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

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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

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**

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<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>11:00 – 11:05</td>
<td>Welcome and introduction by Prof Judith Rees, Director CCCEP/GRI, LSE</td>
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<td>11:05 – 13.15</td>
<td>Kick-off presentations and discussion forum:</td>
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<td></td>
<td><strong>What are the key determinants for insurance market growth and how to measure it?</strong></td>
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<td>Presentations:</td>
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<td>o Yongdong Liu</td>
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<td>o Andreas Richter</td>
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<td>o Ian Webb</td>
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<td>o Florian Englmaier</td>
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<td>o Axel Fürderer</td>
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<td>Followed by round-table discussion chaired by LSE.</td>
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<tr>
<td>14:00- 15:00</td>
<td>Set of presentations of findings from LSE research programme on the Economic Impacts of Climate Change in Emerging Economies: <strong>What implications could climate change have for the development of insurance in emerging markets?</strong></td>
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<tr>
<td></td>
<td>o Climate change and insurance demand in the BRICs (Ranger)</td>
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<td>o Climate change and the political, legal and regulatory framework for insurance in emerging markets (Surminski)</td>
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<td>o Risk governance and the role of public and private actors (Surminski)</td>
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<td>15:15 – 16:45</td>
<td>Expert statements and discussion forum:</td>
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<td><strong>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?</strong></td>
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<td>o Maricarmen Esquivel (IDB)</td>
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<td>Followed by round-table discussion chaired by LSE.</td>
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<td>16:45 – 17:00</td>
<td>Concluding remarks (MR and LSE)</td>
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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.

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

**Decomposing Insurance Growth Structure**
- Adjusted Growth Curve of World Insurance vs. GDP per Capita

**Two Insurance Growth Models**
- Ordinary Growth Model: $Y = \frac{1}{2} (b_1 + b_2 + b_3 \cdot X)$
- Adjust Growth Model: $Y = \frac{1}{2} (b_4 + b_5 + b_6 \cdot D_i + \varepsilon)$

- $b_1, b_2, b_3$: three parameters
- $D_i$ ($i=1, ..., 94$): country dummy with respect to country $i$
- $\varepsilon$: residual

- $Y$: insurance penetration
- $X$: GDP per capita
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- 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 no effects on the insurance industry being positive.
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References
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.

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Recent Trends 2

Non-Life or General Insurance Density and Penetration

Recent Trends 3

Life Insurance Market Structure

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 liberalisation?
- 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 margins. How LIC is dominating despite its size?
- In the general insurance segment, private insurers are efficient. Which are the times of business where competition is cut throat?
- Is FDI going to improve efficiency?

Recent Trends 4

General Insurance Market Structure

Issues and Recommendations

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 fall to comply. For example, LIC, National, ICICI Lombard
- Size of firm (not market share) is an important factor.
- Is it necessary to raise foreign equity cap to 40 percent 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?
- In 1969, the Crop Insurance Bill was introduced. The model was proposed for State governments' approval with the Central Govt. acting as reinsurer, but most states declined to be a part of this programme on financial grounds

Issues and Recommendations

- First experiment: GIC in 1972-73 insured 11-4 cotton growers in Gujarat. Later extended to other crops (groundnut, wheat and potato) and states (Andhra Pradesh, Gujarat, Karnataka, Maharastra, 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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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.

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Example: Crop Insurance in the United States

- Prior to 1958, practically no crop insurance was available in the US.
- Government subsidies policy (partial insurance).
- The war effort and food surplus (1940s).
- Public insurance system (PICS) was initiated.
  - Aided in growth of insurance
  - The war effort and food surplus (1940s).
- To increase participation, premiums were heavily subsidized. 
  - Certain perils are excluded by up to 90%.
  - Increased amount be to cheap coverage (1960).
- However, problems in the US crop insurance market:
  - High costs, premium waivers of SF (Stolen focus) in 1981.
  - Moral hazard.

Do Premium Subsidies Cause Moral Hazard?

<table>
<thead>
<tr>
<th>Premium Subsidies</th>
<th>Contingent Premiums</th>
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<tr>
<td>Payment of Premium</td>
<td>Regardless of State</td>
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<td>Influence of Subsidies</td>
<td>Increase moral hazard</td>
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<td>Examples</td>
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<td>Insurance</td>
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<td>Crop insurance</td>
<td>Long-term care insurance</td>
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<td>Disability insurance</td>
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- Regulatory action that aims to climate growth, can have adverse consequences, depending on design.

References

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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
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References

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) catastrophes. 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.

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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.

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:

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.

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 setting 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)

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 covariates (charitable donor money flows, ...)

Preliminary Results

References

http://pubs.aeaweb.org/doi/pdfplus/10.1257/jel.46.2.285

http://pubs.aeaweb.org/doi/pdfplus/10.1257/aer.91.5.1369
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6. Evaluating the economics of climate risks and opportunities in the insurance sector - A glance into the crystal ball

Axel Fürderer, Munich Re

Presentation
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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.

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**Conclusions**

1. Based on a simple model, gross premium volumes across the BRICS could rise at rates of 5.8% to 12.1% 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. our broad conclusions also relevant beyond BRICS

**Drivers of Insurance Demand**

- Local impacts of climate change
- Local adaptation
- Local GNI 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**

- Example baseline projection for China
- Historical and projected gross premium volumes for each country under different assumptions.
- Historical and projected GDP growth (3 scenarios)
- Changes to the premium volume from the growth

**1. Wealth and Climate Change**

- Baseline Projections
- Effect of Climate Change 2030
- Two scenarios of economic costs of climate changes from Mearns 2010 are integrated into the baseline model.
  - For all BRICS, influence of climate change is 5-43%, small compared to growth in premium volumes expected at a rate of 5.8% to 12.1% per year.
  - Adjusted to 4.4% for China.
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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 decades, depending on the country.
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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

http://www.ccccp.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
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
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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:

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1 Comparing political, regulatory and legal drivers of insurance development

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

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

Correlation coefficients between policy indexes

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

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

3 The example of risk governance in China

3 The example of risk governance in China II
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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
3. Political and regulatory drivers 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

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

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

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

Findings
- There is an overlap 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 relationship is 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.

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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 modelling 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%

4. Financier
   - Risk financing line for risk retention
     - Initial capital reserves
     - Contingent credit (e.g. CAT DDO)
     - Economic mechanisms: low cost risk retention versus commitment device
     - Temporary premium finance
     - E.g. IMF grants and concessional 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

References
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References
http://www.gfdrr.org/docs/Track-II_Catrisk_financing_Overview_booklet.pdf


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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.
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.

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Increasing costs

LAC is the most vulnerable region

- LAC has the highest average economic damages in the world (0.5% of GDP per event).
- 70% of countries do not have the financial capacity to recover from a catastrophic event.
- 20% of LAC countries have deficiencies in risk management.

Natural disasters in LAC

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Source: EMB (2011)

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

“Mega” disasters in the region

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

<table>
<thead>
<tr>
<th>PRE-DAITE</th>
<th>EX-Ante</th>
<th>Identification Prevention and Mitigation Preparedness</th>
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<tbody>
<tr>
<td>INSTRUMENT</td>
<td>ACTION</td>
<td>Response Rehabilitation Reconstruction</td>
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<tr>
<td>Investment loan</td>
<td>Public investment loan (debt and capital)</td>
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<tr>
<td>Loans to support policy reforms (PF)</td>
<td>Contingent Credit Line</td>
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<tr>
<td>Technical Cooperation (non reimbursable)</td>
<td>Contingent Credit Facility</td>
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<tr>
<td>Disaster insurance facility</td>
<td>Emergency FC</td>
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<tr>
<td>Immediate Response Facility (IRF)</td>
<td>Public investment loan (reconstruction)</td>
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</tbody>
</table>

* Directed and EWA reimbursable

Instruments

- Development and implementation of domestic insurance market
- Integration and supervision of domestic insurance market
- Development and implementation of domestic insurance market

Source: IDB
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**Partnerships and innovation**
- Costa Rica: technical assistance to strengthen supervision and regulation of insurance market
- Bolivia: Centro de Estudios Económicos, Universidad Privada Boliviana (Cochabamba) to develop policy indexed to climate indices (potatoes, wheat, corn)
- Peru: Lima, Ministry of Housing (SQ). SERMAC (Centro Estadístico Peruano-Japonés)
- Biati: micro-insurance, FUNCOSE (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 banks in dealing with governments, civil society and the private sector.
- Integrate public and private financing and capacity building into a single framework for climate action.

**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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**References**


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.

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Insurance in emerging markets: determinants of growth and the case of climate change?
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.
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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previously worked at the UK’s Department for International Development (DFID). Dr Davies holds a PhD in Environmental Technology from Imperial College London.

Daniel Clarke is an actuary and development economist who works on disaster risk financing and insurance both for people on low incomes and for low and middle income country governments. He is a senior actuarial consultant at the World Bank’s Disaster Risk Financing and Insurance Program (DRFIP), and a Researcher at Oxford University’s Centre for the Study of African Economies, and has worked on agricultural and disaster insurance in India, Ethiopia, Bangladesh, Mexico, Colombia, the Caribbean region and the Pacific region. Daniel has a first class degree from Cambridge University in Mathematics and a D.Phil. in Economics from the University of Oxford, and is a Fellow of the Institute of Actuaries.

Florian Englmaier (born in 1974) studied Economics at the University of Munich where he received a PhD in Economics (summa cum laude) in 2005. Since 2012 he is a full Professor of Organizational Economics at the University of Würzburg. Prior to his current appointment, he held a chair in Organizational Economics at the University of Konstanz, an assistant professor position at the University of Munich, a PostDoc Position at Harvard (joint appointment Economics Department and HBS), a PostDoc Position at University College London (ELSE) and has spent terms as a visiting scholar at the Stanford GSB and the Kellogg School of Management. His research interests are in Organizational Economics, Industrial Organization, Contract Theory, Behavioral Economics, Political Economics, and Experimental Economics.

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.

Maricarmen Esquivel Gallegos joined the IDB as a Climate Change Sr. Associate in March of 2012. She is currently working on adaptation projects that seek to increase knowledge and adaptive capacity at the local, sectoral, and national level in the region. Her academic and professional interests have focused on environmental governance and decision making for sustainable development and vulnerability reduction, particularly in understanding the linkages between environmental, economic, and social processes that drive land transformation. She is interested in the role of tools such as land use planning and integrated water resources management, and in
their relationship with other local and national plans and priorities. She has over 7 years of experience working in the field, and prior to joining the IDB, she was a Disaster Risk Management and Environmental Consultant for The World Bank. Maricarmen is from San Jose, Costa Rica, and holds a Master in City Planning from MIT, an MSc in Environment and Development from LSE, and a BA in Economics with minors in Biology and Environmental Studies from Georgetown University.

**Yongdong Liu** was born in China in January 1985. He earned his B.A. in Economics and B.S. in Statistics in June 2006 from Peking University in China, M.A. in management in July 2009 from Chinese Academy of Sciences and M.A. in Statistics in May 2011 from University of California, Berkeley. Yongdong Liu began his doctoral study at University of California, Berkeley in August 2009 and now is a PhD candidate in Agricultural Economics. He was the recipient of The Liu Graduate Research Fellowships in Chinese Studies in 2011, the Graduate School Summer Research Fellowship in 2012 and the Institute of Business and Economic Research Mini Grant in 2012.

**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.

Nicola Ranger is a Senior Research Fellow within the Centre for Climate Change Economics and Policy and the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science. Nicola joined LSE in March 2009 from Risk Management Solutions Ltd. Previous to this she held positions within Defra and on the Stern Review on the Economics of Climate Change. Her areas of expertise include risk assessment and decision making, and the interpretation of scientific information for decision support. Her research focuses on the implications of climate change for the insurance industry, adaptation planning and policy and climate-resilient development. Nicola holds a PhD in Atmospheric Physics from Imperial College London.

Ernst Rauch studied geophysics at the Ludwig Maximilian University in Munich/Germany. After completing his degree, he became a research assistant. In 1988, he joined the Geo Risks Research Department at Munich Re, where he has headed the Corporate Climate Centre since 2008 and is responsible for the following topics: climate change, risk management, business development, asset management and climate & renewables. The Corporate Climate Centre is also responsible for coordinating the Munich Re Programme of the LSE Centre for Climate Change Economics and Policy.

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