Disaster Risk Insurance Concepts and Schemes

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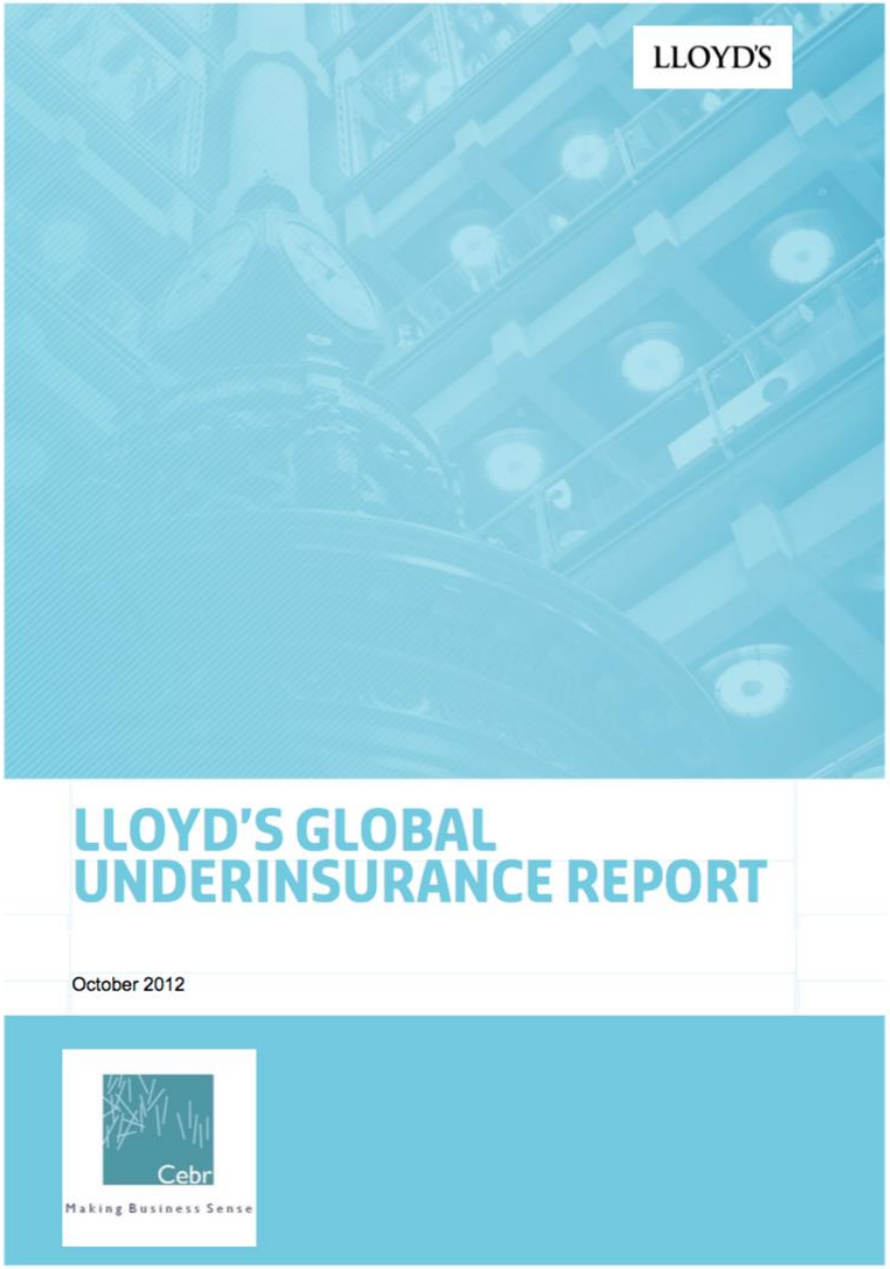
Lloyd's of London



LLOYD'S

42 Countries
90% of global insurance premium

Penetration = spend/GDP

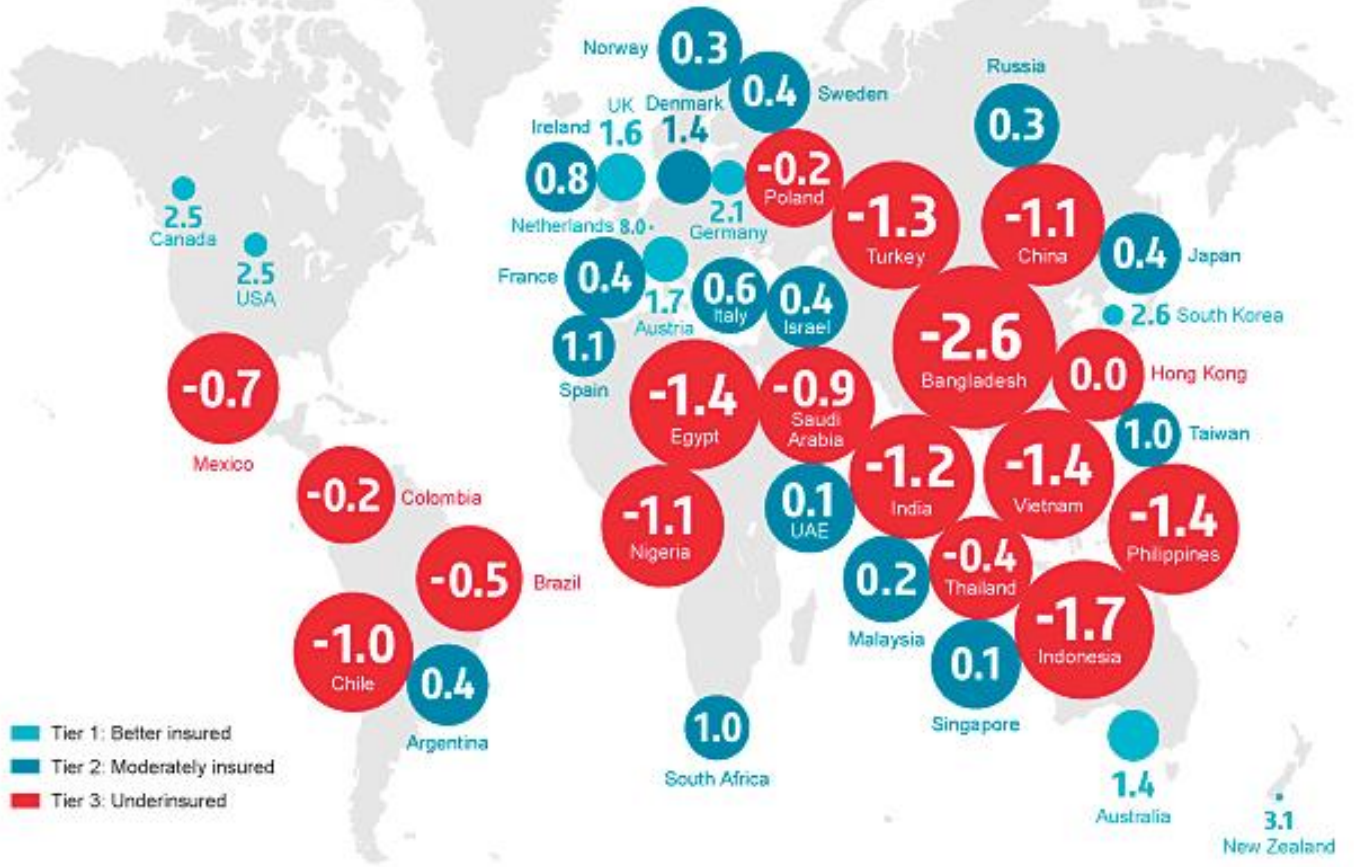
Expected annual loss – based on events 1900-2012

Benchmarked requirement based on 3 countries with lowest catastrophe levels per income band

Worked example - ***Estimating underinsurance for Brazil in 2011***	
Non-life insurance penetration in 2011:	**1.5%**
***LESS* Expected annual loss (% of GDP):**	**(0.11%)**
Expected loss adjusted insurance penetration:	**1.3%**
***LESS* Benchmark requirement** (for middle income)**:**	**(1.9%)**
Benchmarked insurance coverage:	**-0.51%**
Underinsurance (0.51% of nominal GDP in 2011 in $US)	**$12.68bn**

LLOYD'S

UNDERINSURANCE MAP



BETTER INSURED

8.0	Netherlands	2.1	Germany
3.1	New Zealand	1.7	Austria
2.6	South Korea	1.6	UK
2.5	US	1.4	Australia
2.5	Canada		

MODERATELY INSURED

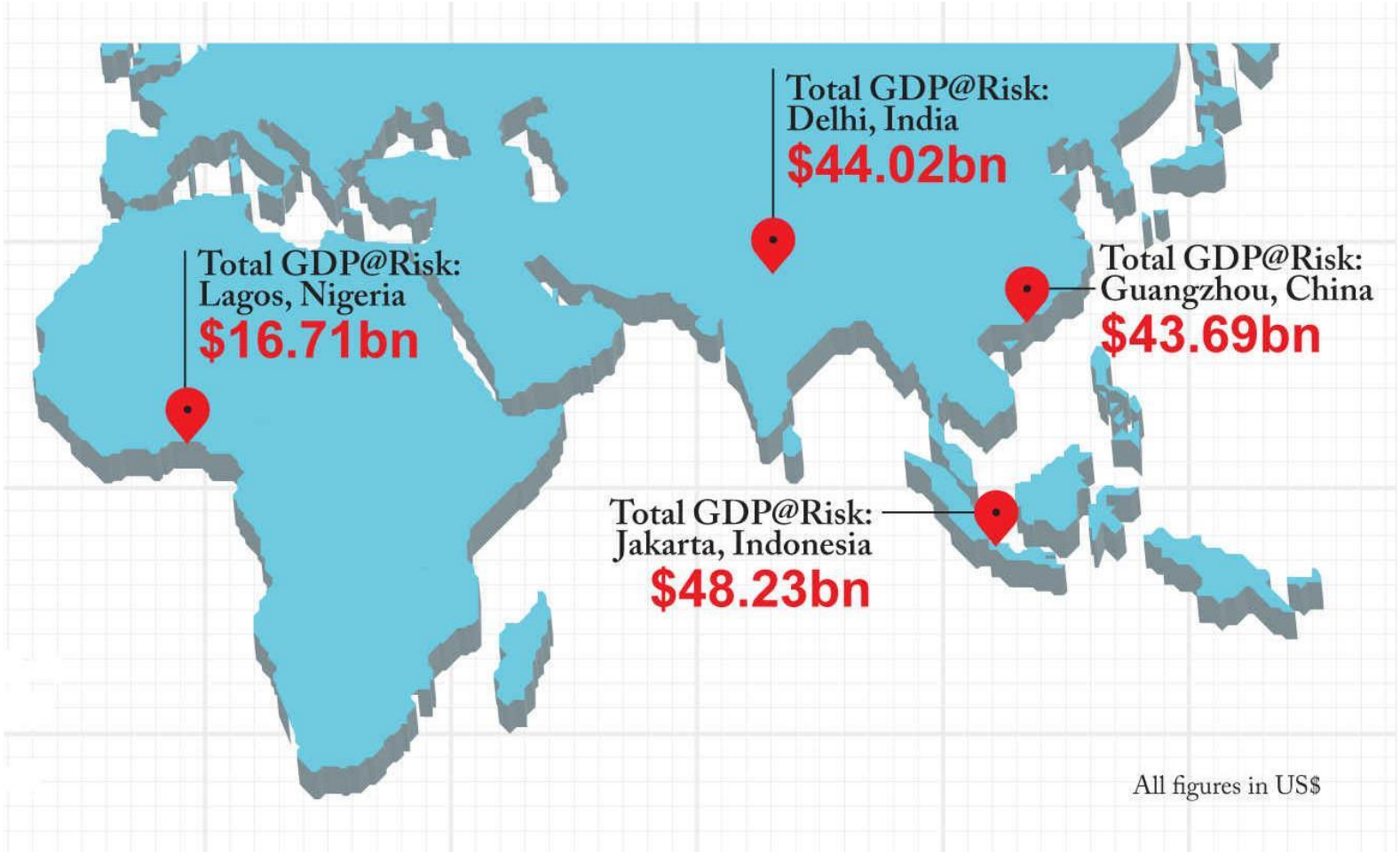
1.4	Denmark	0.4	Japan
1.1	Spain	0.4	France
1.0	South Africa	0.4	Sweden
1.0	Taiwan	0.3	Russia
0.8	Ireland	0.3	Norway
0.6	Italy	0.2	Malaysia
0.4	Argentina	0.1	Singapore
0.4	Israel	0.1	UAE

UNDERINSURED

0.0	Hong Kong	-1.1	Nigeria
-0.2	Poland	-1.2	India
-0.2	Colombia	-1.3	Turkey
-0.4	Thailand	-1.4	Egypt
-0.5	Brazil	-1.4	Philippines
-0.7	Mexico	-1.4	Vietnam
-0.9	Saudi Arabia	-1.7	Indonesia
-1.0	Chile	-2.6	Bangladesh
-1.1	China		

Emerging economies have the most to lose

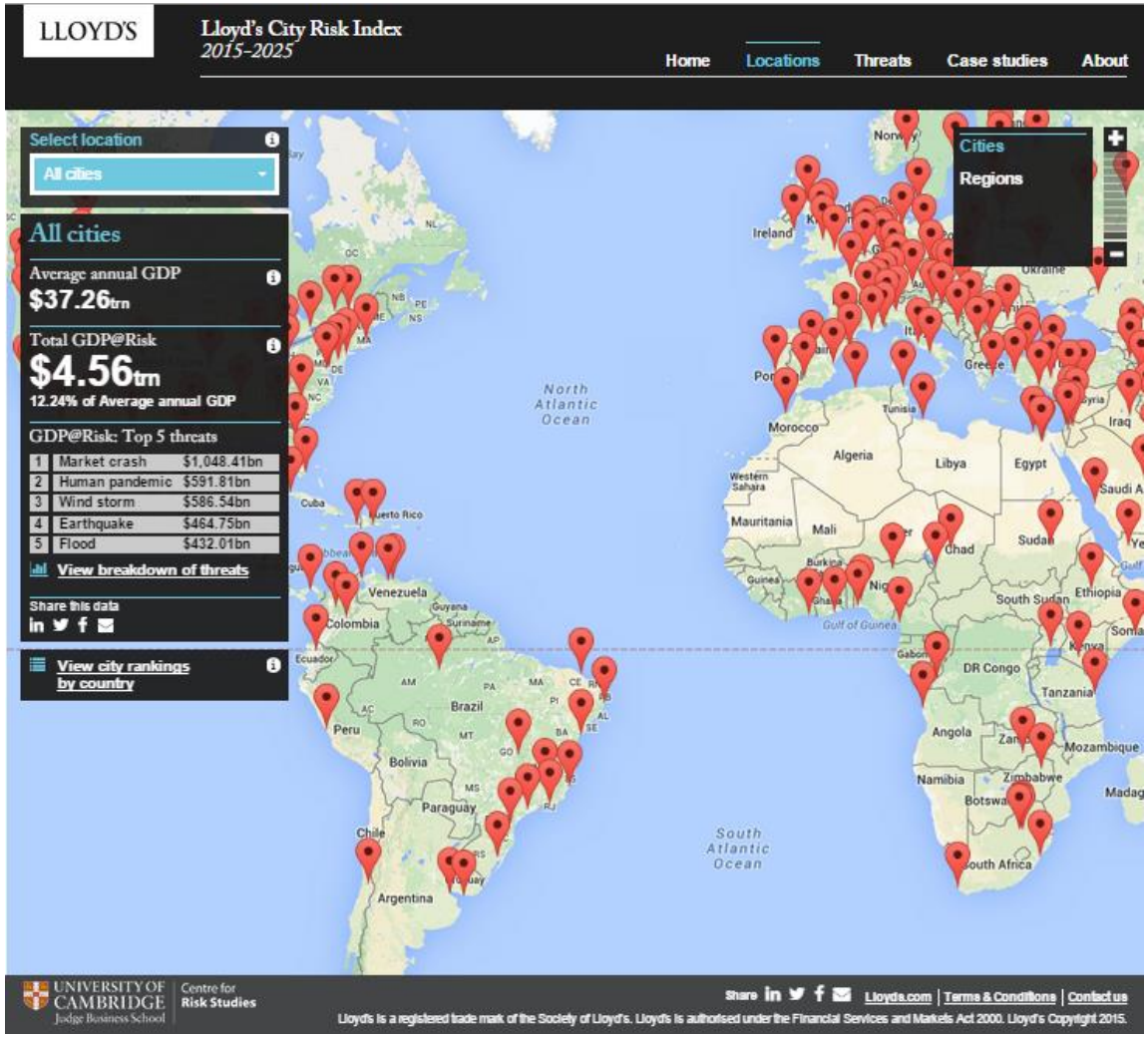
- Total GDP@Risk: $3.26trn



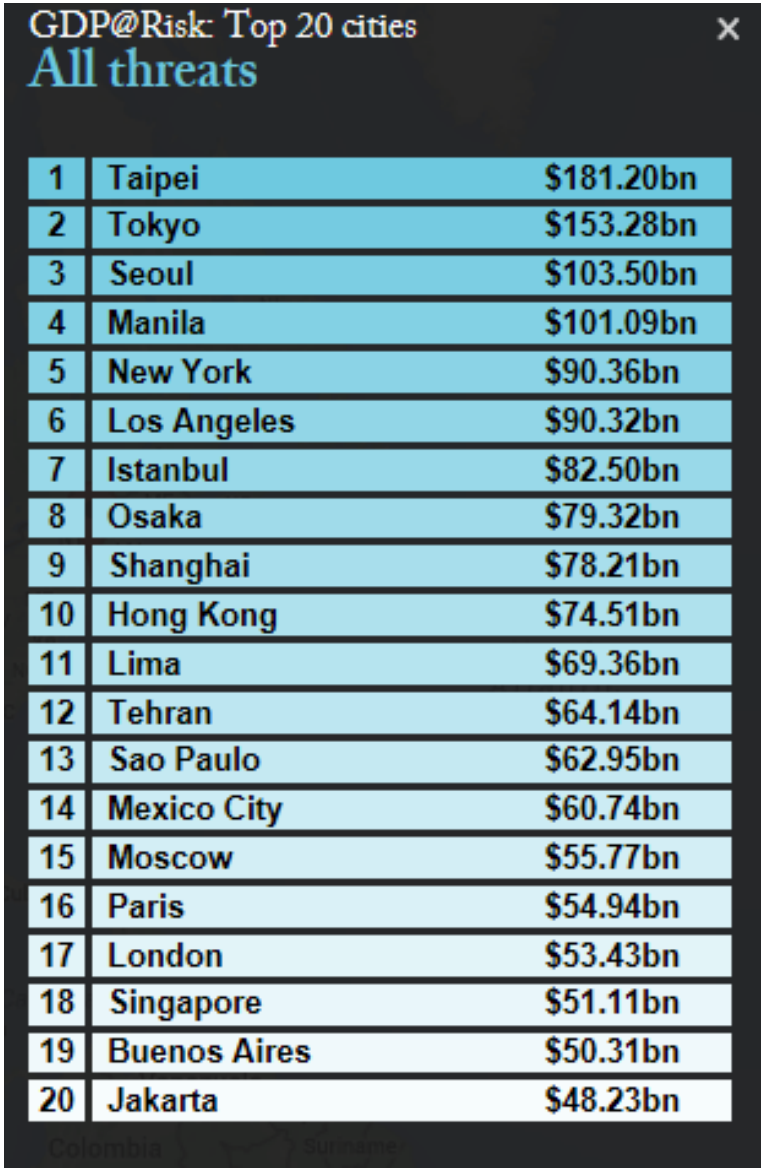
City risk index highlights resilience opportunities

Lloyd's City Risk Index

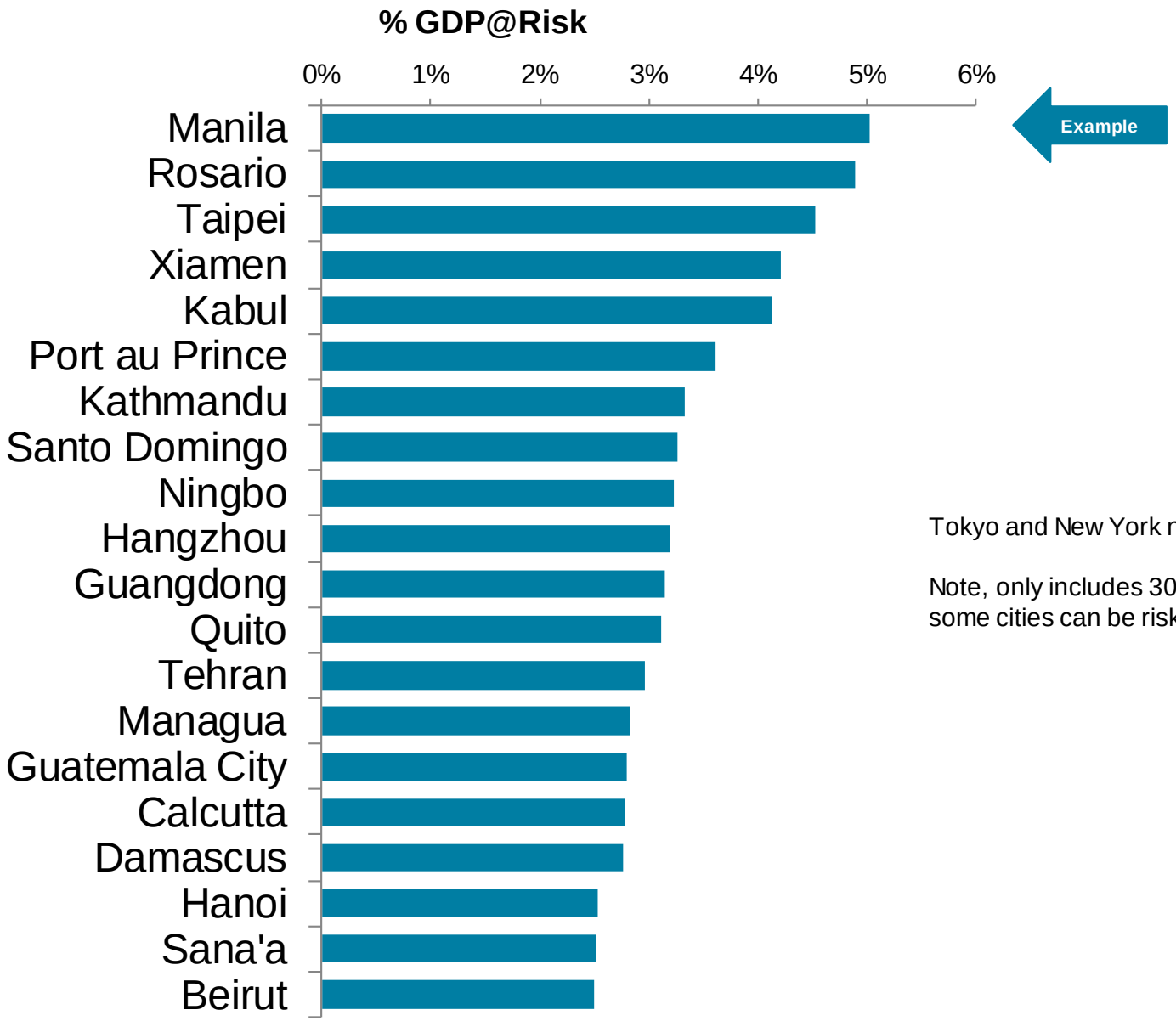
- **Total GDP@Risk All Cities:** $4.56trn
  - 301 cities
  - 50 cities analysed in greater depth
  - Downloadable city factsheets
  - Three threat types:
    - Manmade
    - Natural
    - Emerging



GDP @ Risk – Nominal values gives one order….



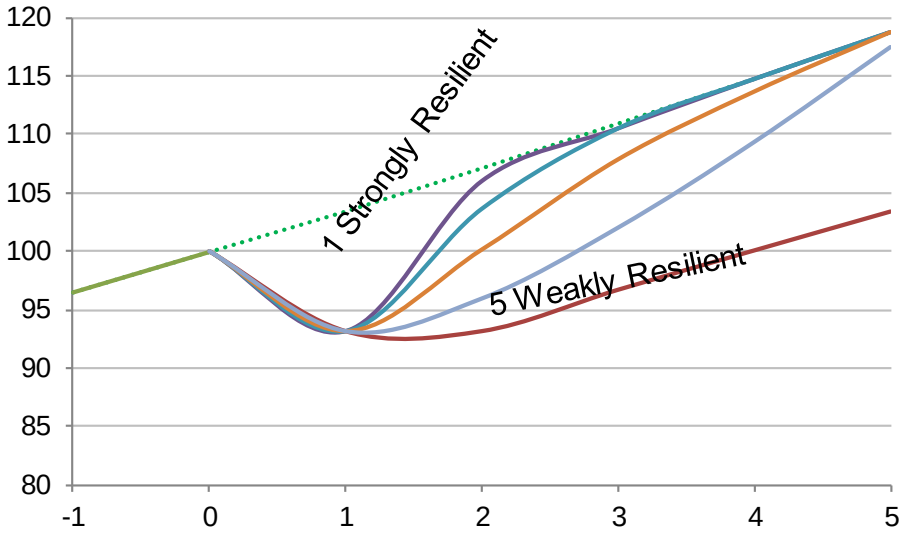
GDP @ risk as % of GDP gives a different order…



Tokyo and New York now absent.

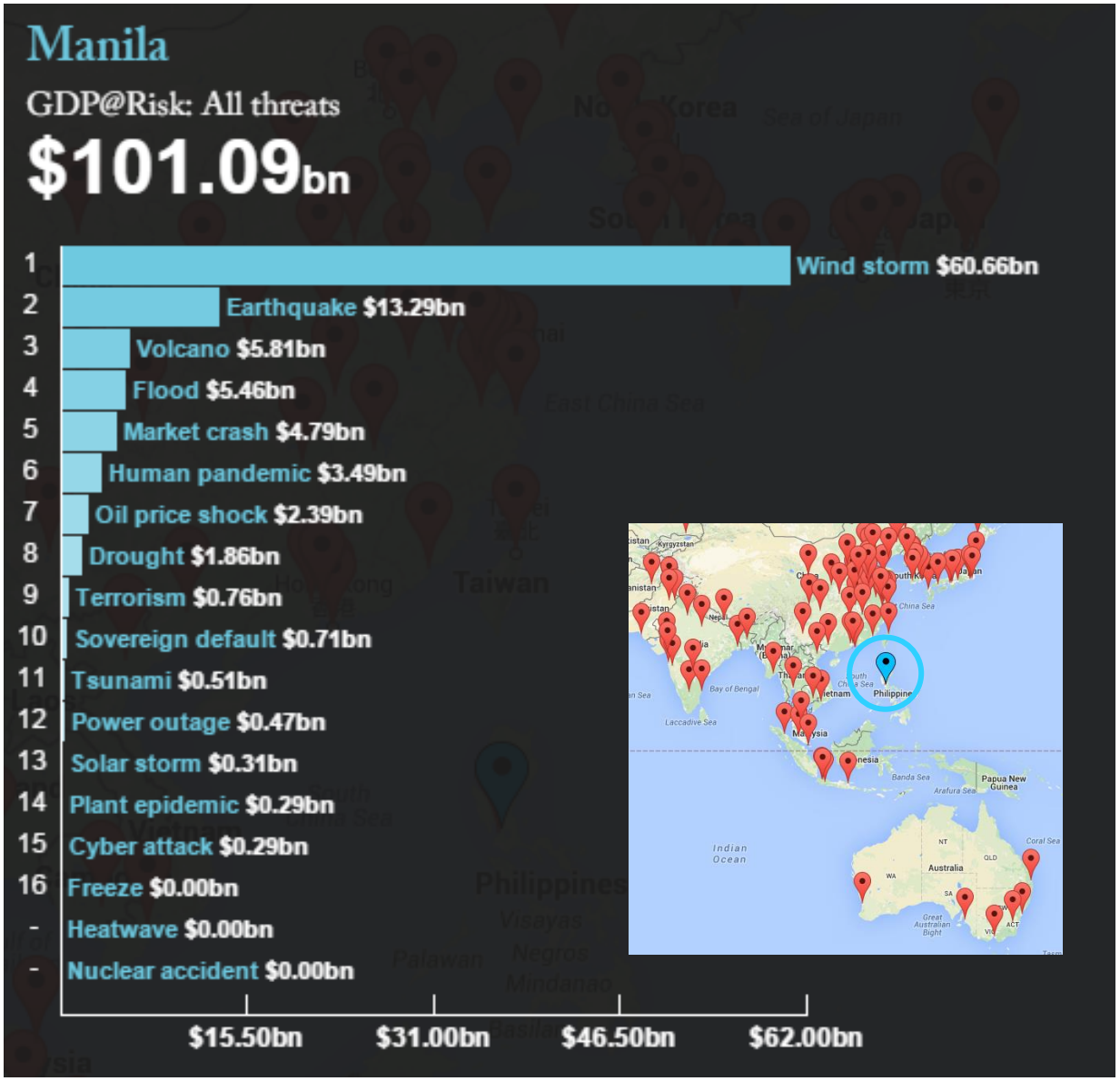
Note, only includes 301 cities some cities can be riskier still.

City Resilience Analysis



- The speed of recovery of the city is influenced by its social and economic resilience, and physical capacity to respond
- We have developed a resilience classification (1-5) for cities based on four factors
  - Governance; Social coherence; Economic strength; Infrastructure systems
- Recovery is calibrated from precedent studies of economic recovery after disaster

Underlying analysis suggests Manila has “weak resilience”



Manila, Philippines categorized as ‘4: Weak Resilience’

Recovery of the economy after a disaster depends on

- Access to recovery finance
- Economic spare capacity
- Capital infrastructure
- Social cohesion
- Governance capability

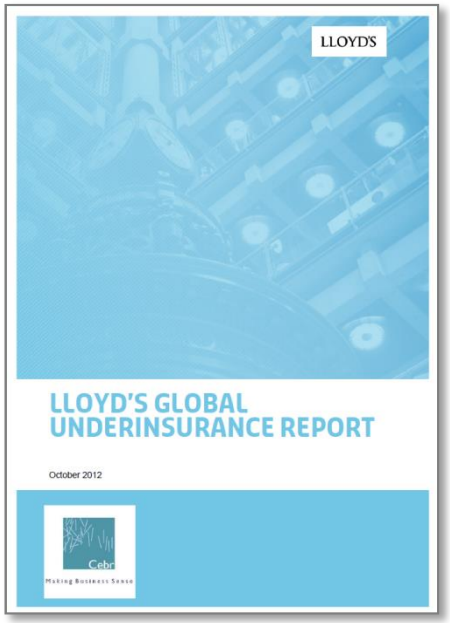
Insurance plays a key role in providing recovery finance

Our previous research highlights considerable underinsurance

Table 3 – Benchmarked insurance coverage (2011)

Rank	Country	Benchmarked insurance coverage	Underinsurance (US$ bn)	Rank	Country	Benchmarked insurance coverage	Underinsurance (US$ bn)
1	Netherlands	8.01	-	22	Norway	0.25	-
2	New Zealand	3.05	-	23	Malaysia	0.15	-
3	South Korea	2.55	-	24	United Arab Emirates	0.08	-
4	United States	2.53	-	25	Singapore	0.08	-
5	Canada	2.47	-	26	Hong Kong	-0.03	$0.08
6	Germany	2.11	-	27	Poland	-0.15	$0.78
7	Austria	1.67	-	28	Colombia	-0.17	$0.57
8	United Kingdom	1.60	-	29	Thailand	-0.41	$1.41
9	Australia	1.39	-	30	Brazil	-0.51	$12.68
10	Denmark	1.36	-	31	Mexico	-0.67	$7.78
11	Spain	1.05	-	32	Saudi Arabia	-0.93	$5.35
12	South Africa	1.02	-	33	Chile	-0.97	$2.40
13	Taiwan	0.97	-	34	China	-1.09	$79.57
14	Ireland	0.75	-	35	Nigeria	-1.11	$2.64
15	Italy	0.62	-	36	India	-1.18	$19.72
16	Argentina	0.44	-	37	Turkey	-1.31	$10.23
17	Israel	0.44	-	38	Egypt	-1.36	$3.20
18	Sweden	0.44	-	39	Philippines	-1.36	$2.90
19	Japan	0.43	-	40	Vietnam	-1.38	$1.69
20	France	0.39	-	41	Indonesia	-1.67	$14.12
21	Russia	0.34	-	42	Bangladesh	-2.64	$2.99
	Total underinsurance		-		***Total underinsurance***		***$168.11***

Source: "EM-DAT", World Bank, Sigma, CEBR analysis



October 2012

Benchmarked insurance coverage = Insurance penetration less expected nat cats less benchmark minimal insurance spend

If Manila improved its 'resilience' it's GDP@Risk would fall dramatically

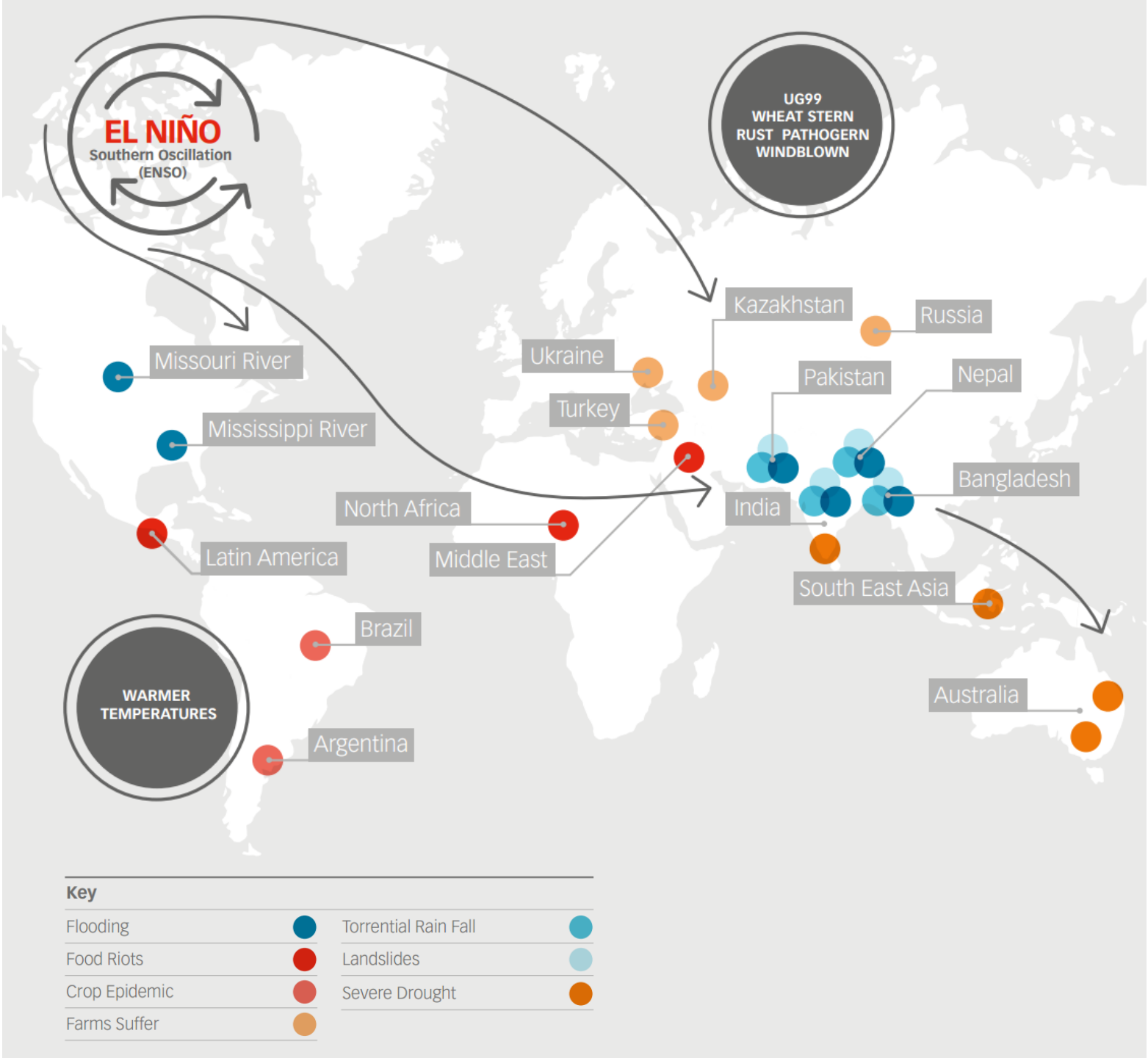
	Total $GDP@Risk (Bn)	World Ranking by $GDP@Risk	**as % of total GDP 2015-2025**	World Ranking by % of GDP
Resilience 'Weak'	$101.09	4	5.03%	1
Resilience Improved from 'Weak' to 'Moderate'	$88.53	6	4.40%	2
Resilience Improved from 'Weak' to 'Very Strong'	$70.41	10	3.50%	5

Improving resilience by one grade: saves **$12 Bn** of expected economic loss over the next decade

'Moderate resilience' countries include: Thailand, Malaysia, and Colombia

Focus on emerging risks:

Food system shock


EL NIÑO
Southern Oscillation
(ENSO)
UG99
WHEAT STERN
RUST PATHOGERN
WINDBLOWN
Kazakhstan
Russia
Ukraine
Pakistan
Nepal
Turkey
Missouri River
Mississippi River
Bangladesh
India
North Africa
Middle East
Latin America
South East Asia
Brazil
WARMER
TEMPERATURES
Australia
Argentina
Key
Flooding
Food Riots
Crop Epidemic
Farms Suffer
Torrential Rain Fall
Landslides
Severe Drought

Food System Shock Scenario

- Combined effect is a global **production shock** to the world's staple food crops

fall in global production

Food System Shock Scenario

- Production shock results in **price spikes**

increase in price versus the average levels experienced during the 20 years prior to the global food price shock of 2007-08

Food System Shock Scenario

- Combination of high food prices and political instability **severely impact financial markets**

Agricultural stocks

European stock markets **10%**

US stock markets **5%**

Lloyd's disaster risk facility

Lloyd's Disaster Risk Facility (DRF)

$400m capacity for nat cat risks:

Supply-side factors

- Developing countries provide a diversification opportunity
- Data availability and quality is improving rapidly
  - Technology drivers such as GIS and uptake of mobile phones
  - **However unlocking data-mines is key**
- Insurers could be well placed to provide essential services in addition to post-event financial indemnity:
  - Risk insight: measurement & modelling
  - Material support after an event: pre-agreed contracts for critical disaster response capabilities
- These principles could be applied to a range of perils, not only natural catastrophe

Demand factors

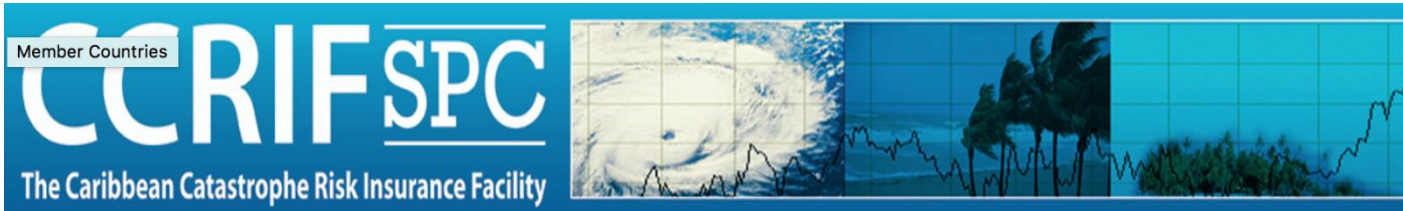
- The most likely purchasers of insurance in the short term:
  - Governments (including regional consortia)
  - State-owned enterprises (a major component of many developing economies)
- Product development is focused on parametric products:
  - Absence of local insurance ecosystem
  - Speed & simplicity are customer priorities
  - Basis risk is manageable; meaningful risk transfer is possible

CCRIF and ARC

CCRIF

LLOYD'S

- Prompted by Hurricane Ivan in 2004
  - Grenada and the Cayman Islands, 200% GDP
  - Regional losses US$ 6 billion for the event.
- Commenced 2007,
- Not-for-profit risk pooling facility
  - Owned by Caribbean governments.
- parametric insurance for: tropical cyclones, earthquakes and excess rainfall (attach at 1/5-1/20; exhaust at 1/75-1/200)
- short-term liquidity – 14 days payout
- 16 members: Anguilla, Antigua & Barbuda, Bahamas, Barbados, Belize, Bermuda, Cayman Islands, Dominica, Grenada, Haiti, Jamaica, St. Kitts & Nevis, Saint Lucia, St. Vincent & the Grenadines, Trinidad & Tobago and Turks & Caicos Islands.
- 12 payouts totalling US$35,572,474 to 8 member governments.



African Risk Capacity

- Purchaser: African Union Member States
- Coverage: drought.
- Payments: 2-4 weeks of harvest - reaching households within 120 days
- Payout when the rainfall deviation is sufficiently severe
- Max USD $30 million per country per season for drought events that occur with a frequency of 1 in 5 years or less.
- 1/25 year event = 10% GDP in Malawi (source ARC)

Global collaboration required

oasis

Loss Modelling
Framework Ltd


Oasis projected Model Coverage 2016
Over 70 models from 12 providers
OASIS

Insurance Development Forum

LLOYD'S

'Understanding risk to create resilient platforms for sustainable growth and human dignity'

- Industry led collaboration with key public institutions
  - UNDP
  - World Bank
- Identification of strategic insurance development targets
- Mobilise collective resources for common strategic requirements
- Appropriate structure and governance
  - Principles group: Steven Catlin, Helen Clark (UNDP), Joaquim Levy (CFO world bank)
  - Executive secretariat
  - Working groups

- Understanding risk
  - Modelling working party
  - Data
- Risk and insurance regulation – enabling access to insurance
- Risk sharing and transfer
  - Demand side working party
- Sustainable and resilient investments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