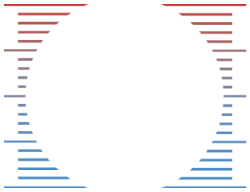


Centre for
Climate Change
Economics and Policy

Grantham Research Institute on
Climate Change and
the Environment

Climate Change and Non-Life Insurance Demand in the BRICS

Nicola Ranger

with Swenja Surminski and Andrew Williamson

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

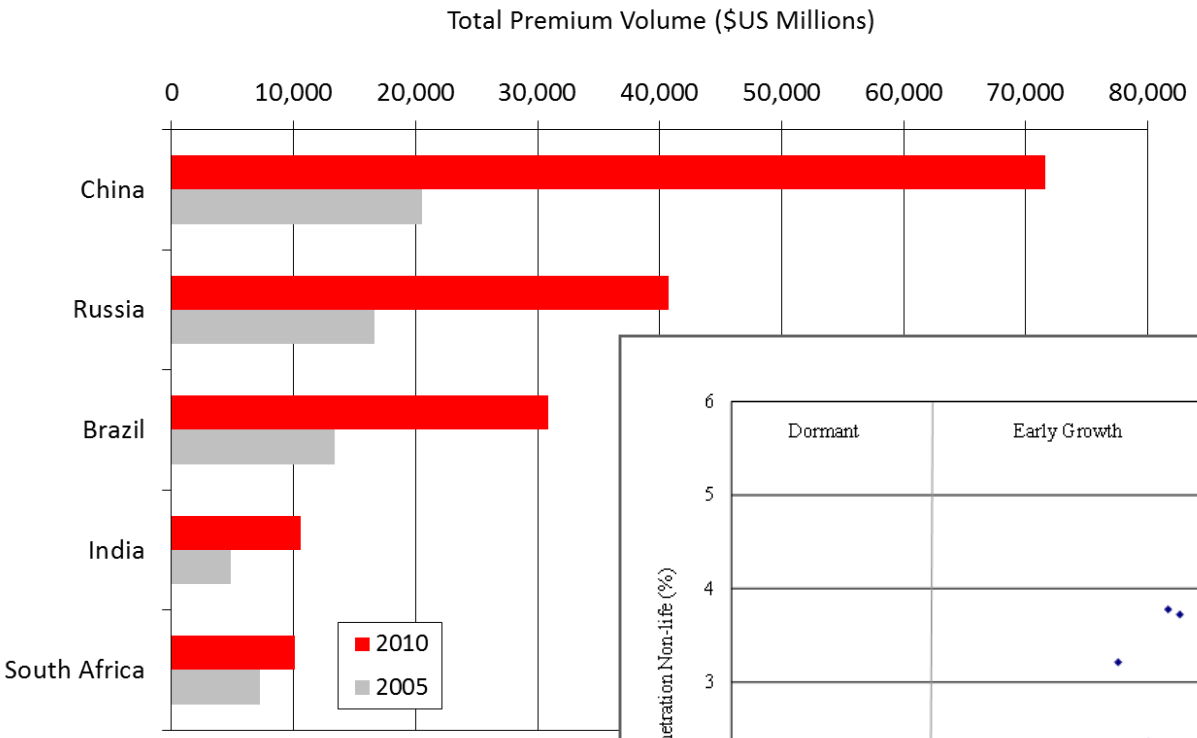
Living With Environmental Change LWEC

Munich RE

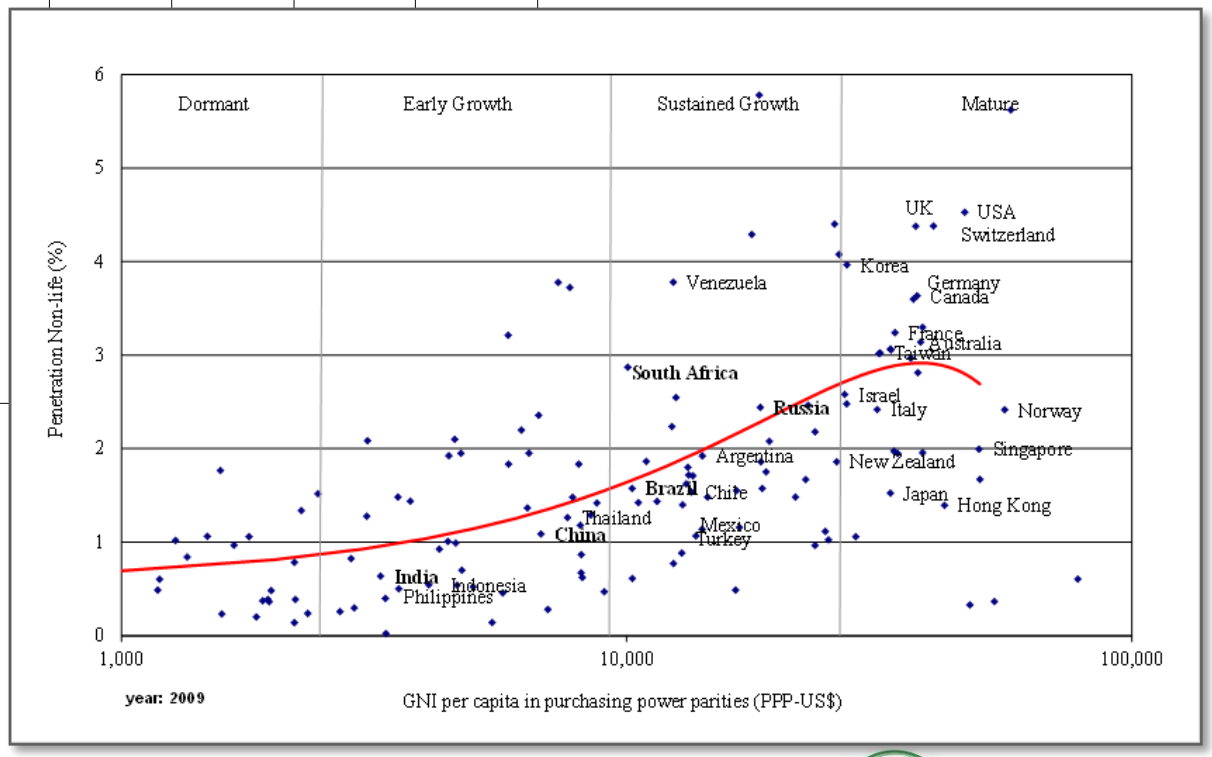
LSE THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

UNIVERSITY OF LEEDS

Why Climate Change and BRICS?



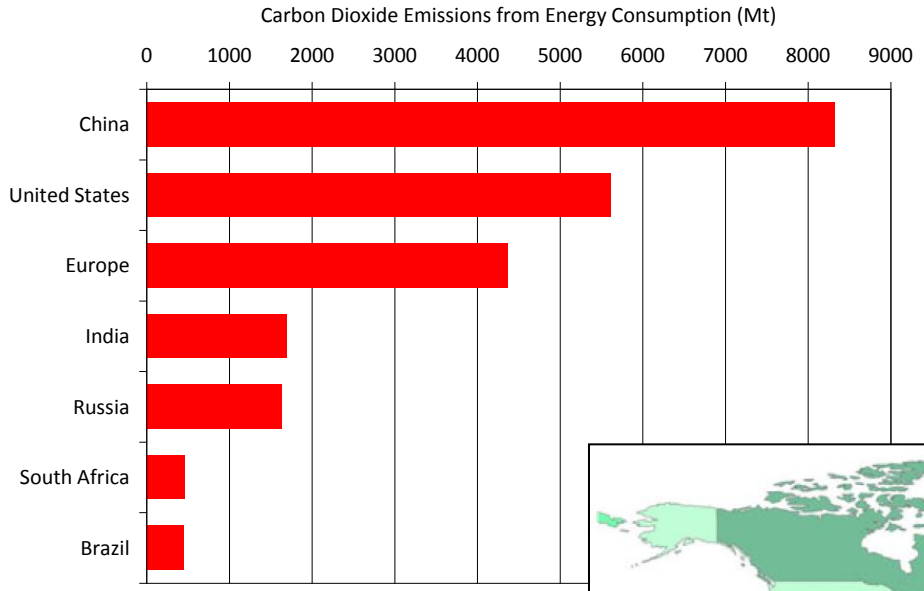
- Over the past decade, the emerging economies have been the dominant driver of global non-life premium growth



Centre for Climate Change Economics and Policy

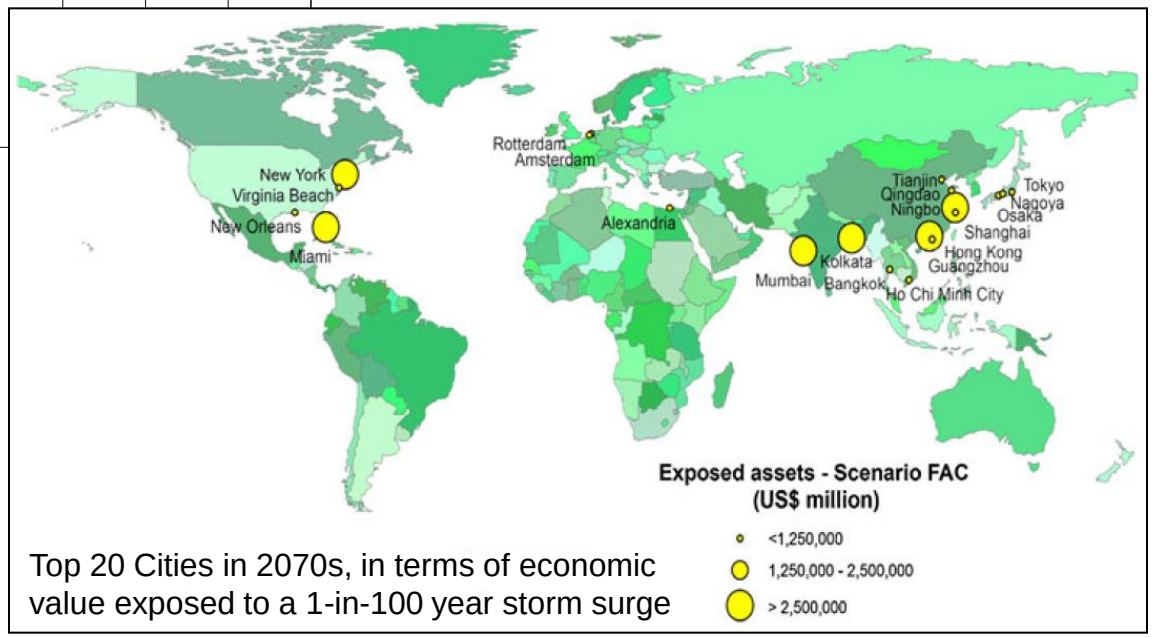
Grantham Research Institute on Climate Change and the Environment

Why Climate Change and BRICS?



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

- 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



Top 20 Cities in 2070s, in terms of economic value exposed to a 1-in-100 year storm surge

Contents

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

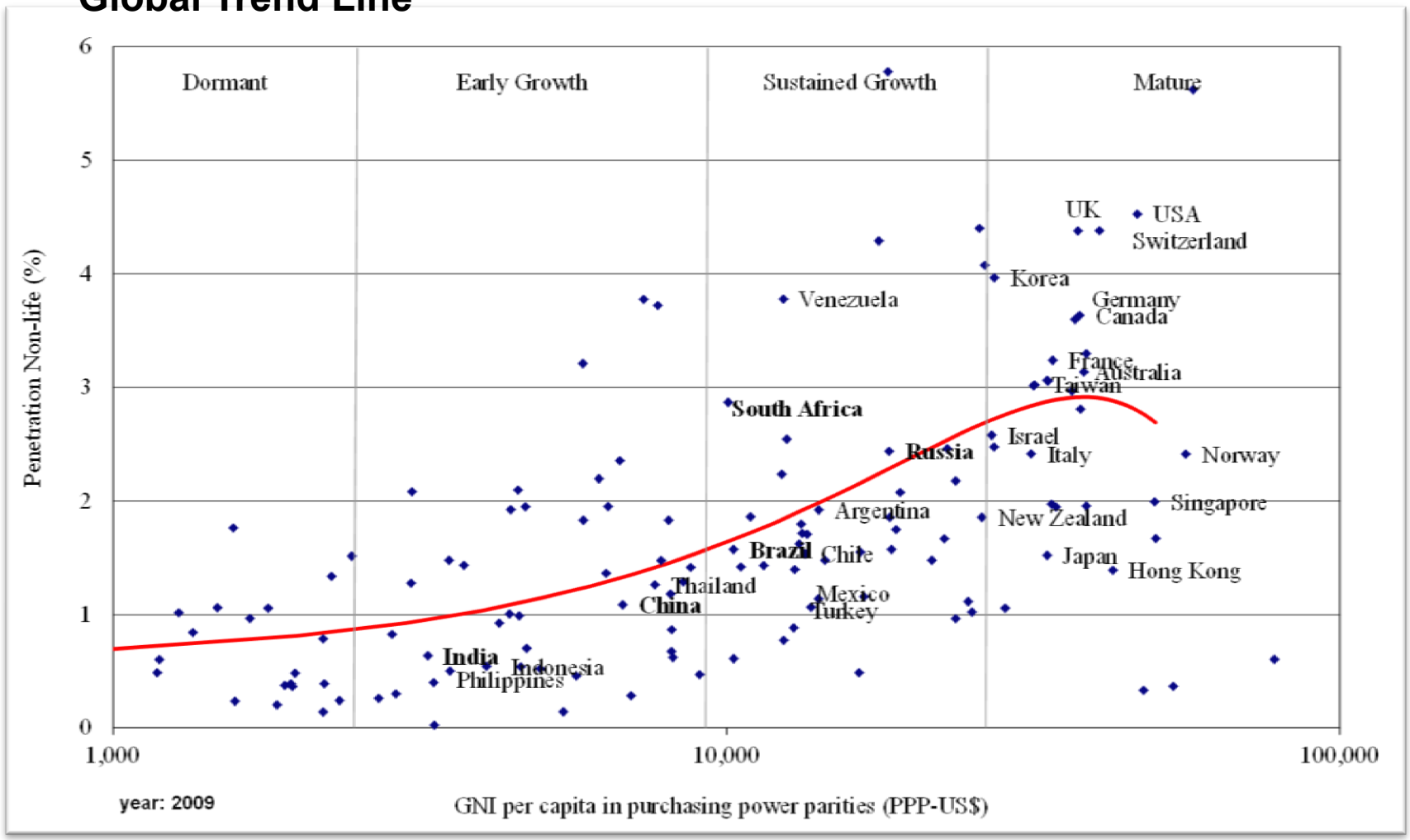
Conclusions

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. our broad conclusions also relevant beyond BRICS

Drivers of Insurance Demand

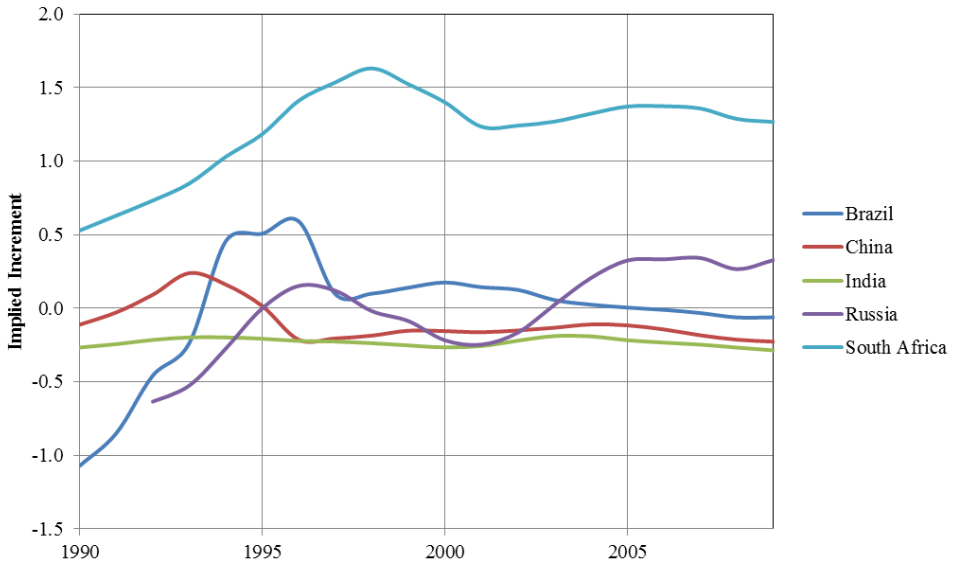
‘Global Trend Line’



Source: data provided by Munich Re

Drivers of Insurance Demand

Deviation of countries' insurance penetration from the Global Trend Line



Drivers of non-life insurance demand beyond income

Group of Drivers	Examples
Macroeconomic factors	Economic stability Inflation rates Developed and stable financial markets Openness to trade
Political, regulatory and legal factors	Stable legal and institutional frameworks Adequate insurance law Opening distribution channels (e.g. bancassurance) Conducive regulatory environment Property rights Judicial efficiency and transparency Mandatory insurance lines
Socio-cultural factors	Education Financial literacy Religious and cultural attitudes to risk and insurance Perception of other available financing in the event of a loss, such as disaster aid
Risk factors	The nature of exposure, such as the number of cars Natural catastrophe exposure Risk awareness linked with recent catastrophe experience

Sources: Brainard 2008; Feyen et al. 2011, Hussels et al. 2006; Swiss Re 2004; USAID 2006

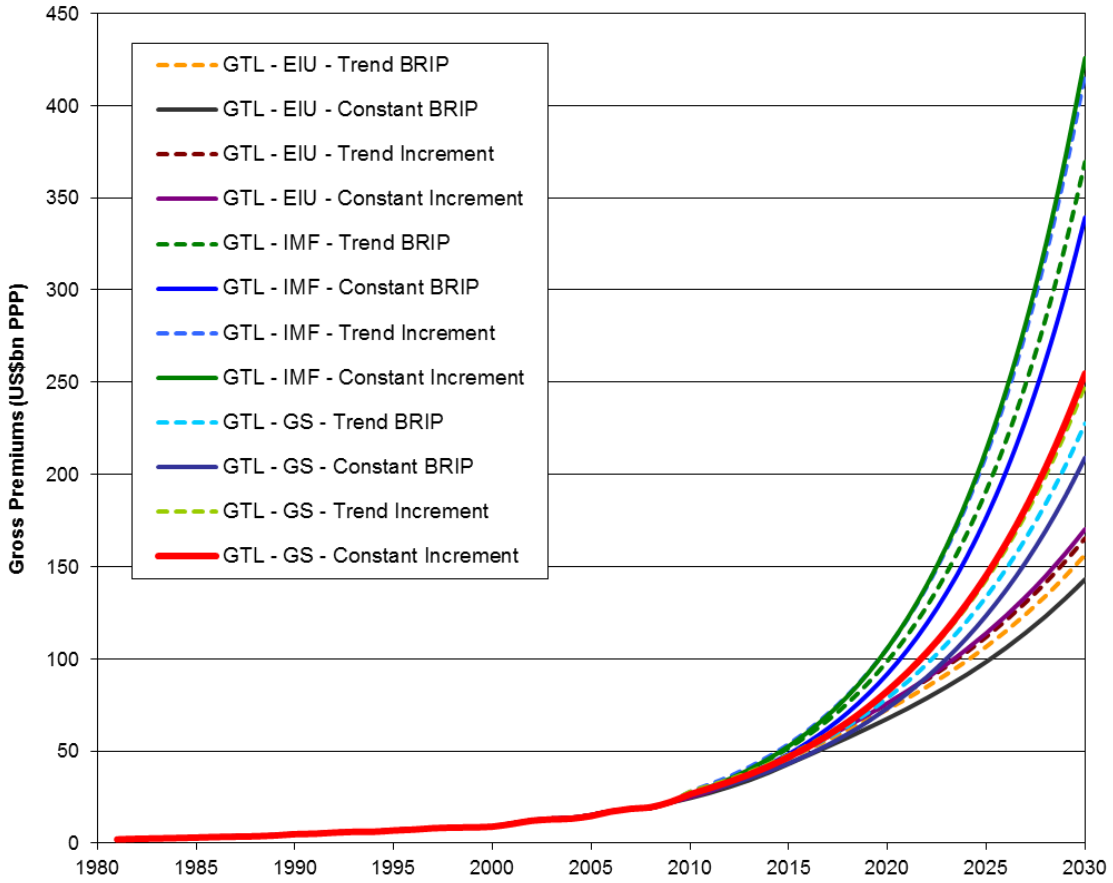
Five ‘Pathways of Influence’

- Local impacts of climate change
- Local adaptation
- Local GHG mitigation
- Global impacts and responses

1. Impacts on wealth
2. Changing regulatory and public policy environment
3. Changing attitudes to risk and insurance, including willingness to pay
4. Changing supply of insurance
5. New markets associated with mitigation and adaptation

1. Wealth Pathway

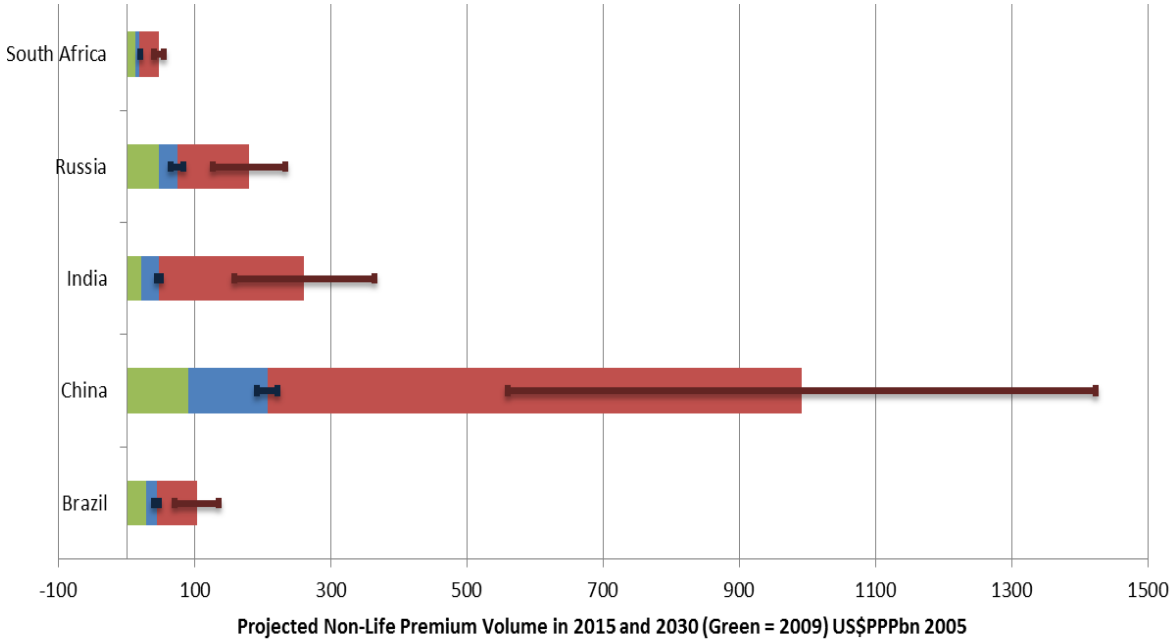
Example baseline projection for China



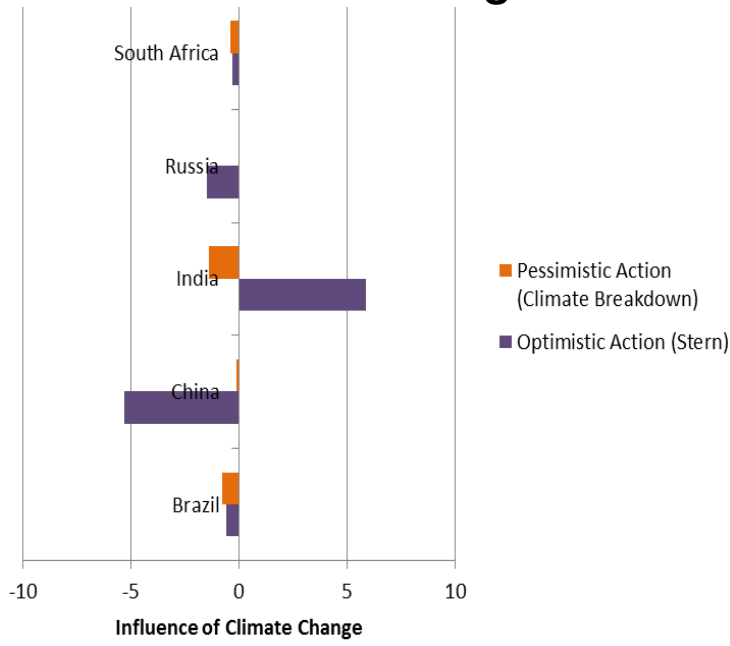
- Forecasts use empirical method based on Zheng et al. 2009
- We develop ensembles of forecasts for each country based on a suite of different assumptions:
  - The empirical relationship between income and penetration
  - Future economic growth (3 sources)
  - Changes in the deviation of penetration from the growth line

1. Wealth and Climate Change

Baseline Projections



Effect of Climate Change 2030



- Two scenarios of economic costs of climate change from Mercer 2010 are integrated into the forecast models
- For all BRICS, influence of climate change is (very) small compared to growth in premium volumes expected as a result of economic growth – e.g. at most a 0.4% adjustment on the CAGR (baseline: 5.4% South Africa to 12.3% China).

2. Public Policy Pathway

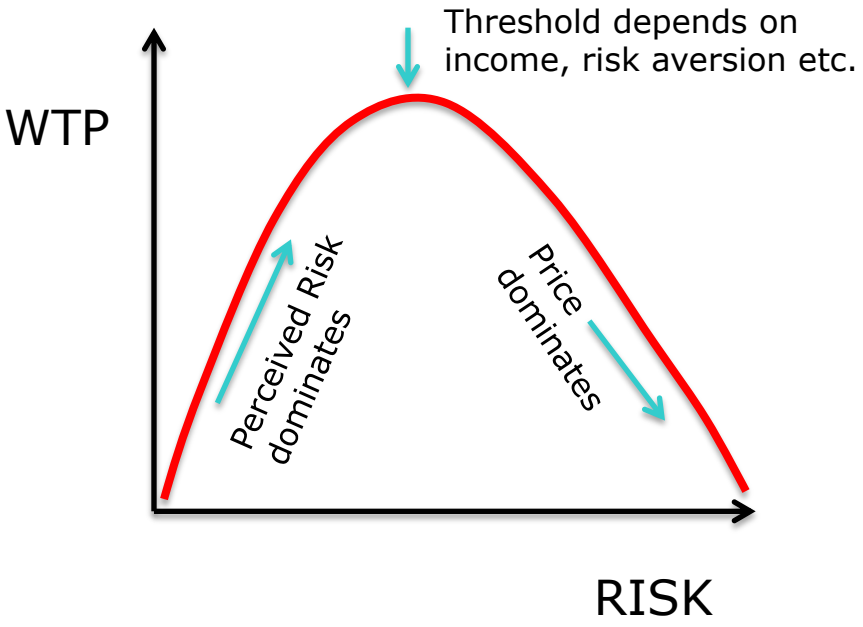
- Public policy and regulation can be potent drivers of demand though creating the necessary preconditions for insurance and influencing the operating environment of the industry.
- Many examples of where rising risk or risk awareness has initiated public interventions in the market – e.g. state-subsidized 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 (tariffs) on Insurance	-
Tax incentives for Insurance	+
Premium subsidies	+
Price regulation	+/-
Compulsory insurance cover	+
Introduction of public insurance	+/-
Regulation of (re)insurance (including transparency, capital requirements etc)	+/-
Opening distribution channels (including bancassurance and brokers)	+

3. Willingness to Pay

WTP = f (PRICE, INCOME, PERCEIVED RISK, RISK AVERSION)

Theoretical Model:



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-Blettner 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)

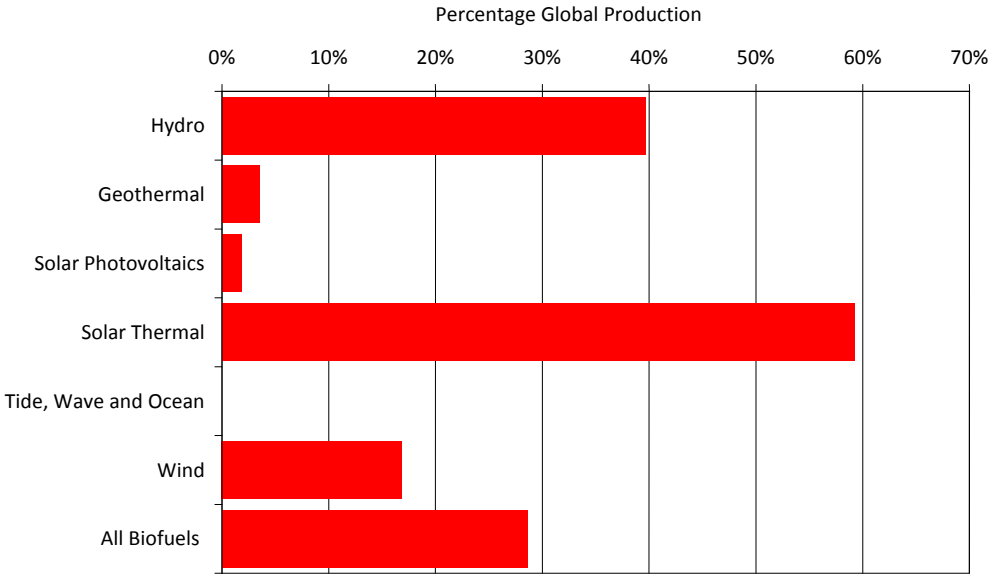
Category	*Criterion*	*Characteristic*	*Impacted by climate change?*
Actuarial	Risk/uncertainty	Measurable	Yes
	Loss occurrences	Independent	Possibly
	Maximum loss	Manageable	Likely
	Average loss	Moderate	Yes
	Loss frequency	High	Yes
	Moral hazard, Adverse selection	Not excessive	Unlikely
Market-determined	Insurance premium	Adequate, Affordable	Yes
	Insurance cover limits	Acceptable	Possibly
	Industry capacity	Sufficient	Yes
Societal	Public policy	Consistent with cover	Likely
	Legal system	Permits the cover	Unlikely

5. Opportunities for New Products and Services

Significant growth potential in LOBs linked with GHG Mitigation and Adaptation

Energy:

- 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.



Source: BRICS, IEA 2010

Others:

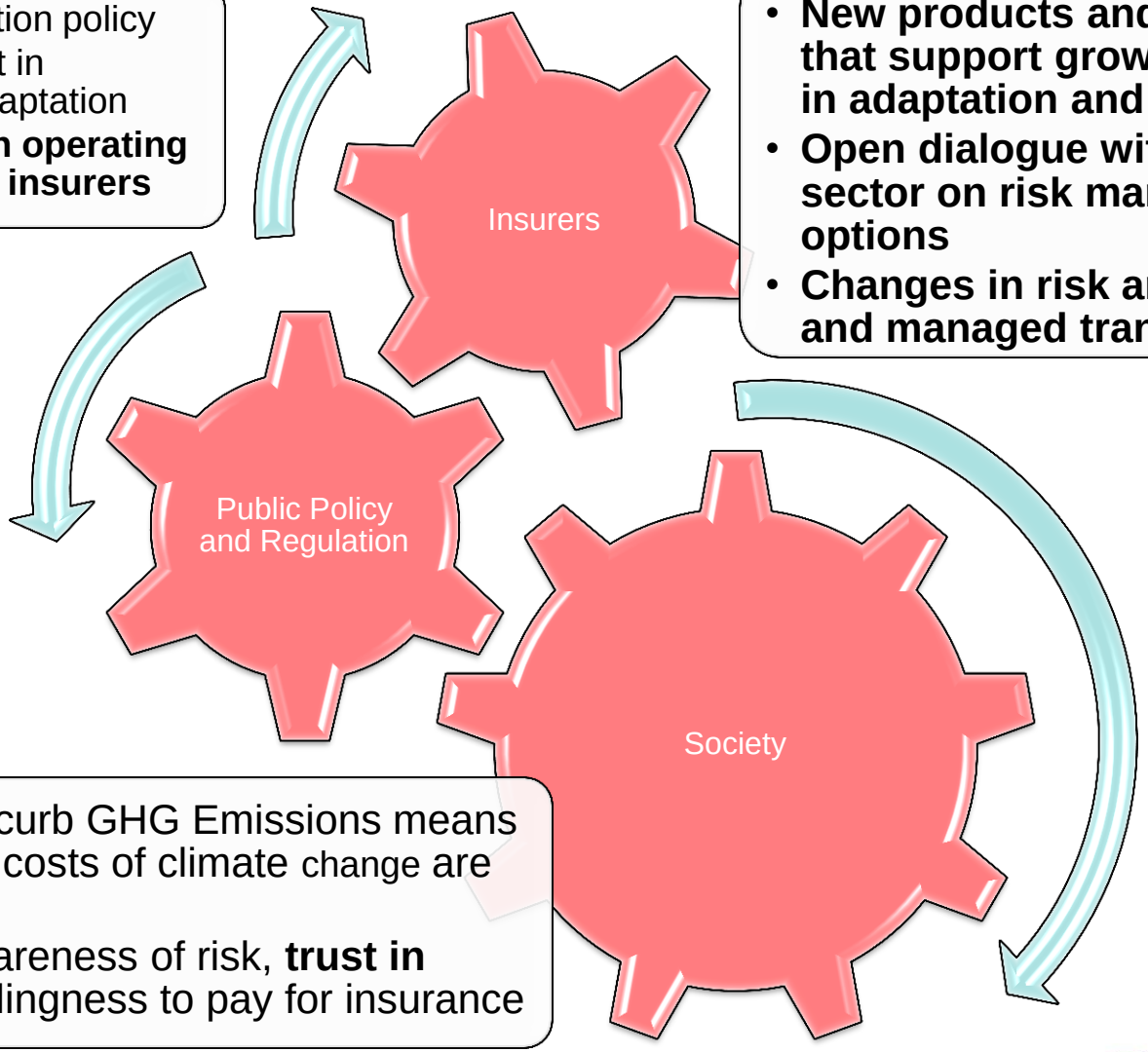
- 'Green' technologies and processes
- Carbon finance – e.g. credit delivery guarantees
- Adaptation – e.g. microinsurance, sovereign risk transfer, innovative products that reward risk reduction

Summary of Conclusions

Pathway of Climate Change Influence	Approximate Scale of Impact on Premium Volumes in BRICS economies in 2015 ($ bn)	Regional Focus and Direction of Impact (n.b. each has a dependence on (re)insurer responses)
Impact on income levels	**-4 to + 1bn**	Small impact relative to baseline economic growth in most countries (i.e. less than around $1bn). Potential for more significant impacts in India (+/-) and China (-).
Public policy and regulation	**Up to +6 (India) to +12bn (China)**	Potential for sizeable positive impacts in India and China where insurance penetration is currently low relative to income levels. Potential for smaller positive impacts in other countries. Potential for some negative impacts in countries or regions with high exposure to natural hazards
Supply factors	No data	Potential for negative impact in regions and lines of business with high exposure to natural hazards (e.g. in particular, China, India and to a lesser extent Brazil).
Willingness to pay for insurance	No data	Potential for positive impact in regions and lines of business with lower 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).
New products and services	No data	Positive under most scenarios for the BRICS. Largely focussed in China, India and Brazil
Baseline economic growth (i.e. no climate change)	***Up to around +20 to +30bn in most countries; or up to 125bn in China***	*Significant increase in premium volumes in all countries. The smallest increases are projected in South Africa (around $5bn by 2015) and largest in China (around $80-125bn by 2015). Source: Ranger and Williamson (2011).*

Optimistic (High Demand) Scenario

- Proactive adaptation policy
- Public investment in mitigation and adaptation
- **Improvements in operating environment for insurers**



- **New products and services that support growing market in adaptation and mitigation**
- **Open dialogue with public sector on risk management options**
- **Changes in risk anticipated and managed transparently**

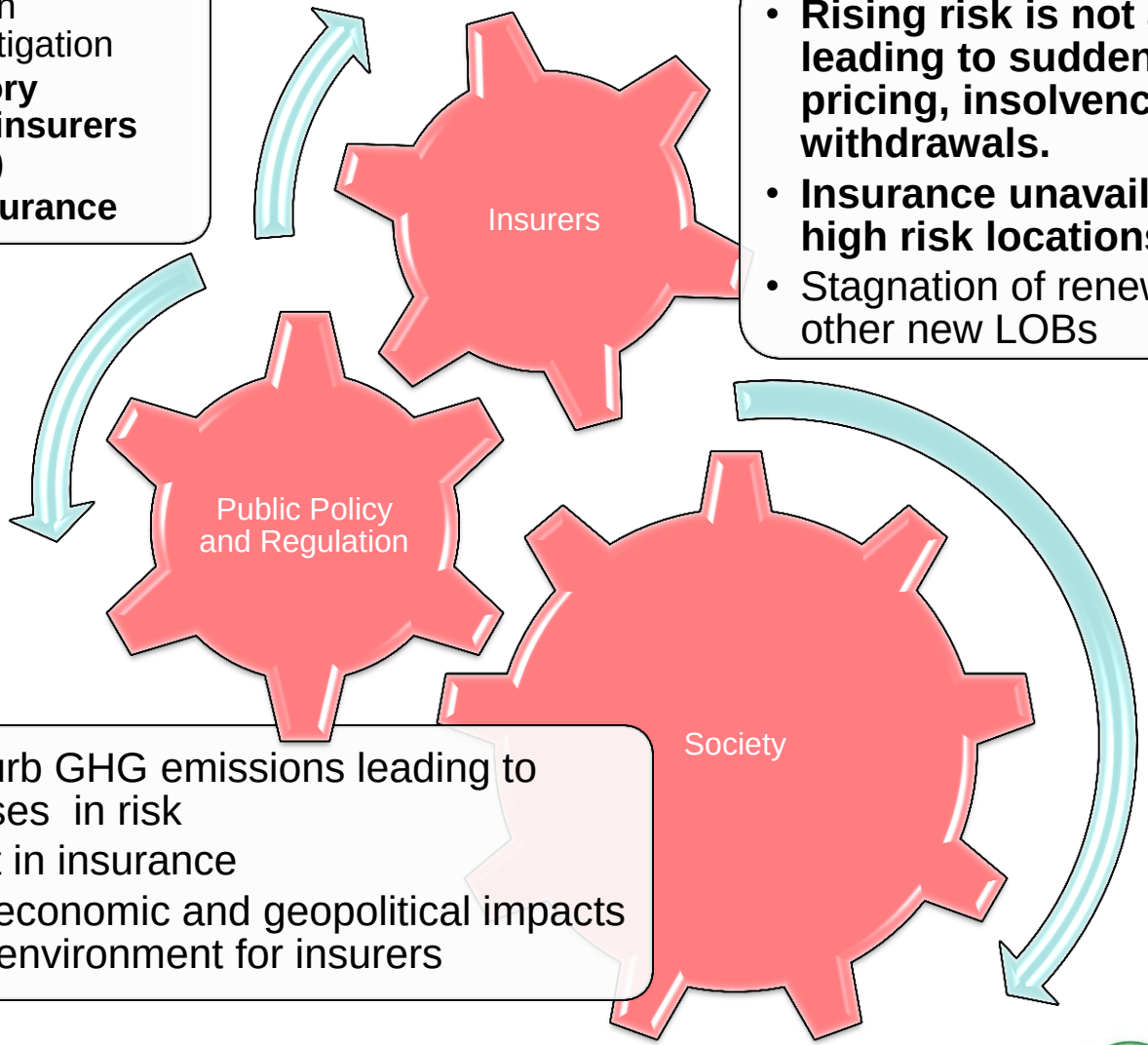
- Strong action to curb GHG Emissions means that the physical costs of climate change are moderate
- Rising public awareness of risk, **trust in insurers** and willingness to pay for insurance

Centre for Climate Change Economics and Policy

Grantham Research Institute on Climate Change and the Environment

Pessimistic (Low Demand) Scenario

- Low investments in adaptation and mitigation
- **Tougher regulatory environment for insurers (price regulation)**
- **Rising public insurance**



- **Rising risk is not anticipated, leading to sudden increases in pricing, insolvencies and withdrawals.**
- **Insurance unavailable in many high risk locations**
- Stagnation of renewables and other new LOBs

- Weak action to curb GHG emissions leading to significant increases in risk
- Lower public trust in insurance
- Long-term macroeconomic and geopolitical impacts – less conducive environment for insurers

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