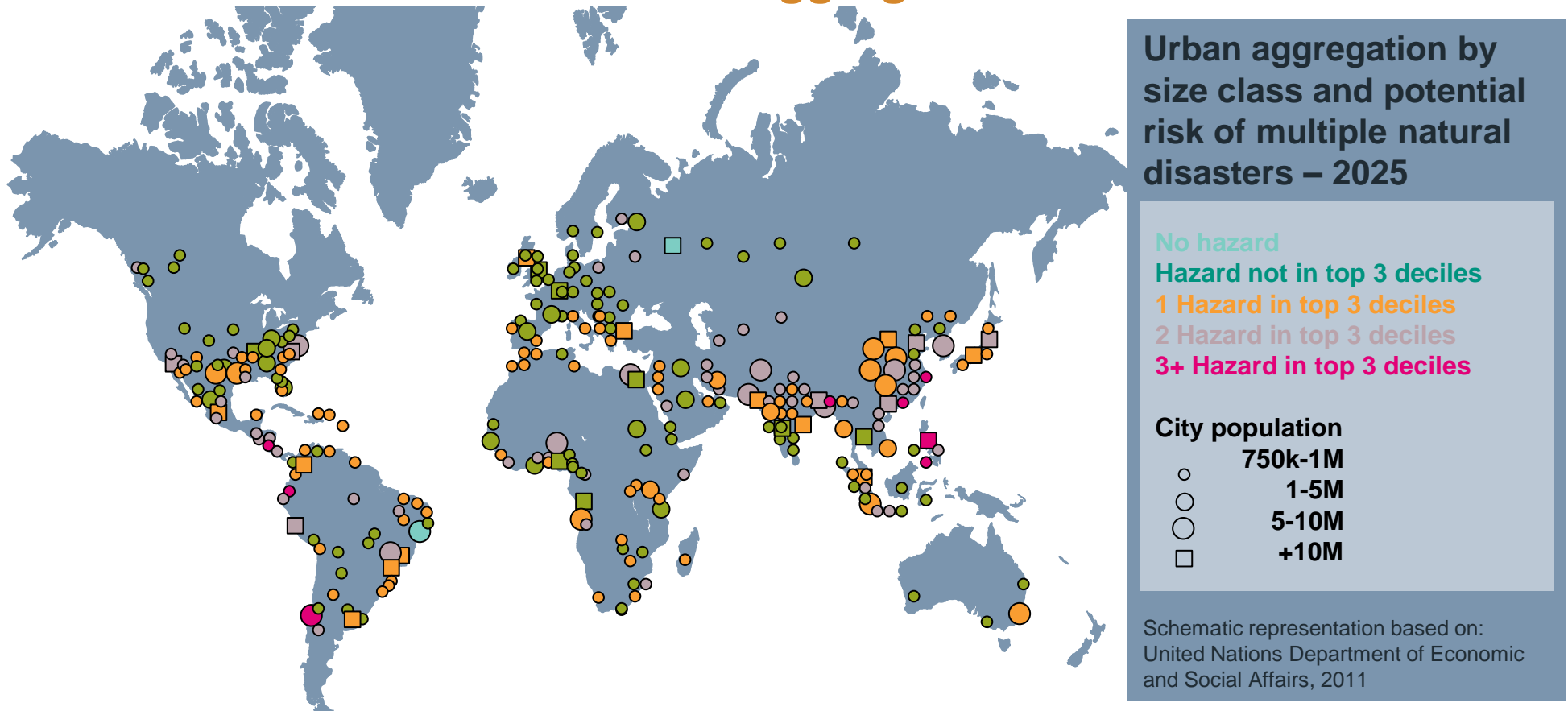
### Nat Cat Effect > Opportunities

- 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

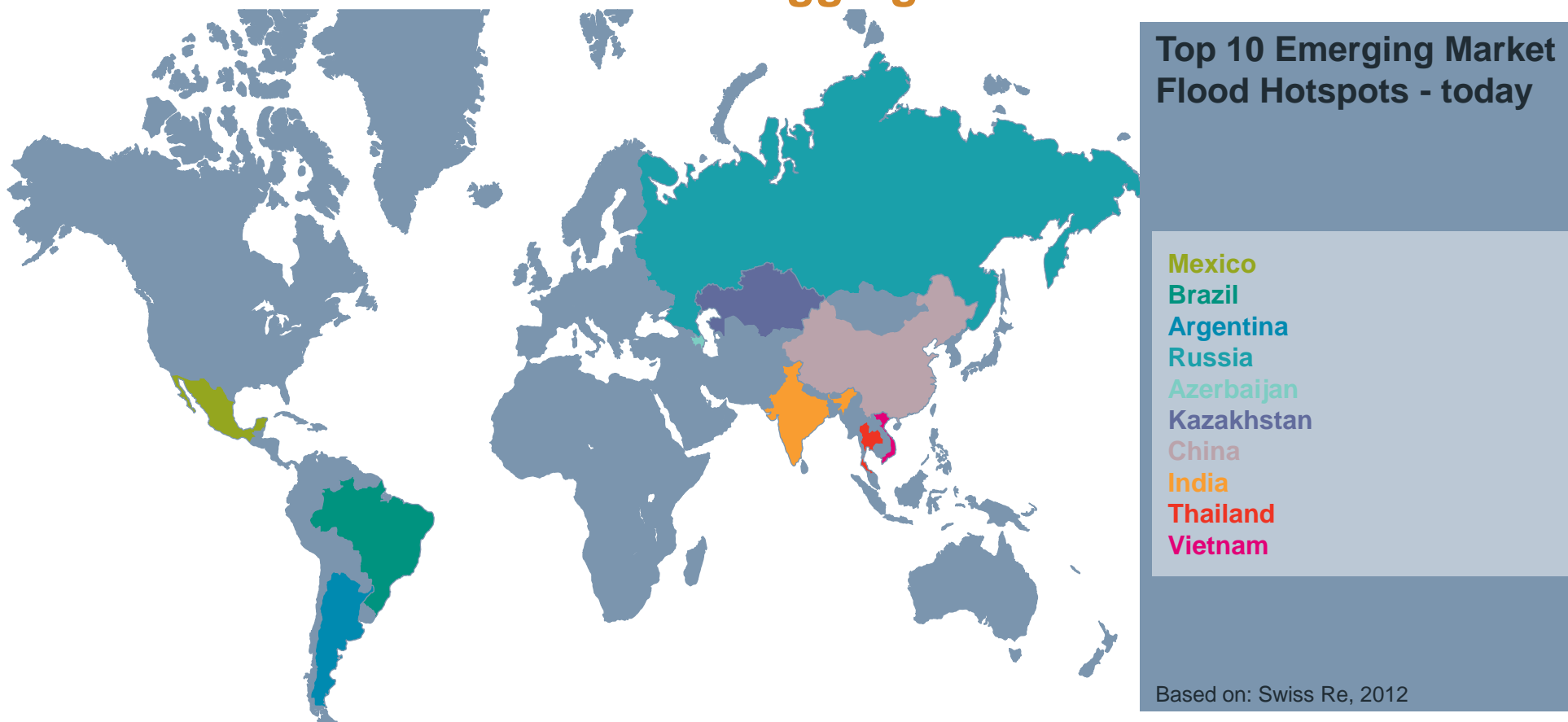
### Nat Cat Effect > Focus on risk aggregation for un-modelled risk



# Data in Growth Markets

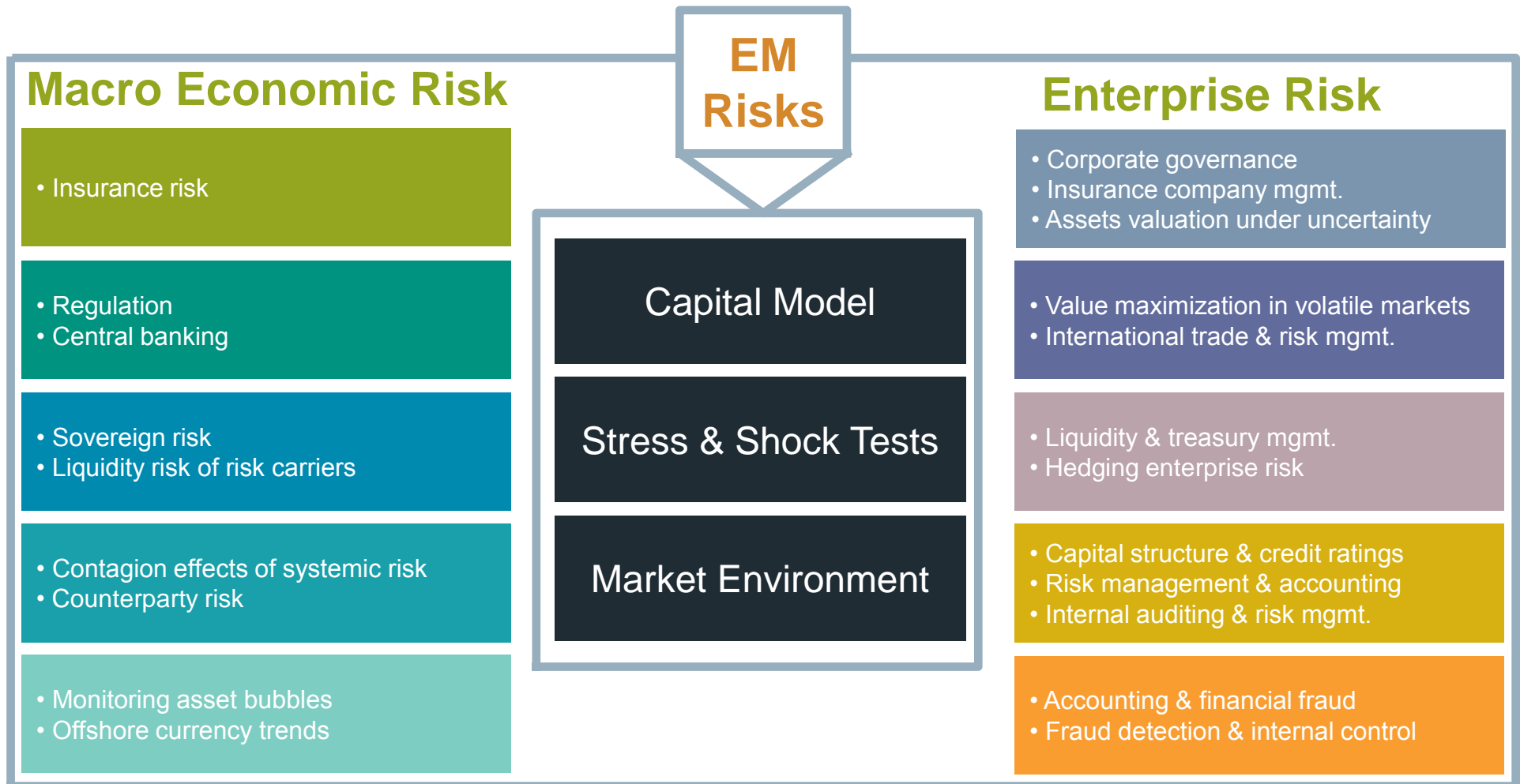
## 1. Risk appetite and performance

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



# Methods and Assumptions for Growth Markets

## 2. Controlling Risk and Growth



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# Methods and Assumptions for Growth Markets

## 3. Communication of Risk

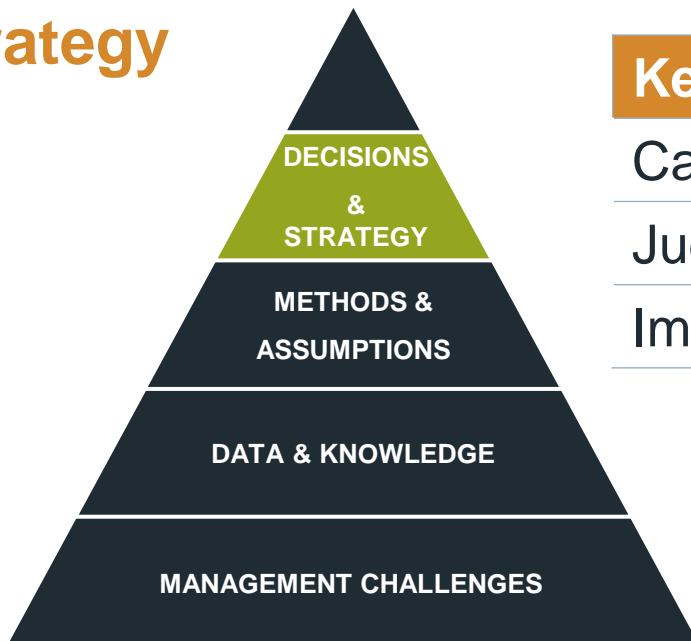
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### ORSA Effect

- 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

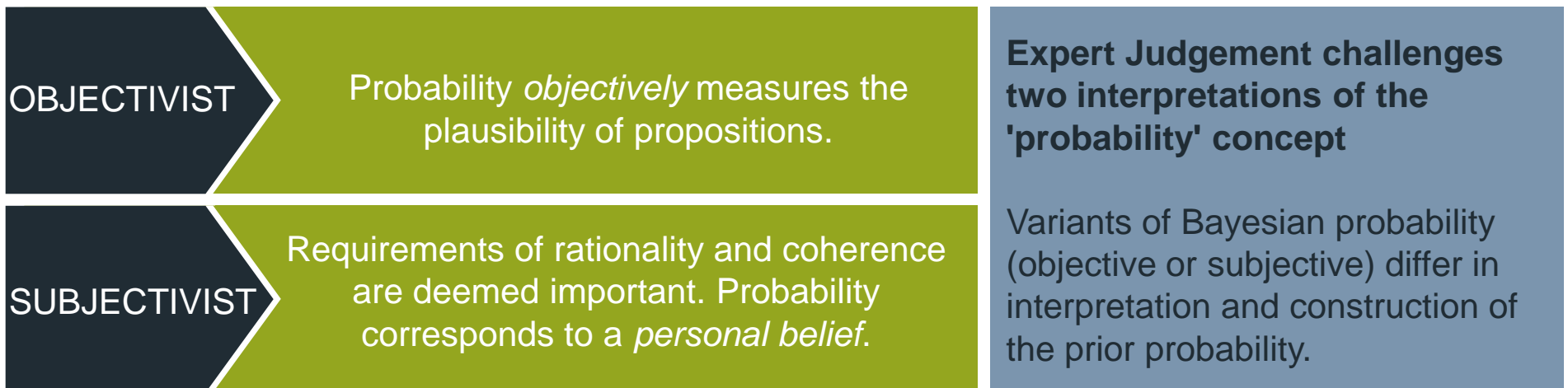
Capital Model	Decision support
Judgment	Execution & simplicity
Implementation	Target operating model

# Decision and Strategy

## 1. Decision Modelling

### Complex decision support modelling only informs judgement

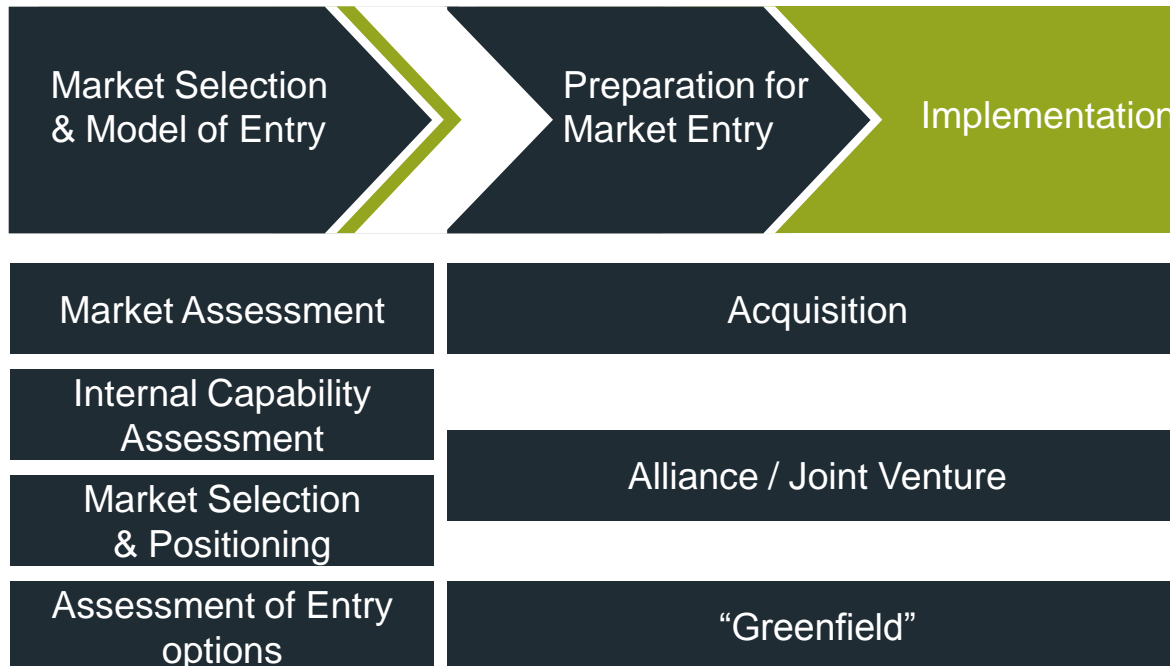
- Models, such as Bayesian ones, can inform on the basis of a set of known information and assumed probabilities.
- Reasoning uses propositions whose truth or falsity is yet uncertain. Initial probabilities are updated in the light of new, relevant data.



# Decision and Strategy

## 2. Execution

### Simplicity enables execution

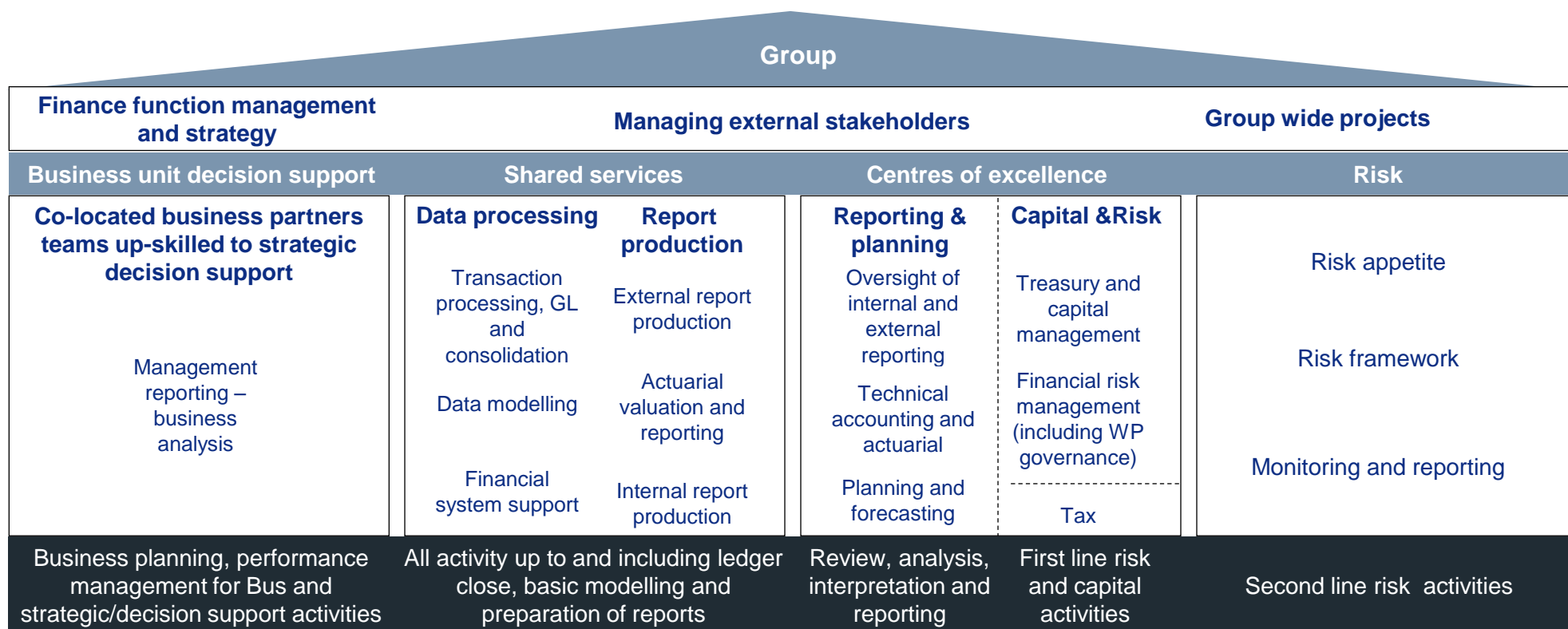


- Identify the market
- Develop sourcing opportunities
- Decide form of investment & control
- Consider operating model from tax perspective
- Identify & approach potential targets & partners
- Building & validating business plan
- Location & site assessment

# Decision and Strategy

## 3. Target Operating Model

### Target operating model flexibility supports implementation



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# Questions or comments?

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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.

