

# **Insurance in emerging markets: determinants of growth and the case of climate change?**

**Proceedings of the Autumn Symposium**

**Wednesday, 21<sup>st</sup> November 2012**

**at the**

**London School of Economics and Political Science**

Held as part of the LSE Munich Re programme:

***'Evaluating the Economics of Climate Risks and Opportunities in the Insurance Sector'***

### **Note regarding slides**

These proceedings and slides of the presentations are available online at  
<http://www.cccep.ac.uk/Events/Past/2012/November/insurance-markets-growth-climate-change-symposium.aspx>

### **Acknowledgements**

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## **SYNOPSIS**

The 'LSE/MR Symposium on Insurance in Emerging Markets' brought together a small group of leading academics and practitioners to discuss the different determinants of insurance growth. The aim was to have an open exchange on latest findings, considering evidence from emerging markets and developed markets, as well as comparing tools and methods for evaluation. Over the past decade, growth in insurance demand in the emerging economies has been a key driver of global non-life premium growth. Current forecasts suggest that these markets will continue to be areas of significant growth over the coming decade. Although several studies (for example Feyen et al. 2011; Enz 2000; Zheng et al. 2008, 2009) have found that one of the most significant historical drivers of non-life insurance demand in emerging economies is income per capita, this alone cannot wholly explain the long-term evolution of insurance penetration at a country level. The LSE/MR research programme on 'Evaluating the Economics of Climate Risks and Opportunities in the Insurance Sector' has explored the major determinants of the demand for insurance in the context of climate change. Ranger and Surminski (2011) suggest five pathways of influence: economic growth; willingness to pay for insurance; public policy and regulation; the insurability of natural catastrophe risks; and new opportunities associated with adaptation and greenhouse gas mitigation.

The symposium provided an opportunity to present the findings under the LSE/MR research programme, while inviting a discourse on how best to link the topic of climate change with general insurance economics.

The event followed the tradition of earlier academic symposia held as part of the LSE/MR programme, facilitating a dialogue between practitioners from the industry and the academic world.

## AGENDA

11:00 – 11:05	Welcome and introduction by Prof Judith Rees, Director CCCEP/GRI, LSE
11:05 – 13.15	<p>Kick-off presentations and discussion forum:</p> <p><b>What are the key determinants for insurance market growth and how to measure it?</b></p> <p>Presentations:</p> <ul style="list-style-type: none"><li>o Yongdong Liu</li><li>o Subir Sen</li><li>o Andreas Richter</li><li>o Ian Webb</li><li>o Florian Englmaier</li><li>o Axel Fürderer</li></ul> <p>Followed by round-table discussion chaired by LSE.</p>
14:00- 15:00	<p>Set of presentations of findings from LSE research programme on the Economic Impacts of Climate Change in Emerging Economies: <b>What implications could climate change have for the development of insurance in emerging markets?</b></p> <ul style="list-style-type: none"><li>o Climate change and insurance demand in the BRICs (Ranger)</li><li>o Climate change and the political, legal and regulatory framework for insurance in emerging markets (Surminski)</li><li>o Risk governance and the role of public and private actors (Surminski)</li></ul>
15:15 – 16:45	<p>Expert statements and discussion forum:</p> <p><b>The future of insurance in the BRICS – climate change and beyond, how can the industry prepare and what is the role of multilateral development banks?</b></p> <p>Introductory statements:</p> <ul style="list-style-type: none"><li>o Daniel Clarke (World Bank)</li><li>o Craig Davies (EBRD)</li><li>o Maricarmen Esquivel (IDB)</li><li>o Thomas Mahl (Munich Re)</li></ul> <p>Followed by round-table discussion chaired by LSE.</p>
16:45 – 17:00	Concluding remarks (MR and LSE)

## PRESENTATIONS

### 1. Insurance Growth Structure and International Comparison

**Yongdong Liu, Peking University**

#### **Abstract**

Considering the limitations of the traditional methods in international insurance research, we propose a new paradigm. This paradigm not only enables us to compare the relative insurance growth levels across countries, but also makes it feasible to identify the driving forces for insurance growth at different economic development stages. The main findings are as follows. First, we should re-evaluate the insurance growth level, and adjust our prediction for the insurance growth potential for both emerging and developed countries. Second, the insurance growth is mainly driven by economic factors in developed countries, whereas it is largely driven by institutional factors in emerging countries. Third, with economic development, the contribution of the institutional factors to the insurance growth would gradually decrease and be partially replaced by that of economic factors. Based on this judgment, it is crucial for the insurance companies in the emerging countries to adjust their business strategy to achieve a sustainable development.

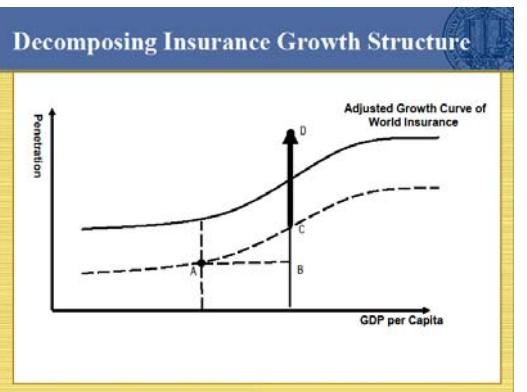
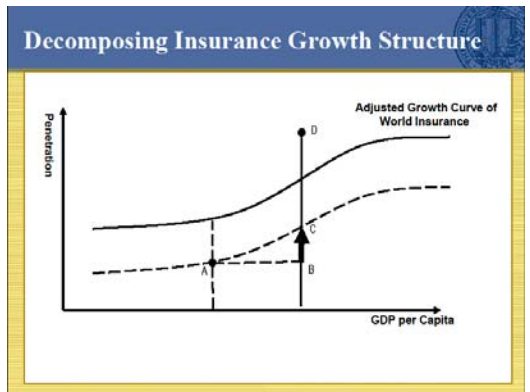
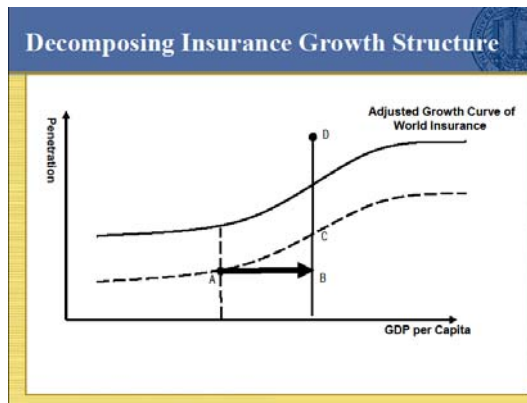
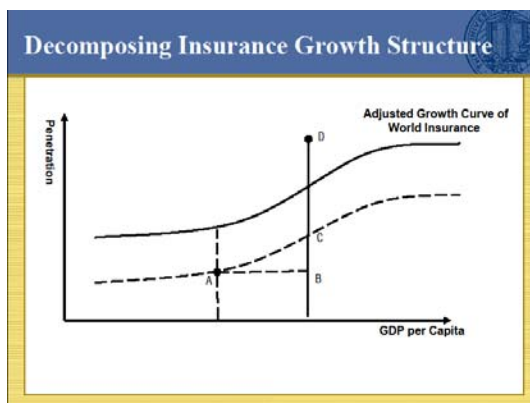
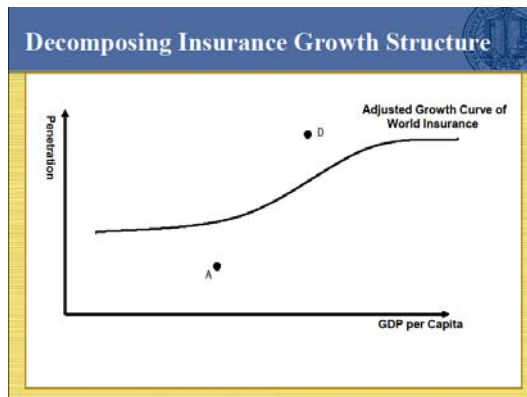
#### **Presentation**

<p><b>Insurance Growth Structure and International Comparison</b></p> <p>Wei Zheng, Peking University Yongdong Liu, University of California, Berkeley Yiting Deng, Duke University November 21, 2012</p>	<p><b>Introduction</b></p> <ul style="list-style-type: none"><li>• Our Research on Insurance Market<ul style="list-style-type: none"><li>– Long term prediction of China's insurance growth level</li><li>– Comparison of Insurance Growth Level</li><li>– Insurance Growth Structure</li><li>– Economic and Institutional Factors in Insurance Growth</li><li>– Insurance Development Index</li></ul></li></ul>
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### Insurance Growth Structure

- Insurance growth can be decomposed into three parts.
  - Regular Growth
  - Deepening Growth
  - Institutional Growth



### Two Insurance Growth Models

Ordinary Growth Model  $Y = \frac{1}{\beta_1 + \beta_2 + \beta_3 X}$

Adjust Growth Model  $Y = \frac{1}{\beta_1 + \beta_2 + \beta_3 X} + \sum_{i=1}^{94} \beta_i D_i + \epsilon$

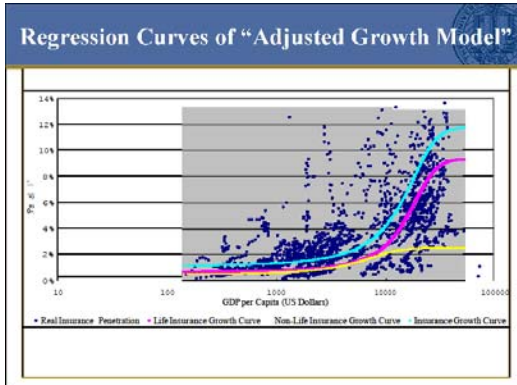
$\beta_i$

- Y : insurance penetration,
- X : GDP per capita

- $\beta_1, \beta_2, \beta_3$ : three parameters
- $D_i$  ( $i=1, \dots, 94$ ): country dummy with respect to country  $i$
- $\epsilon$ : residual



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### Life Insurance Growth Structure (1980-2010)

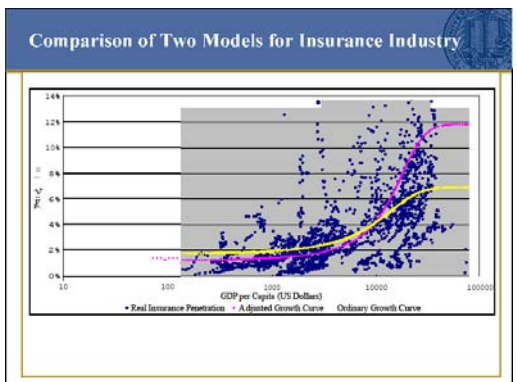
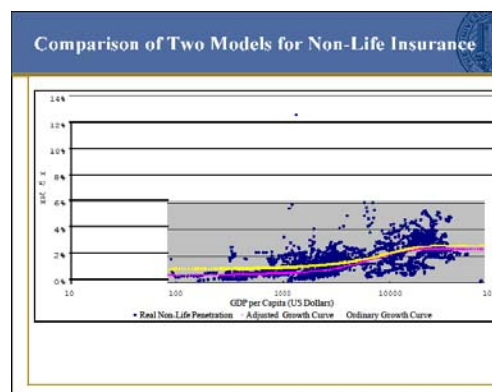
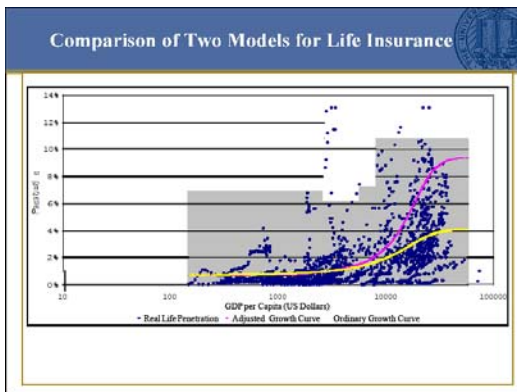
	Obs.	Regular	Deepening	Institutional
<b>Developed Market</b>	26	39%	81%	-21%
<i>G7</i>	7	41%	42%	17%
<b>Developing Market</b>	28	69%	49%	-19%
<i>Emerging Market</i>	17	27%	34%	39%
<i>BRICS</i>	4	15%	6%	80%
<b>World Average</b>	54	55%	65%	-20%

### Non-Life Insurance Growth Structure (1980-2010)

	Obs.	Regular	Deepening	Institutional
<b>Developed Market</b>	26	80%	4%	16%
<i>G7</i>	7	79%	1%	20%
<b>Developing Market</b>	27	84%	11%	5%
<i>Emerging Market</i>	16	73%	14%	14%
<i>BRICS</i>	4	45%	9%	46%
<b>World Average</b>	53	82%	8%	10%

### Insurance Growth Structure (1980-2010)

	Obs.	Regular	Deepening	Institutional
<b>Developed Market</b>	25	52%	31%	17%
<i>G7</i>	7	54%	23%	23%
<b>Developing Market</b>	27	70%	15%	15%
<i>Emerging Market</i>	15	47%	15%	38%
<i>BRICS</i>	4	15%	7%	78%
<b>World Average</b>	52	61%	23%	16%



### Effects of Institutional Factors on Insurance Growth

- When GDP per capita is low
  - Institutional factors have positive effects on both the life insurance and the non-life insurance, especially on life insurance.
  - with its net effects on the insurance industry being positive.

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Effects of Institutional Factors on Insurance Growth	Conclusions
<ul style="list-style-type: none"><li>• When GDP per capita is high<ul style="list-style-type: none"><li>– Institutional factors have small or even negative effects on the life insurance and positive effects on the non-life insurance.</li><li>– with its net effects on the insurance industry being negative, and the negative effects are notable</li></ul></li></ul>	<ul style="list-style-type: none"><li>• As the economy develops, the contribution of the institutional factor to the insurance growth would gradually decrease, and the economic factor would play a more active role in driving the insurance growth.</li></ul>

**References**

Zheng, W., Liu, Y., & Deng, Y. (2009). New Paradigm for International Insurance Comparison: With an Application to Comparison of Seven Insurance Markets.

Zheng, W., Liu, Y., & Deng, Y. (2009). A Comparative Study of International Insurance Markets. The Geneva Papers on Risk and Insurance-Issues and Practice, 34(1), 85-99.

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## **2. Insurance in India: Determinants of growth and the case of climate change**

**Subir Sen, TERI University**

### **Abstract**

There are three issues of interest that the presentation covers. The development of the Indian insurance industry following liberalisation in 1999 is presented first. Next, we discuss the preparedness of the industry against possibility of insolvency due to climate extremes. Finally, a brief snapshot of the state of agricultural insurance in the country is analysed.

The formation of an independent regulator for the insurance sector paved the way for deregulation of the life and general insurance businesses, nationalised in 1956 and 1972 respectively. At present there are 24 life insurers, 27 general insurers and one reinsurer in the economy which witnessed a growth rate (annual percentage change) of around 8.5 percent during the period 2005-10. Gross savings to GDP ratio stands at 33 percent but this seems to have marginal impact on the parameters defining insurance consumption. Life insurance penetration is around 4.5 percent of GDP and general insurance penetration is less than 1 percent of GDP.

Although premium figure and insurance penetration figures have improved, India continues to be an under-insured market. Strict entry norms, mainly affecting flow of foreign direct investment, hindered growth of the industry. The regulations guiding the operations of insurers and particularly price and investment regulations have revealed the cautious approach the economy adopted for enhancing competition in the sector, dominated by public monopolies, Life Insurance Corporation of India (LICI) and the four general insurers collectively referred to as NOUN. After a decade of liberalisation, it is observed that the LICI dominates the life segment with a market share of around 70 percent. General insurance market structure is more oligopolistic in character with a group of insurers observed to be very active and demonstrating better performance over their peers. In terms of economic efficiency, the public insurers and those which are promoted by firms having businesses in banking and non-banking segments are better performers.

Taking into account the worries relating to insolvency, the regulator monitors the available solvency margins of the insurers. Insurance pools specific to different policies are quarterly reviewed. Actions are taken against insurers failing to comply with the required levels of solvency. Reports of mis-selling of insurance policies, refusal and delays in claims settlement, etc., are also being supervised. The disclosure standards are being developed to match global standards although according to the policy makers the industry is not mature enough to fully adopt the recent IFRS guidelines. The most active lines of business are motor insurance, health insurance

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and life insurance but these are business where the issue of sustainability is very crucial. Very few insurers have reported profits and the industry is in urgent need of additional capital. It is also interesting to note the geographical spread of the insurers, mostly located in the urban centres and developed states. Despite efforts to expand services to the social and rural sectors, the achievements made through policy and regulatory initiatives are not too impressive.

Agricultural sector is heavily dependent on activities of the government controlled Agricultural Insurance Company of India Limited (AIC), which plays an important role in implementing centrally sponsored schemes. Although, there have been initiatives from selected private insurers in the form of weather based index insurance, but most of them are still at the experimental level in collaboration with the state governments. A country with the largest agricultural labour force, India has been experimenting with different types of crop insurance schemes. Moving ahead from the simplest of crop insurance scheme to what today stands as modified new agricultural insurance scheme (MNAIS), the success story is average with marginal increase in the number of farmers and area under cultivation insured. An estimate for the year 2007-08 reveals that only 15 percent of the farmers were insured in the country. This figure reflects the scope for insurance activity to expand and the need for risk management policies for a sector which is most likely to be affected by the effect of climate change. The latter gains more importance when one highlights the fact that in the backdrop of limited social security, the population dependent on agriculture is highly vulnerable and less resilient to impacts of climate change on agricultural productivity. As part of an exercise, many alternatives were proposed to the Government to strengthen the existing risk management practices with an emphasis on the supporting role of the insurers.

### **Presentation**

The image shows two presentation slides side-by-side. The left slide is the title slide, and the right slide is the outline slide. Both slides have a dark blue header and footer area.

**Slide 1: Title Slide**

- Header: LSE, Autumn Symposium, Subir Sen
- Title: Insurance in India: Determinants of growth and the case of climate change
- Presenter: Subir Sen, Assistant Prof.
- Logo: IIT Delhi University
- Location: New Delhi, India
- Date: November 21, 2012
- Footer: Navigation icons

**Slide 2: Outline Slide**

- Header: LSE, Autumn Symposium, Subir Sen
- Header: Outline
- Header: Outline of Presentation
- Header: Background
- Header: Structure and Performance
- Header: Agricultural Insurance
- Outline:
  - 1 Socio-economic and Political background
  - 2 Structure and Performance of insurers post liberalisation
  - 3 Strength of insurers
  - 4 State of Agricultural insurance
- Footer: Navigation icons

# Insurance in emerging markets: determinants of growth and the case of climate change?

## Socio-Economic and Political Determinants

- From Hammond, Houston and Melander (1967) till Outreville (2012)...

## Socio-Economic and Political Determinants

- From Hammond, Houston and Melander (1967) till Outreville (2012)...
- Economic Variables:** Budget, no. of credit cards, homeownership, national income, personal income (current/ expected/ future/ family), net worth/ wealth/ savings, occupation, price of insurance, other prices/ inflation/ interest rate, expected inflation, social security, stock market, market structure
- Demographic Variables:** Age, bequest motive (family size/ no. of children/ dependency ratio/ life stage), birth rate, life expectancy at birth, consumer sentiment, education, gender, geographic mobility, information seeking, work ethics
- Socio-Political Variables:** Legal system, political environment, enforcement of property rights, regulations, religion, culture and community, risk aversion

## Indian Exercise: Life Insurance

- Income, financial depth, interest rate, ... significant economic determinants

## Indian Exercise: Life Insurance

- Income, financial depth, interest rate, ... significant economic determinants
  - Overall GDP growth: 6.5% in 2011-12 against 8.4% in 2010-11. Growth in real GDP placed at 5.5% in Q1 of 2012-13. ... *How is stagnation going to affect the growth of the insurance industry?*
  - M3 growth year-on-year has fallen from 13.4% in Sept 2012 compared to 16.6% previous year. Banks are controlling NPAs and NBFCs activities are expanding. *Will these have a negative impact on the insurance sector?*
  - Bank rate 9% compared to 6% previous year, economy experiencing higher inflation. *Inflation and higher interest rate may affect growth.*

- Price of insurance, dependency ratios, literacy, life expectancy, Urbanisation, ... provide ambiguous results

- Price of insurance, dependency ratios, literacy, life expectancy, Urbanisation, ... provide ambiguous results
  - Is price deregulation not affecting the growth of the insurance industry?*
  - Are there alternative financial or social instruments similar to insurance?*
  - Is insurance business localised in Urban centres?*
  - Have regulations towards the promotion of insurance business in rural sector reached desired level?*
- Role of IRDA and delays in implementation of forward looking policies

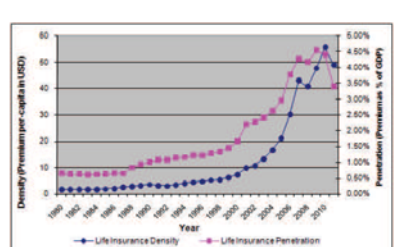
## Structure



- 24 Life insurers and non-life insurers respectively (as on September 2012)
- 1 reinsurer - General Insurance Corporation of India

## Recent Trends 1

### Life Insurance Density and Penetration



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### Recent Trends 2

#### Non-Life or General Insurance Density and Penetration

Density (Premium per capita in USD) — General Insurance Density  
 Penetration (Premium as % GDP) — General Insurance Penetration

### Recent Trends 3

#### Life Insurance Market Structure

LIC Private HHI

### Recent Trends 4

#### General Insurance Market Structure

NOUN Private HHI

### Performance

- LIC is the most efficient life insurer. No convergence towards perfect competition... market could be considered a natural monopoly. *If so, why is it increasing the number of insurers after liberalization?*
- Private insurers with knowledge of Indian financial system are better performers. *What are the constraints that prohibit expansion of private insurers and especially those promoted by banks?*
- Large agency force is unproductive, raises expenses, and impacts operating margin. *How LIC is dominating despite its size?*
- In the general insurance segment, private insurers are efficient. *Which are the lines of business where competition is cut throat?*
- Is FDI going to improve efficiency?*

### Strength of Insurers

By strength, the emphasis is on solvency

- Definition of required solvency margin and the solvency ratio
- Importance of both capital and investments
- Bigger insurers fail to comply. For example, LIC, National, ICICI Lombard
- Size of firm (not market share) is important factor.
- Is it necessary to raise foreign equity cap to 49 per cent as provided in the Insurance Laws (Amendment) Bill, 2008 as against the 26 percent?*
- Should Govt. permit GIC to raise capital from the market and allow entry of foreign re-insurers to enhance protection of the insurers?*

### Issues and Recommendations

- Due to limited penetration of formal risk pooling mechanisms, farmers dependence on traditional modes and methods
- Heavy reliance on Government spending to manage various risks and lack of private interests. *Whether it is a supply side problem or a demand side problem?*

### Issues and Recommendations

- Due to limited penetration of formal risk pooling mechanisms, farmers dependence on traditional modes and methods
- Heavy reliance on Government spending to manage various risks and lack of private interests. *Whether it is a supply side problem or a demand side problem?*
- In 1965, the Crop Insurance Bill was introduced. The model was proposed for State governments' approval with the Central Govt. acting as re-insurer, but most states declined to be a part of this programme on financial grounds

### Issues and Recommendations

- First experiment:* GIC in 1972-73 insured H-4 cotton growers in Gujarat. Later extended to other crops (groundnut, wheat and potato) and states (Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Tamil Nadu and West Bengal). The product was offered till 1978-79 covering only 3110 farmers for a premium of Rs. 4.54 Lakhs and paid Rs. 37.88 lakhs as claims.

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Issues and Recommendations

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Structure and Performance  
Agricultural Insurance

- *First experiment:* GIC in 1972-73 insured H-4 cotton growers in Gujarat. Later extended to other crops (groundnut, wheat and potato) and states (Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Tamil Nadu and West Bengal). The product was offered till 1978-79 covering only 3110 farmers for a premium of Rs. 4.54 Lakhs and paid Rs. 37.88 lakhs as claims.
- Shift from *homogeneous approach* to *individual approach* and back to *Homogenous Area Approach*
- Pilot Crop Insurance Scheme (PCIS) launched in 1979-80 covering food crops (cereals, millets), oilseeds, cotton, potato and chickpea. Confined only to loanee farmers of institutional sources on a voluntary basis

Issues and Recommendations

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Agricultural Insurance

- Move from PCIS to CCIS(1985-86) to ECIS(1997-98) to NAIS(1999-2000) to FIIS (2003-04) to MNAIS(2010-11)
- Several Pilot Weather based indexed insurance: *Rainfall Insurance* - ICICI Lombard(2003-04), *Barish-Bima* - IFFCO-Tokio(2004-05), *Varsha Bima* - AIC(2004-05), ...
- Proposal for *Monsoon-linked insurance indices*
- As on 2007-08, farmers covered as % of total stands at 15.27 percent
- Developments in *Microinsurance*

Recommendations

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Structure and Performance  
Agricultural Insurance

- What are the initiatives required while introducing WBCIS or MNAIS?
  - Infrastructure, Pricing, payment facilities, Dissemination and information sharing, Pilot and experimentation, and Government Role
- What measures are necessary for better, efficient and practical implementation of new practices in the event of climate change?
  - To consider *village panchayat* as the insurance unit
  - Phase out Govt. subsidy or design a policy of incentives
  - Promotion of risk mitigation culture
  - Insurance beyond sowing to harvest and coverage extended for post harvest losses?
  - Changes in the concepts related to calculation of threshold or guaranteed yield; to incorporate and develop pricing based on actuarial practices

References:

LSE, Autumn Symposium  
Subir Sen  
Outline of Presentation  
Background  
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- "Sources of (In-)Efficiency for Indian Life Insurers After a Decade of Liberalisation" (work under review; Co-author Prof. Paul Klumpes)
- "Predicting Market Structure and Solvency Determinants for Indian Insurers: Analysis of Financial Statement Information" (work in progress)
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### 3. Regulation and Insurance Market Growth

Andreas Richter, Ludwig-Maximilians-Universitaet

#### Abstract

Regulatory actions can support growth in insurance markets for climate related risks. These market interventions, however, need to be well-considered and must not lead to adverse consequences. Several examples illustrate how market regulation, and in part the specific role of the state, influence market penetration and potentially add additional capacities to existing markets. The US crop insurance market is quoted as an example and shows how regulation led to an increase in demand while causing significant adverse consequences at the same time. Considering the potential future impact of climate (change) related risks on our economies, market development needs to be strengthened and success factors for regulation-induced growth need to be established.

#### Presentation

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## Regulation and Insurance Market Growth

With an Emphasis on Climate(-Change)-Related Risks

Andreas Richter

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#### Agenda

- Preliminary Remarks
- The Role of Regulation for Insurance Market Growth
- An Example: Crop Insurance in the U.S.

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#### Preliminary Remarks: Regulatory Tools in Insurance Markets

- Regulatory tools
  - Product standardization
  - Rate making / premiums
  - Distribution channels
  - Reporting and disclosure standards
  - Capital Requirements
  - Regulation of investments
  - (State) Insurance Guarantee Funds
- Current emphasis in insurance regulation: Solvency regulation
- Current issues in the EU include, e.g.
  - Life insurance: Solvency II and interest rate guarantees
  - Asset side: regulatory framework for sustainable investments

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#### Aspects of Climate(-Change)-Related Risks

- Characteristics of climate(-change)-related risks
  - Low-probability-high-consequence (LPHC) events often underestimated by individuals
  - Increasing frequency and severity of catastrophic events → insufficient supply of (re-)insurance capacities
- Emerging markets
  - In many cases: Under-developed insurance markets
  - Gap between economic losses and insured losses very large
    - China flood 2012: economic losses 55 times greater than insured losses
    - Thailand flood 2011: economic losses 250% of insured losses (or 1850% of (annual) premiums written)

Regulation is needed to reduce market failure, and support the growth of insurance market for climate risks.

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# Insurance in emerging markets: determinants of growth and the case of climate change?





### Agenda

- Preliminary Remarks
- The Role of Regulation for Insurance Market Growth
- An Example: Crop Insurance in the U.S.

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### Starting Points for Regulation

- Demand for existing coverage must be expanded, and additional capacity for LPHC risks should be generated
- Regulation of the underlying risks is particularly important for climate-related insurance coverages
  - Mitigation:
    - Building and construction standards for homes and infrastructure
    - Public investment in mitigation infrastructure, e.g. dikes, flood plains
- Establishing insurance markets in a sustainable fashion requires insurer financial stability and trust in the insurance sector

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### Possible (Regulatory) Strategies for Stimulating Market Growth

- Mandatory insurance to address under-developed demand
  - But: Threat of highly correlated losses (→ capacity constraints) and tendency towards uniform premiums
  - Risk awareness campaigns
- Keep products simple and establish trust via distribution channel regulation
- Improve insurer stability and increase capacity via risk-based capital requirements (Solvency II ...)
- Public risk mitigation (can help make risks insurable and/or coverage affordable)
- The state as risk-bearer
- State-/Tax-subsidized premiums
  - Can help make coverage affordable, increase demand
  - Fundamental principle of risk-based premiums may be maintained

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### Assessment of Capital Requirements under Solvency II

- Standard approach
  - Presumably used by most small and medium-sized insurers for implementation cost reasons
  - Combination of scenario and factor-based approach
  - May lead to unwanted effects, e.g. distorted risk sensitivity
  - Ignore region specific hazards
  - Might result in significant mistakes in evaluating capital charges for climate-specific risks
- Internal models
  - Mostly based on commercial models → lack of transparency (black box)
  - Few modeling agencies in the market → highly correlated model risk

Does the option to choose (standard vs. internal model) set the right incentives?

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### Public-Private-Partnerships (PPPs) as Possible Solution

- PPPs can enhance market penetration by partnering private insurance companies with governmental resources.
- Examples:
  - NFIP (National Flood Insurance Program – USA)
    - State offers insurance capacity, distribution by private companies
    - Certain policies are subsidized
  - CCR (Caisse Centrale de Réassurance – France)
    - Reinsurer of last resort for risks considered as 'uninsurable', e.g. flood and earthquake
    - Mandatory private insurance with subsidized government reinsurance option
  - Extremus (Terrorism Insurance Company – Germany)
    - Primary insurer for terrorism risks exclusively, pooled capacity of €2 billion offered by its shareholders (several German insurance companies)
    - Backed by federal capital guarantee (additional €8 billion capacity)

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### Possible (Regulatory) Strategies for Stimulating Market Growth

- Mandatory insurance to address under-developed demand
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- State-/Tax-subsidized premiums
  - Can help make coverage affordable, increase demand
  - Fundamental principle of risk-based premiums may be maintained

Market interventions can create growth, but side-effects must be limited.

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### Agenda

- Preliminary Remarks
- The Role of Regulation for Insurance Market Growth
- An Example: Crop Insurance in the U.S.

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# Insurance in emerging markets: determinants of growth and the case of climate change?

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**Example: Crop Insurance in the United States**

- Prior to 1938 practically no crop insurance coverage was obtainable in the US.
  - Beneficial from public policy perspective, but
  - Strongly correlated losses made market solution unfeasible (Miranda and Glauber, 1997).
- Public insurance system (FCIC) was initiated
  - Almost no demand for insurance
  - This was attributed to adverse selection (Kramer, 1983)
- To increase participation, premiums were heavily subsidized
  - Certain premiums are subsidized by up to 60%
  - Increased demand due to cheap coverage (Glauber, 2004)
- However, problems in the US crop insurance market exist
  - Decreased use of fertilizer (Smith and Goodwin, 1996; Coble et al., 1997)
  - High costs: premium subsidies of \$7.3 billion paid in 2011
  - Moral hazard

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**Do Premium Subsidies Cause Moral Hazard?**

- This can be the case (Jaspersen and Richter, 2012):
  - Depending on the type of premium, subsidies may amplify moral hazard, but the opposite effect is also possible.

	Non-Contingent Premiums	Contingent Premiums
Payment of Premium	Regardless of state	Only if no loss occurs
Influence of Subsidies	Increase moral hazard	Decrease moral hazard
Examples	- Most P&C insurance - Health insurance - Crop insurance	- Long term care insurance - Unemployment insurance - Disability insurance

- Regulatory action that aims to stimulate growth, can have adverse consequences, depending on design.

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## 4. Insurance Market Development: Observations

Ian Webb, Financial Services Authority

### Abstract

My talk will focus on the international insurance market development, identifying patterns seen across markets, and the link with socioeconomic, financial market, regulatory and general business drivers. Other factors linked to insurance market growth will be discussed, and suggestions for further research proposed.

### Presentation

**Insurance Market Development: Observations**

Insurance in emerging markets: determinants of growth and the case of climate change

Symposium: London School of Economics

Nov. 21, 2012  
Ian Webb

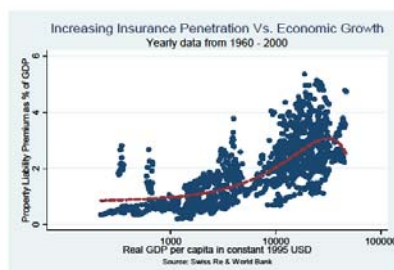
### Empirical Evidence: Contribution to Economic Development

#### Objectives/Reach of Empirical Analysis

- Causality & correlation
  - Limits of econometric analysis
  - Importance of economic models and "a good story"
  - Previous econometric analysis of financial sector

General consensus: insurance is strong predictor of economic growth across countries at different stages of development

### Insurance – GDP Growth Relationship: "S" Curve



### Stages of Insurance Market Development and Balanced Growth Between Insurance and the Economy

#### Non-Life Insurance Penetration



## Insurance in emerging markets: determinants of growth and the case of climate change?

### Empirical Evidence: Role in Financial Sector Development

#### Insurance and the Financial Sector

- Greater Financial Sector Depth (Complement)
  - Non-diversifiable risk (credit, investment)
  - Savings instruments
  - Retirement risk vehicles
  - Long-term finance
- Greater Financial Sector Efficiency (Compete)
  - Institutional investor project monitoring and transparency pressure
  - Enhancing focus of banking through competition
  - Lowering cost of risk

### Stages of Insurance Market Development

#### Stages

- Dormant – preconditions missing
- Early – market exists but growth is constrained
- Sustained growth – market expanding and institutional framework strengthening
- Mature – full array of services, market turning to substitutes

### Decisive factors at Different Stages of Insurance Market Development

Type of State	Level Insurance Market	Decisive Factors at Different Stages of Insurance Market Development	
		External: Economic/ Legal/ Political/ Environmental	Internal: Insurance Building Blocks
Emerging	Dormant	<ul style="list-style-type: none"> <li>- Current economic</li> <li>- Political stability</li> <li>- Property rights</li> <li>- Protection of assets</li> </ul>	<ul style="list-style-type: none"> <li>- Insurance Law (Regulator or Supervision)</li> <li>- Risk management at government level (national disaster planning)</li> </ul>
Lower Income	Early	<ul style="list-style-type: none"> <li>- Income</li> <li>- Economic stability</li> <li>- State</li> </ul>	<ul style="list-style-type: none"> <li>- IAS Compliance (Regulator / Supervision)</li> <li>- Perception of risk</li> <li>- Professional of market</li> <li>- Actuarial capacity</li> <li>- Data collection</li> <li>- Market penetration</li> </ul>
Mid-High Income	Sustained Growth	<ul style="list-style-type: none"> <li>- Income</li> <li>- Judicial efficiency and transparency</li> </ul>	<ul style="list-style-type: none"> <li>- IAS Compliance (Regulator / Supervision)</li> <li>- Industry market conduct</li> <li>- Consumer support</li> <li>- Collaboration private/public sectors</li> <li>- Market diversification</li> </ul>
Upper Income	Mature		<ul style="list-style-type: none"> <li>- Allowance of self-management and finance</li> <li>- Financial market risk re-valuation</li> </ul>

### Decisive factors at Different Stages of Insurance Market Development

Type of State	Insurance Stage	Decisive Factors at Different Stages of Insurance Market Development	
		External: Economic/ Legal/ Political/ Environmental	Internal: Insurance Building Blocks
Emerging	Dormant	<ul style="list-style-type: none"> <li>- Current economic</li> <li>- Political stability</li> <li>- Property rights</li> <li>- Protection of assets</li> </ul>	<ul style="list-style-type: none"> <li>- Insurance Law (Regulator or Supervision)</li> <li>- Risk management at government level (national disaster planning)</li> </ul>
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Upper Income	Mature		<ul style="list-style-type: none"> <li>- Allowance of self-management and finance</li> <li>- Financial market risk re-valuation</li> </ul>

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<http://wber.oxfordjournals.org/content/17/1/51.full.pdf+html>

## 5. Identifying the effect of insurance markets on countries' resilience

Florian Englmaier, University of Würzburg

### Abstract

It is important to understand whether the degree of development of its insurance markets affects a country's resilience to (natural) catastrophies. If it is indeed the case that better developed insurance markets help countries to avoid being derailed from their growth paths, an important policy implication could be drawn: It is of first order importance to further develop insurance markets in (developing) countries. In particular in light of the challenges posed by man-made climate change, presumably substantially increasing the risk of catastrophic natural events, this seems even more urgent. However, establishing the causal link between insurance market development and resilience to natural catastrophies is very tricky. Germany is more resilient than Haiti, its insurance markets are better developed, but also a great many other characteristics that likely affect resilience are also different.

However, in particular building on the contributions by Acemoglu et al (2001) and LaPorta et al (1998), the literature on institutions on growth has developed remedies for exactly these questions. It is argued that mere coincidence in the colonization process of countries can have large effects on a country's modern institutions. This "mere colonizational coincidence" is orthogonal to many other country characteristics (location, natural endowments, etc.). It is this exogenous variation that we exploit to get at the causal link between insurance market development and resilience to natural catastrophies.

### Presentation

*Identifying the effect of insurance markets  
on countries' resilience*

Florian Englmaier & Till Stowasser

Würzburg

LSE, Nov 21, 2012

### Motivating Question

- Does insurance market development affect a country's resilience to (natural) catastrophies?
- If this is the case this implies an important policy recommendation:  
Developing insurance markets in (developing) countries is of first order importance - in particular in light of the challenges posed by man-made climate change

## Insurance in emerging markets: determinants of growth and the case of climate change?

### Challenge

- Establishing a causal link between insurance market development and resilience to natural catastrophes is very tricky:
  - Germany is more resilient than Haiti and its insurance markets are better developed
  - However, a great many other characteristics that likely affect resilience also differ.

Florian Engmaier & Till Stowasser (Würzburg) Identifying the effect of insurance markets on LSE, Nov 21, 2012 3 / 8

### Strategy

- Find some exogenous variation that affects market development but is not (or at least less) correlated with "these many other characteristics".
- Look at the Institutions and Growth literature that is faced with a similar problem.
- There are two prominent approaches:
  - Rafael LaPorta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2008) "The Economic Consequences of Legal Origins," *Journal of Economic Literature*, Vol. 46:2, 285-332
  - Daron Acemoglu, Simon Johnson, James A. Robinson (2001) "The Colonial Origins of Comparative Development: An Empirical Investigation," *American Economic Review*, Vol. 91:5, 1369-1401

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### LaPorta et al.

- Whether a country was colonized by England, Spain, or France at some point was largely random (certainly it was not influenced by today's growth patterns) but had a lasting effect on its institutional development.
  - In particular, English colonies tend to have more market based institutions (facilitated by stronger property rights protections and better contract enforcement).
- ⇒ This should also affect insurance market development.

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### Acemoglu et al.

- Mortality rates of early settlers had a large influence on whether a colony was established as a settler colony or as an extractive colony.
  - 90% of settlers die → no prospects of settling the place → no need to establish strong institutions as in the mother country → lasting negative effect on institutional development (and hence efficiency of markets)
  - most settlers survive → might make sense to settle the place → to attract settlers, establish institutions as in the mother country → lasting positive effect on institutional development (and hence increased efficiency of markets)

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### Data

- LaPorta et al. and Acemoglu et al. provide their classification schemes
- OECD-GDP data (+ additional controls) to establish growth rates
- insurance market data (MRe)
- MRe-NatKat data to identify natural disasters (and their severity)
- additional co-variates (charitable donor money flows, ...)

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### Preliminary Results

?

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### References

Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer (2008) "The Economic Consequences of Legal Origins," *Journal of Economic Literature*, Vol. 46:2, 285–332

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<http://pubs.aeaweb.org/doi/pdfplus/10.1257/aer.91.5.1369>

## 6. Evaluating the economics of climate risks and opportunities in the insurance sector - A glance into the crystal ball

Axel Fürderer, Munich Re

### Presentation



The People's Republic of China 中华人民共和国

Evaluating the economics of climate risks and opportunities in the insurance sector - A glance into the crystal ball

The London School of Economics and Political Science  
Axel Fürderer | Munich Re Client Management Greater China and Southeast Asia  
London | 01 November 2012




Warning



The London School of Economics and Political Science  
Axel Fürderer | 01 Nov 2012

What can we do best ?



Turning risk... into value


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What exactly does it mean ?



The London School of Economics and Political Science  
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Agenda for today



1. Current status of the Chinese non-life insurance industry
2. Current and challenges ahead
3. Climate change - a vicious cycle
4. Risks and opportunities for the insurance sector

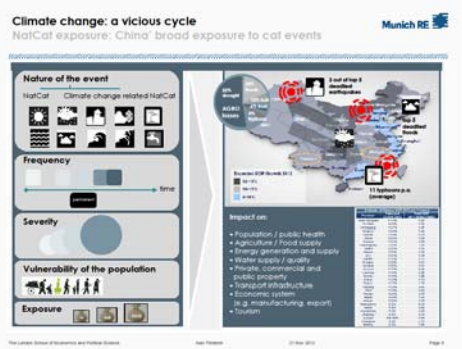
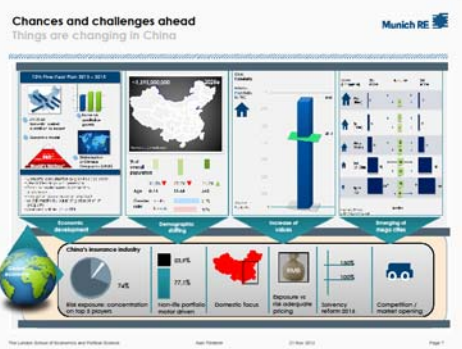
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Current status of the Chinese non-life insurance industry  
Motor insurance is the dominating line of business



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# Insurance in emerging markets: determinants of growth and the case of climate change?



### NatCat exposure

Top 10 largest city populations in 2011

Top 10 largest city populations in 2011 of 8th - 10th risk deciles by type of hazard

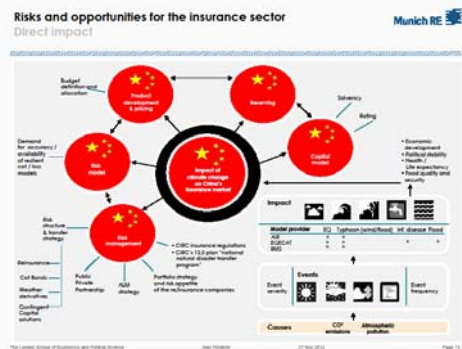
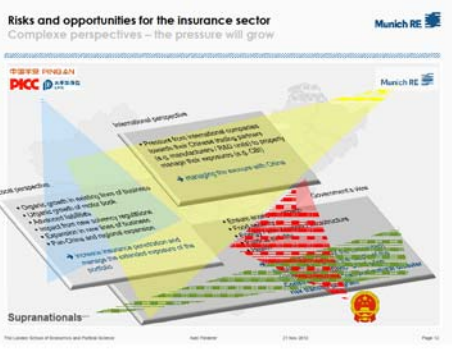
Rank	Country	City	Population	Hazard
1	China	Shanghai	23,000,000	Earthquake
2	China	Beijing	21,000,000	Earthquake
3	China	Guangzhou	15,000,000	Earthquake
4	China	Shenzhen	12,000,000	Earthquake
5	China	Chengde	10,000,000	Earthquake
6	China	Chongqing	9,000,000	Earthquake
7	China	Harbin	8,000,000	Earthquake
8	China	Xi'an	7,000,000	Earthquake
9	China	Nanjing	6,000,000	Earthquake
10	China	Wuhan	5,000,000	Earthquake

### NatCat exposure

Top 10 fastest growing city populations in 2001 - 2011

Top 10 fastest growing city populations in 2011 of 8th - 10th risk deciles by type of hazard

Rank	Country	City	Population	Hazard
1	China	Shanghai	23,000,000	Earthquake
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6	China	Chongqing	9,000,000	Earthquake
7	China	Harbin	8,000,000	Earthquake
8	China	Xi'an	7,000,000	Earthquake
9	China	Nanjing	6,000,000	Earthquake
10	China	Wuhan	5,000,000	Earthquake





## 7. Climate Change and Non-Life Insurance Demand in the BRICS

Nicola Ranger, LSE

### Abstract

Over the past decade, growth in insurance demand in the BRICS has been a key driver of global non-life premium growth. Current forecasts suggest that these markets will continue to be areas of significant growth. For example, based on a simple model, we project that gross premium volumes in the BRICS economies could increase at a rate of between 5.4 and 12.3% per year over the coming decade, depending on the country. We consider how climate change may influence these trends in the period to 2030. We argue that the influence of climate change will be more multifaceted, complex and regionally variable than portrayed in the past. We suggest five pathways of influence: wealth; willingness to pay for insurance; policy and regulation; changes to the supply of insurance; and new opportunities associated with adaptation and mitigation. We conclude that, with the exception of policy and regulation, the influence of climate change on insurance demand to 2030 is likely to be small when compared with the expected growth due to rising incomes, but is not insignificant. For example, we expect the impact on premium volumes mediated through wealth to be small; less than a 0.4% adjustment in the annual growth rate to 2030. But, we also conclude that the scale of the risks and opportunities will depend partly on (re)insurer responses to the challenges of climate change. We outline five actions that could pave the way for future opportunities.

### Presentation

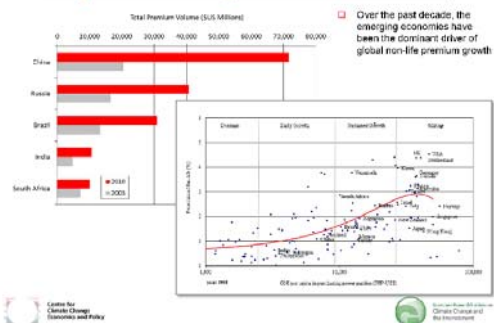


### Climate Change and Non-Life Insurance Demand in the BRICS

Nicola Ranger  
with Swenja Surminski and Andrew Williamson

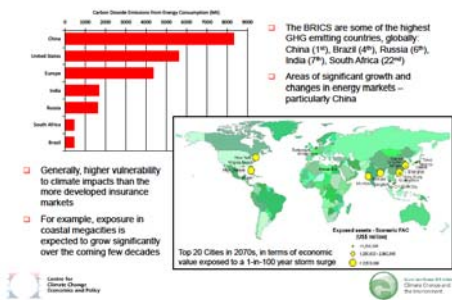


### Why Climate Change and BRICS?



# Insurance in emerging markets: determinants of growth and the case of climate change?

## Why Climate Change and BRICS?



- Generally, higher vulnerability to climate impacts than the more developed insurance markets
- For example, exposure in coastal megacities is expected to grow significantly over the coming few decades

- The BRICS are some of the highest GHG emitting countries, globally
- China (1<sup>st</sup>), Brazil (4<sup>th</sup>), Russia (6<sup>th</sup>), India (7<sup>th</sup>), South Africa (22<sup>nd</sup>)
- Areas of significant growth and changes in energy markets – particularly China

## Contents

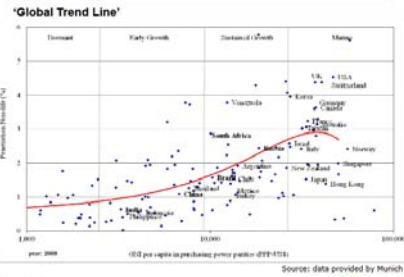
- The 5 'Pathways of Influence'
- Quantitative and qualitative evidence for each pathway to 2030
- Scenarios of implications for the insurance industry

## Conclusions

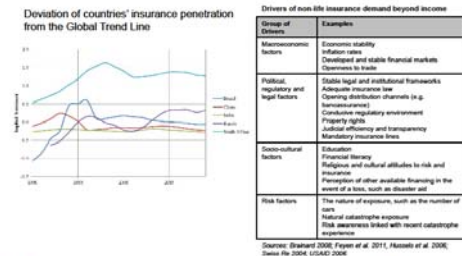
- Based on a simple model, gross premium volumes across the BRICS could rise at rates of 5.4% to 12.3% per year over the coming decade, depending on the country
- The influence of climate change will be multifaceted, complex and regionally variable
- We conclude that overall, the influence of climate change will be small when compared with the growth expected due to rising incomes, with one exception...
- Changes in public policy and regulation associated with climate change could bring considerable threats, but also opportunities
- The scale of the threats and opportunities will depend partly on the response of the insurance industry to the challenges posed by climate change.

*n.b. our broad conclusions also relevant beyond BRICS*

## Drivers of Insurance Demand



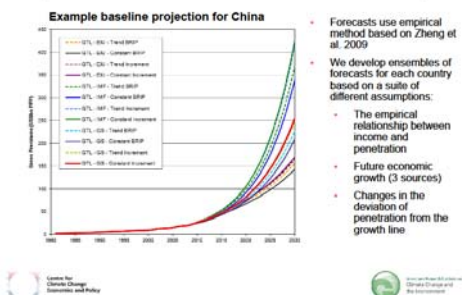
## Drivers of Insurance Demand



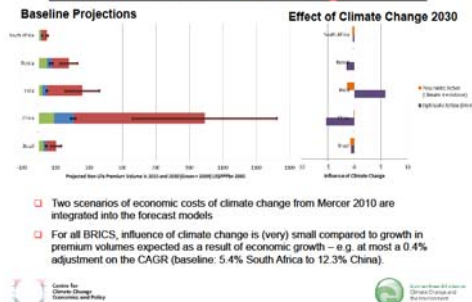
## Five 'Pathways of Influence'

- Local impacts of climate change
  - Local adaptation
  - Local GHG mitigation
  - Global impacts and responses
- Impacts on wealth
  - Changing regulatory and public policy environment
  - Changing attitudes to risk and insurance, including willingness to pay
  - Changing supply of insurance
  - New markets associated with mitigation and adaptation

## 1. Wealth Pathway



## 1. Wealth and Climate Change



# Insurance in emerging markets: determinants of growth and the case of climate change?

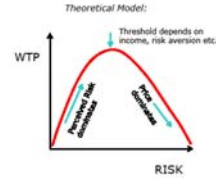
## 2. Public Policy Pathway

- Public policy and regulation can be potent drivers of demand though creating the necessary preconditions for insurance and influencing the operating environment of the industry.
- Many examples of where rising risk or risk awareness has initiated public interventions in the market – e.g. state-subsidized agricultural insurance in China and India, Turkey Catastrophe Insurance Pool.
- Speculate that future influence of this pathway will depend on current status of market development – those countries with the largest 'catch-up' potential are China and India – for example, potentially up to \$12bn and \$6bn, respectively, 'catch up' by 2015.
- Also threats – e.g. price regulation resulting from rising premiums

Direct Public Policy/Regulatory Driver	Effect on insurance penetration
Market Liberalisation	+
Tax (burden) on insurance	-
Tax incentives for insurance	+
Premium subsidies	+
Price regulation	+/-
Compulsory insurance cover	+
Introduction of public insurance	+/-
Regulation of insurance (including transparency, capital requirements etc)	+/-
Opening distribution channels (including bancassurance and brokers)	+

## 3. Willingness to Pay

$$WTP = f(\text{PRICE, INCOME, PERCEIVED RISK, RISK AVERSION})$$



## 4. Supply of Insurance

Climate change could challenge the availability of insurance

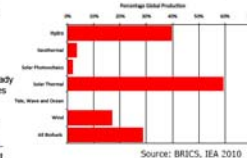
- Higher, more uncertain, more volatile and more correlated risks could lead to withdrawals from some markets
- Empirical evidence (Born & Klimaszewski-Blethner 2012) suggests that, for homeowners insurance, insurers are more likely to reduce their coverage in response to unexpected severe events

### Criteria for Insurability (Herweijer et al. 2009)

Category	Criterion	Characteristic	Impacted by climate change?
Actuarial	Risk uncertainty	Measurable	Yes
	Low co-insurance	Independent	Yes
	Maximum loss	Proximal	Yes
	Average loss	Likely	Yes
	Low frequency	Measurable	Yes
Market-determined	Moral hazard, Adverse selection	High	Yes
	Insurance premium	Not insurable	Yes
	Insurance cover limits	Adapted, Affordable	Yes
Social	Industry capacity	Acceptable	Yes
	Public policy	Sufficient	Yes
Legal system	Consistent with other	Legal	Yes
	Legal system	Enforceable	Yes

## 5. Opportunities for New Products and Services

Significant growth potential in LOBs linked with GHG Mitigation and Adaptation



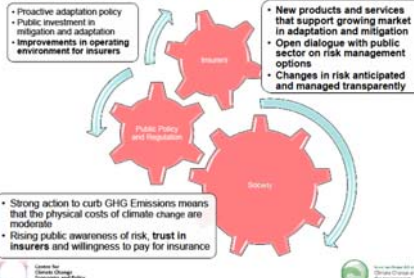
- China, Brazil and India alone already account for 35% global renewables production
- Globally, demand for renewables expected to triple by 2035 (IEA)
- Some substitution effect with high-carbon insurance lines, but overall increasing energy demand suggests an overall increase in insurance demand
- Changing characteristics of risk – more decentralised, private.
- Scale of opportunity will depend on ability to overcome existing barriers.

- Others:
- 'Green' technologies and processes
  - Carbon finance – e.g. credit delivery guarantees
  - Adaptation – e.g. microinsurance, sovereign risk transfer, innovative products that reward risk reduction

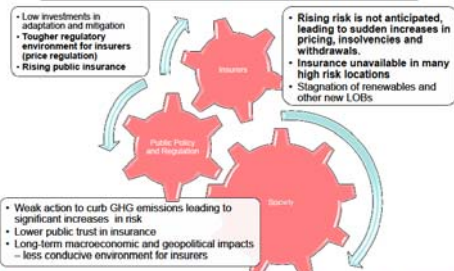
## Summary of Conclusions

Pathway of Climate Change Influence	Approximate Scale of Impact on Premiums Volumes in BRICS economies in 2015 (\$ bn)	Regional Focus and Direction of Impact (i.e. each has a dependence on (re)insurer responses)
High risk events (e.g. hurricanes, floods, droughts, wildfires, etc.)	Up to around \$20 to \$30bn	Potential for 'high' exposure to weather hazards (particularly where the 'catch-up' potential of insurance penetration is greatest, such as in India and China) and negative impact where there is high exposure (e.g. in particular, China, India and to a lesser extent Brazil).
Steady state (e.g. sea level rise, etc.)	Up to around \$10 to \$20bn	Significant increase in premium volumes in all countries. The greatest increases are projected in South Africa (around \$10bn by 2015) and largest in China (around \$20-30bn by 2015). Source: Ranger and Williamson (2011)

## Optimistic (High Demand) Scenario



## Pessimistic (Low Demand) Scenario



## Implications for Insurers Today

Many climate change factors are exogenous, but others are at least partly dependent on how the industry itself responds. We suggest that there are a number of ways that the industry can promote the optimistic growth path, rather than the pessimistic path:

- Taking a longer-term perspective in strategic business planning
  - Anticipating changing risk levels in underwriting / risk management practices to reduce the chance of insolvencies, rapid increases in premiums (or hardening in conditions) and withdrawals from markets in response to rising hazard levels.
- Showing insurance to be part of the solution - enhancing reputation and recognition of the value of insurance
  - Raising awareness of risk - education / disseminating risk information
  - Innovative product design and public-private partnerships to support adaptation
- Innovating and building technical capacity to capture new market opportunities associated with the transition to a low-carbon economy.
  - Lobbying government to take action to reduce risks and curb GHG emissions.

### Conclusions

1. Based on a simple model, gross premium volumes across the BRICS could rise at rates of 5.4% to 12.3% per year over the coming decade, depending on the country
2. The influence of climate change will be multifaceted, complex and regionally variable
3. We conclude that overall, the influence of climate change will be small when compared with the growth expected due to rising incomes, with one exception...
4. Changes in public policy and regulation associated with climate change could bring considerable threats, but also opportunities
5. The scale of the threats and opportunities will depend partly on the response of the insurance industry to the challenges posed by climate change.

n.b. broad conclusions also relevant beyond BRICS



### References

Ranger, N and Surminski, S (2011) A preliminary assessment of the impact of climate change on non-life insurance demand in the BRICS economies. Munich Re Programme Technical Paper No. 63 [http://www.cccep.ac.uk/Publications/Working-papers/Papers/70-79/WP72\\_climate-change-non-life-insurance-brics.pdf](http://www.cccep.ac.uk/Publications/Working-papers/Papers/70-79/WP72_climate-change-non-life-insurance-brics.pdf)

## **8. The impact of climate change on the BRICS economies**

**Swenja Surminski, LSE**

### **Abstracts**

#### **Climate change and the political, legal and regulatory framework for insurance in emerging markets**

##### **i) Comparing political, regulatory and legal drivers of insurance development across countries**

Literature provides wide agreement on the importance of the political, regulatory and legal (PRL) factors as drivers for the development of the insurance sector. This appears to be especially true for developing economies, where changes in the structure and quality of the PRL factors, coupled with an emergence from the early growth to sustained growth stage of economic development, can result in multiple (and maximised) returns to scale from investments in the insurance industry. While it is possible to compare economic drivers across countries through metrics such as GDP per capita, there is no current equivalent method to our knowledge that allows one to compare the extent and quality of the political, regulatory and legal determinants of insurance sector development. In this project we therefore devise our own composite indicator or index – the Determinants of Insurance Development Index (DIDI) as a first step to gauge the level of development of the PRL factors across different countries. We are currently conducting an econometric cross-country analysis to verify our findings.

##### **ii) Monitoring climate policy in emerging markets and the application to business planning**

The last two decades have witnessed an explosion in the publication of country indexes that measure and rank the relative policy performances of governments. Whilst there is a well understood audience for such rankings amongst policy-makers and the media, much less is known about their use and applicability to business users and business planning. In this study we explore if and how policy indexes can assist business decision-making and compare and contrast the strength and weaknesses of using indexes between their current target audience of government decision makers and business planners. We focus on one particular area – climate policy – where several of these types of indexes have been developed, all with different aims, varying in methodology applied and data used. Our analysis is supported by an investigation of the information content of these climate change indexes and by a number of stakeholder interviews with business representatives. Despite several challenges and limitations to the use of policy indexes by business leaders, we suggest that the need for data and information to support business planning and market entry decisions is strong – particularly in emerging markets and in sectors that face political uncertainty.

### **References**

Surminski, S. and Williamson, A. Policy indexes – what do they tell us and what are their applications? The case of climate policy and business planning in emerging markets. September

2012. <http://www.cccep.ac.uk/Publications/Working-papers/Abstracts/100-109/policy-indexes-climate-policy-business-planning-in-emerging-markets.aspx>

**iii) Political and regulatory drives for insurance and climate change – the example of risk governance in China**

China is exposed to a range of natural hazards, such as earthquakes and typhoons, causing large-scale human tragedy and significant economic losses. Some of the meteorological hazards such as floods and droughts are expected to grow in intensity and frequency due to climate change, while at the same time exposure levels are also increasing, mainly driven by economic growth and rapid urbanization. The provision of catastrophe insurance is still underdeveloped in China: while agricultural catastrophe insurance cover is available and supported by Government policy, there is only limited catastrophe insurance outside the agriculture sector. While a range of proposals and suggestions for catastrophe insurance schemes have been discussed recently by the Government, no progress has been made in terms of implementation. In contrast, the agriculture sector has seen a range of reforms of the provision of catastrophe insurance has, with strong political support and significant subsidies being paid to encourage take-up amongst the rural population. How can these differences in use of insurance for risk governance be explained? This case study looks at the policy and regulatory drivers of catastrophe insurance in China and explores why catastrophe risk transfer has been introduced in the agriculture sector, but not for general property risks in China. The analysis concludes with an assessment of the potential role of climate change for the provision of catastrophe insurance in China.

**iv) Risk governance, climate change and the role of public and private actors - the example of agriculture insurance in India**

Climate change adaptation is an increasingly important field and will involve a range of actors from national governments to private companies, communities and households. There is a growing policy discourse supporting the involvement of the private sector in adaptation, however there is little empirical examination to show how the sector might be involved and how adaptation might be governed. This paper uses evidence from the field of risk governance and insurance and analytical frameworks from the wider governance literature to draw important findings for the governance of adaptation. We use the recently published Compendium of Disaster Risk Initiatives in the Developing World and a case study of agricultural insurance in India to argue that the role of the private sector is increasing but so far within a particular model of engagement. In the context of climate change, how the public-private relationships are constructed is key to how adaptation can be leveraged from such an arrangement. The evidence in this paper suggests that due to commercial viability and other concerns there will continue to be a role for the public sector alongside the private sector to ensure adaptation measures address vulnerability. In conclusion we argue that the type of relationship between the public and the private actors has a significant influence on the adaptation outcomes. The question is not purely about involving the private

## *Insurance in emerging markets: determinants of growth and the case of climate change?*

sector which is how this is currently framed within policy and academic work on adaptation, but how the private actors are engaged. Governments seeking to engage private actors need to build those relationships with the desired adaptation outcomes in mind.

### References:

Fisher, S. and Surminski, S. 'The roles of public and private actors in the governance of adaptation: the case of agricultural insurance in India', September 2012, Munich Re Programme Technical Paper No. 15 <http://www.cccep.ac.uk/Publications/Working-papers/Abstracts/100-109/public-private-actors-governance-adaptation-agricultural-insurance-in-india.aspx>

### Presentation

**The impact of climate change on the BRICS economies:**

- The political, legal and regulatory framework for insurance in emerging markets
- Risk governance and the role of public and private actors

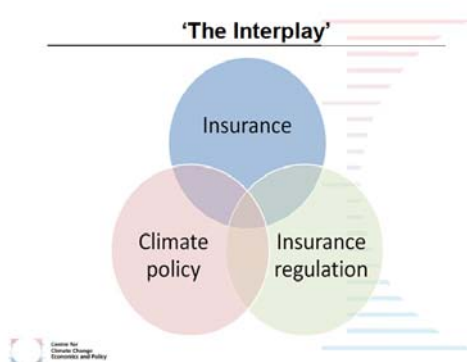
Dr Swenja Surminski, London School of Economics  
Autumn Symposium, 21<sup>st</sup> November 2012, London

Logos: LSE, Centre for Climate Change Economics and Policy, Global Institute for Climate Change and the Environment, Munich RE

**Five pathways of climate change influence on insurance demand**

- Economic growth
- **Public policy and regulatory environment**
- Risk levels and willingness to pay
- Supply factors
- New products

Logo: Centre for Climate Change Economics and Policy



**Topics**

- 1 **Comparing political, regulatory and legal drivers of insurance development across countries**
- 2 Monitoring climate policy in emerging markets and the application to business planning
- 3 Political and regulatory drives for insurance and climate change – the example of risk governance in China
- 4 Risk governance, climate change and the role of public and private actors - the example of agriculture insurance in India

Logo: Centre for Climate Change Economics and Policy

# Insurance in emerging markets: determinants of growth and the case of climate change?

## 1 Comparing political, regulatory and legal drivers of insurance development

Component Measures	Reference
1. National political and institutional stability and quality	Blairard (2008); Hussels et al. (2008); USAID (2006)
2. Observance of insurance regulatory principles	Blairard (2008); Suresh (2004); USAID (2006)
3. Level of financial market development	Blairard (2008); Fagan et al. (2011); Suresh et al. (2008); Ward and Zühlke (2002); Eshwar et al. (2004); USAID (2006)
4. Conductiveness of the regulatory environment for business	Blairard (2008); Suresh (2004); USAID (2006)
5. Protection of property rights, judicial efficiency and transparency	Blairard (2008); Hussels et al. (2008); Fagan et al. (2011); Bank and World (2002); Suresh et al. (2008); Ward and Zühlke (2002); Eshwar et al. (2004); USAID (2006)

Center for Climate Change Economics and Policy

## Topics

1 Comparing political, regulatory and legal drivers of insurance development across countries

2 Monitoring climate policy in emerging markets and the application to business planning

3 Political and regulatory drives for insurance and climate change – the example of risk governance in China

4 Risk governance, climate change and the role of public and private actors - the example of agriculture insurance in India

Center for Climate Change Economics and Policy

## 2 Monitoring climate policy in emerging markets and the application to business planning I

- ❑ The European Bank for Reconstruction and Development's (EBRD) Climate Laws, Institutions and Measures Index, or CLIMI (2011)
- ❑ Germanwatch's Climate Change Performance Index (using the climate policy component of the overall index), (2012, uses 2011 data)
- ❑ The EBRD's Index of Sustainable Energy (again taking the climate policy component of the overall index), (2010)
- ❑ Künkel, Jacob and Busch's Climate Policy Index (2006).

Center for Climate Change Economics and Policy

## 2 Monitoring climate policy in emerging markets and the application to business planning II

Correlation coefficients between policy indexes

	EBRD - CLIMI (2011)	EBRD - ISEI (Climate Policy) (2010)	Germanwatch - Climate Change Performance Index (Policy component) (2012)	Künkel et al. - Climate Policy Index (2006)
EBRD - CLIMI (2011)	1.00	0.85	0.19	0.84
EBRD - ISEI (Climate Policy) (2010)	0.85	1.00	0.32	0.96
Germanwatch - Climate Change Performance Index (Policy component) (2012)	0.19	0.32	1.00	0.37
Künkel et al. - Climate Policy Index (2006)	0.84	0.96	0.37	1.00

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## 2 Monitoring climate policy in emerging markets and the application to business planning III

- ❑ There is evidence of business use of climate policy indices.
- ❑ The indices display varied information content.
- ❑ There appears to be a trend towards 'build-your-own indices' within the business community.
- ❑ The evolution of policy indices suggest a move away from output measures towards input metrics.

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## Topics

1 Comparing political, regulatory and legal drivers of insurance development across countries

2 Monitoring climate policy in emerging markets and the application to business planning

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4 Risk governance, climate change and the role of public and private actors - the example of agriculture insurance in India

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## 3 The example of risk governance in China I

Nat Cat Insurance Agriculture	Nat Cat Insurance Property
• Available since 1982	• Very limited availability
• High political support, incl. premium subsidies, technical support, 'last resort' backing, financial aid for new provincial insurers, no premium tax	• Mixed political support – proposals are discussed, but no implementation
• Initially operated by public insurer, now growing private involvement.	• Range of proposals for public/private mix
• Regulated by Agricultural Law, not under Insurance Law	• Proposed under Insurance Law.
• Endorsed as tool for climate change adaptation by government	• Key driver is earthquake risk, climate change seen as aggregator

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## 3 The example of risk governance in China II

- ❑ Clear difference in utilization of insurance to manage agricultural and property risks.
- ❑ Public policy and insurance regulation are the key governance drivers for nat cat insurance in China.
- ❑ Climate change is already impacting insurance in the form of policy commitments by the Government in their national adaptation strategy.
- ❑ A trend towards greater private sector engagement exists, but the challenges of affordability and availability will require public role.
- ❑ What about the effectiveness of insurance and the link to overall risk management?

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# Insurance in emerging markets: determinants of growth and the case of climate change?

## Topics

- 1 Comparing political, regulatory and legal drivers of insurance development across countries
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- 4 Risk governance, climate change and the role of public and private actors - the example of agriculture insurance in India



## 4 Risk governance, climate change and the role of public and private actors - India I

Research question:

How have the roles of the public and private sector changed over time in risk governance and what can be learned from this for climate change adaptation?

Our approach:

We are using insights from natural hazard governance and insurance, and adopting analytical frameworks from the broader governance literature.



## 4 Risk governance, climate change and the role of public and private actors - India II

← Increasing autonomy of private actors		← Increasing autonomy of public actors →			
Private self-governance	Private self-governance in the shadow of hierarchy (or opportunity)	Delegation to private actors	Co-governance of public and private actors	Consultation and co-action of private actors	Public governance
No public involvement	Private actors bearing further legislation and to self-regulate. Could also apply in case of anticipating new business opportunities.	Delegation of specific functions such as outsourcing of public services; involves varying levels of autonomy	Joint decision-making over an issue	Using expertise of private sector	No private involvement
PepsiCo SICO schemes	WASTE/WATER/ICE/CO2 Livelihood pilot	W/CCIS W/CCIS (private actors undertake risk, but operate within rules of the scheme set by government)			Experimental schemes CCIS W/CCIS



## 4 Risk governance, climate change and the role of public and private actors - India III

2007 – PepsiCo Frito Lay offer weather risk advice and index insurance as part of their contract farming (potatoes suppliers) in India



## 4 Risk governance, climate change and the role of public and private actors - India IV

### Findings

- There is an opening of risk governance and adaptation to private actors but this is occurring within a particular model of engagement between public and private actors that has restricted the role private players can play.
- In the context of climate change, how the public-private relationships are constructed is key to how adaptation can be leveraged from such an arrangement.



## **9. The future of insurance in the BRICS – climate change and beyond, how can the industry prepare and what is the role of multilateral development banks?**

**Daniel Clarke, World Bank**

### ***Abstract***

The donor community and multilateral development banks can play four key complementary roles in the development of catastrophe insurance solutions for BRICs: convening power, promoter of public goods that permit the development of risk market infrastructure, provider of technical assistance for innovative catastrophe insurance solutions, and financier. The World Bank has developed a methodology and a suite of disaster risk financing products and services that allow it to support governments in these four ways. For more than a decade, the World Bank has helped governments to increase their financial response capacity in the aftermath of disasters while protecting their long term fiscal balance, and has assisted member countries in establishing disaster risk financing mechanisms that can increase insurance penetration and “crowd in” the private insurance and capital markets. In 2000, the World Bank technical assistance supported the establishment of the Turkish Catastrophe Insurance Pool. Since then, the World Bank has been involved in more than 40 disaster risk financing operations. These operations include, for example, the Caribbean Catastrophe Risk Insurance Facility (CCRIF), the Malawi weather derivatives intermediation, and a series of contingent loans against natural disasters (CAT DDOs) in Costa Rica, Colombia, Peru, El Salvador, and the Philippines. The World Bank is one of the few international development institutions which has a fully dedicated team of experts working on disaster risk financing and insurance.

### ***Presentation***



The future of insurance in the BRICS – climate change and beyond, how can the industry prepare and what is the role of multilateral development banks?

The roles of multilateral development banks in the development of catastrophe insurance solutions in the BRICs

1. Convening power
2. Promoter of public/club goods that permit the development of risk market infrastructure
3. Provider of technical assistance for innovative disaster risk financing and insurance (DRFI) solutions
4. Financier

Cummins and Mahul (2008)

Daniel Clarke, World Bank  
21 November 2012

LSE/MR Autumn symposium on insurance in emerging markets

# Insurance in emerging markets: determinants of growth and the case of climate change?

## 1. Convening power

- In-depth knowledge of client countries
- Relationship with donors
- Reputation for impartiality

⇒ catalytic role in the development of efficient partnerships among countries, donors, and private markets for the financing of catastrophe risks.

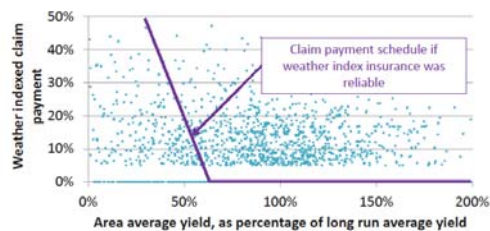
## 2. Promoter of Public Goods

- Donors can play a major role in financing public goods that contribute to the creation of a risk market infrastructure, which facilitates the development of market-based risk financing solutions.

Public goods include

- Information collection and management systems
- Catastrophe risk assessment programs
- Risk modeling development programs
- Awareness and education campaigns
- Institutional capacity building

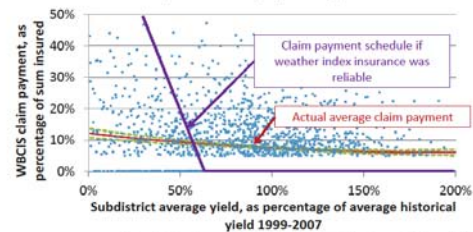
For example, are agricultural insurance indices a natural monopoly?  
(Is a single, coordinated investment needed?)



Weather index insurance may not offer reliable protection for farmers ⇒ more substantial, coordinated investments in data may be required.

For example, across an Indian state:

- Correlation between yield and claim payment only -13%



9 years of data, 318 products sold across one state in India. Source: Clarke et al. (2012)

## 3. Provider of technical assistance for innovative disaster risk financing and insurance (DRFI) solutions

- Support governments in making sound sovereign DRFI decisions
  - E.g. World Bank's DRFIP tools
  - Links to:
    - Public debt management
    - Fiscal risk management
    - Disaster risk management
- Risk retention
  - Budget allocation/reserve fund
  - Line of credit/contingent credit
- Risk transfer
  - National and regional catastrophe insurance pools (for example, TCIP, CCRIF) or joint mechanisms (for example PDRFI)
  - Reinsurance
  - Catastrophe bonds
  - Index insurance
- (Risk transfer versus risk retention see Gollier (2003))

## 4. Financier

- Risk financing line for risk retention
  - Initial capital/reserves
  - Contingent credit (e.g. CAT DDO)
  - Economic motivation: low cost risk retention versus commitment device
- Temporary premium finance
  - E.g. IDA grants and concessionary loans

The roles of multilateral development banks in the development of catastrophe insurance solutions in the BRICs

1. Convening power
2. Promoter of public/club goods that permit the development of risk market infrastructure
3. Provider of technical assistance for innovative disaster risk financing and insurance (DRFI) solutions
4. Financier

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1. Cummins, J.D. and O. Mahul, "Catastrophe risk financing in developing countries: Principles for Public Intervention," The World Bank, Washington, D.C., 2008.
2. Gollier, C., "To Insure or Not to Insure?: An Insurance Puzzle," The GENEVA Papers on Risk and Insurance-Theory, 2003, 28 (1), 5-24.

## **References**

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Clarke, D.J., O. Mahul, K.N. Rao and N. Verma, (2012) "Weather Based Crop Insurance in India," World Bank Policy Research Working Paper 5985.

<http://www->

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Clarke, D.J. and O. Mahul, (2011) "Catastrophe risk financing and contingent credit: a dynamic analysis," World Bank Policy Research Working Paper 5693.

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[wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2011/06/20/000158349\\_20110620100433/Rendered/PDF/WPS5693.pdf](http://wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2011/06/20/000158349_20110620100433/Rendered/PDF/WPS5693.pdf)

## **10. EBRD perspective**

**Craig Davies, EBRD**

### ***Discussion notes***

The European Bank for Reconstruction and Development is an international financial institution that promotes transition to market economies in 29 countries from Central Asia to North Africa. As international awareness grows of the need to adapt to a changing climate, EBRD is taking steps to integrate climate change adaptation into its operations and to find innovative ways of mobilising private sector action on adaptation. This is particularly important in the more climate-vulnerable parts of the Bank's region such as Central Asia, the Caucasus, south-eastern Europe (including Turkey) and southern and eastern Mediterranean. EBRD recognises the importance of promoting market-based solutions to the adaptation challenge and believes that the insurance industry has the potential to help manage weather-related risks to businesses and provide commercial incentives for private sector action on adaptation.

However, in much of the EBRD region the insurance industry is poorly developed, which hinders the development and use of weather-related insurance products. In response, EBRD is now working to understand the potential for the use of weather-related insurance products to support climate change adaptation in the EBRD region, and to identify practical options for supporting the development and implementation of such products. EBRD is currently exploring ways of structuring its investments across different sectors to incentivise the use of weather-related insurance products that promote adaptation, as well as examining the scope for promoting the use of such approaches through its investments in the insurance sector.

The EBRD region is overwhelmingly middle-income, with a number of large, yet climate-vulnerable, emerging economies. This creates valuable opportunities for innovation in the use of insurance-based approaches for managing climate risks. EBRD's commercially-oriented approach is also important in a region that does not enjoy the same level of access to concessional adaptation finance as low-income regions. Adapting to climate change in middle-income countries will only be achieved by harnessing the potential of the private sector and by developing adaptive responses that make business sense. The insurance industry has a critical role to play in this.

## **11. Towards a Comprehensive Disaster Risk Management and Adaptation Approach in LAC: The Role of Financial Instruments**

**Maricarmen Esquivel Gallegos, IDB**

### **Abstract**

The IDB is working with countries in the Latin America and Caribbean Region on a comprehensive disaster risk management and finance approach that integrates risk assessment, risk reduction and management, and risk transfer. The program focuses on institutional capacity building, knowledge transfer, and product design and financing. To implement this approach, the IDB has placed substantial emphasis on 1) promoting a policy dialogue among the public sector, international institutions and the private sector, 2) strengthening institutional capacity, 3) providing tailor-made solutions, 4) emphasizing solutions that promote private sector participation and deepening of domestic risk markets, as well as their integration with regional and international risk and capital markets, 5) seeking to complement efforts with other related initiatives. The Bank also brings years of experience providing financial resources during natural disasters, with instruments for emergencies and reconstruction. The IDB has been working with several organizations, including NOAA, NASA, USGS, and Berkeley University, and with the insurance and reinsurance industry, including Swiss Re and Munich Re. Donors include SECO, JICA, KfW, and the activities are being coordinated with WB and ADB. Since 2009, the IDB has approved over 6 Contingent Credit Loans (Dominican Republic, Honduras, Panama, Costa Rica, Ecuador, and Peru) and an Insurance Facility (Dominican Republic). It also has supported Disaster Financial Risk Management and Local Insurance Market Development in Central America. It is currently working on the Regional Insurance Facility for Central America.

### **Presentation**



Towards a Comprehensive Disaster Risk  
Management and Adaptation Approach in LAC:  
The Role of Financial Instruments

LSE Autumn Symposium  
Insurance in Emerging Markets: Determinants of Growth and  
the Case of Climate Change?

Inter-American Development Bank  
Climate Change and Sustainability Division  
Infrastructure and Environment Sector

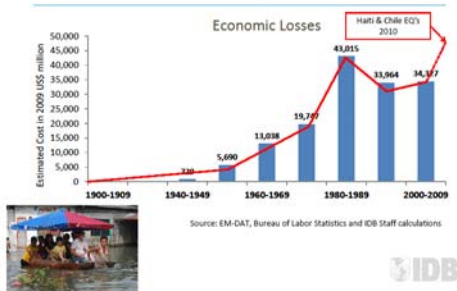
### **Content**

- Increasing losses in LAC
- A comprehensive approach to DRM and CCA
- Financial instruments for DRM
- Partnerships and innovation
- IDB's Climate Change Action Plan
- Questions/Discussion

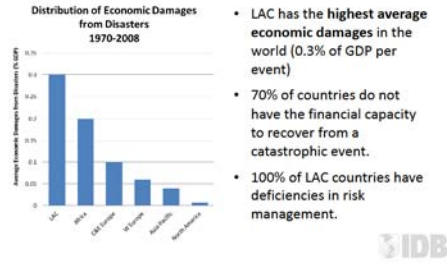


# Insurance in emerging markets: determinants of growth and the case of climate change?

## Increasing costs



## LAC is the most vulnerable region



## Natural disasters in LAC

No. of Climate-Related Disasters: Example from Central America\*

	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010
Guatemala	1	0	1	5	3	6	12	10
Honduras	4	3	3	5	7	8	14	7
El Salvador	0	0	2	3	4	7	8	7
Nicaragua	1	3	1	2	4	10	9	8
Costa Rica	3	2	0	2	6	7	10	6
Panama	3	1	2	2	3	4	8	7

Source: EM-DAT (2011)

\* More than 6 events/year are indicated in red

## "Mega" disasters in the region

Chile earthquake (Feb 2010)  
Economic loss: US\$30 billion  
Human losses: 525 death

Haiti earthquake (Jan 2010)  
Economic loss: US\$7.8 billion  
Human losses: 316,000 death

Colombia Floods (Nov-Dec 2010)  
Economic loss: US\$5.0 billion  
Human losses: 389 death

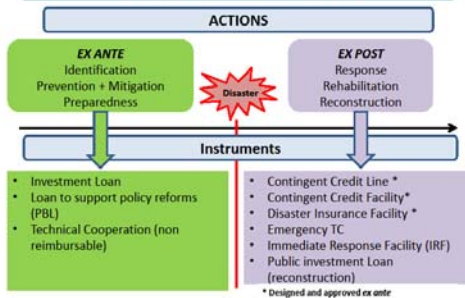
## IDB: Comprehensive Approach

- Comprehensive disaster risk management and finance approach: integrates risk assessment, risk reduction and management, and **risk transfer** [climate change adds a new layer]
- Through institutional capacity building, knowledge transfer, product design and financing.
- The private sector is a **key player**

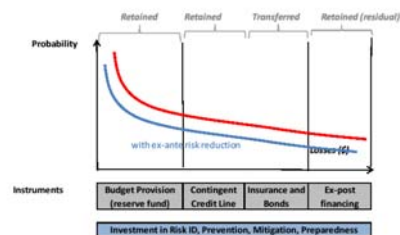
## Disaster Risk Financing Strategy



## DRM Instruments

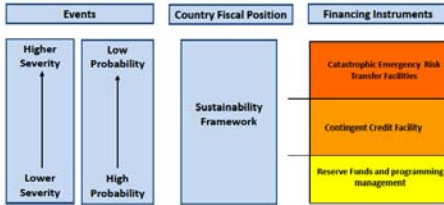


## Instruments



# Insurance in emerging markets: determinants of growth and the case of climate change?

## IDB Financial protection structure for natural disasters emergencies



## Financial Programming & Budgetary/Reserve Funds



- Objective**
- Institutional strengthening of the ND fiscal programming function, in particular the structuring and operation of budgetary/reserve funds for financing extraordinary emergency public expenditures caused by frequent & low impact natural disasters.
- IDB intervention focuses**
- Fiscal Sustainability Studies on public expenditure financing during ND emergencies.
  - Development of governmental institutional capacity for financial management of ND contingent liabilities.
  - Development of ND emergency financing mechanisms for high recurrence low impact events (budgetary reallocations, reserve funds, etc.).
  - Development of systems and procedures for improved assessment and control of values at risk of ND, and their efficient financial coverage.
- Main Achievements**
- Fiscal Sustainability Studies on public expenditure financing during ND emergencies and recommendations for design and or creation of reserve funds done in 6 COSEFIN countries. ATNs, in DR to Improve mayor public infrastructure assets valuation systems.

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## Contingent Credit Facility (CCF)

- Objective**
- Complement countries availability of liquid financial resources to timely cover extraordinary public expenditures during emergencies resulting from severe or catastrophic ND events.
- The instrument**
- US\$ 600 million Facility to grant contingent loans of up to US\$ 100 million, with disbursements contingent to the occurrence of an event with location, type and magnitude previously agreed with the Bank. The line has been expanded recently, with no global limit and up to 300 million per operation.
  - Allows Provision of customized ND coverage to countries: The instrument is adaptable to cover different types of natural disasters depending on countries needs.
- Main Achievements**
- The Facility was approved by the Executive Directory in February of 2009. The first Loan has been approved for Dominican Republic in November 2009. Currently there are three additional operations approved, Honduras, Ecuador, Panama and other three are being negotiated with Costa Rica, Peru and Nicaragua.



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## Main advantages of the CCF-Contingent Loans

- There is no cost in the determination of the damage (losses) because the compensation for an event with determined characteristics is defined previous to the occurrence of the event.
- Rapid disbursement upon verification of occurrence of an eligible event.
- Clear mechanism to identify if the triggers (that give access to the disbursement under the CCF Loans) have been activated or not.
- Flexibility to chose between using the resources under the CCF Loan itself or using ULB from a list of previously approved IDB Loans, contractually agreed by the country and the Bank.
- Efficient complement of other contingent credit arrangements (CAF or World Bank Cat-DDO; etc.)



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## The IDB ND Catastrophic Emergencies Insurance Facility (CEIF) Program



- Objective**
- To complement the Institutional capacity for ND financial risk Management by enabling the development of efficient coverage for extraordinary expenses during catastrophic emergencies by transferring the risk to the international markets, through a captive insurance platform.
- IDB intervention focus**
- Technical assistance To design and structure the institutional Platform and the initial parametric coverage for natural disasters.
  - Financing the platform operational costs during the take off period.
- Main Achievements**
- Regional TA for designing and structuring of two facilities in member countries. Insurance facility designed and began to be structured in one country (DR). Design in a second country (HO), about to begin.
  - Loan approved (24 Million) to support financing launching of Insurance facility in the DR.

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## CEIF-An Operational Example: The Dominican Republic



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## CEIF - Main advantages

- Allows broad and efficient high rated access to the international risk and capital markets.
- Constitutes an institutional platform for efficient public financial risk management that in time could be used to transfer other type of public financial risks (i.e. climate change impacts, agricultural and food security risks, etc).
- Promotes expansion of international private insurance sector participation in domestic risk coverage, thus furthering the deepening and broadening of the market.
- Through the launching of new insurance lines, provides opportunities for domestic insurers development and growth.
- Complements and build up upon other similar multilateral initiatives in the region, like the World Bank CCRIF.



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LA NUEVA FACILIDAD DE CREDITO CONTINGENTE DEL BID

Facilidad de Crédito Contingente para Emergencias Catastróficas de Centroamérica y el Caribe



## Partnerships and innovation

- **Costa Rica:** technical assistance to strengthen supervision and regulation of insurance market
- **Bolivia:** *Centro de Estudios Economicos, Universidad Privada Boliviana* (Cochabamba) → to develop policy indexed to climatic indices (potatoes, wheat, corn)
- **Peru:** Lima, Ministry of Housing (EQ). SISMIC (*Centro Sismologico Peruano-Japones*)
- **Haiti:** micro-insurance, FONCOSE (ONG)
- **San Juan, Argentina:** (hail, or *granizo*, affects grapes, integral approach)



## Climate Change Action Plan

Support LAC countries in reducing their vulnerability to climate change as well as contributing to low carbon development in the region

- ✓ Mobilize a range of financial and nonfinancial instruments for institutional, technical, and financial capacity building
- ✓ Provide guidance for the Bank's dialogue with governments, civil society and the private sector
- ✓ Integrate public and private financing and capacity building into a single framework for climate action.

The Action Plan details operational priorities, activities and timeframe required, and monitors output contributions as required in the General Capital Increase (GCI-9)

## One of the Strategic Activities:

- Scaling-up investments and leveraging private sector funds.
  - Use of fast start resources in the region
  - Deploy adaptation funds
  - Promote use of REDD, FIP and FCPF resources
  - **Develop innovative funding mechanisms to attract private sector investments**

## Questions/Discussion

- Is insurance effective for climate adaptation?
- **What can we do together?** (Academic institutions, insurance and re-insurance industries, MDBs, etc.)
- Commercially viable?
- Politically desirable?
- Who pays?
- Who benefits?
- Expectations of policy makers ?



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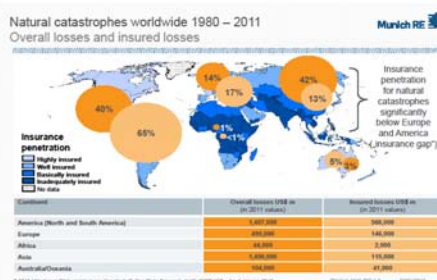
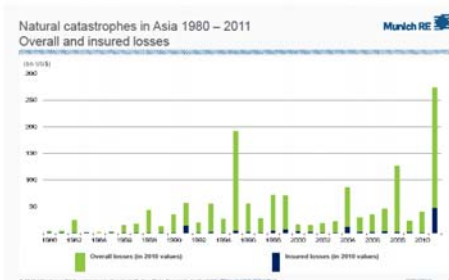
## 12. NAT-CAT RISK MANAGEMENT

Thomas Mahl, Munich Re

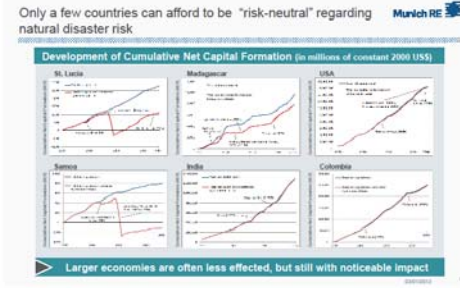
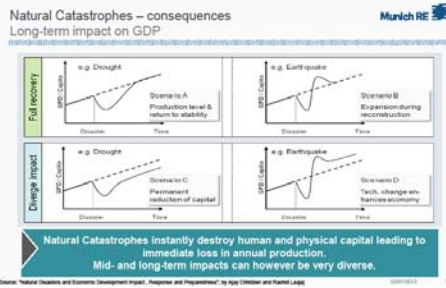
### Abstract

Over the last 30 years a significant increase in losses caused by natural catastrophes could be observed. Climate change, population growth, urbanization as well as location and settlement in vulnerable areas have been identified as the main drivers for these trends. Particularly the developing countries seem to be extremely vulnerable towards extraordinary events like natural catastrophes by having only limited available financial resources to cope with these challenges. Hence with reference to the governments' responsibility and established role (reinsurer of last resort) an optimal national risk financing and insurance strategy with ex ante and ex post financial instruments should be developed to ensure the continuation of governmental operations and the timely restoration of critical infrastructures in the aftermath of an event. Reinsurance and their various solutions can support and enhance the governments capability to close the identified financial gap.

### Presentation

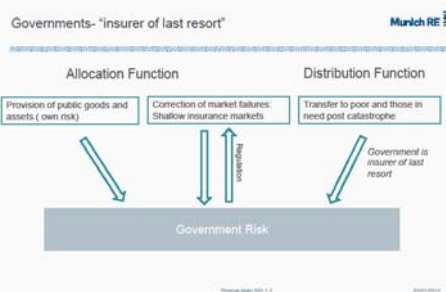
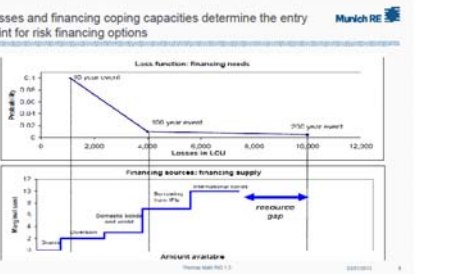


# Insurance in emerging markets: determinants of growth and the case of climate change?



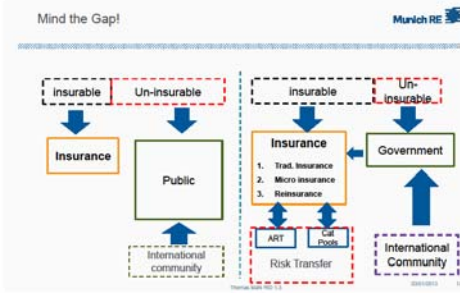
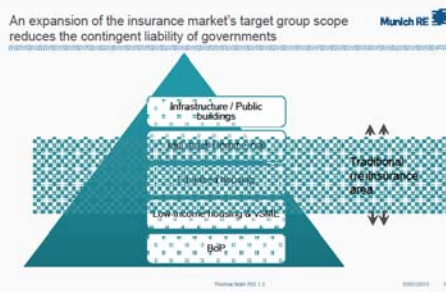
### An intuitive approach suggests a certain differentiation of countries

Industrialised countries	Developing countries
Tend to suffer higher economic losses in strict dollar terms	Natural hazards cause setbacks to economic and social development
High insurance penetration for property	Lower insurance penetration and higher vulnerability of property
Immediate emergency and medical care available	Limited availability of medical care infrastructure
More mechanisms to avoid loss of life (early warning systems)	Lack of resources for early warning systems
Relieve risks	Transfer risks

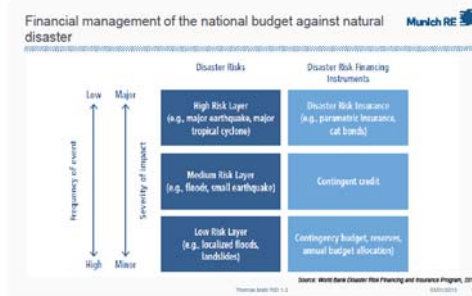
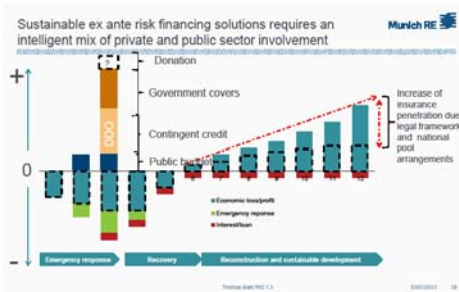
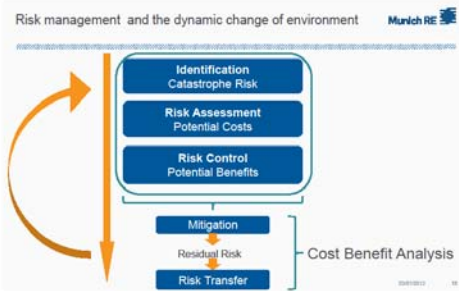


### Enterprises and the public sector faces the highest complexity of risk

	Personal and Commercial Risks	Technological and Infrastructural Risks	Natural Hazards	Environmental Risks	Social and Political Risks	Purely financial and other Risks
Public Sector	✓	✓✓	✓✓	✓✓	✓✓	✓✓
Enterprise	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
Residential	✓✓	✓	✓✓	✓	✓	✓



# Insurance in emerging markets: determinants of growth and the case of climate change?



As partner for governments our value proposition is based on three pillars

Value optimiser/Complex risk factors	Growth partner/ Know-how provider	High level of security
<ul style="list-style-type: none"> <li>In-depth modelling expertise</li> <li>Opinion leader in Nat Cat &amp; Risk</li> <li>Standardized internal risk management process for identification and evaluation of emerging risks</li> </ul>	<ul style="list-style-type: none"> <li>Prime partner as disaster risk advisor for supranational organisation</li> <li>Longstanding PPP experience with governmental agencies</li> <li>Expert for risk and insurance related regulatory frameworks</li> </ul>	<ul style="list-style-type: none"> <li>Prime capacity provider for risk transfer solutions</li> <li>Pioneer in ex-ante disaster risk financing schemes</li> <li>Development of innovative reliable disaster risk assessment-revaluation tools</li> </ul>

Clear positioning as a comprehensive service reinsurer

Drawing a line between public and private liabilities

	National Pool/Private sector Solutions	Government Cover
Policyholder	Private households or companies	Public Agencies or Institutions
Funding / Government role	(mostly) financed by private policyholders	<ul style="list-style-type: none"> <li>Part of the federal budget</li> <li>Government decides about allocation of resources in cases of nat. disasters</li> </ul>
Insured assets	Private property	Public property and bridging of liquidity gaps in federal budgets
Examples	<ul style="list-style-type: none"> <li>Turkish Catastrophe Insurance Pool</li> <li>TREIF</li> <li>Mapark</li> </ul>	<ul style="list-style-type: none"> <li>CCRIF</li> </ul>

Generally pools pay out on an indemnity basis. This would not be appropriate in case of government covers. A fast payout, which is not subject to discussions is crucial to the purpose. Hence, parametric triggers are an ideal solution.

- Overview of existing catastrophe risk financing schemas
- New Zealand Earthquake Commission
  - Caribbean Catastrophe Risk Insurance Facility (CCRIF)
  - Internationaler Rückversicherungsverband (IRV)
  - Indonesia Earthquake Company (Mapark)
  - Norsk Naturskade pool (NNPP)
  - Elementarschaden Pool (ES-Pool)
  - Programul Român de Asigurare la Catastrofe (PRAC)
  - Taiwan Residential Earthquake Insurance Fund (TREIF)
  - Turkish Catastrophe Insurance Pool (TCIP)
  - Icelandic Catastrophe Fund
  - The California Earthquake Authority (CEA)
  - Icelandic Catastrophe Fund
  - Fonden (Mexico)

Our team

Public Sector Affairs

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# Insurance in emerging markets: determinants of growth and the case of climate change?



### Turkey and the Earthquake exposure

- Expected annual economic losses due to earthquakes around \$1 billion
- Marmara and Duzce earthquakes (Aug. 1999) death toll > 18,000; damage > \$10 billion
- During the last few years over 100 earthquakes ranging from 4.0 to 6.2 on Richter Scale.
- 70% of the population lives in 1<sup>st</sup> and 2<sup>nd</sup> earthquake zones

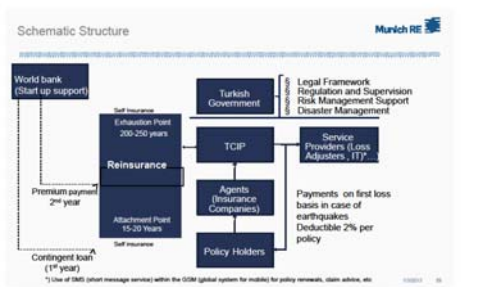
### Turkish Catastrophe Insurance Pool (TCIP)

**Background**

- Low insurance penetration
- High exposure to a variety of adverse natural events- particularly earthquake
- Insufficient Nat-cat capacity in the domestic market
- Dependence on assistance from international donors to finance post-disaster needs

**Objectives**

- Protection of the federal budget
- Provide homeowners with reconstruction financing after major catastrophic events
- Cover as much as possible of the economic losses
- Encourage physical risk mitigation
- Diversification of risk
- Highest standards of governance and operations and lowest possible operational costs for Pool
- Minimize cost by relying on existing distribution and service capabilities of private primary insurance



### Original Terms and Conditions

Premium is determined by :-

- Earthquake Cresta Zones
- Construction Type of the building
- The area of the building in square meters

Sum insured		Tariff rate				
Type of Building	USD/m <sup>2</sup>	Zone 1 %	Zone 2 %	Zone 3 %	Zone 4 %	Zone 5 %
A) Steel of Reinforced Carcass	330	2.20	1.55	0.83	0.55	0.44
B) Amassed Stone & Brick	237	3.85	2.75	1.43	0.60	0.5
C) Others	123	5.5	3.53	1.76	0.78	0.56

84000 USD limit per policy

20% discount in case of renewal and where block policies are sold in respect of RuB.

### Statistics

- Started penetration despite compulsory EQ insurance decree law
- Poor enforcement and lack of hazards information
- Only legally built with proper permits buildings are insured
- Widespread squatter communities (gecekondu)
- Need for improved building practices

### Turkish Catastrophe Insurance Pool (TCIP)



# Insurance in emerging markets: determinants of growth and the case of climate change?

### Taiwan and the Earthquake exposure

- Taiwan is highly exposed to earthquake
- September (1999) Chi Chi earthquake
  - Death toll >2400;
  - Economic damage >\$12 billion
  - Insured loss > \$600mio
- End of 1999: Insurance law manifested the establishment for a mechanism for assuming earthquake risks
- July 2001: The Taiwan Residential Earthquake Pool came into existence

Source: Munich RE Geo Services  
Thomas Wahl PhD 1.3 03/01/2013 38

### Taiwan Residential Earthquake Pool

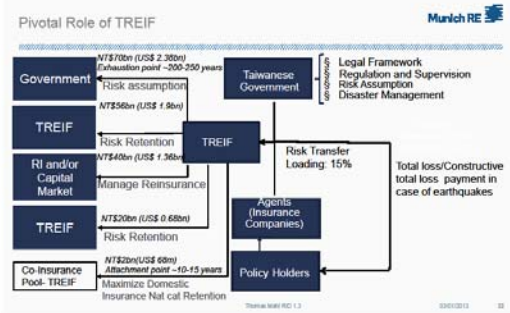
**Background**

- Low insurance penetration in Nat-Cat 1,13%
- High exposure to a variety of adverse natural events- particularly earthquake
- Insufficient Nat-cat capacity in the domestic market
- Dependence on assistance from government

**Objectives**

- Protection of the federal budget
- Provide homeowners with reconstruction financing after major catastrophic events
- Diversification of risk
- Highest standards of governance and operations and lowest possible operational costs for Pool
- Maximization of the local retention
- Minimize cost by relying on existing distribution and service capabilities of private primary insurance

Quote: MR KE  
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### Pivotal Role of TREIF

- Assume the risk of residential earthquake insurance from local insurance companies
- Manage the risk spreading mechanism
- Administer residential earthquake insurance underwriting, claims settlement, reinsurance placement, co-insurance and auditing
- Education and training

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### Original Terms and Conditions

**Subject matter:** Household building

**Perils insured:** Earthquake shock, Fire or explosion caused by Earthquake, Landslide, subsidence, earth movement, rupture caused by earthquake, Tsunami – tidal waves or flood caused by earthquake

**Premium:** NTS 1,350 (US\$ 46)

**Sum Insured:** NTS1,200,000 (US\$ 41,000)

**Contingent Living Expenses:** NTS160,000 (US\$ 5,100)

**Loss Trigger:** The loss will be paid when the insured residential building is suffered an earthquake event and its damage reached actual total loss or constructive total loss<sup>1)</sup>

<sup>1)</sup>The criteria for determining a Constructive Total Loss is described as: the repair cost of the damaged part of the residential building is more than 50% of the replacement cost of the building

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### Statistics

Take up rate and written premium

The chart shows the following trends from 2000 to 2009:

- Fire Insurance (Bar):** Shows a steady increase in written premium over the period.
- TREIF VA (% of Fire) (Red Line):** Shows a steady increase from approximately 5% in 2000 to 15% in 2009.
- TREIF Take-up rate (%) (Blue Line):** Shows a steady increase from approximately 10% in 2000 to 28% in 2009.

- Take up rate at 28% only
- Mortgage borrowers buy Fire insurance only
- Solution based on uniform premium doesn't motivate risk mitigating activities

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## **DISCUSSION NOTES**

The core element of the symposium was the exchange of views and ideas through open discourse. Throughout the event, three main strands of discussions emerged, triggered by the presentations and expert statements: insurance growth factors, insurance of natural disasters, and the role of multilateral lenders in managing climate risks and developing insurance solutions. Below is a brief summary of the key points discussed:

### ***i) Insurance growth in emerging markets – drivers, quantification, demand versus supply side***

- Limits to econometric analysis, especially cross-sector and over time, were noted, particularly around endogeneity, the role of the financial sector and causality. It was recognised that financial services are essential to economic development and that insurance is critical in managing non-diversifiable risk, generating price signals in the market, and providing a competitive long-term savings vehicle.
- It was commented that for BRIC countries institutional factors appear to be very significant, but as GDP per capita increases, the significance of these appears to decline.
- Decomposing institutional factors is a challenge – for example it was suggested that analysing contract enforcement would be very interesting, but data is limited. ‘Rule of Law’ or ‘social security’ are widely recognized indicators for the impact of institutional factors.
- Accounting for regulatory activity and the impacts on insurance development is still limited, mainly due to lack of detailed data. Regulation may impact on certain business lines but it is unclear how this could be generalized and how to account for expected time-delays between imposition of regulatory measures and felt impact.
- The effectiveness of regulation was discussed in the context of solvency, where a degree of ‘model risk’ was noted, when operators are allowed to use their own internal models.
- In the context of natural disasters a range of regulatory approaches exists, aimed at demand and supply of insurance. The discussion focused on recent experience with flood insurance, where mandating cover, raising awareness and product regulation have been applied in order to increase insurance penetration. It was suggested that mandating coverage is not popular with industry because of highly correlated losses and risks, as well as capacity constraints. It might also lead away from risk-based premiums.
- The question whether limited coverage was a capacity gap, a pricing question, or due to low demand was raised. If demand is the problem one solution is education and awareness raising. It was suggested that this was a regulation problem with misaligned incentives for elected governments, where use of budgets on low frequency events was

not seen as a good use of public funds. Greater transparency about the size of economic effects of natural disasters would allow work to start on translating this into workable systems.

- The possibility of treating the market as a network and using literature from network industries to develop insights into supply issues was raised as a potential new route for investigation.

## ***ii) Catastrophe risks and climate change***

- Climate change impacts are hard to estimate. Impacts will vary across regions, with, for example, changes in harvest times or crop use. The nature and frequency of events will need to be considered, along with vulnerability and exposure of potentially affected populations. Combined events with significant costs were also raised as a potential concern. The relationship of external events with countries internal processes was noted as an interesting and complicated area and the example of the Haiti earthquake was given.
- When linking disaster risk management to climate change there may be implications for the whole cycle of risk management: risk assessment, risk reduction, risk transfer – climate change adds a new layer to all of this and challenges existing approaches.
- In this light the importance of new risk management approaches and a greater focus on resilience was raised. New ways of analysing and shifting risk were also discussed.
- The importance of new risk management requirements (including risk analysis and transfer) was raised.
- Risk mitigation/risk reduction was felt to be a key element in this, as this can help make risks insurable, and thereby make insurance affordable and grow markets.
- The evaluation of governments' resilience to natural catastrophes remains a challenge. Potential indicators were discussed - GDP may not be suitable and net capital stock might be a better indicator. Further work on this is required.
- It was asked whether we could measure resilience to catastrophes through using deviations from mid-term GDP growth trajectories, but comparing impacts of events across differently sized countries might lead to distorting results, unless there is normalization for population and size.
- Existing insurance schemes for disaster risks appear to be a patchwork, with no clear framework for setting up new schemes. This was felt to be especially important in emerging markets. Future research is needed on what works. The need to look at what is insured and how, e.g. state or private was raised.



*Insurance in emerging markets: determinants of growth and the case of climate change?*

- The question of how well the development of insurance markets reflected countries response to natural disasters was raised. Policy could be developed to support insurance markets. Establishing the causal link is hard as things vary between countries. Germany is more resilient than Haiti, and the insurance industry is better developed, but we cannot derive a causal relationship from this.
- There was agreement that the key challenge of insurance in the face of rising risks is affordability. It was commented that most coverage schemes for climate risks relies on some form of subsidy. This is particularly clear in the context of agricultural insurance. But the effectiveness in an economic sense remains unclear.
- The provision of insurance often becomes a very political issue. For example the subsidies for agricultural insurance can often be explained by political drivers (supporting rural communities, food security etc.).

**iii) The role of multilateral lenders**

- The three approaches by World Bank, IDB and EBRD were discussed. It was noted how they differ, for example in terms of private sector focus. Overall a wide agreement to link risk reduction to risk transfer was noted – but this is a key challenge, only limited evidence of how this works in practice exists.
- Several attributes for the overall role were mentioned: Multilateral lenders have convening power, in-depth knowledge, relations with donors, reputation for impartiality, and can have catalytic role in building public/private partnerships. Can be promoting public goods (for example risk data); developing risk management strategies for governments or engage in temporary premium finance.
- Insurance is understood as one option for risk management – but supply and demand issues make this difficult for scaling up, while effectiveness (when is insurance the most appropriate measure?) and link to risk reduction are still unclear.
- One key question relevant to work of multilateral lenders: How can we better assess and reduce the impact of natural disasters on economic growth in developing countries?
- Climate change concerns could become driving force for rising insurance market penetration – multilateral lenders can use this as a platform from which to support building markets. The example of Columbia was raised – after significant flood losses new innovative legislation was introduced to reduce and manage risks.
- But getting right level of data (geographic and granularity) remains a key challenge.
- From private sector point lenders should focus on ‘charity hazard’ – where government intervention distorts the market and sets adverse incentives, discouraging those at risk from taking risk management steps. Reducing this would be a major improvement.

## **PARTICIPANT BIOGRAPHIES**

**Hans-Jörg Beilharz** studied economics in Heidelberg, Germany, and Baton Rouge, Louisiana. In his PhD-thesis, he wrote about the boundaries of knowledge in deciding about macroeconomic policy. He joined the economic research team of Munich Re four years ago and is responsible for the economics of natural catastrophes, energy and climate change. As such, he is involved in the LSE/Munich Re research programme about climate risks and insurance. Furthermore, he examines the risks an insurance company might be confronted with when making business in a certain country. This includes country-specific financial and political risks.

Before coming to Munich Re, he worked as research assistant at the University of Heidelberg and as a consultant in the German energy sector.

**Jörg Wolfgang Bruniecki**, holds a diploma in Economics and Accounting from the university of cooperative education in Stuttgart. He is an Alumni of the Horst K. Janott scholarship program in cooperation with the Georgia State University in Atlanta. Mr. Bruniecki started his career as a Property Underwriter at Generali Lloyd Versicherung AG.

In 2001 Mr Bruniecki joined Munich Re as Client Manager and Property Underwriter for Global Clients where, in May 2006, he got promoted to Senior Property Underwriter. In 2007 in addition to his responsibilities Mr. Bruniecki was appointed as Executive Director of MSP Underwriting as well as Non-Executive Director of Beaufort Underwriting Agency limited. In this role he was responsible for the integration and strategic development of the newly acquired MSP Group into Munich Re and acted as the representative of Munich Re at local board level. In May 2008 he became Executive Manager within the Global Clients division.

In 2010 Mr. Bruniecki moved to Munich Re's Reinsurance Development division where he first headed as Corporate Broker Executive the strategic development of broker relationships worldwide and today as Head of Corporate Client and Channel Management is responsible for the development of MR's Sales capabilities at corporate level worldwide. Since April 2012 he is additionally heading the business development activities as Managing Director for Public Sector Affairs.

**Craig Davies** is Senior Manager, Climate Change Adaptation at the European Bank for Reconstruction and Development (EBRD). He leads EBRD's work on mainstreaming climate resilience into EBRD's investment operations in Central and Eastern Europe, Central Asia, the Caucasus, Turkey and the Southern & Eastern Mediterranean. He joined EBRD in 2006 having

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**Axel Fürderer.** After 13 years in the banking and financial services industry, Axel began his reinsurance career at Munich Re's Asia division in 2001, with a focus on innovative insurance solutions. In 2007 Axel moved to Munich Re's primary insurance operation (ERGO International) and was their first Chief Representative in India, responsible for developing the Munich Re Group's non-Life and life primary insurance joint ventures. Since his return to Munich Re in mid 2009 he has been a Client Manager for Greater China and Southeast Asia, concentrating on new business development.

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**Samuel Fankhauser** is Co-Director at the Grantham Research Institute on Climate Change and the Environment at the London School of Economics. He is also a Director of economics consultancy Vivid Economics. Sam is a member of the Committee on Climate Change, an independent public body that advises the UK government on its carbon targets, and the CCC's Adaptation Sub-Committee. Previously, he has worked at the European Bank for Reconstruction and Development (EBRD), the World Bank and the Global Environment Facility. Sam's research interests include climate change policy, carbon markets and the economics of adaptation to climate change. He studied economics at the University of Berne, the London School of Economics and University College London

**Ana Lopez** is a research officer at the Centre for Climate Change Economics and Policy (CCCEP) at the London School of Economics. Her area of expertise is in climate science with a particular focus on the quantification of climatic risks to inform adaptation management of natural and human systems. Ana has a background in theoretical Physics and her previous experience involves several years of research developing novel mathematical tools for the study of complex dynamical systems. During the last few years, first as a Tyndall Research Fellow at Oxford University and now at LSE, her research focused on the evaluation and development of methodologies for the estimation of climate change impacts and climatic risks using different climate modelling tools, applying these approaches to water resources systems, freshwater ecosystems, and flood hazards. Ana's research interests include climate model validation and evaluation, temporal and spatial limits for impacts relevant climate model information, detection and attribution of climate change, vulnerability approaches to mitigation and adaptation to climate change, the intersection between climate science and decision making under deep uncertainty, and the application of disaster risk reduction and risk management methodologies in the context of adaptation to climate change.

**Thomas Mahl**, Vice President, Public Sector Affairs, Munich Reinsurance Company. Mr Thomas Mahl, a Certified Risk Manager (Univ.), holds a MBA in Economics and Accounting from the University in Augsburg. He started his career as primary insurance underwriter 13 years ago. In 1999, Mr Mahl joined Munich Re where he was appointed as Marine Underwriter for Korea and Japan and was Topic Network leader of Munich Re's Marine Knowledge Management Network. Since 2006, Mr Mahl joined the Innovative Solutions Team of Asia and effective April 2008, he was assigned to Munich Re Singapore as Innovative Solutions Manager. July 2012, Mr. Mahl was allocated back to Munich to support the newly formed department public sector affairs in the development of tailor made governmental solutions.

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He is a member of the Supervisory Board of Lebensversicherung von 1871, a Munich-based life insurance company, and has acted as an advisor and guest lecturer at the Chinese-German University College (CDHK) at Tongji University in Shanghai. His main research interests are in insurance economics, the economic analysis of law, and the management of catastrophic risks.

**Judith Rees** was Deputy Director of LSE from 1998 to 2004, and Acting Director from May 2011 until September 2012. She also holds the following positions: Director of the Centre for Climate Change Economics and Policy; President of the Royal Geographical Society; Member of the UN Secretary General's Advisory Board on Water and Sanitation; Member of the International Scientific Advisory Council (ISAC); Member of The Netherlands' national research programmes: Climate changes Spatial Planning (CcSP) and Knowledge for Climate (KfC).

Judith has acted as an advisor to the World Bank on water privatisation, regulation and pricing and to a number of national governments on institutional design and regulatory regimes. She was member of the Technical Advisory Committee of the Global Water Partnership from 1996 until 2009. Judith has also been chair of the Training and Development Board and member of the central Council at the Economic and Social Research Council (ESRC), from 2004 to 2010. Judith was awarded the title of a Commander of the Order of the British Empire (CBE) in 2006.

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In 2010, Swenja also set up an independent climate risk consultancy, advising policy makers, international organizations and the insurance industry. From April 2007 until September 2010,

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Swenja worked for the Association of British Insurers (ABI) as Climate Change Adviser. Her key areas of work were climate impacts, mitigation policies, and the role of insurance in the climate change context. Swenja coordinated the ABI's response to the 2007 summer floods in the UK, led several industry research projects on climate change, and sat on various research steering groups, guiding the knowledge exchange between climate scientists and the insurance industry. Swenja has been a member of the Management Committee of the industry's ClimateWise initiative, of the European Insurance Industry Climate Change Taskforce (CEA) and of the London Climate Change Partnership Steering Group. She has been advising on climate change risks at UN, EU and UK level and is the author of several papers on these topics. She is a member of the Geneva Association's Climate Risks and Insurance working group. Prior to taking up her role at the ABI, Swenja was working in the Risk Management division of insurance broker Marsh McLennan and in the Geoscience Team at Munich Re. Swenja was a Fulbright Scholar in the US, studying Environmental Economics and International Relations at the University of New Hampshire. In 2002 Swenja received a PhD in Political Science/Economics from Hamburg University for her work on 'Climate Change and the Insurance Industry'.

**Ian Webb** has over 15 years of experience assisting national and international organizations modernize insurance regulatory/supervisory frameworks, train professionals in insurance and risk management and evaluate and improve the performance of micro-insurance organizations. He has authored a number of articles, reports, monographs and textbooks and served as a program evaluator for national and international agencies. His work includes drafting EU Solvency II Guidance on governance, risk management and investments within the IGSRR working group of EIOPA; formulating prudential policy at the UK Financial Services Authority (FSA); evaluating micro-insurance programs and drafting textbooks as Director of Consulting Services for Lawrie Savage and Associates; working on training programs and initiatives for national and international agencies as director of research and training at the International Insurance Foundation (IIF); and evaluating the performance of a political risk guaranty agency as a consultant to the World Bank. Ian Webb has a PhD in risk management and insurance, Masters in both Finance and Economics and a BA in mathematics. He speaks English and Spanish fluently, and is proficient in French.