



Cambridge Centre for Risk Studies
Advisory Board Research Showcase – 23 January 2018

Global Risk Index 2018

Centre for
Risk Studies

 UNIVERSITY OF
CAMBRIDGE
Judge Business School

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2018 Global Risk Index

Measure impact of 22 threats on cities that contribute half of global GDP



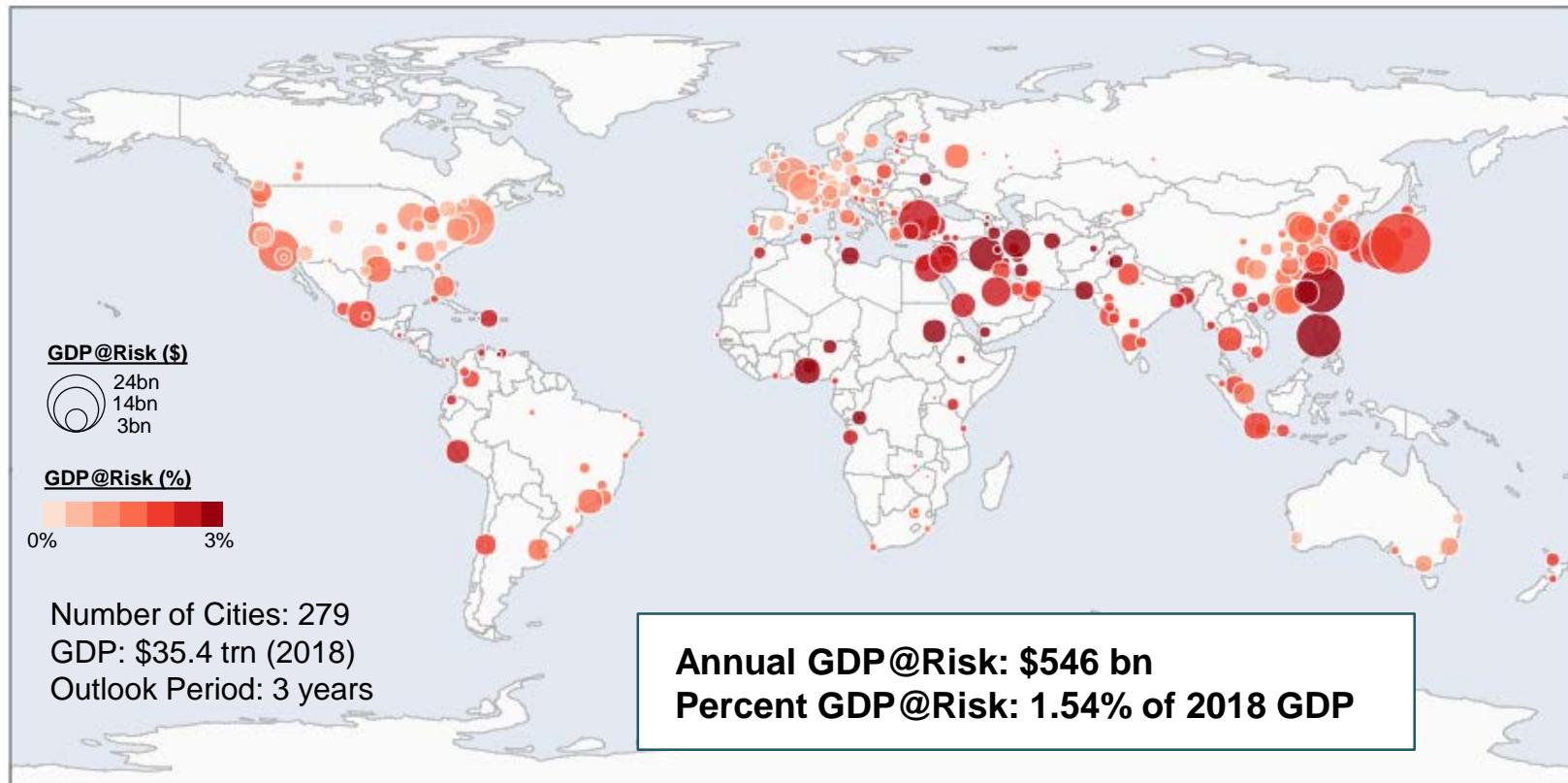
Annual update of GDP@Risk:

2015: \$485bn

2016: \$504bn

2017: \$523bn

2018: \$546bn



Views of Risk

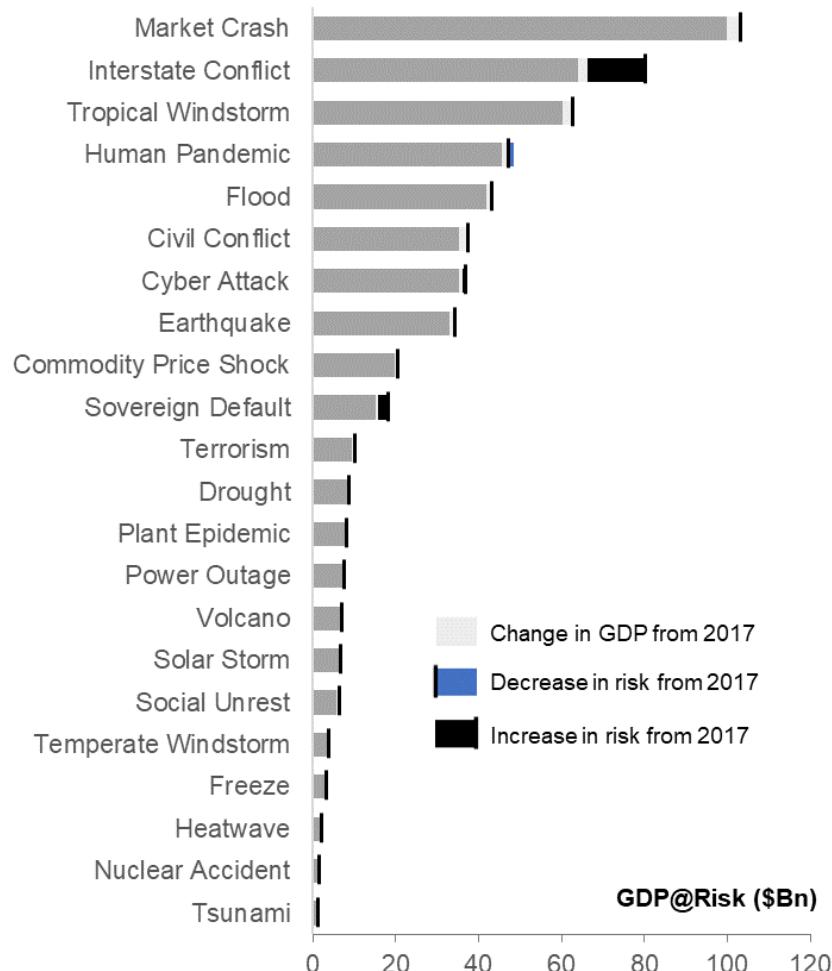
Top 20 Cities at Risk

+Top Risk Type

City	Country	GDP@Risk (\$bn)
Tokyo	Japan	24.31
New York	United States	14.83
Taipei	Taiwan	14.48
Manila	Philippines	13.27
Osaka	Japan	12.42
Los Angeles	United States	11.56
Istanbul	Turkey	11.22
Shanghai	China	8.48
London	United Kingdom	8.43
Baghdad	Iraq	8.14
Seoul	South Korea	7.13
Hangzhou	China	6.45
Riyadh	Saudi Arabia	6.20
Nagoya	Japan	6.15
Paris	France	5.94
Tehran	Iran	5.78
Tel Aviv	Israel	5.73
Suzhou	China	5.73
Chicago	United States	5.72
Tianjin	China	5.72

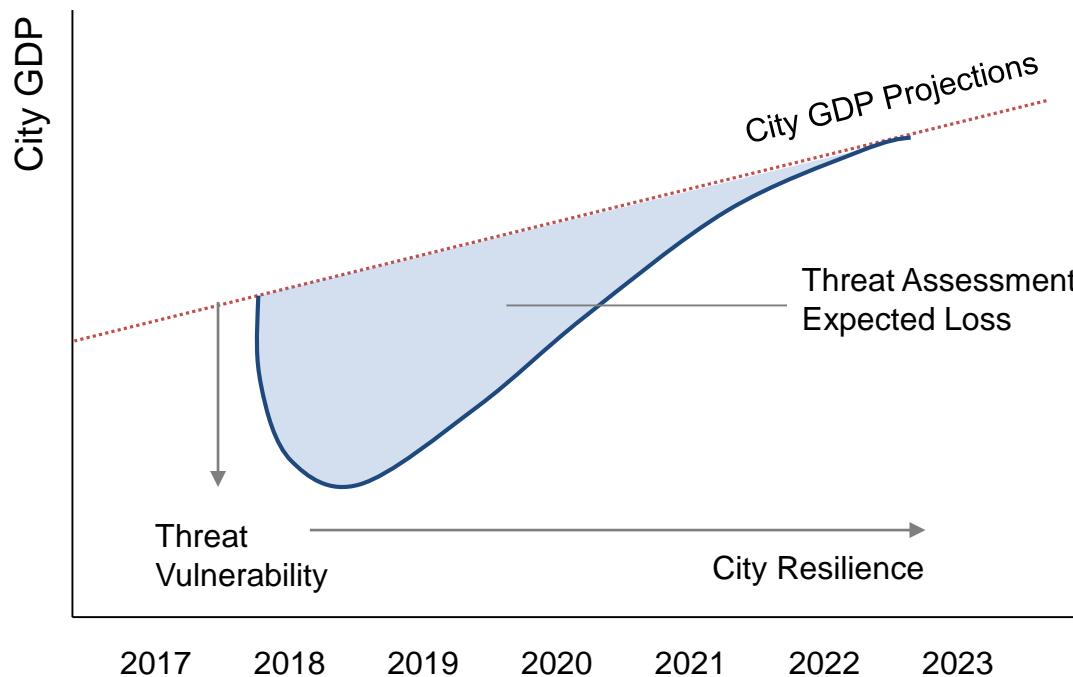
Ranking of Threats

+Changes from 2017



GDP@Risk - Methodology

City GDP Projection <i>Oxford Economics</i>	Threat Vulnerability <i>Evidence Base</i>	City Resilience <i>INFORM + Sigma</i>	Threat Assessment <i>Evidence Base</i>	Expected Loss <i>Simplify calculation</i>
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City Definitions and GDP Projections

- How do we define a city?
- Standardize city definition and GDP estimates
 - Oxford Economics City GDP data
 - Detailed specification of city boundaries and estimation methodology
 - Cities defined as larger urban agglomerations which we believe is better suited for economic impact analysis
 - E.g. Tokyo Major Metropolitan Area: Tokyo, Yokohama-shi, Kawasaki-shi, Saitama-shi, Chiba-shi
- **300 cities → 279 cities**
 - Some cities have unreliable GDP data
 - Some cities have been merged



Annual Changes

GRI 2018
+Risk: 2017 → 2018
GDP 2018: \$35.4 tn
GDP@Risk: \$546 bn
%GDP@Risk: 1.54%

+GDP: 2017 → 2018
GDP 2018: \$35.4 tn
GDP@Risk: \$531 bn

Δ GDP@Risk: +4.4%
Δ Resilience: -2.0%
Δ GDP: +3.3%
Δ Risk: +2.9%

GRI 2017 estimate

+Risk: 2015 → 2017
GDP 2017: \$34.3 tn
GDP@Risk: \$523 bn
%GDP@Risk: 1.53%

+GDP: 2015 → 2017

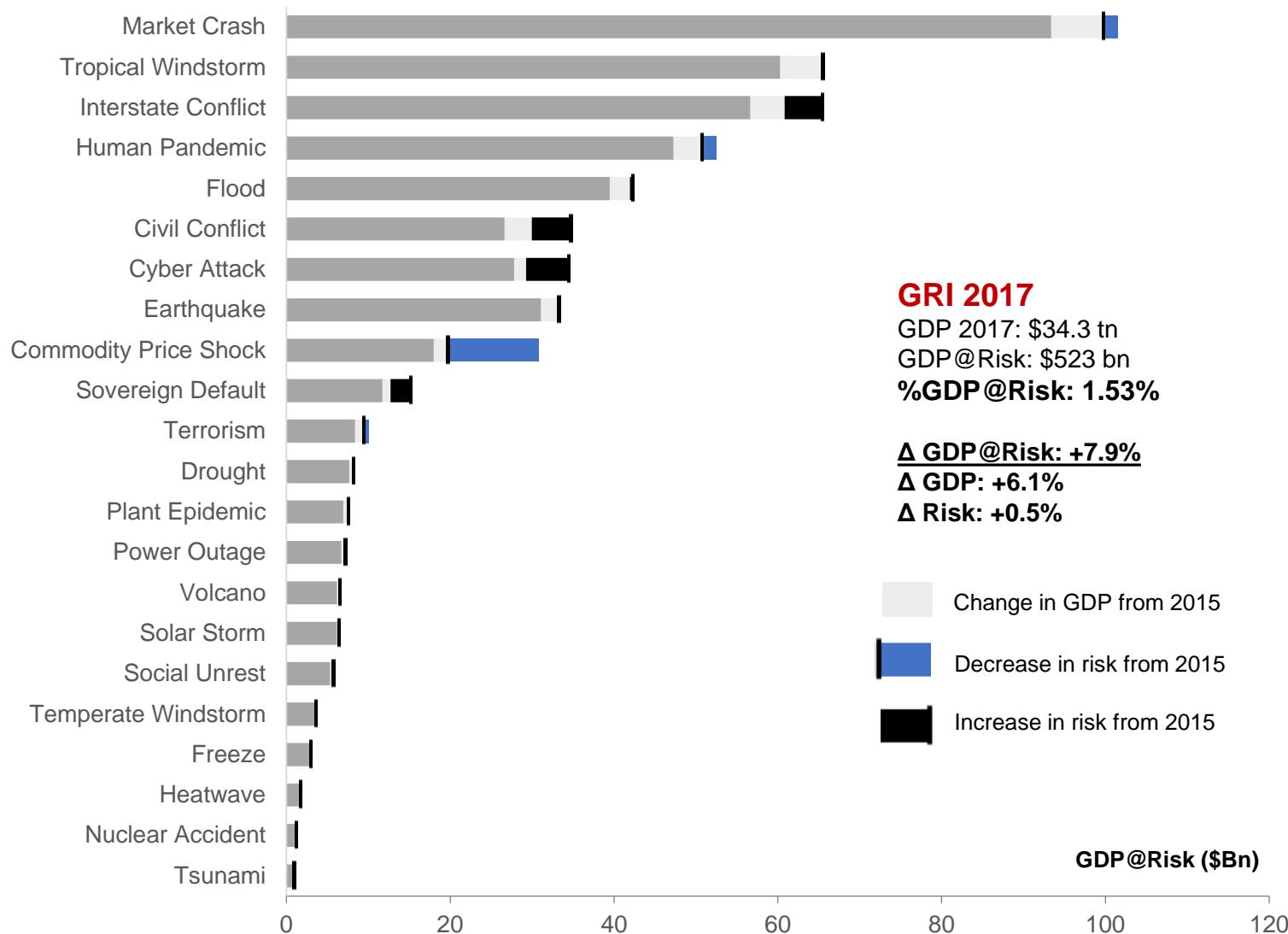
GDP 2017: \$34.3 tn
GDP@Risk: \$521 bn

GRI 2015 estimate
GDP 2015: \$32.31 tn
GDP@Risk: \$485 bn
%GDP@Risk: 1.50%

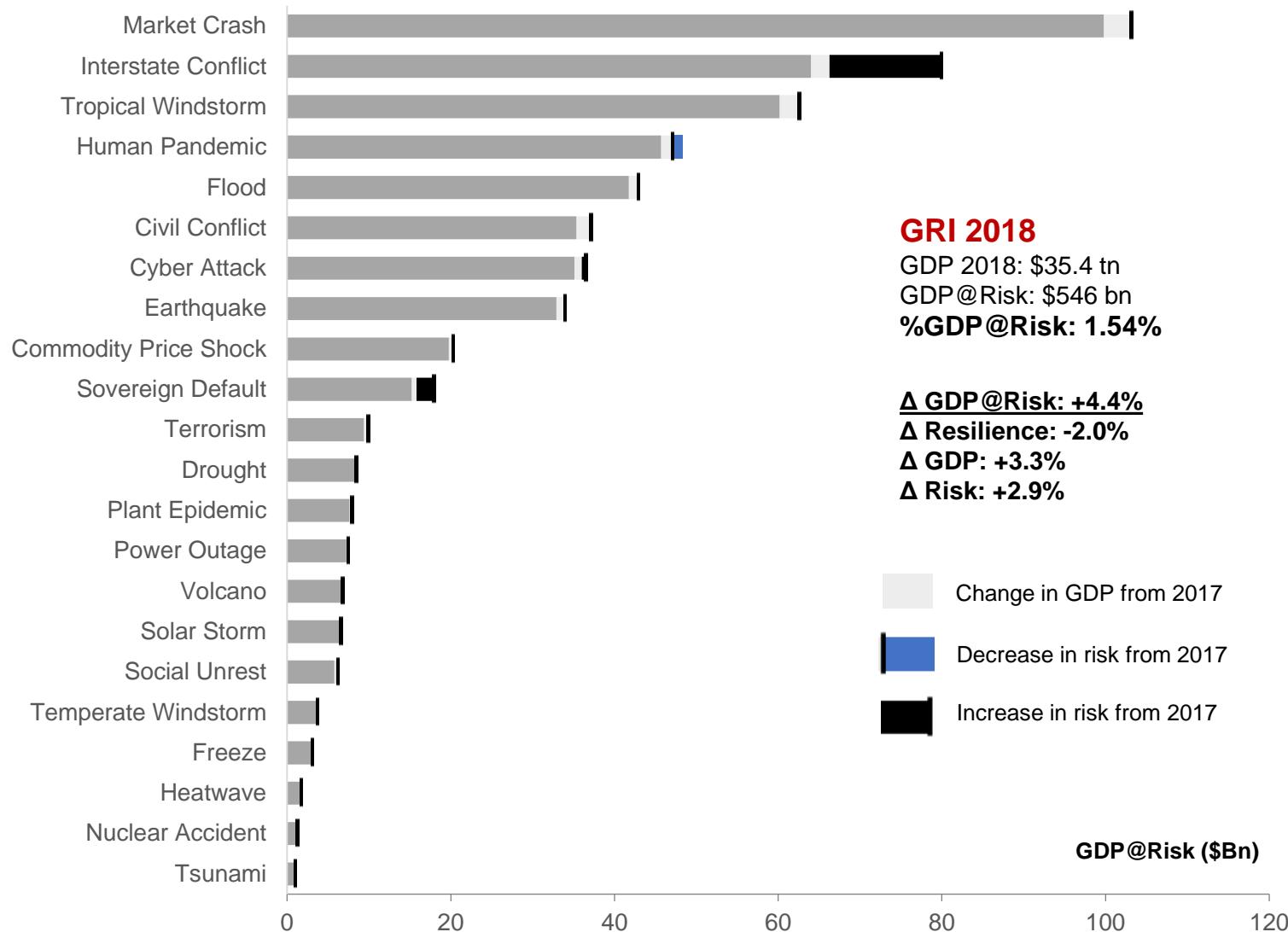
Δ GDP@Risk: +7.9%
Δ GDP: +6.1%
Δ Risk: +0.5%

+Resilience: INFORM
GDP 2017: \$34.3 tn
GDP@Risk: \$513 bn

2015 to 2017



2017 to 2018



Resilience

- Each city is assigned a city resilience score based on three core components

$$\text{City Resilience Score} = \text{Vulnerability}^{1/3} * \text{Coping Capacity}^{1/3} * \text{Economic capacity}^{1/3}$$

- City Resilience Scores are grouped into five resilience levels
 - 1 Very Strong, 2 Strong, 3 Moderate, 4 Weak, 5 Very Weak
 - Reflect major step changes and group similar cities
- **Impact estimate:** 2.0% decrease in GDP@Risk (part model-driven, part actual)

Vulnerability

Economic, political, social characteristics that can be destabilised

Data Sources:

UN Consortium:
Index for Risk
Management (INFORM)

Coping
Capacity

Institutional capacity to respond to disasters

Economic
Capacity

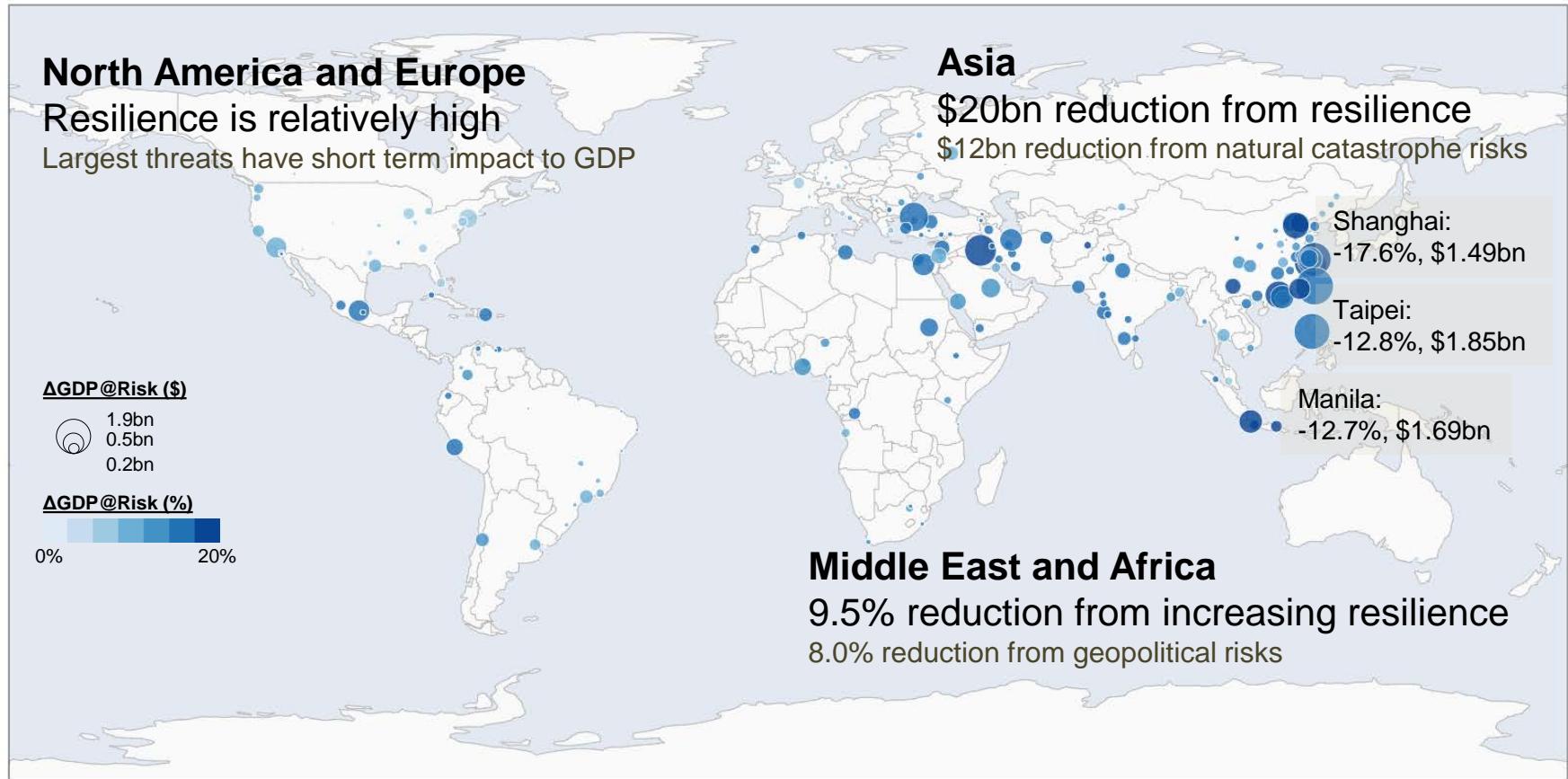
Insurance and wealth as factors of fiscal resilience

Swiss Re:
SIGMA Non-Life Insurance Penetration

Oxford Economics:
City GDP/Capita

Increasing Resilience

- If all cities increased their resilience by one ranking, GDP@Risk decreases by \$38bn to \$508bn, a 6.9% reduction in expected loss.



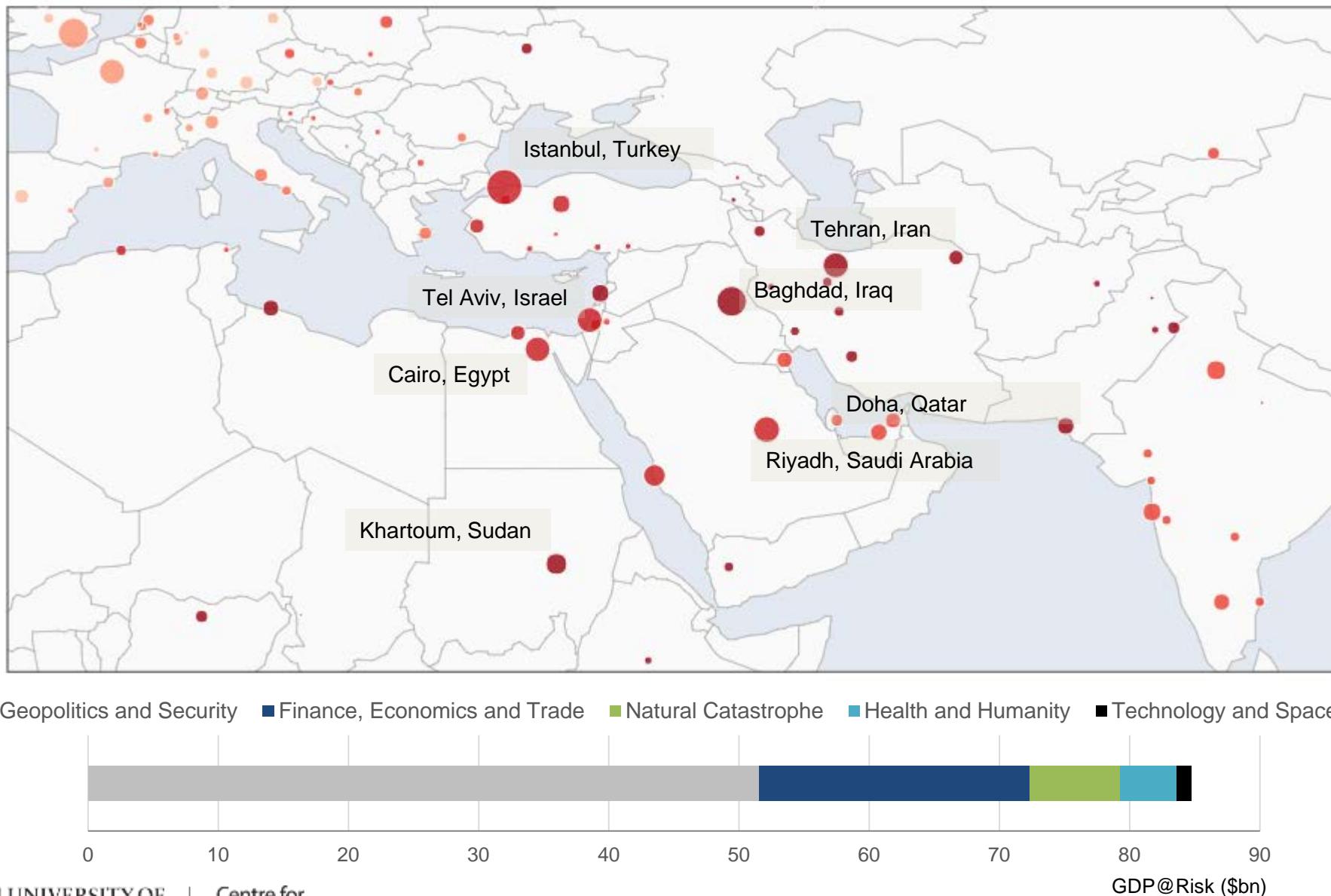
Regional Focus - Asia



■ Natural Catastrophe ■ Geopolitics and Security ■ Finance, Economics and Trade ■ Health and Humanity ■ Technology and Space



Regional Focus – Middle East and Africa



Annual Threat Assessments

- Each year CRS assesses whether there has been significant recent change in any of the threats relative to our baseline assessment
- The review process involves:
 - Sourcing *high quality, consistent, updated* data layers as evidence base for threat assessments
 - Identification of recent major events and other factors that may significantly change either the likelihood or severity of possible events during the outlook period
 - Consultation with internal or external experts
 - A more refined assessment to find any geographic variation in threat changes



Geopolitical Risks – Interstate Conflict

- Data layer: Global Firepower Index; conflict pair identification
- Ceasefire broken between **Armenia** and **Azerbaijan**
- Heightened tensions between **Saudi Arabia** and **Qatar**
- **United States** involved in multiple international disputes, most notably related to the nuclearization of **North Korea**
 - War like rhetoric and strategic threats
 - Continued provocations including nuclear tests and IRBM / ICBM missile launches (inc. flights over Japan)
 - Increased US show of force/deterrence and sanctions activity
 - Severe escalation could spill over into a supra-regional power war



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Former NATO military chief: there's a 10% chance of nuclear war with North Korea

And a 20-30% chance of a conventional one.

Updated by Yochi Dreazen | Sep 28, 2017, 9:00am EDT



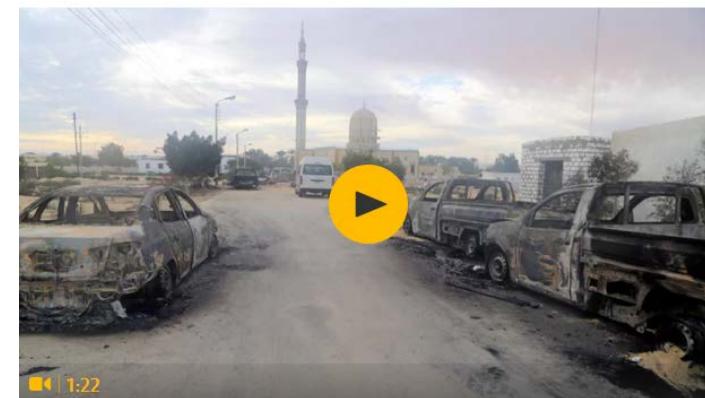


Geopolitical Risks - Terrorism

- Data layer: Global Terrorism Index
- Terrorist cells increasingly fragmented giving rise to 'lone-wolf' attacks, but potential for large-scale attacks still remain
 - **Syria/Iraq:** ISIS caliphate continues to be eroded through military coalition
 - **Philippines, Malaysia, Indonesia:** Increased presence of ISIS
 - Incidences in **Egypt** (300 killed in November) and **Turkey** have increased
 - Increase in number of 'low-tech' attacks in Western European countries including **Finland, Denmark, Sweden, Germany, France** but counter-terrorism efforts are still strong and interdicts most plots
 - **Myanmar:** Divisive ethnic tensions especially between Muslims and Buddhists. Possibility of IS and other extremist groups exploiting refugee crisis.

Egyptian warplanes strike 'terrorist' targets after mosque attack kills 305

Scores more wounded when al-Rawdah mosque in north Sinai bombed and fleeing worshippers gunned down



Geopolitical Risks – Social Unrest, Civil Conflict



■ Social Unrest

- Data Layer: Economist Intelligence Unit's Social Unrest Index
- **United States**: experiencing heightened social/racial tensions and increased polarization following Trump election; social media bias playing a role
- Protests in **Venezuela** and **Iran**
- **Greece** and **Egypt**: showing signs of stabilization
- Increasing social unrest in **India** about ethnic, caste and religious issues, labour and employment, and minority and women's rights



■ Civil Conflict (previously Separatism)

- Data Layer: Global Internal Violent Conflict Risk Index
- **Myanmar**: Divisive ethnic tensions have increased significantly in Rakhine state. Over 600,000 Rohingya displaced.
- Increased separatist activity seen in Kashmir, **India** that has lead to Indian military interventions in 2017



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