Insurance solutions for catastrophic events

Basic approach, conceptual design and examples

AIIF 2014 - Azerbaijan International Insurance Forum

Baku - June19th & 20th, 2014

Jürgen Brucker

Munich RE

About Munich Re

Baku - June19th & 20th, 2014

Munich RE

Added value within the group
Diversified structure – More security

Munich Re (Group)*

Reinsurance

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Munich RE Risk Solutions

Corporate Insurance Partner
Great Lakes Reinsurance (UK) PLC
KA Köln.Assekuranz Agentur GmbH
MSF Pritchard Syndicate 318
Temple Insurance Company
Watkins Syndicate

Munich RE

new/re

American Modern Insurance Group

Munich Health

MUNICH HEALTH

Munich RE

DKV SEGUROS MÉDICOS

DKV Belgium

DKV Luxembourg

GLOBALITY DKV

Daman ضمان

mednet

ApolloMunich HEALTH INSURANCE

storebrand

Primary insurance

ERGO

ERGO

DAS

ERGO Direkt

DKV

ERV

Asset Management

MEAG

* This listing is incomplete and provides no precise indication of shareholdings.

All segments contributing to strong Group result

Munich Re (Group) – FY 2013

Net result
€3,342m (€1,198m in Q4)

Delivering good net result supported by sound core business and low tax rate

Shareholders' equity
€26.2bn (+1.4% vs. 30.9.)

Strong capital position according to all metrics allowing for dividend increase and share buy-back

Investment result
RoI of 3.5% (3.7% in Q4)

Solid result given low interest rates and moderate risk profile

Reinsurance

Net result
€2,797m (€1,089m in Q4)

P-C
Combined ratio 92.1% (89.3% in Q4) – Better than target of 94%

Life
Technical result close to target – mix of positive and adverse developments

Primary insurance

Net result
€433m (€73m in Q4)

P-C
Combined ratio 97.2% (97.5% in Q4) – Nat cats in Germany

Life
Result in line with expectations

Health
Solid, stable performance

Munich Health

Net result
€150m (€56m in Q4)

Primary insurance
Combined ratio 93.5% (93.7% in Q4) – Good result largely driven by improved US Medicare business

Significant currency effects partially offset by organic growth

Gross premiums written in €m

2012	51,969
Foreign-exchange effects	–1,498
Divestment/Investment	–105
Organic growth	694
2013	**51,060**

Segmental breakdown in €m

Reinsurance property-casualty
17,013 (33%) (▲ –0.2%)

Primary insurance property-casualty
5,507 (11%) (▲ –0.8%)

Primary insurance life
5,489 (11%) (▲ –5.3%)

Primary insurance health
5,671 (11%) (▲ –1.1%)

Reinsurance life
10,829 (21%) (▲ –2.7%)

Munich Health
6,551 (13%) (▲ –2.3%)

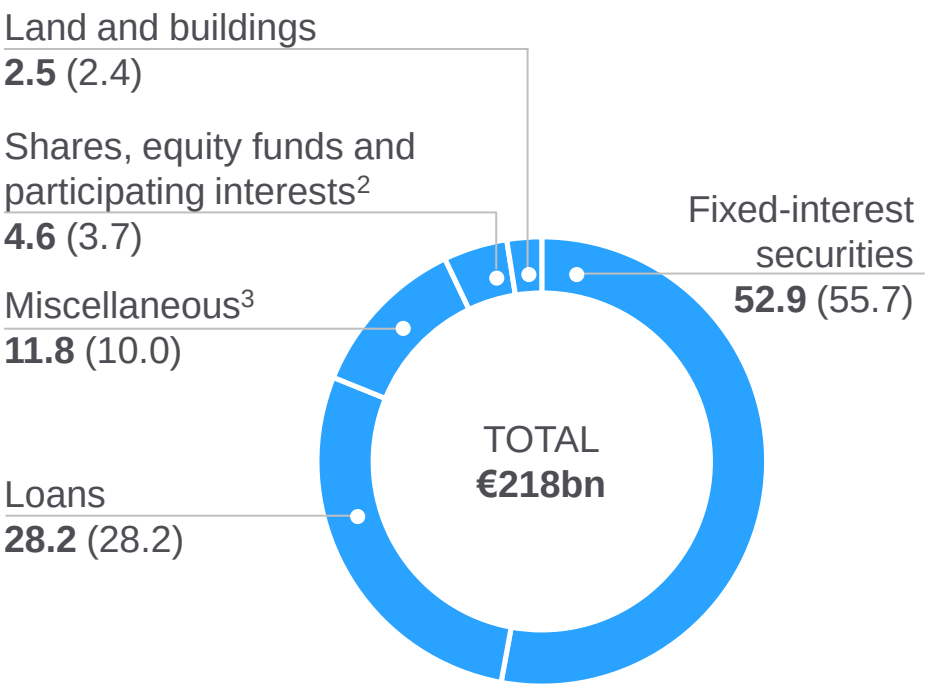
Solvency and ratings

Ratings

Rating agency	Rating	Outlook	Last Modification
A.M. Best	A+ (Superior)	Stable	7 Sept. 2007
Fitch	AA- (Very strong)	Stable	19 July 2005
Moody‘s	Aa3 (Excellent)	Stable	17 March 2005
Standard & Poor‘s	AA- (Very strong)	Stable	22 Dec. 2006

Active asset management on the basis of a well-diversified investment portfolio

Investment portfolio[1] in %

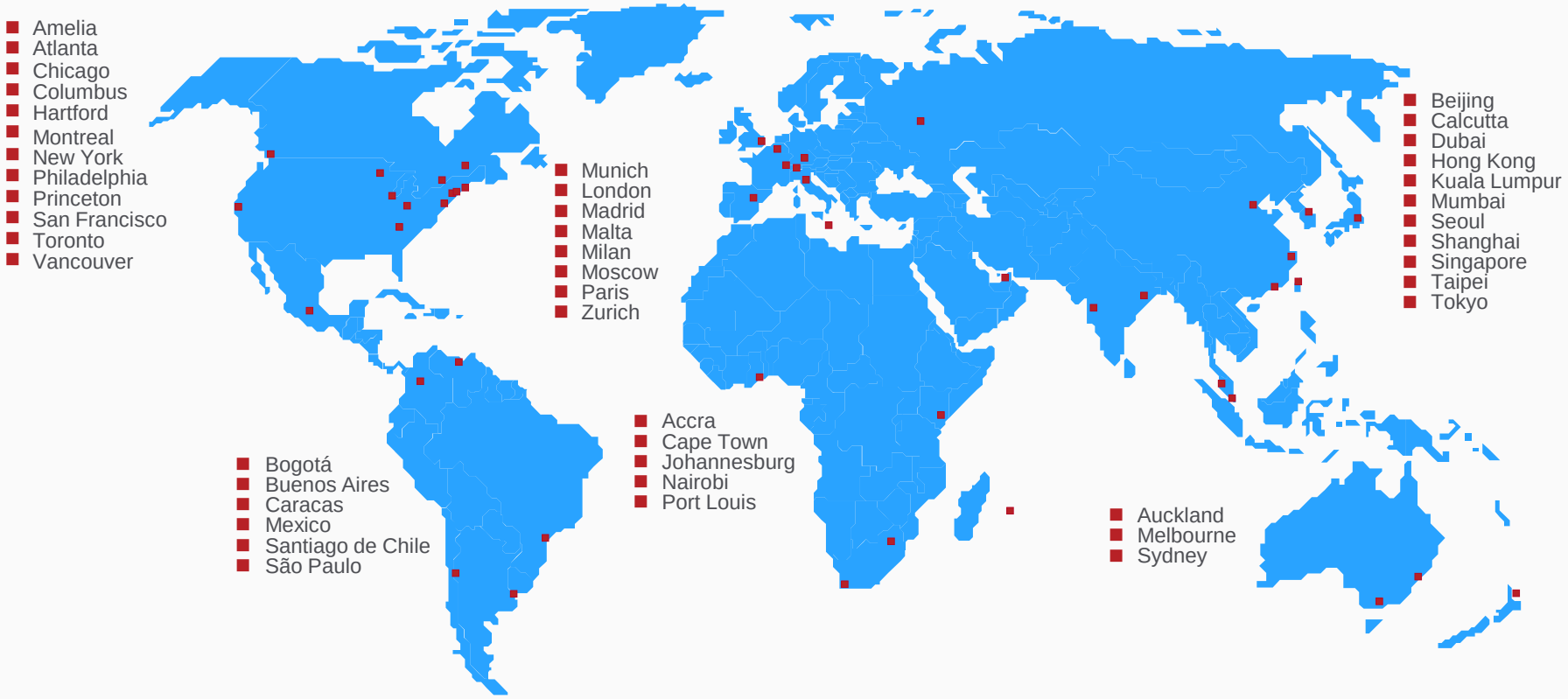


Portfolio management

- Decreasing market values due to rising interest rates and devaluation of foreign exchange rates
- Reduction of German, US, UK and Australian government bonds
- Reduction and ongoing geographic diversification of covered bonds
- Further cautious expansion of corporate bonds across all industries
- Increase of equity-backing ratio to 4.5%[2]

[1] Fair values as at 31.12.2013 (31.12.2012). [2] Net of hedges: 4.5% (3.4%). [3] Deposits retained on assumed reinsurance, unit-linked investments, deposits with banks, investment funds (excl. equities), derivatives and investments in renewable energies/infrastructure and gold.

Present in all markets



Agenda

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1. Current situation
2. Motivation for new Insurance Solutions
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7. Further considerations
8. Next steps

Current situation

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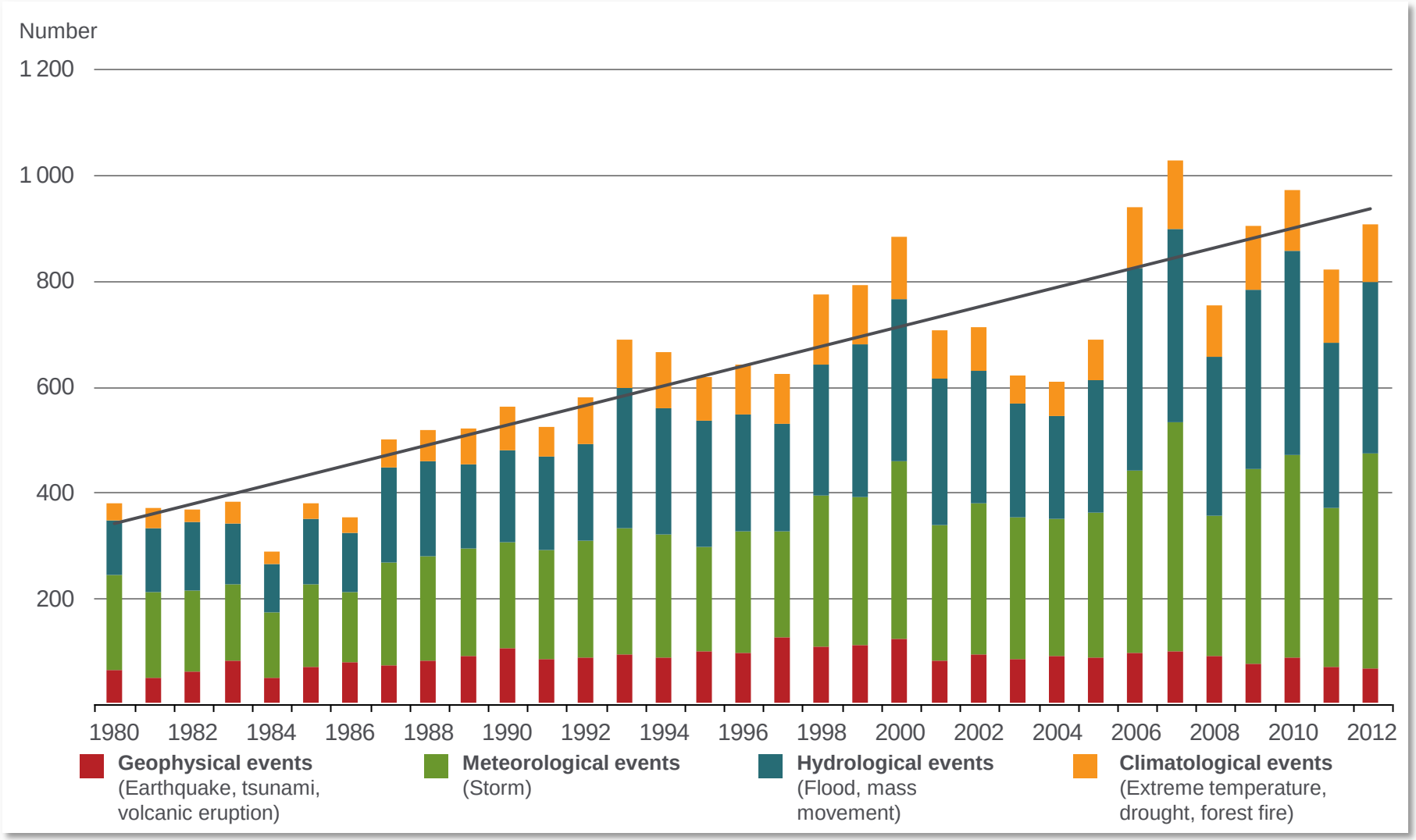
1. Worldwide trend - increasing nat cat events
2. Better standard of living combined with increased claims awareness
3. Social changes in the society (lesser reliance on family members in case of an emergency)
4. Urban growth with high value concentration >> higher losses to be expected
5. Severe economic losses if industrialized areas or infrastructure is severely effected
6. High cost burden for governments following a large event may result in cost savings in other public financed sectors of the economy

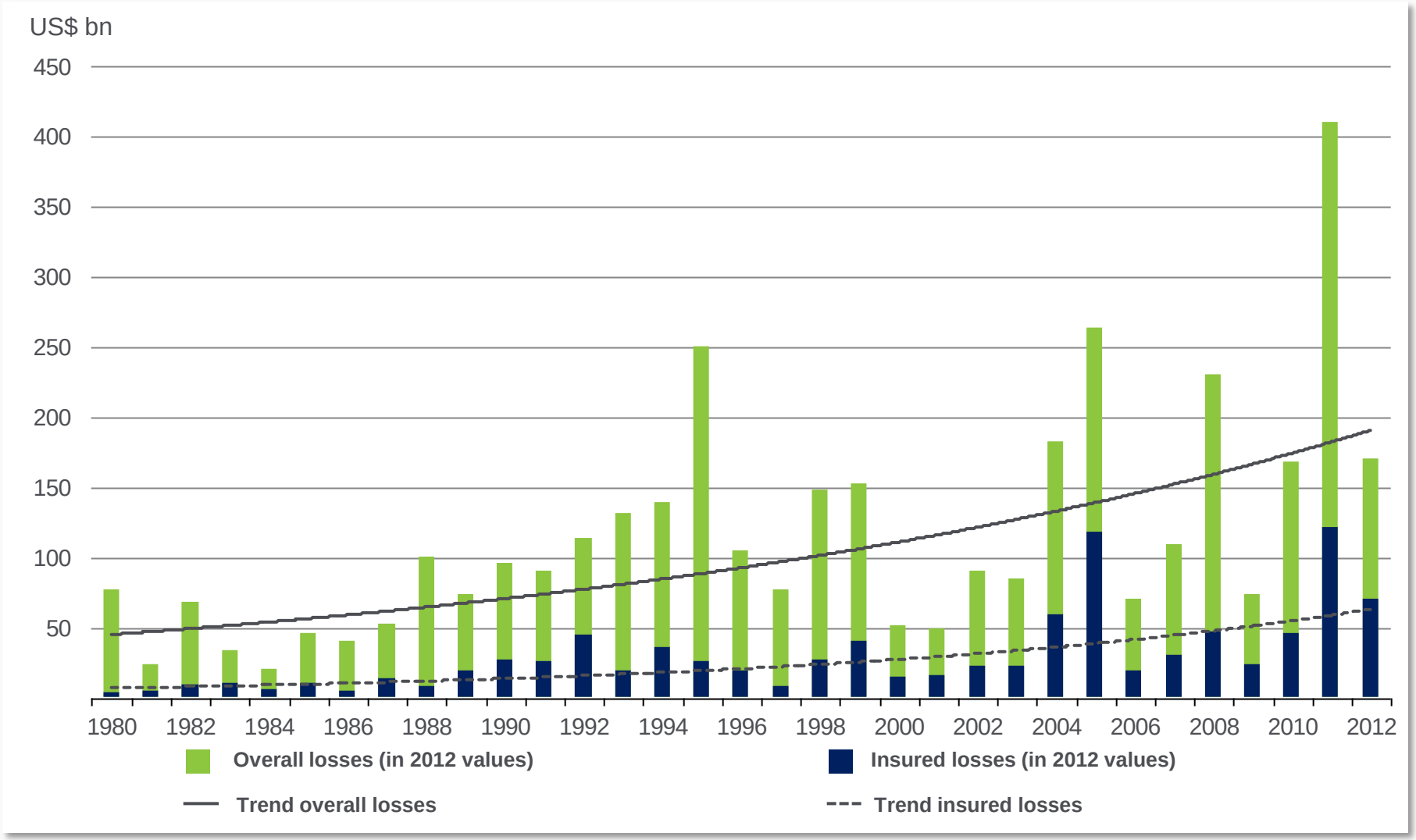
Natural catastrophes worldwide 1980 – 2012

Number of events with trend

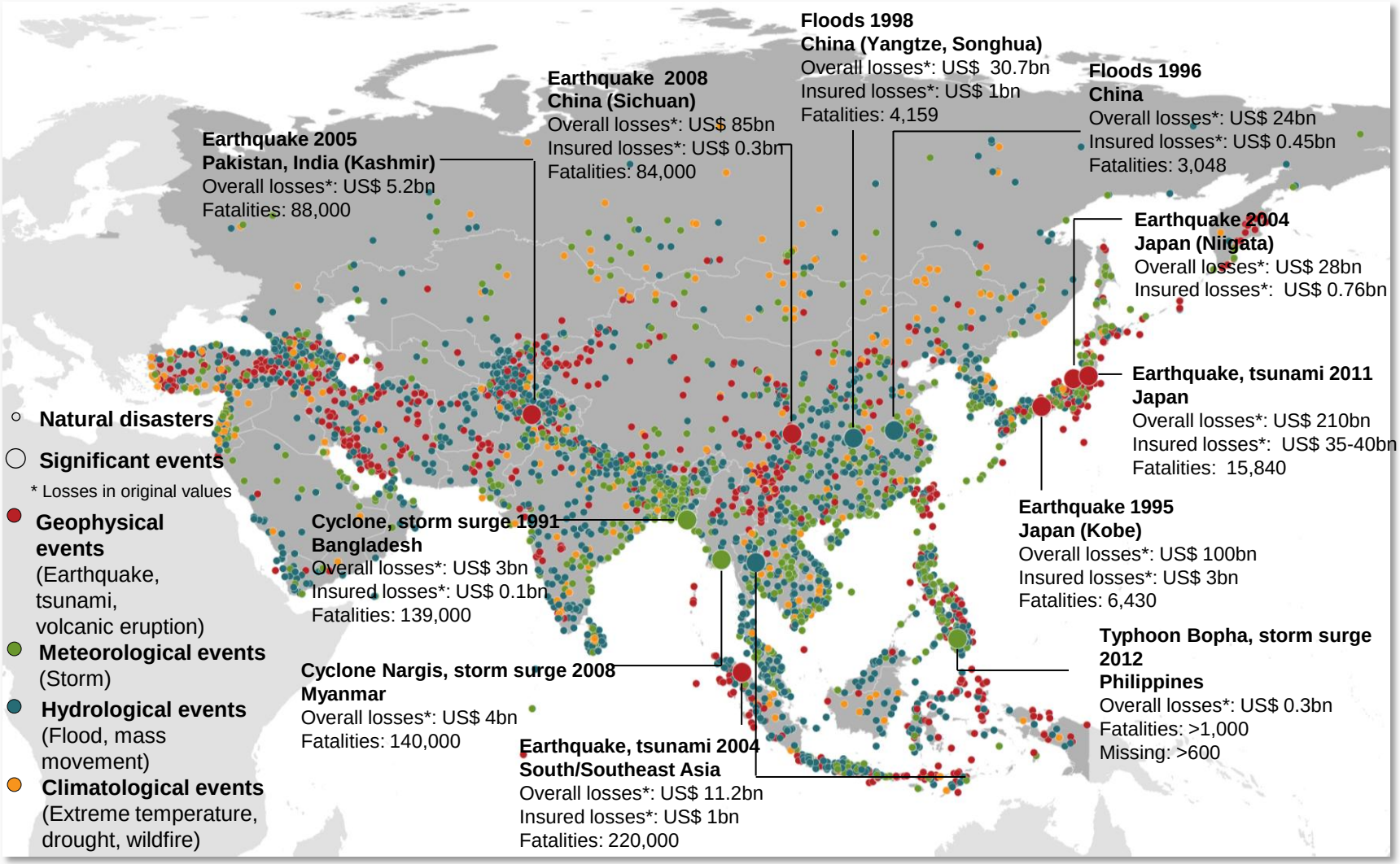


Natural catastrophes worldwide 1980 – 2012

Overall and insured losses with trend



Natural catastrophes in Asia
1980 - 2012



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Motivation for new Insurance Solutions

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1. Disparity of economic losses versus insured losses
2. Severe Cat events could have significant impacts on national budgets
3. Possible collapse of entire economy
4. Stagnation in the economic development for several years
5. Adequate pre loss considerations have proved enormous recovery effects helping to keep downside effects as low as possible
6. More and more countries are looking for possibilities to improve their catastrophe management
7. In general, the risk awareness and **(pre loss)** risk management of a wider public will improve

Natural catastrophes worldwide 1980 – 2012

Percentage distribution – ordered by continent

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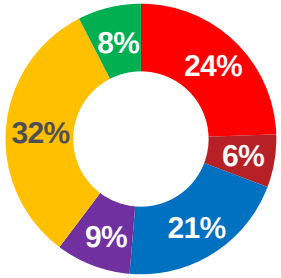
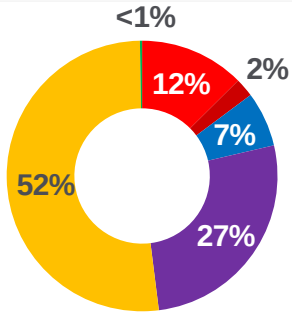
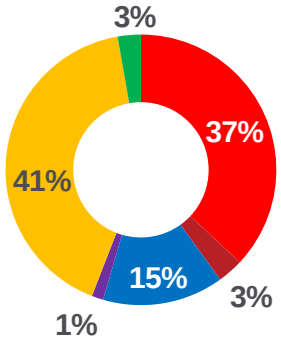
21,000 Loss events



2,300,000 Fatalities

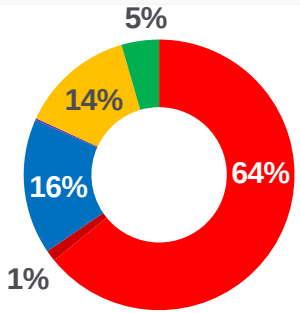


Overall losses* US$ 3,800bn



*in 2012 values

Insured losses* US$ 970bn

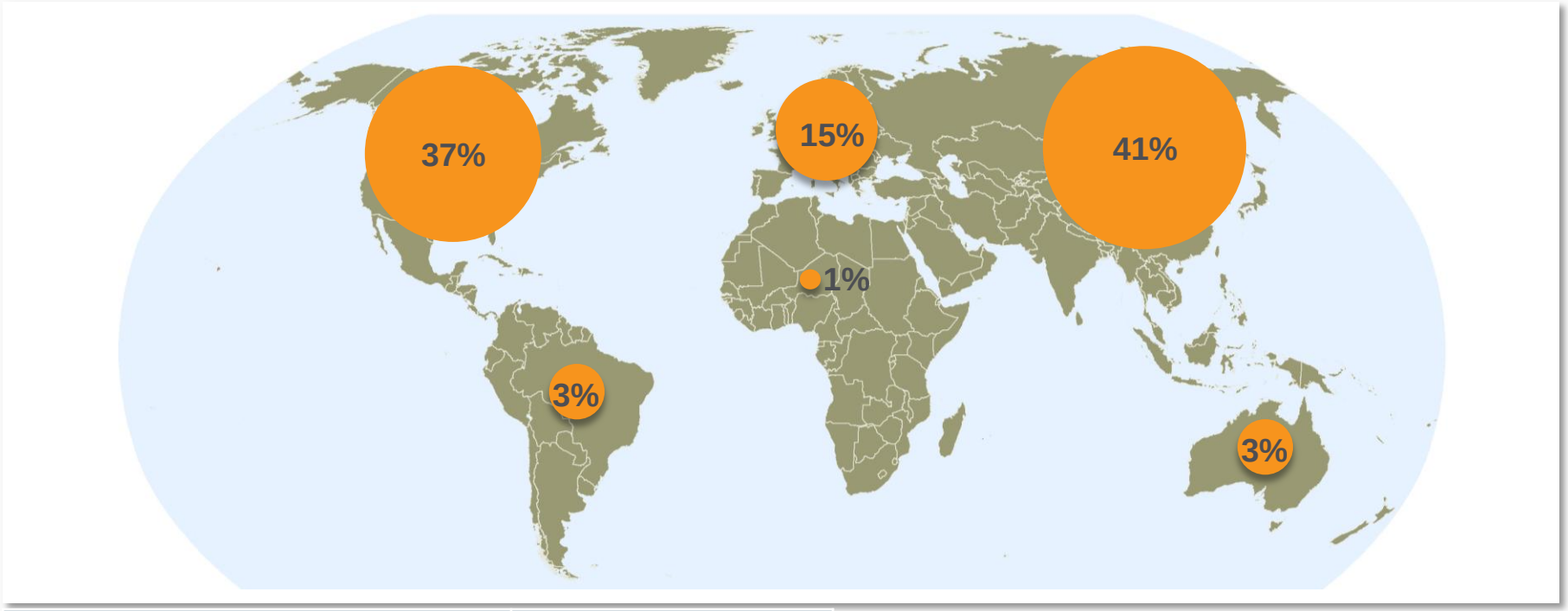


*in 2012 values

North America, incl. Central America and Caribbean | South America | Europe | Africa | Asia | Australia/Oceania

Natural catastrophes worldwide 1980 – 2012

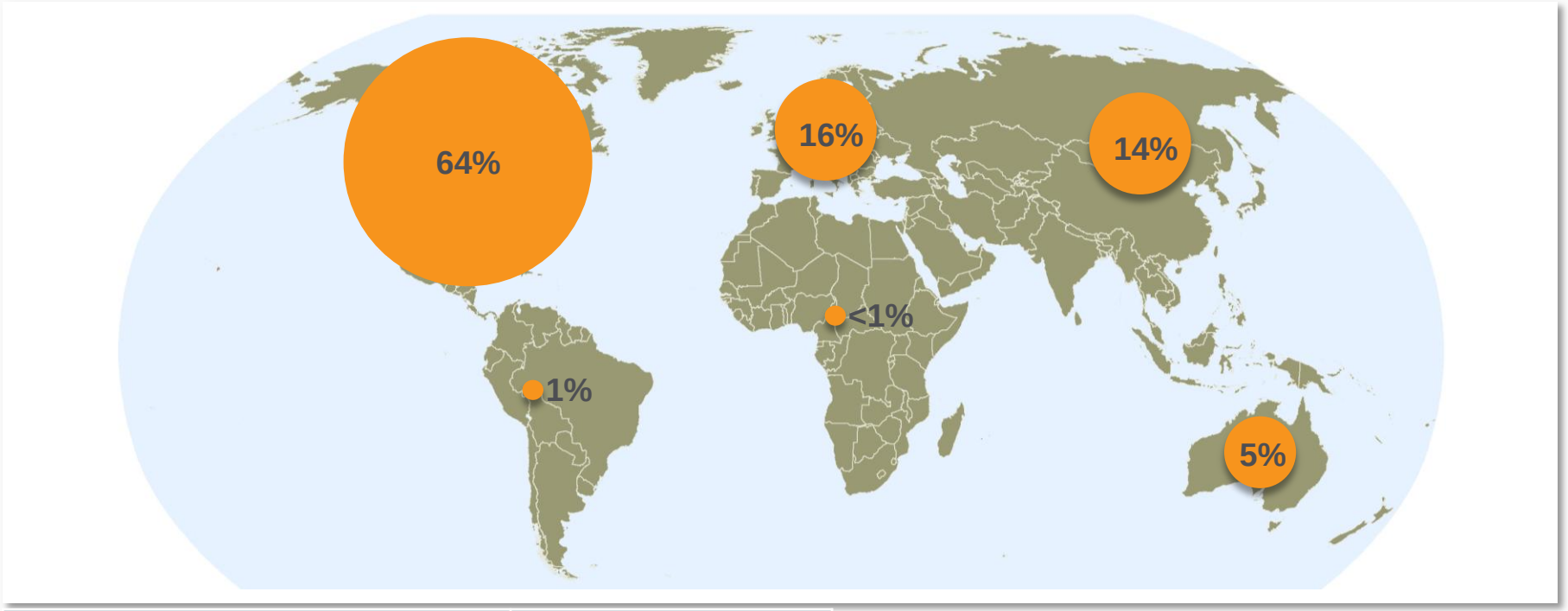
Overall losses US$ 3,800bn - Percentage distribution per continent



Continent	Overall losses US$ m
America (North and South America)	1,500,000
Europe	500,000
Africa	45,000
Asia	1,600,000
Australia/Oceania	105,000

Natural catastrophes worldwide 1980 – 2012

Insured losses US$ 970bn - Percentage distribution per continent



Continent	Insured losses US$ m	Overall losses US$ m
America (North and South America)	630,000	1,500,000
Europe	160,000	500,000
Africa	2,100	45,000
Asia	130,000	1,600,000
Australia/Oceania	42,000	105,000

NatCatSERVICE

Income Groups

defined by World Bank 2012

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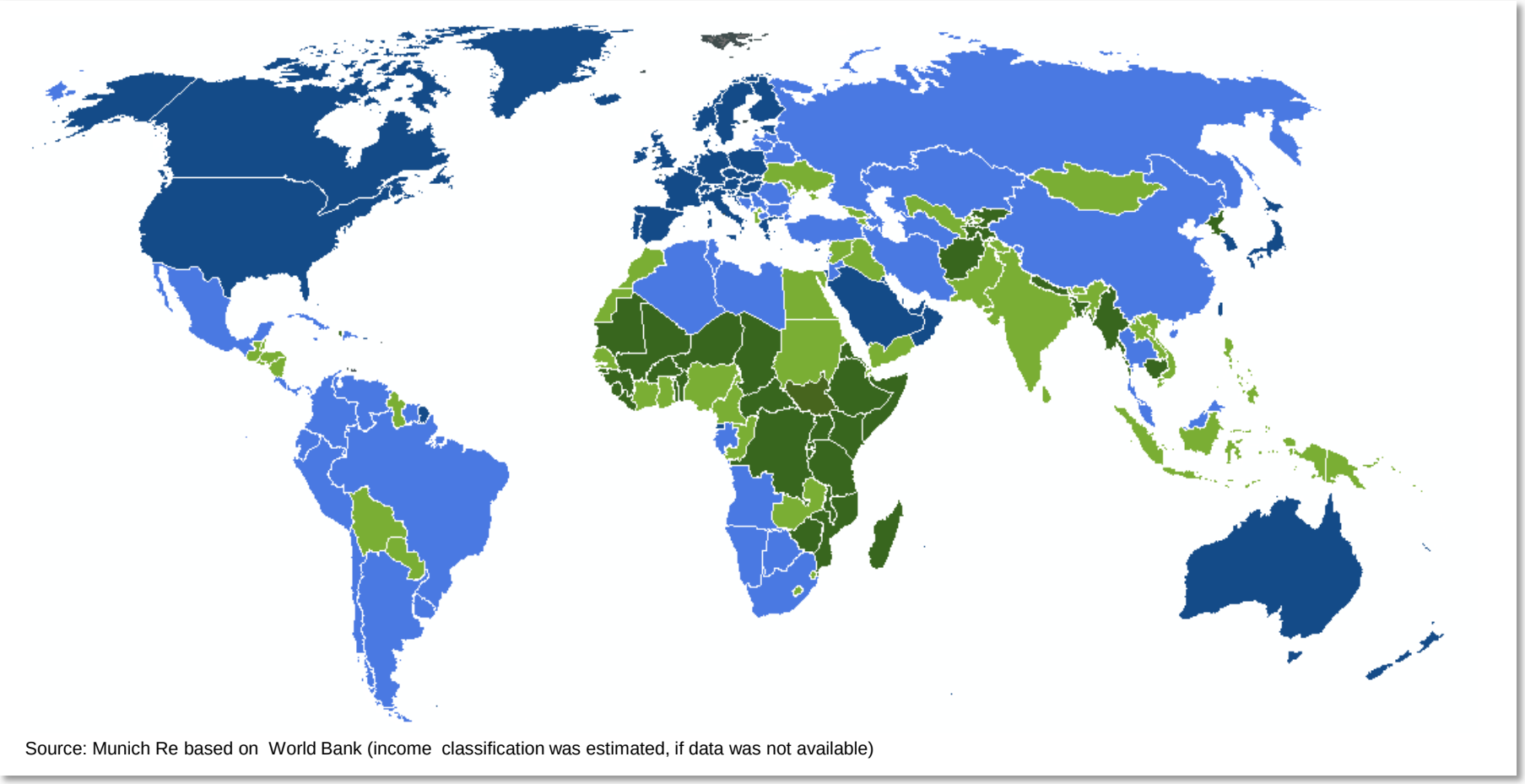


Source: Munich Re based on World Bank (income classification was estimated, if data was not available)

Income Groups 2012 (defined by World Bank, July 2012):

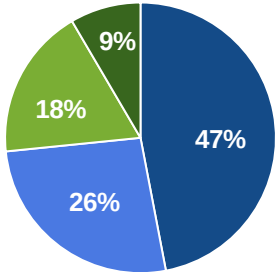
High income economies	Upper middle income economies	Lower middle income economies	Low income economies
(GNI ≥12,476 US$)	(GNI 4,036 – 12,475 US$)	(GNI 1,026 – 4,035 US$)	(GNI ≤1,025 US$)

NatCatSERVICE

Natural catastrophes worldwide 1980 – 2012

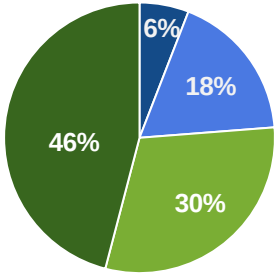
Income Groups defined by World Bank 2012

23,500 Loss events**

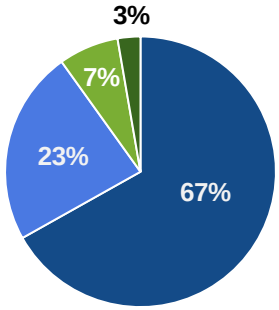


** Events reported at individual country level: i.e. storm could affected three countries and is reported as three events.

2,300,000 Fatalities

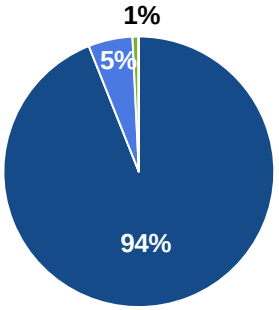


Overall losses* US$ 3,800bn



*in 2012 values

Insured losses* US$ 970bn



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Risk awareness

1. Many countries are characterized by
   - Low risk awareness
   - Lack of corresponding risk management
   - Low insurance penetration

Reasons for low risk awarnesss

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1. People tend to repress bad experiences quite fast
2. Tendency to believe: It won’t hit me
3. Large return periods of Nat Cat events
4. Underestimation in most parts of the world
5. People have other priorities instead of buying insurance cover

Pre loss vs. post loss management

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1. Many countries neglect pre loss considerations

Advantage:

- No capital allocation necessary
- Existing budget can be used for more popular projects

Disadvantage:

- Lack of appropriate monetary funds in case of an event
- Random distribution of money
- Politically influenced indemnification, particularly in election years

Options for the future

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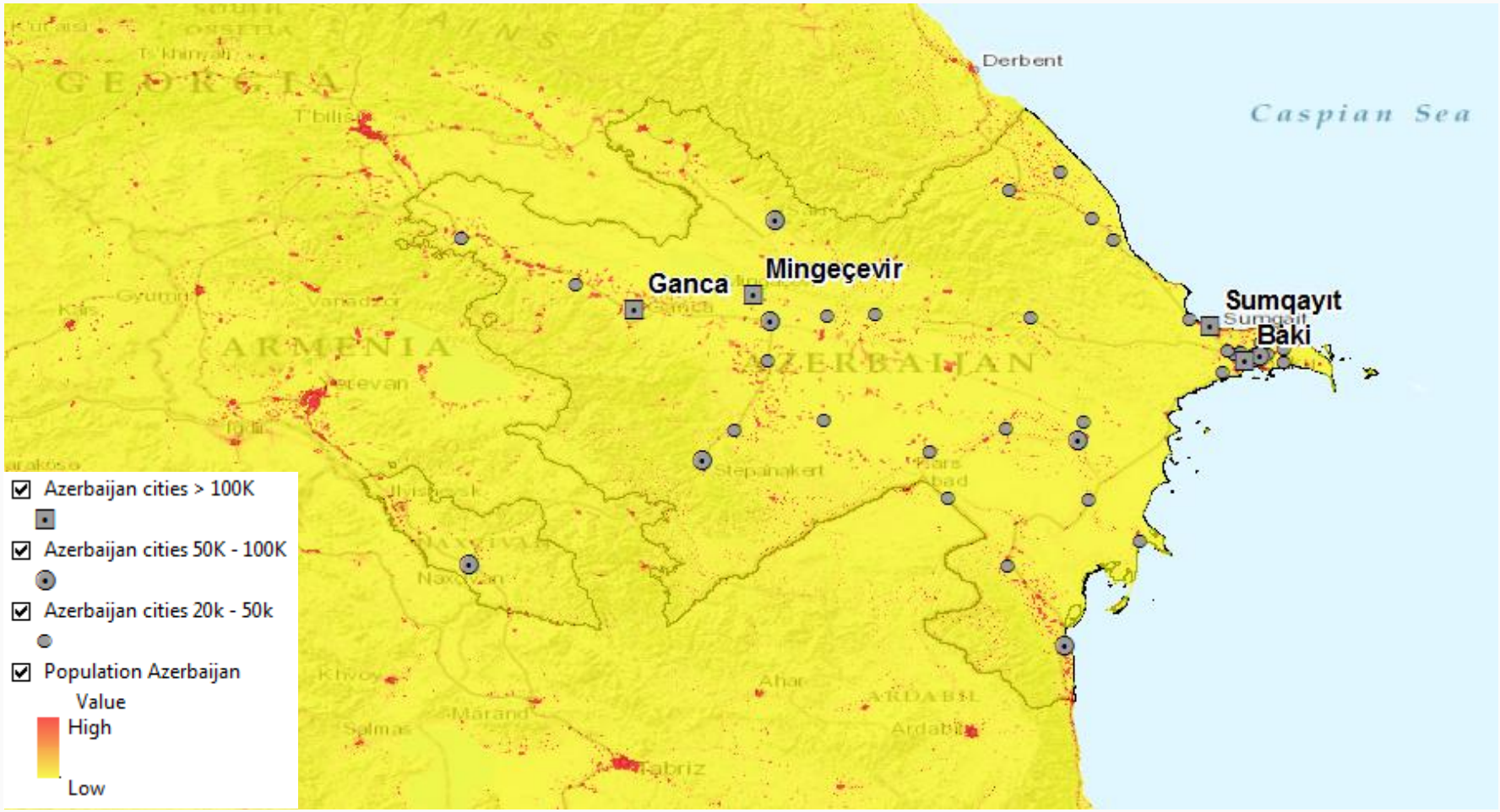
1. Joint efforts to change situation prospectively
2. Nationwide insurance as an option
3. Parties needed:
   - Government
   - Insurance industry
   - Individuals (insured)

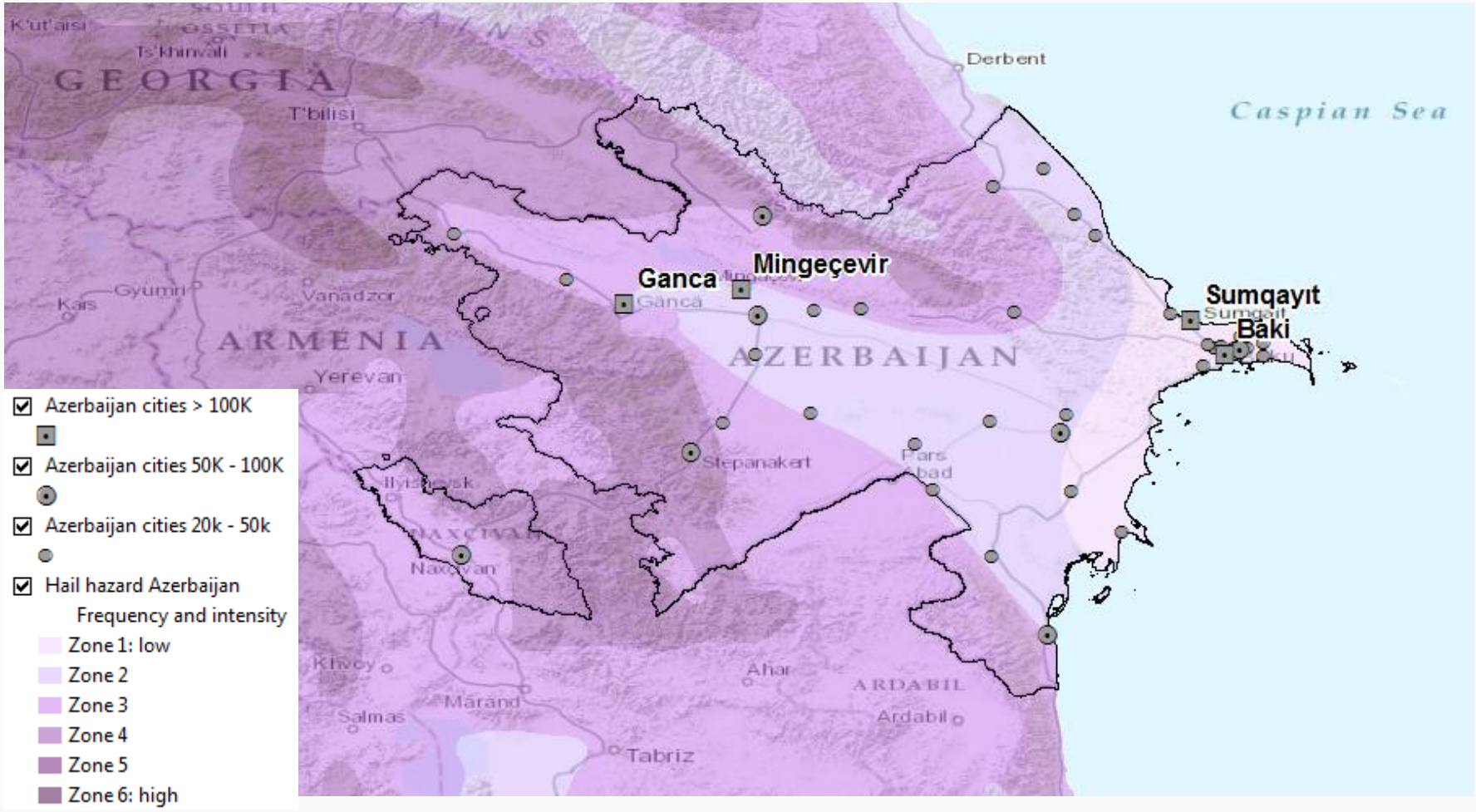
Strong commitment of all parties involved required!

Overview Azerbaijan Population



Overview Azerbaijan
Extratropical Storm

Overview Azerbaijan
Hail



Overview Azerbaijan Earthquake

Azerbaijan EQ Analyses: affected cities / total affected population

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Affected Population

EQ Zone	Pop. (Mio)	Percentage
1	3.9	48%
2	4.2	51%
3	0.1	2%
Sum Pop.	8.2	100%

Affected cities (Population > 20.000)

Munich Re hazard Zone	Number of Risk Locations	Percent
Zone 0: MM V and below	0	0.0%
Zone 1: MM VI	0	0.0%
Zone 2: MM VII	23	52.3%
Zone 3: MM VIII	21	47.7%
Zone 4: MM IX and above	0	0.0%
No information available	0	0.0%
Invalid coordinates	0	0.0%
Sum	**44**	**100%**

Probable maximum intensity (MM: modified Mercalli scale) with an exceedance probability of 10% in 50 years (equivalent to a „return period“ of 475 years) for medium subsoil conditions.

Kazakhstan
Analyses: Affected cities / population by EQ

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Affected Population

EQ Zone	Pop. (Mio)	Percentage
0	8.7	56%
1	1.5	10%
2	2.3	15%
3	1.7	11%
4	1.2	8%
Sum Pop.	15.4	100%

Affected cities (Population > 100.000)

Munich Re hazard Zone	Number of Risk Locations	Percent
Zone 0: MM V and below	15	71.4%
Zone 1: MM VI	2	9.5%
Zone 2: MM VII	2	9.5%
Zone 3: MM VIII	1	4.8%
Zone 4: MM IX and above	1	4.8%
No information available	0	0.0%
Invalid coordinates	0	0.0%
Sum	**21**	**100%**

Probable maximum intensity (MM: modified Mercalli scale) with an exceedance probability of 10% in 50 years (equivalent to a „return period“ of 475 years) for medium subsoil conditions.

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Pool considerations – Hypothesis

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1. Established pools are structured rather individual
2. High level of solidarity in most existing NatCat pools
3. Compulsory insurance recommended for penetration purposes

Pool Considerations
Insurers View

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- Differentiation between public and private liabilities

1. Insured perils
2. Policy construction
3. Territorial scope
4. Insured objects
5. Insured individuals
6. Pool participation
7. Premium

Drawing a line between public and private liabilities

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Catastrophe Insurance Solutions

Overview

Two** possible insurance **solutions** were **identified

*The first option is mostly used for rebuilding **private property**;*

*second is used for rebuilding **public property** in case of catastrophic events*

	National Pool Solutions	Government Covers
Role of Government:	- Legal framework, - Supervision, regulation, … and/or operation of the insurance pool a) Government plays no further role b) Government subsidize the fund	- Legal framework, - Supervision, regulation, … and/or operation of a fund, captive or facility - Paying of (re-)insurance premiums from annual budget - Decision about the allocation of resources in cases of natural disasters
Policyholder:	Private households or companies	Public Agencies or Institutions
Funding:	Insurance cover is (mostly) financed by private policyholders	Insurance cover is part of the federal budget and is financed by taxes (and/or donors)
Insured Assets:	**Private interest**	**Public property** and bridging of **liquidity gaps** in federal budgets
Examples:	a) Turkish Catastrophe Insurance Pool b) Taiwan Residential Earthquake Insurance Pool	• CCRIF • FONDEN

1. Insured perils – 1
Single NatCat perils vs. multi NatCat perils

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- **Single NatCat peril (EQ only)**

  Advantage:

  - Simple modeling and premium calculation
  - High transparency

  Disadvantage:

  - No diversification
  - Possible antiselection

1. Insured perils – 2
Single NatCat perils vs. multi NatCat perils

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- **Multi NatCat perils (EQ + Flood + Storm + …)**

  Advantage:

  - Wide scope of cover
  - Increased diversification
  - Reduced anti-selection

  Disadvantage:

  - Complex modeling
  - Lack of transparency

2. Policy construction - 1
NatCat perils only vs. combination with other perils

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- **NatCat perils only**

  Advantage:

  - Transparent
  - Independent from additional perils

  Disadvantage:

  - No diversification
  - Adverse selection
  - Limited market penetration

2. Policy construction - 2
NatCat perils only vs. combination with other perils

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- **Multi peril policy**

  Advantage:

  - Increased diversification
  - Reduced anti-selection
  - High level of market penetration

  Disadvantage:

  - Compulsory correlation of different perils

3. Territorial Scope
National

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- **National**

  Advantage:

  - Reasonable diversification effects
  - Large number of insured's
  - Easy to agree

  Disadvantage:

  - Lack of acceptance in less exposed areas

4. Insured objects - 1
Buildings / Contents / Consequential loss

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- **Buildings only**

  Advantage:

  - Protection of large values
  - Easy to administer

  Disadvantage:

  - Limited protection of values

4. Insured objects - 2
Buildings / Contents / Consequential loss

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- **Buildings & Contents**

  Advantage:

  - Comprehensive cover for private individuals
  - Large collective

  Disadvantage:

  - Increased loss potential
  - Higher premium for individuals
  - Lack of interest to insure contents
  - Increased administration

4. Insured objects - 3
Buildings / Contents / Consequential loss

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- **Consequential loss**

  Advantage:

  - Comprehensive cover for the industry
  - Reduction of economic losses

  Disadvantage:

  - Increased loss potential
  - Higher premium for individuals
  - Difficult and time consuming loss adjustment
  - Increased administration

5. Insured individuals 1
Private vs. Commercial/Industry

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- **Private only**

  <u>Advantage</u>:

  - Protection of human population
  - High level of transparency

  <u>Disadvantage</u>:

  - Limited compensation compared to overall loss

5. Insured individuals - 2
Private vs. Commercial/Industry

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- **Commercial/Industry**

  Advantage:

  - Huge risk collective
  - High level of compensation for incurred losses

  Disadvantage:

  - Complex modeling
  - Complex premium calculation
  - Lack of transparency

6. Pool participation - 1
Voluntary vs. compulsory

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- **Voluntary**

  Advantage:

  - Fair
  - Limited moral hazard

  Disadvantage:

  - Reduced market penetration
  - Adverse selection

6. Pool participation - 2
Voluntary vs. compulsory

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- **Compulsory**

  Advantage:

  - High market penetration
  - High level of solidarity
  - Diversification of risks
  - No adverse selection of risks

  Disadvantage:

  - Increased moral hazard
  - Huge loss potential

7. Premium -1
Individual vs. flat premium

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- **Individual premium**

  Advantage:

  - Fair
  - Reduced anti-selection
  - Reduced moral hazard

  Disadvantage:

  - More complex
  - Increased operating expenses

7. Premium - 2
Individual vs. flat premium

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- **Flat premium**

  Advantage:

  - Easy to administer

  Disadvantage:

  - Unfair
  - Does not reflect exposure
  - Increased moral hazard
  - Adverse selection

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Pool characteristics

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- **Premium pool**
  - Premium collection through insurers
  - Transfer of premium to pool
  - Transfer of risk to pool
  - Commission paid to insurers as compensation for distribution efforts

Claims settlement:

- Insurers manpower and expertise used for loss adjustment
- Specialized loss adjusters on behalf of pool organization

Pool characteristics

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- **Loss pool**
  - Premium collection through insurers
  - Premium is retained by insurers
  - Pool organizes reinsurance

  Claims settlement:

  - Agreed percentage of loss is retained by individual insurers
  - Excess loss is aggregated through pool
  - Distribution of pool-loss according to market share of insurers

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Possible pool structure

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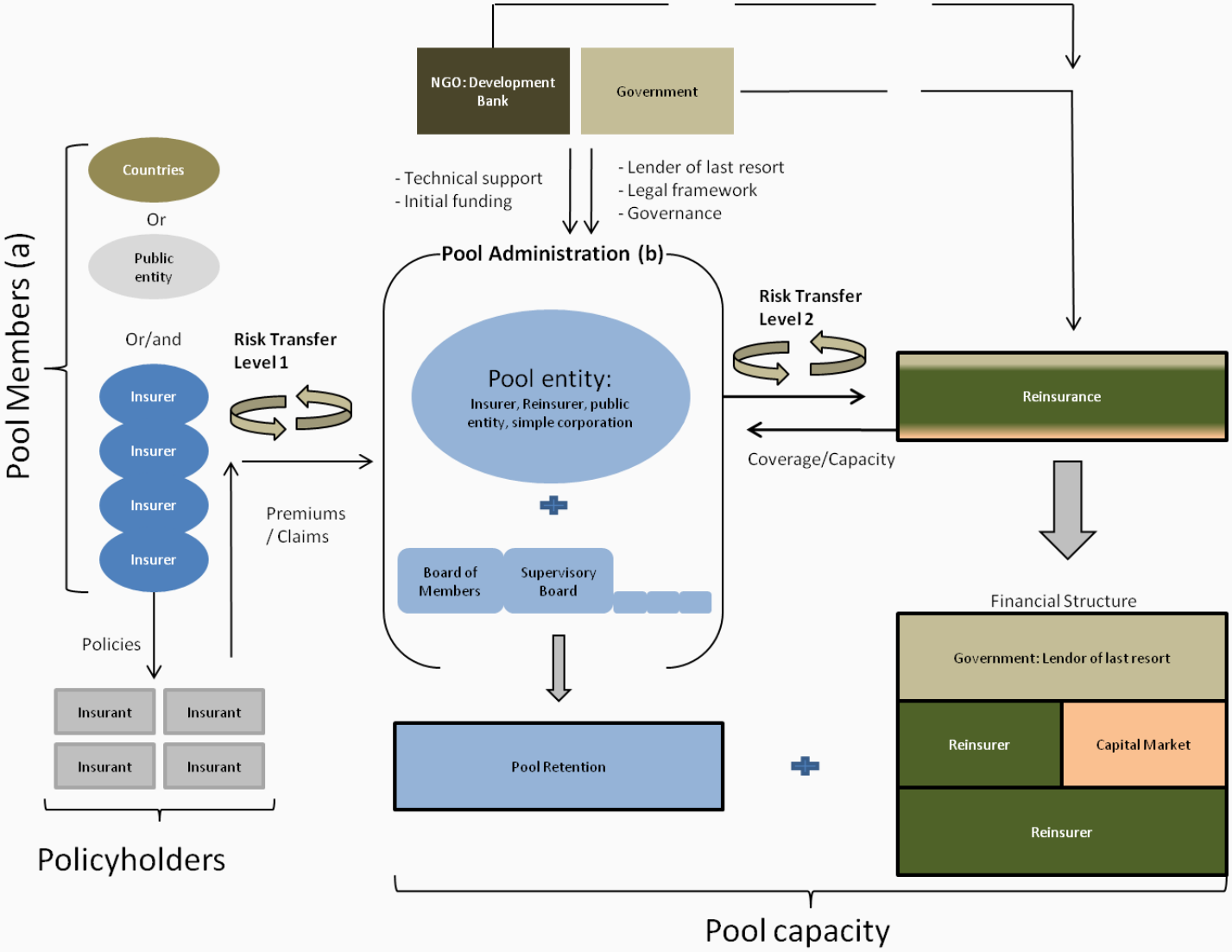

International Cat Pools

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Comparison of Pool Characteristics		1	2	3	4	5	6
Country		**France**	**Iceland**	**Caribbean**	**Norway**	**Rumania**	**Swiss**
Characteristics	**Variables / Name**	Cat-Nat Modell, Caisse Centrale de Reassurance (CCR)	Iceland catastrophe insurance (ICI)	Caribbean Catastrophe Risk insurance Facility (CCRIF)	Norsk Naturskadepool (NNP)	Programul Roman de Asigurare la catastofe - PAID	Kantonale Gebäudever-sicherung (KGV) und der Interkantonale Rückversicherungsver band (IRV/IRG);
Management	public/private/mixed	public	mixed	mixed	mixed	private	public
Governance	public/private/mixed	public	public	mixed	mixed	mixed	public
Funding	public/private/mixed	mixed	private	public	private	mixed	private
constitution Insurer	voluntary/compulsory	compulsory	compulsory	no insurers	compulsory	voluntary	compulsory
constitution Insurant	voluntary/compulsory/"semi compulsory"	semi compulsory	compulsory	voluntary	semi compulsory	compulsory	semi compulsory
geographical coverage	national/regional/intercountry	national	national	intercountry	national	national	regional
Rates	Flat-rate/risk-based	flat-rate	flat-rate	risk-based	Flat-rate	risk-based	flat-rate
Insured Interest	residential/commercial/public	r/c/p	r/c/p	p	r/c	r	r/c
Interest covered	Buildings/contents/ Infrastructure /others	Buildings, Contents, public installations, motor vehicles	Buildings, Contents, public installations	infrastructure	Buildings, Contents	Buildings	Buildings
Perils covered		**All-Risk Cover:** (Flood, EQ, volcanic eruption, landslides, **no storm, no hail, no snowpressure)**	EQ, volcanic eruption, landslides, flood, avalanches, **no storm**	Storm, EQ	Flood, Storm, landslide, EQ, volcanic eruption	EQ, Flood, Landslide	Flood, Storm, hail, avalanches, snow pressure, rockfall, **no EQ**
Reinsuranceprogram	public/private/mixed	public	private	private	private	private	public
Other risk-transfer	No/Yes	no	n/a	yes	n/a	n/a	no
Limit	yes/no	not with CCR	yes	yes	yes	yes	no
Deductible	yes/no	yes	yes	yes	yes	no	yes
Government cover	no/ limited/ unlimited	unlimited	limited	no, Government is the insurant	no	no	unlimited
Reason for establishment	Catastrophe/Market failure / others	catastrophe	catastrophe	catastrophe and others	limited cover through Funds	catastrophe	diverse risk exposures in portfolios-->pooling
seperate policy	yes/no	no	no	yes	no	yes	no
legal nature		law/state-owned joint stock RI	public corporation	indipendent legal entity	n/a	joint stock company owned by Insuerer	public entity
Trigger	Non-indemnity, Indemnity	indemnity	indemnity	Non-indemnity	indemnity	indemnity	indemnity

International Cat Pools

Munich RE

Comparison of Pool Characteristics		7	8	9	10	11
Country		**Swiss**	**Spain**	**Taiwan**	**Turkey**	**Japan**
Characteristics	**Variables / Name**	Elementar-schadenpool (ES-Pool)	Consorcio de Compensacion de Seguros (CCS)	Taiwan residential Earthquak Insurance Fund (TREIF)	Turkish catastrophe insurance pool (TCIP)	Japanese Earthquake Reinsurance Co. (JER)
Management	public/private/mixed	private	public	mixed	mixed	mixed
Governance	public/private/mixed	mixed	public	public	mixed	mixed
Funding	public/private/mixed	private	private	mixed	private	mixed
constitution insurer	voluntary/compulsory	voluntary	compulsory	compulsory	compulsory	compulsory
constitution insurant	voluntary/compulsory/"semi compulsory"	semi compulsory	semi compulsory	semi compulsory	compulsory	voluntary
geographical coverage	national/regional/intercountry	regional	national	national	national	national
Rates	Flat-rate/risk-based	flat-rate	flat-rate	flat-rate	risk-based	risk-based
Insured interest	residential/commercial/public	r/c	r/c/p	r	r	r
Interest covered	Buildings/contents/ Infrastructure /others	Buildings and contents	Buildings, contents, motor vehicle	Buildings	Buildings	Buildings, content
Perils covered		flood, storm, avalanches, snow-pressure, hail, rockfalls, landslides	Flood, EQ, landslides, vulcanic eruption, Storm, meteorits	EQ (following Fire, explosion, landslide, flood, subsidience)	EQ (following fire, explosion, landslide)	EQ, volcanic eruption, tsunami
Reinsuranceprogram	public/private/mixed	private	public	private	private	public
Other risk-transfer	No/Yes	n/a	no	yes	yes	n/a
Limit	yes/no	yes	yes	yes	yes	yes
Deductible	yes/no	yes	yes	n/a	yes	no
Government cover	no/ limited/ unlimited	no	unlimited	limited	limited	limited
Reason for establishment	Catastrophe/Market failure / others	market failure	others	catastrophe	catastrophe	catastrophe
seperate policy	yes/no	no	no	no	yes	yes
legal nature		simple company	state-owned RI	non-profit organisation	legal public entity	Ltd.
Trigger	Non-indemnity, indemnity	indemnity	indemnity	indemnity	indemnity	indemnity

International Cat Pools

Munich RE

Comparison of Pool Characteristics		12	13	14	15	16
Country		**USA**	**USA**	**USA**	**New Zealand**	**Balkan**
Characteristics	**Variables / Name**	California Earthquake Authority (CEA)	National Flood Insurance Program (NFIP)	Florida Hurricane Catastrophe Fund (FHCF)	Earthquake commission (EQC)	Europa RE (in planning, final phase)
Management	public/private/mixed	public	public	public	public	private
Governance	public/private/mixed	public	public	public	public	mixed
Funding	public/private/mixed	private	mixed	private	private	mixed
constitution insurer	voluntary/compulsory	voluntary	voluntary	compulsory	compulsory	voluntary
constitution insurant	voluntary/compulsory/"semi compulsory"	voluntary	semi compulsory and voluntary	voluntary	semi compulsory	voluntary
geographical coverage	national/regional/intercountry	regional	national	regional	national	intercountry
Rates	Flat-rate/risk-based	risk-based	risk-based	risk-based	Flat-rate	risk-based
insured interest	residential/commercial/public	r	r/c	r	r	r/c/p
interest covered	Buildings/contents/ Infrastructure /others	Buildings and contents	Buildings, contents	Buildings	Buildings, contents, Land	Buildings,
Perils covered		EQ (following fire and explosion)	Flood and following claims through erosions (mud slides, no landslide)	Hurricane	EQ, landslide, Tsunami, vulkanic eruption (follwowing storm, flood, fire)	Earthquake (following fire and landslides), Flood, Drought, Freeze, Hail
Reinsuranceprogram	public/private/mixed	private	no/public	public	private	private
Other risk-transfer	No/Yes	Yes	no	yes	private	n/a
Limit	yes/no	yes	yes	yes	yes	yes
Deductible	yes/no	yes	yes	yes	yes	yes
Government cover	no/ limited/ unlimited	no	unlimited	no	unlimited	no
Reason for establishment	Catastrophe/Market failure / others	catastrophe	market failure	market failure	Catastrophe/ others	catastrophe
seperate policy	yes/no	no	yes	yes	no	yes
legal nature		public instrument of California	public entity	state-owend RI	instrumentality of the government	participating Countries
Trigger	Non-indemnity, indemnity	indemnity	indemnity	non-indemnity	indemnity	indemnity and parametric, depends on the policy and risk

Basis of indemnification

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- It needs to be distinguished between the different parties involved
  - **Insured → Insurer**
    Indemnification of actual sustained loss net of deductible
  - **Insurer/Pool → Reinsurer/Capital market**
    Depending on structure, a priority and a maximum limit will be applied
  - **Government**
    Depending on involvement, government may act as lender of last resort

Basis of indemnification - *pool perspective* - 1
Actual sustained loss vs. parametric trigger

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- **Actual sustained loss**

  <u>Advantage</u>:

  - Fair
  - No base risk
  - Loss adequate indemnification, subject to capacity

  <u>Disadvantage</u>:

  - Time consuming to establish the ultimate loss
  - High degree of administration

Basis of indemnification - *pool perspective* - 2
Actual sustained loss vs. parametric trigger

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- **Parametric trigger**
  (an independent indicator is used to trigger the cover, e.g. amplitude >7.5 on the Mercalli scale at a given gauging station, economical loss)
  <u>Advantage</u>:
  - Quick compensation
  - Low administration (post loss)
  - Limited moral hazard

  <u>Disadvantage</u>:
  - Based on “synthetic” trigger, irrespective of actual loss
  - Gauging station may not record the required amplitude, despite a significant loss elsewhere

Basis of indemnification - *pool perspective* - 3
Actual sustained loss vs. parametric trigger

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Possible trigger:

- Subjective measure of the **strength** of an earthquake, assessed on the basis of **local damage**
- Discrete twelve-graded **Mercalli** scale
- Decreases with increasing focal distance

Pool protection - 1
Low return periods vs. high return periods

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- **Low return periods (low capacity)**

  Advantage:

  - Easy to finance
  - Easy to reinsure

  Disadvantage:

  - Limited compensation
  - Not in line with principle aim to achieve reasonable protection
  - Lack of acceptance

Pool protection - 2
Low return periods vs. high return periods

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- **High return periods (>200 years return period – high capacity)**

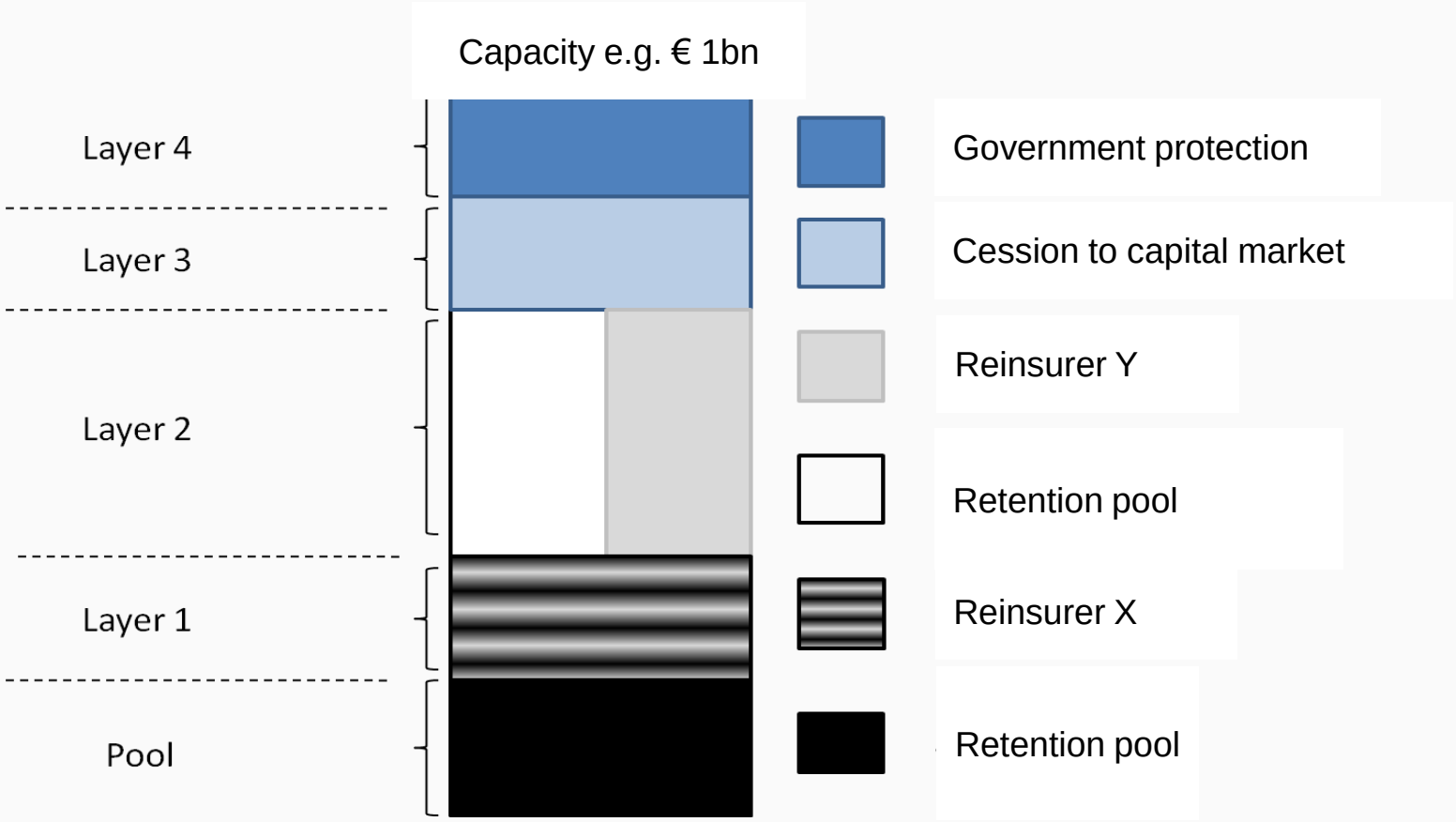
  Advantage:

  - High comfort level
  - High level of acceptance

  Disadvantage:

  - Difficult to structure and finance

Possible pool funding & protection



Agenda

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1. Current situation
2. Motivation for new Insurance Solutions
3. Risk awareness/Exposure
4. Considerations prior to establishment of pools
5. Pool characteristics
6. Pool structure & protection
7. Further considerations
8. Next steps

Further considerations

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- Disaster management
- Recovery considerations
- Building codes
- Tax incentives

Agenda

Munich RE

1. Current situation
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8. Next steps

Next steps

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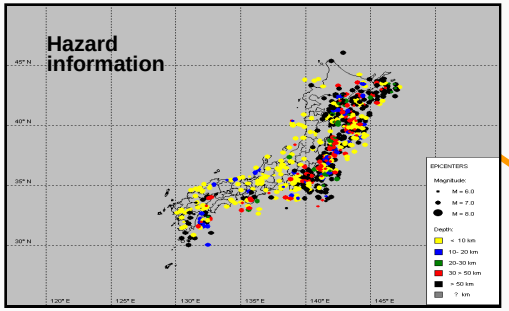
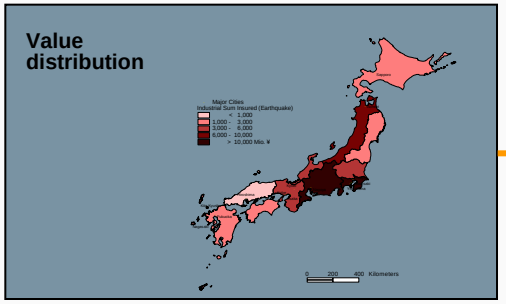
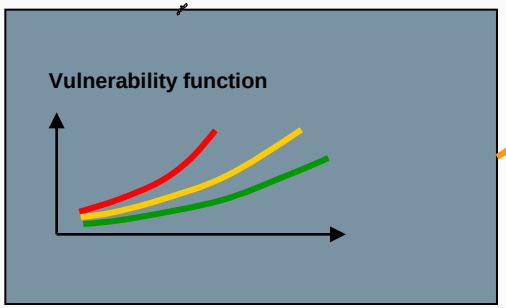
1. Commitment of all involved parties to proceed
2. Discussion of proposed options
3. Involvement of further stakeholders
4. Az EQ Model

The Munich Re risk model: MRHazard







Scientific input

Individual exposure

Munich Re's loss experience

Set of scenarios

Statistics

Risk curve

Expected loss/ loss occurrence probability

Thank you very much indeed for your attention

Jürgen Brucker

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