Low Rate Fog Lifts, But is the Future Clear?

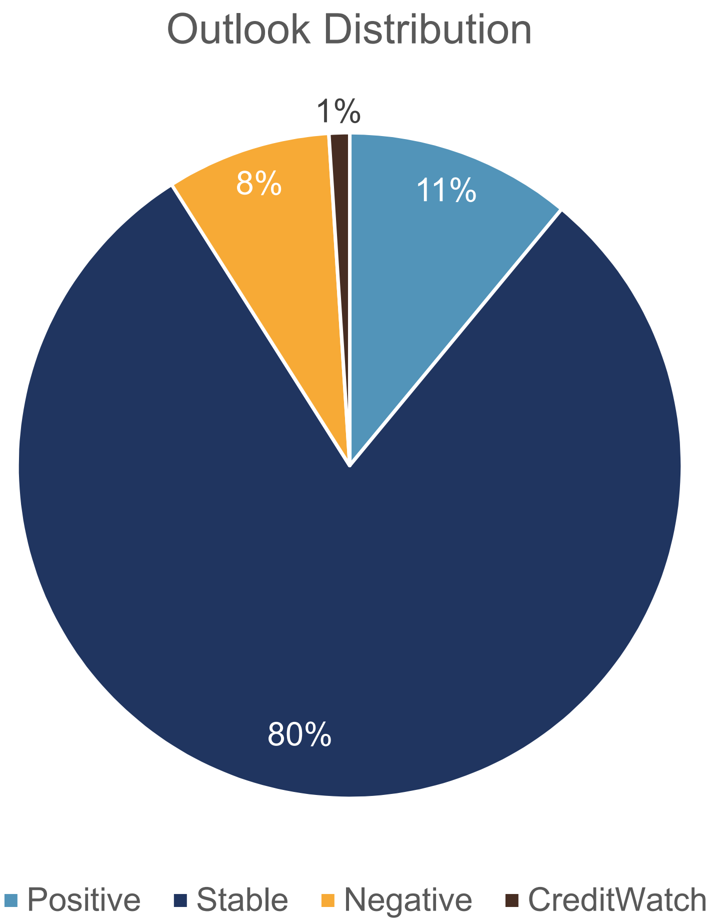
Volker Kudszus, Director

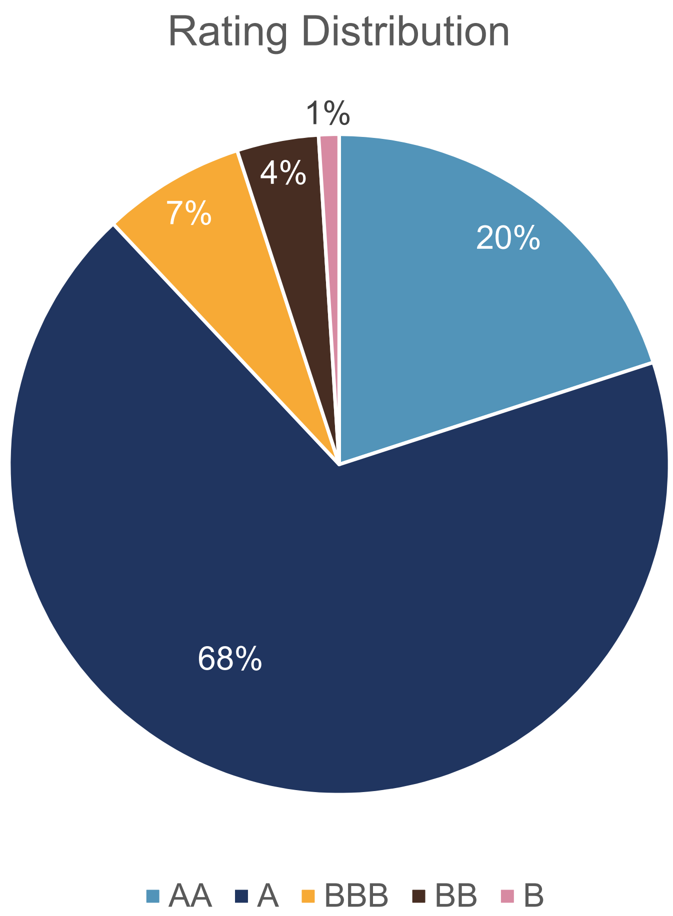
Dennis Sugrue, Senior Director

6 November 2018

S&P Global Ratings

EMEA Insurance Ratings Strong & Stable...



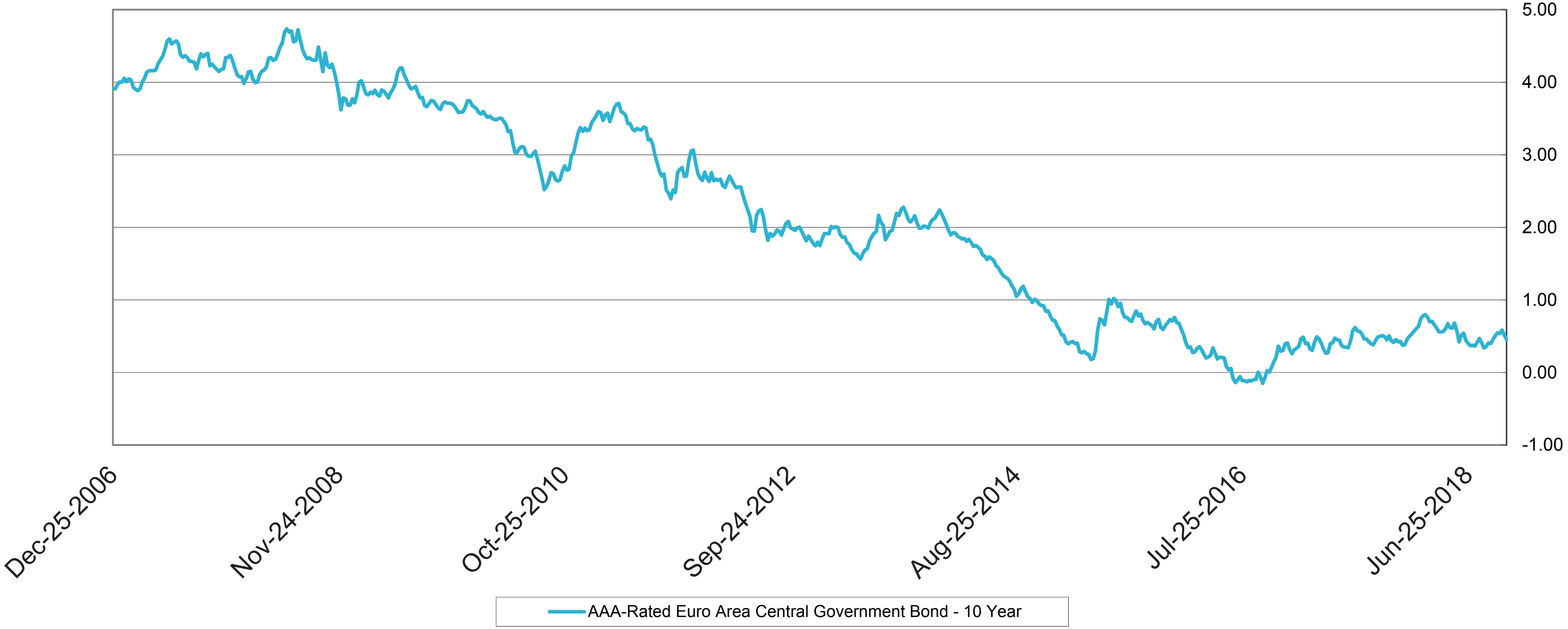


S&P Global Ratings

As of November 4 2018

Interest Rates To Rebound

Our 10 years Eurozone forecast: 2018E 1.1%, 2019E 1.6%, 2020E 2.2%, 2021E 2.7%

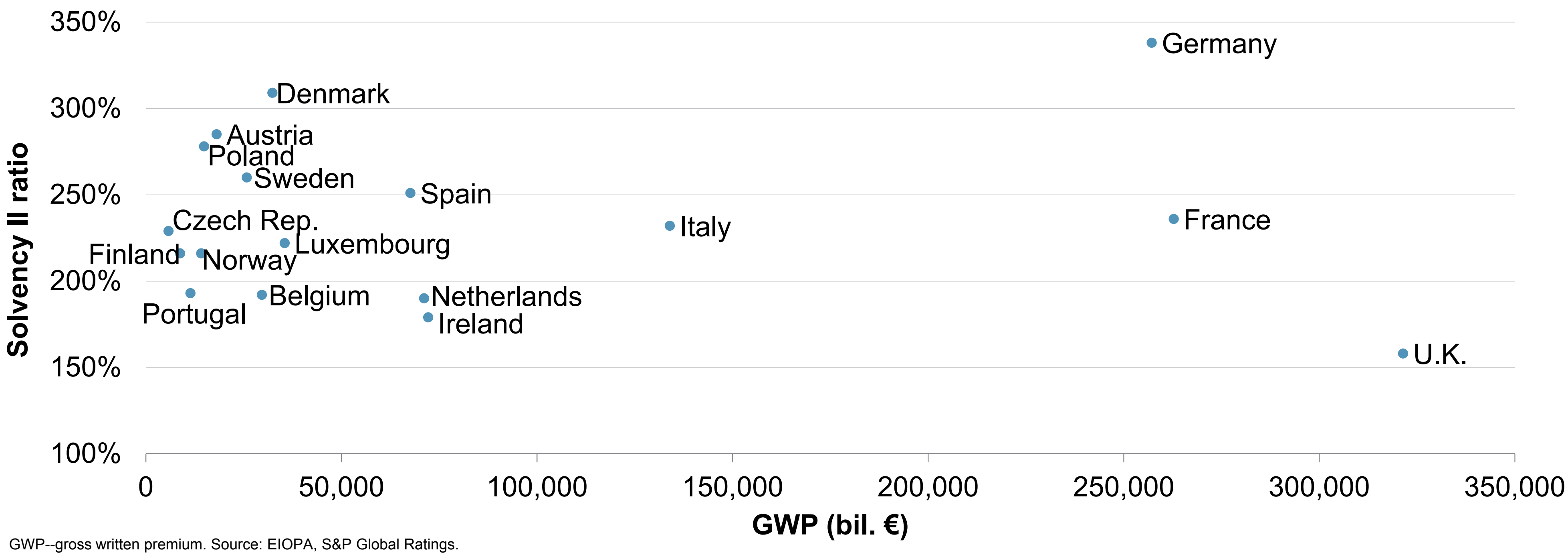


Source: S&P CapIQ October 30 2018, S&P Global September 26 2018

S&P Global Ratings

Strong Capital Starting Point

S-II Ratio for Year End 2017

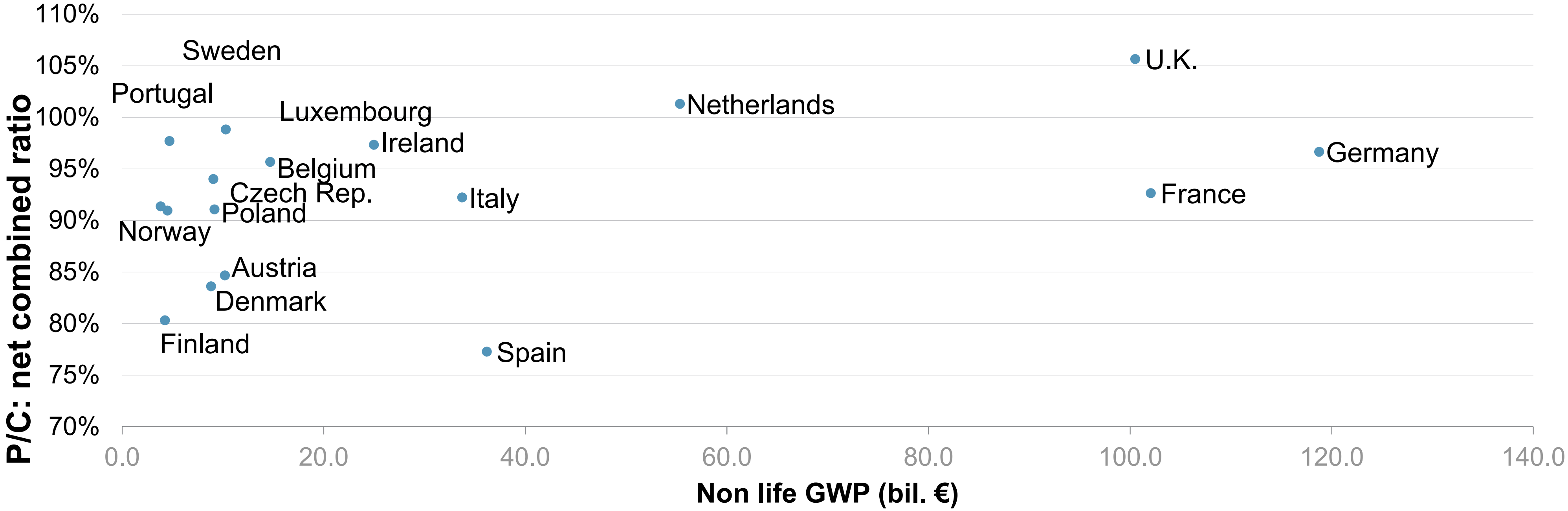


GWP--gross written premium. Source: EIOPA, S&P Global Ratings.

S&P Global Ratings

Non-life Margin offsets Low Yields

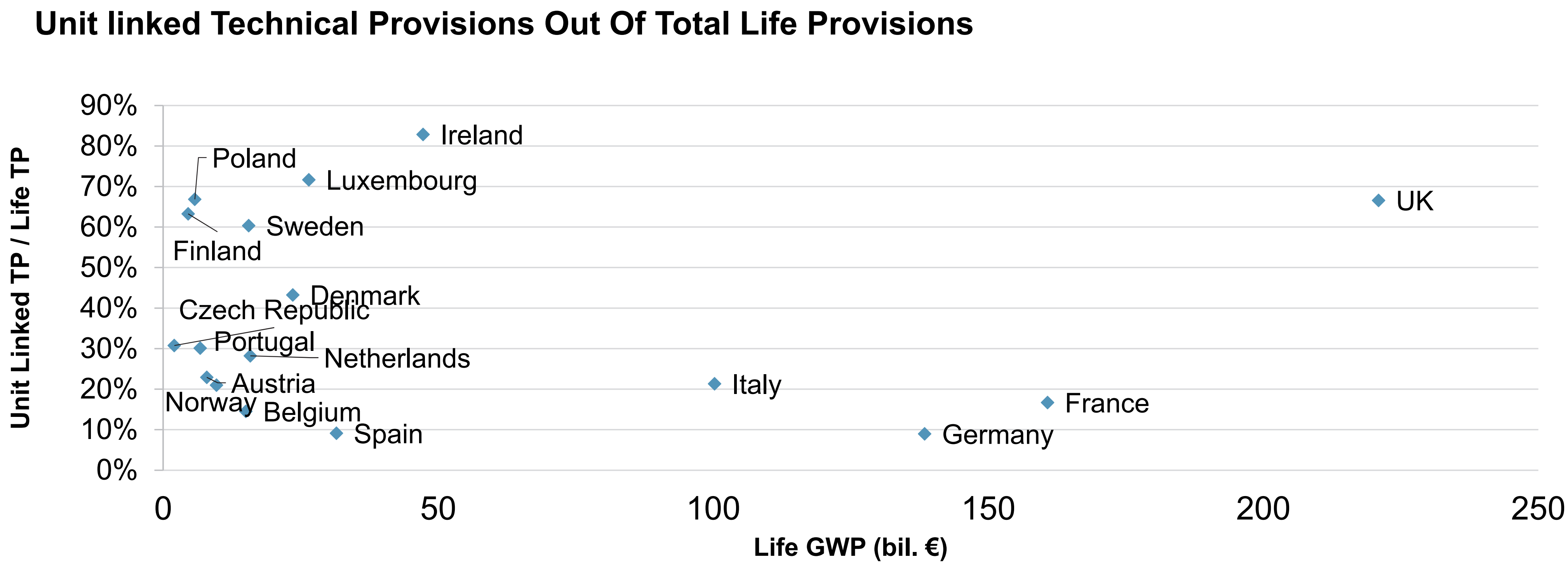
Combined Ratio For Year End 2017



GWP--gross written premium. Source: EIOPA, S&P Global Ratings.

S&P Global
Ratings

Life remains challenged



Source: S&P Global Ratings.

S&P Global Ratings

Regulatory & Accounting Updates

	2015	2016	2017	2018	2019	2020	2021	2022
Solvency II		Start Date			Update		Update	
IFRS 17							Start Date	
ICS				field testing		confidential reporting		
G-SII	EBA			ABA				

S&P Global
Ratings

Structural Differences in EM

- Emerging EMEA ratings weaker than European Peers, on average
- Country risk, governance and concentrations in asset portfolios are the key differences

	W. Europe	Russia/CIS	GCC	S. Africa	E. Europe
Business Risk Profile	Strong	Vulnerable	Satisfactory	Fair	Satisfactory
IICRA	Intermediate Risk	High Risk	Intermediate Risk	Moderate Risk	Moderate Risk
Competitive Position	Strong	Adequate	Adequate	Adequate	Adequate
Financial Risk Profile	Strong	Less than Adequate	Upper Adequate	Less than Adequate	Strong
Capital & Earnings	Strong	Upper Adequate	Moderately Strong	Moderately Strong	Very Strong
Risk Position	Intermediate Risk	High Risk	Moderate Risk	Moderate Risk	Intermediate Risk
Financial Flexibility	Adequate	Adequate	Adequate	Adequate	Adequate
Liquidity	Exceptional	Strong	Strong	Strong	Exceptional
Management & Governance	Satisfactory	Fair	Fair	Fair	Satisfactory
ERM	Adequate, Strong Risk Cont.	Adequate	Adequate	Adequate	Adequate
SACP	a	bb	bbb+	bb+	a-

Ratings are strong and stable…

- EMEA Insurance ratings benefit from:
  - Solid capitalization and strong balance sheets
  - Competitive advantages in key markets, and often diversification of risk and region
  - Enterprise risk management frameworks to identify, quantify and monitor risks

- Insurers outside Europe face additional risks, which are reflected in the ratings

- Management actions have steered companies through a difficult period of recession, low interest rates and market volatility
  - Shifts in business models
  - Disciplined underwriting and investment risk selection

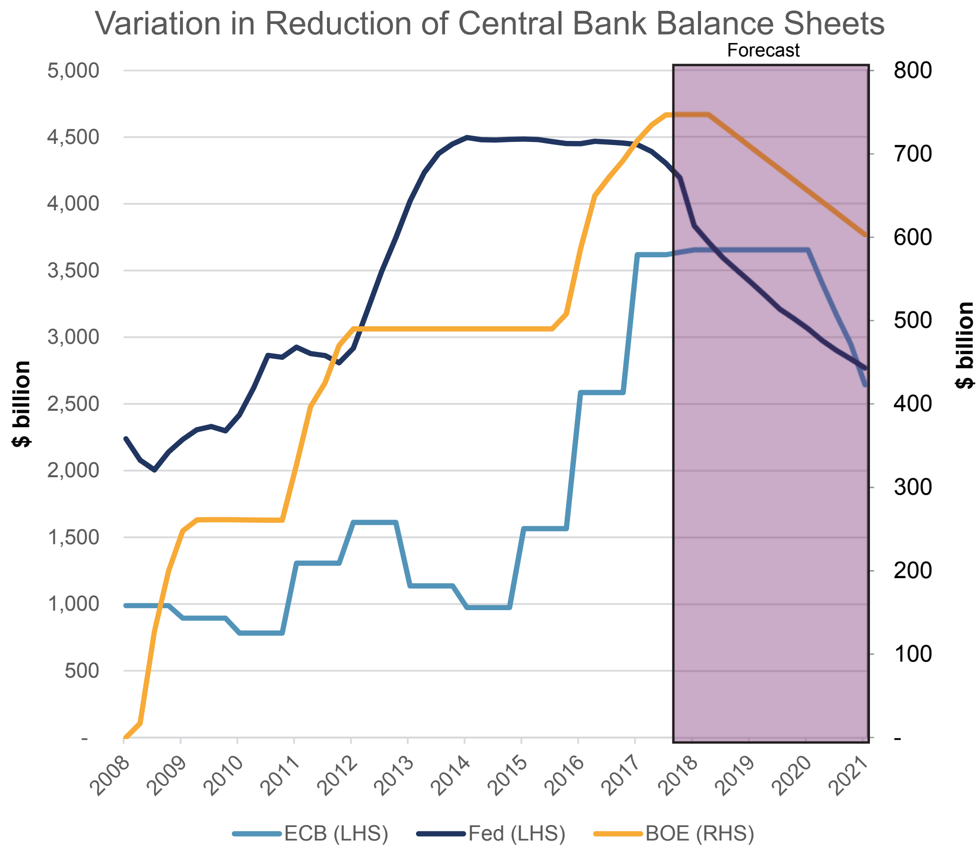
Base case supports stability…

- Measured unwind of QE in the US, UK and EU
- Economic expansion to continue, albeit at a slower pace
- Interest rates to ‘normalize’ gradually, spreads to widen
- Brexit deal to be agreed
- Digitalization / Insurtech will complement the insurance business model

But…

Walking the Tightrope

- Communication and timing will be vital
- Too slow and financial imbalances could build
- Too fast and risk sparking asset volatility, rapid inflation or depressed economic growth
- Insurers w/ US exposure will feel the effects first, good or bad



Source: S&P Global Ratings, Bank of England, US Federal Reserve, European Central Bank

S&P Global
Ratings

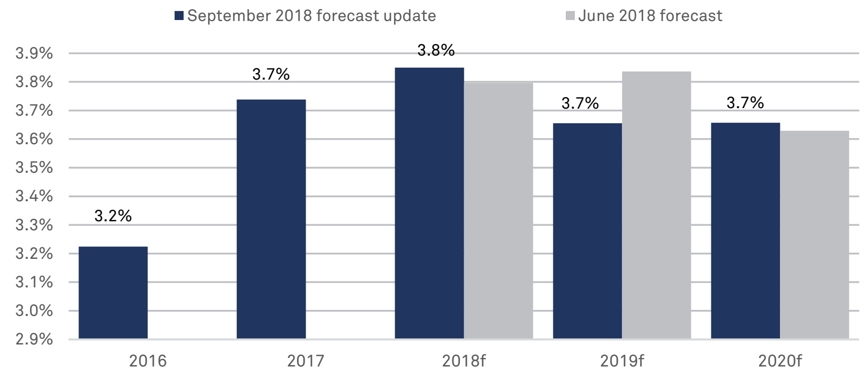
Inflection Point?

- The US seems latest in cycle
  - Economic growth past the peak
  - rates rising and spreads widening.

- Europe arguably more mid-cycle, however disruption in the US would adversely affect European assets and economic growth

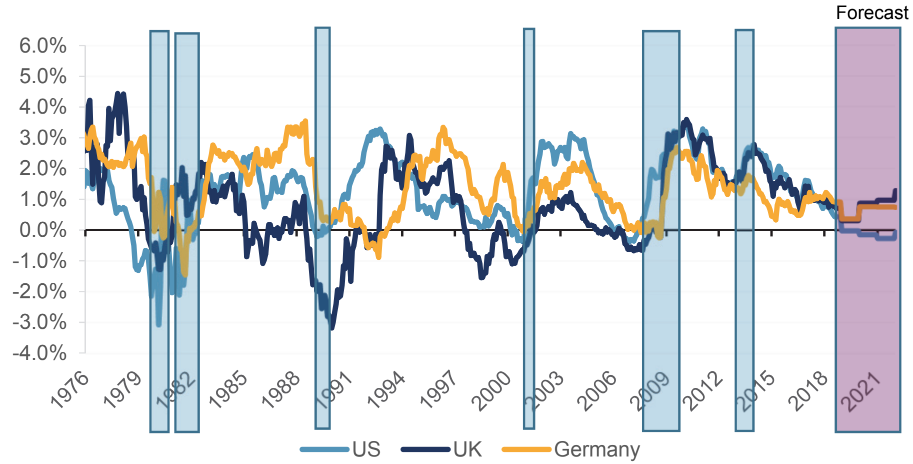
- EMEA Insurers arguably well protected, though balance-sheet and earnings volatility could result

World GDP Growth To Peak in 2018



Source: S&P Global Ratings

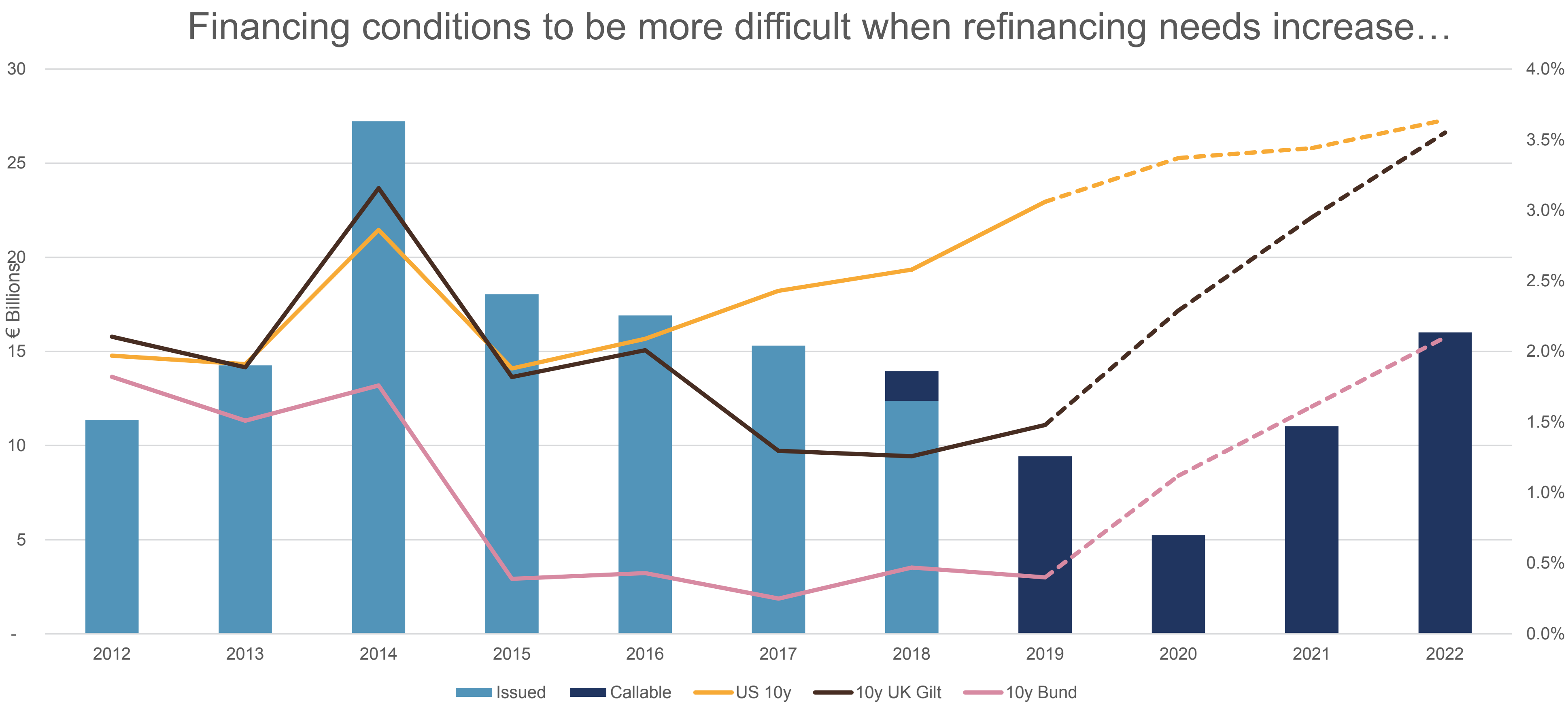
Flat/Inverted Yield Curves' Predictive Powers?



Source: S&P Global Ratings, Bank of England, US Federal Reserve, Bloomberg

S&P Global Ratings

Window closing?



Source: S&P Global Ratings, Bloomberg

S&P Global Ratings

No-Deal Moves Into Sight

- Sovereign Impact
  - 1 Notch Downgrade to the UK would not directly impact UK insurance ratings
- Macroeconomic Shock
  - Estimate economic impact to be equivalent to 'BB' stress scenario
  - 1 in 4 UK insurance groups could see rating change
  - Irish economy likely to be hit harder. Insurers there potentially at risk
- Operational Implications
  - Inability to service policies not a default risk to FSRs / ICRs
  - Delay of claim payments a reputational risk for UK insurers
  - Discontinuity of derivative contracts a liquidity and earnings risk for EU27 Insurers

Insurance Rating Heat Map	
Business Risk Profile	0%
IICRA	7%
Competitive Position	0%
Financial Risk Profile	27%
Capital & Earnings	40%
Risk Position	0%
Financial Flexibility	40%
Liquidity	0%
SACP	27%

Rating score changes due to stress test applied to 15 rated insurance groups most exposed to UK

S&P Global Ratings

Is the Future of Insurance here?

- Data Mining
- Augmented Reality
- Robot cars
- Big Data
- Artificial Intelligence
- Blockchain
- Cloud Computing
- Black Box
- DNA Insurance

Is the future clear?

- Stable outlook for EMEA Insurance is predicated on strong base against familiar risks
- If the downside occurs, insurers will feel the effects, but arguably more resilient today than before the financial crisis
- Without recession, industry still has plenty to keep busy
- But who is most prepared for the unknown unknowns?

S&P European Insurance Conference, 6th November 2018

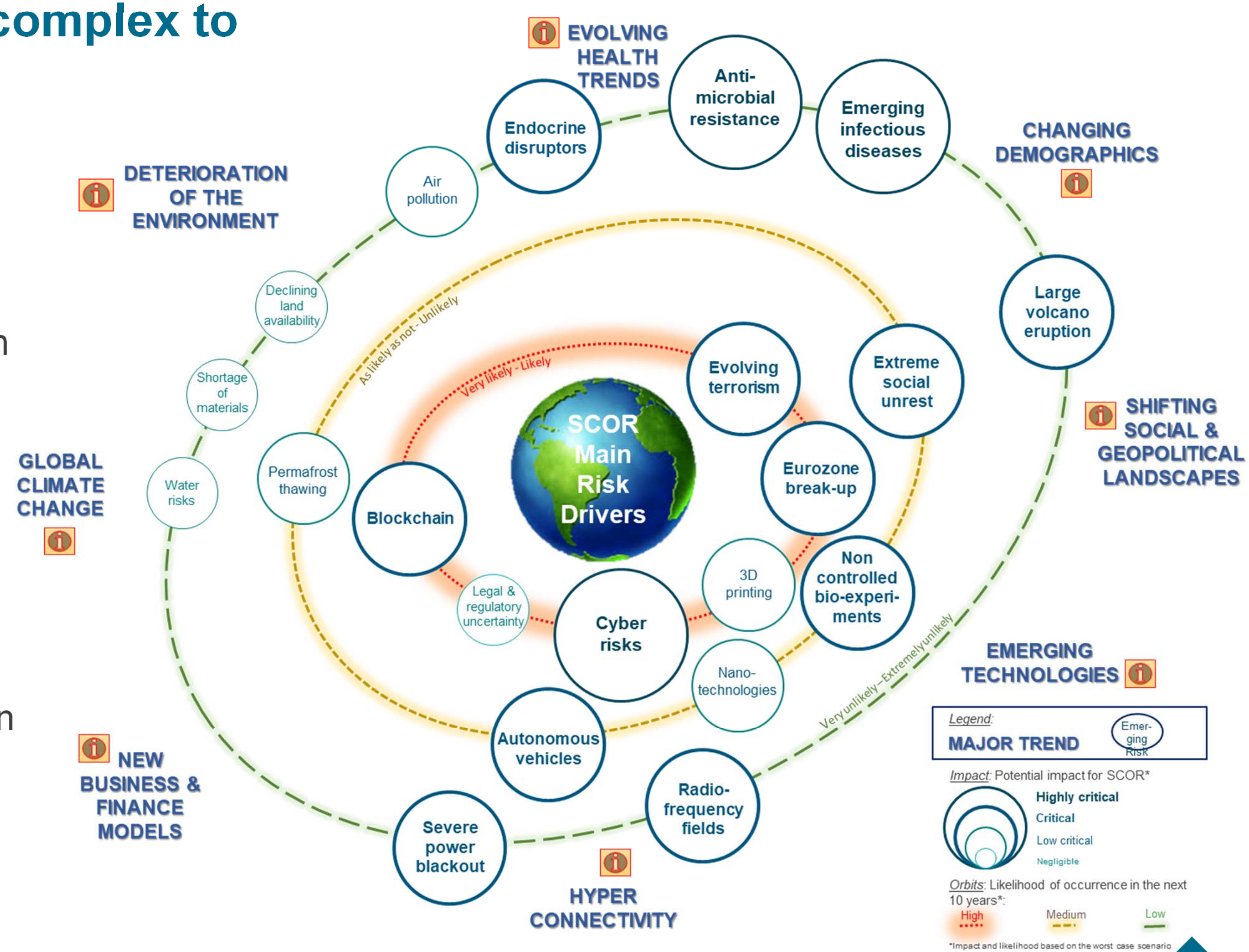
From 2002 to 2018: a reinsurer's perspective
Navigating through increasingly troubled waters

Denis KESSLER
Chairman and CEO – SCOR

SCOR
The Art & Science of Risk

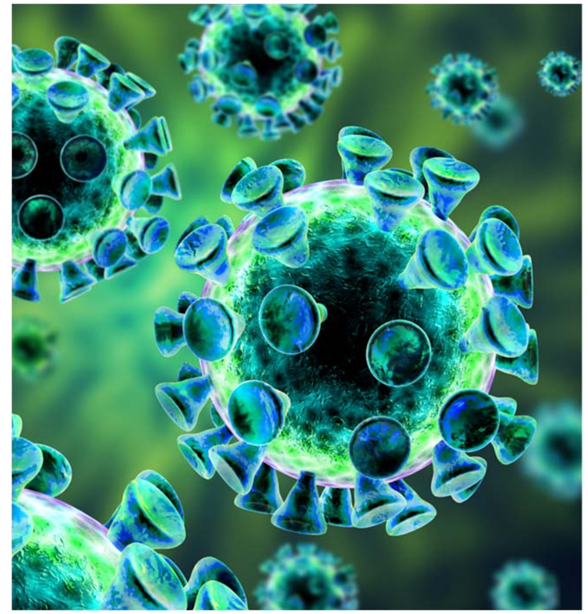
1 Risks are increasingly complex to manage and to model

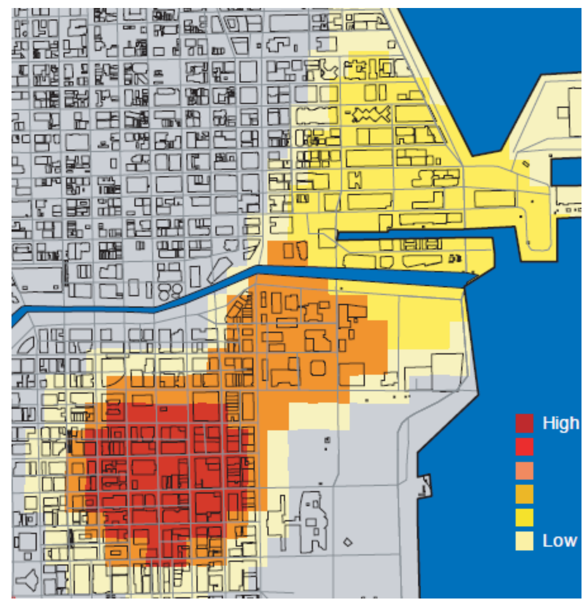
- The risk universe is continuously expanding
- Risks are
  - → increasingly interdependent with complex interactions
  - → less and less circumscribed in time and space (e.g. cyber and terror risks)
  - → increasingly serial and global
  - → increasingly multifaceted
  - → emerging and transforming at an increasingly fast pace, notably because of the acceleration of scientific progress and technological innovation



② The re-insurance industry is exposed to increasingly severe shocks…

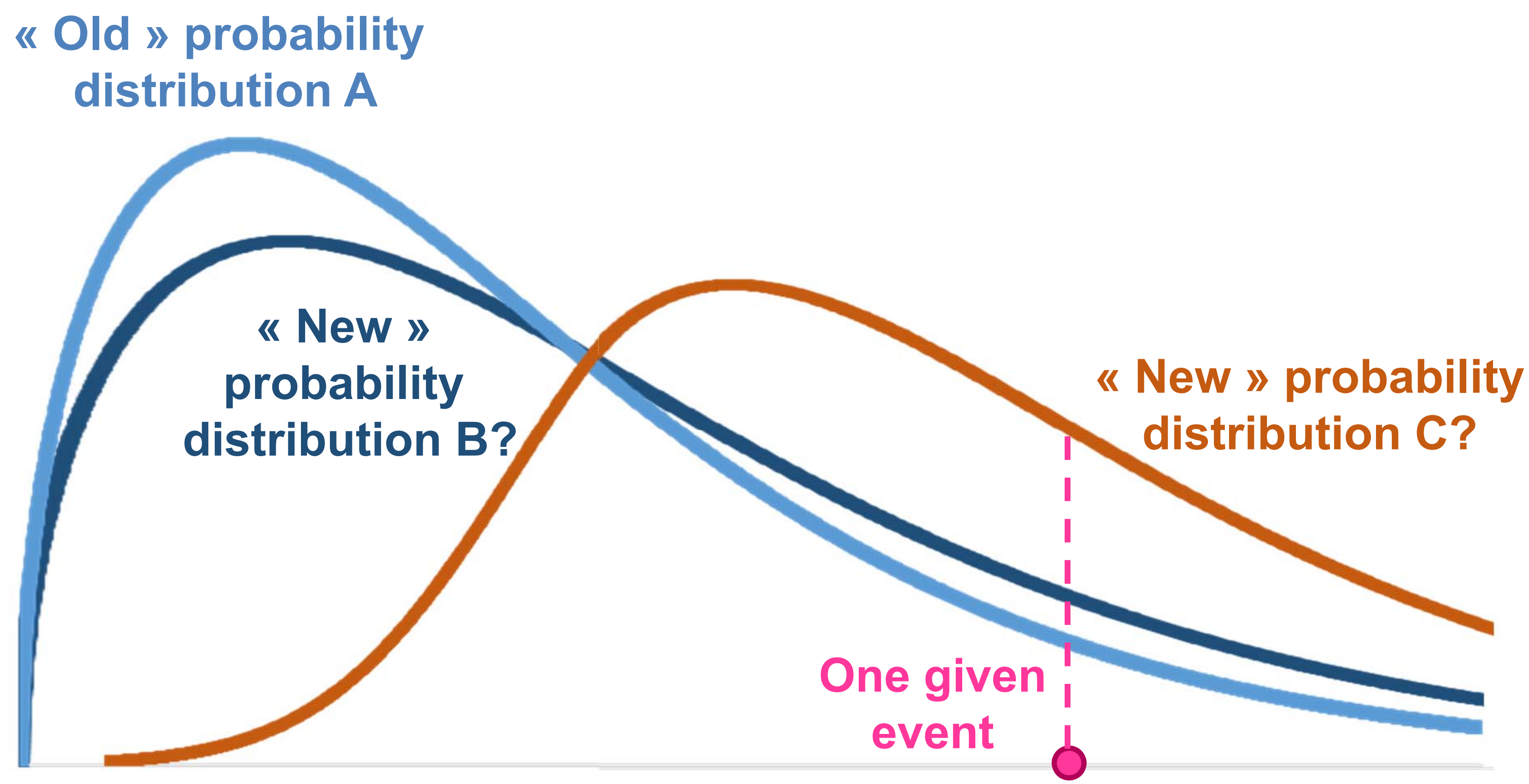
- Global warming has increasingly significant consequences on hydrosphere / weather, resulting in much more destructive natural catastrophes; and the movement seems to accelerate
  - amplitude of sea level rises? change in frequency / severity of cat events ?
  - more extreme events or even emergence of new kinds of tail events (“*hypercane*” hypothesis) ?
  - potential climate chaos?
- The threat of a global pandemic is on the rise due to population growth and globalization
- Terrorism threat has mutated (*hyper terrorism?*)
- The probability of an extremely severe large-scale cyber accident, with far-reaching impacts across business lines / geographies and a lot of “silent” exposures, is increasing





2 … which is raising the fundamental question of the "stability" of the probability distributions

- The concept of ambiguity describes the uncertainty on the probability distribution of a risk
- Each time there is a very large event, two hypotheses may be put forward:
  - The distribution of the considered risk is evolving slightly, with an increased frequency of severe events (i.e. a "fatter tail")
  - The distribution of the considered risk is changing drastically: an event belonging to the tail of the "old" distribution now belongs to the belly of the "new" distribution
- Only time can tell!



Data point in the tail of the current probability distribution A

- Does the probability distribution A remain valid?
- Has it been replaced by the probability distribution B, which has a fatter tail than A?
- Has it been replaced by the probability distribution C, for which the considered event is in the belly and not in the tail ?

SCOR The Art & Science of Risk

3 Re-insurability is increasingly under threat from world refragmentation

- After more than half a century of progressive inclusion, the world today seems to be becoming increasingly fragmented (e.g. Brexit, BEAT, sanctions & embargoes, trade wars, dismantlement of multilateral agreements etc.)
- This refragmentation is pervasive:
  - → international cooperation seems to weaken
  - → tensions between countries / regions are increasing
  - → global norms are being challenged
  - → multilateral institutions appear to be weaker
  - → populist movements are pressuring countries to affirm their sovereignty
- Reinsurers are highly sensitive to these issues, as they may operate optimally in the long run if and only if they get unhampered access to all markets and may pool risks globally

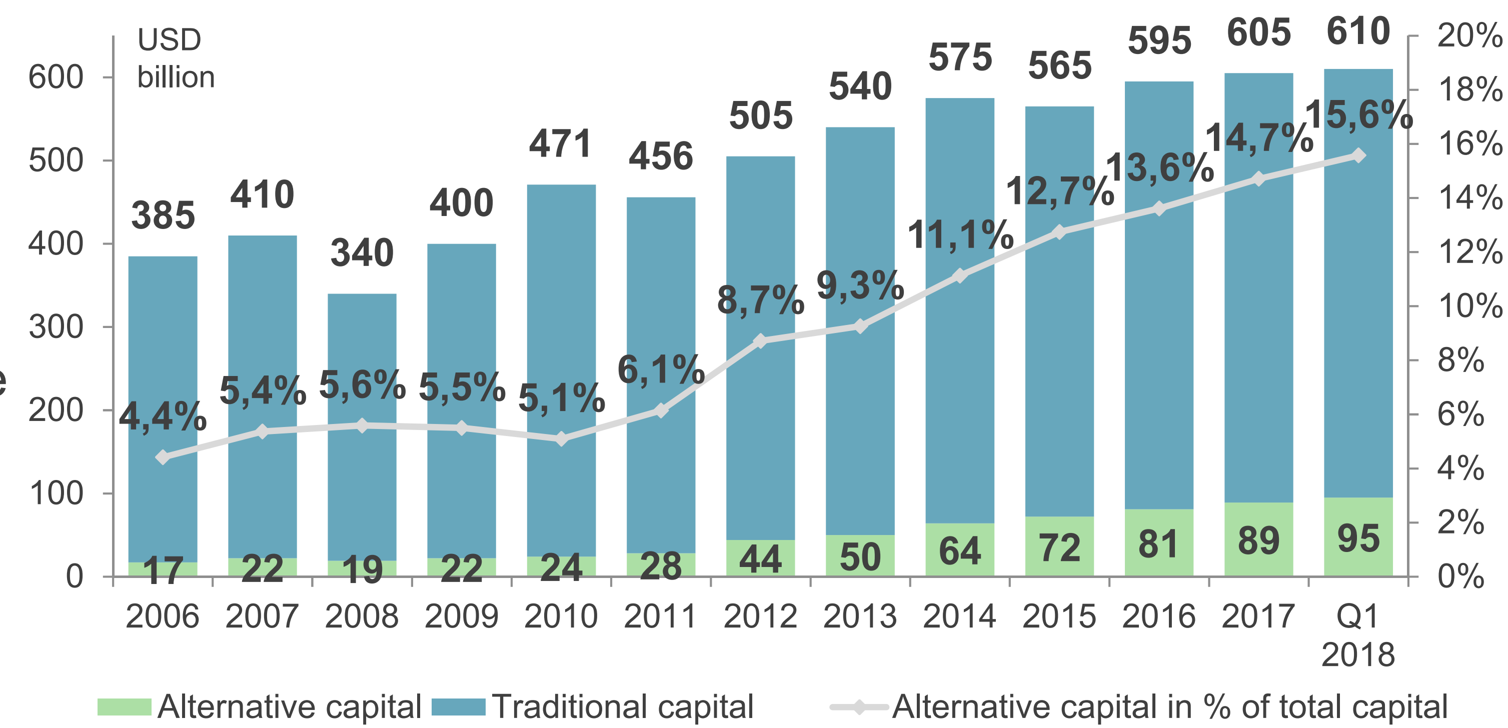
- Managing and mitigating these risks is very challenging, and – for once – more about art than science

4 Contestability from financial markets has intensified since 2010, exerting pricing pressure on Property Cat, with spillover effects on other lines…

- Reinsurers are confronted with financial disruption, in the form of alternative capital
- This increased supply results in material excess capacity and has strongly contributed to the continued P&C Cat pricing erosion over the last 6 years
- The ILS market will continue to grow as both supply & demand will remain strong
  - Supply side: ILS provide uncorrelated returns from the financial markets
  - Demand side: 1/ (Re)insurers will continue to use ILS to diversify their reinsurance / retro panel, and 2/ a growing number of countries wish to set up public-private partnerships relying on parametric ILS solutions to help bridge the protection gap

There is a fundamental difference between competition and contestability: contestability is a situation where new entrants do the same business with a different *production function* (with different constraints or through different technologies)

Global reinsurance capital[1)]



SCOR The Art & Science of Risk

1) Source: AON Benfield

4 … even though traditional reinsurance will never be completely “uberized” by ILS!

- Three main reasons have prevented so far – and will prevent in the future – ILS from truly ousting traditional players
  - The ILS market has **never gone through a real « stress test »**
  - The range of risks covered by ILS remains limited: even though new risks have come to the market (e.g. meteorite strikes, volcanic eruptions, and man-made operational risks such as cyber breaches and rogue trader losses), ILS only cover **event-driven short-tail lines of business** (because investors want their money back after a limited period of time: 3 to 5 years), **for which data is available and which are well-modeled**
  - The **legal / litigation risk is much higher** with ILS than with a traditional reinsurer
- Investors’ growing interest in ILS has been partly driven by the very low yield environment. Will this alternative capital stay even after interest rates normalize?
- Traditional players opportunistically use ILS to expand their capacity and balance their credit exposure. Reinsurers themselves issue around 25%[1)] of ILS!

Alternative capital and ILS are a complement – and not a substitute – to traditional reinsurance

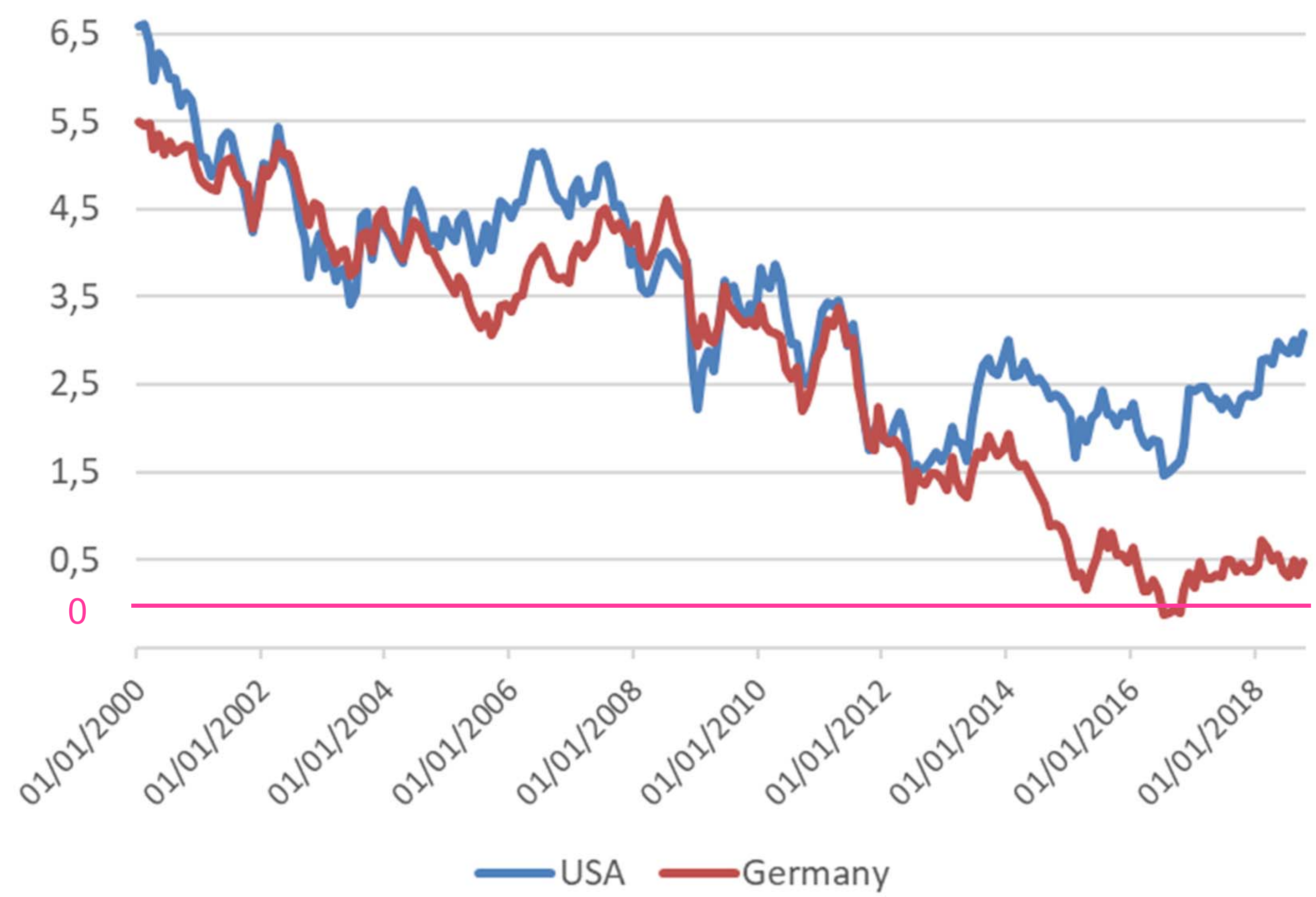
SCOR
The Art & Science of Risk

1) Source: SCOR’s estimates

5 The financial contribution to re-insurers' bottom line has shrunk…

- In the aftermath of the 2007 crisis, a "financial repression" policy has been led by all Central Banks through accommodative monetary policies (QE)
- This very low-yield environment has resulted in a strong decrease of the asset side contribution to re-insurers' bottom line and has been a very heavy hit on re-insurers providing financial guarantees
- After falling to record lows, interest rates have recently increased, but they still remain very low, especially in Europe
- The current and expected future interest rates increases are positive, but will be reflected in the bottom line with delay and in between with unrealized capital losses

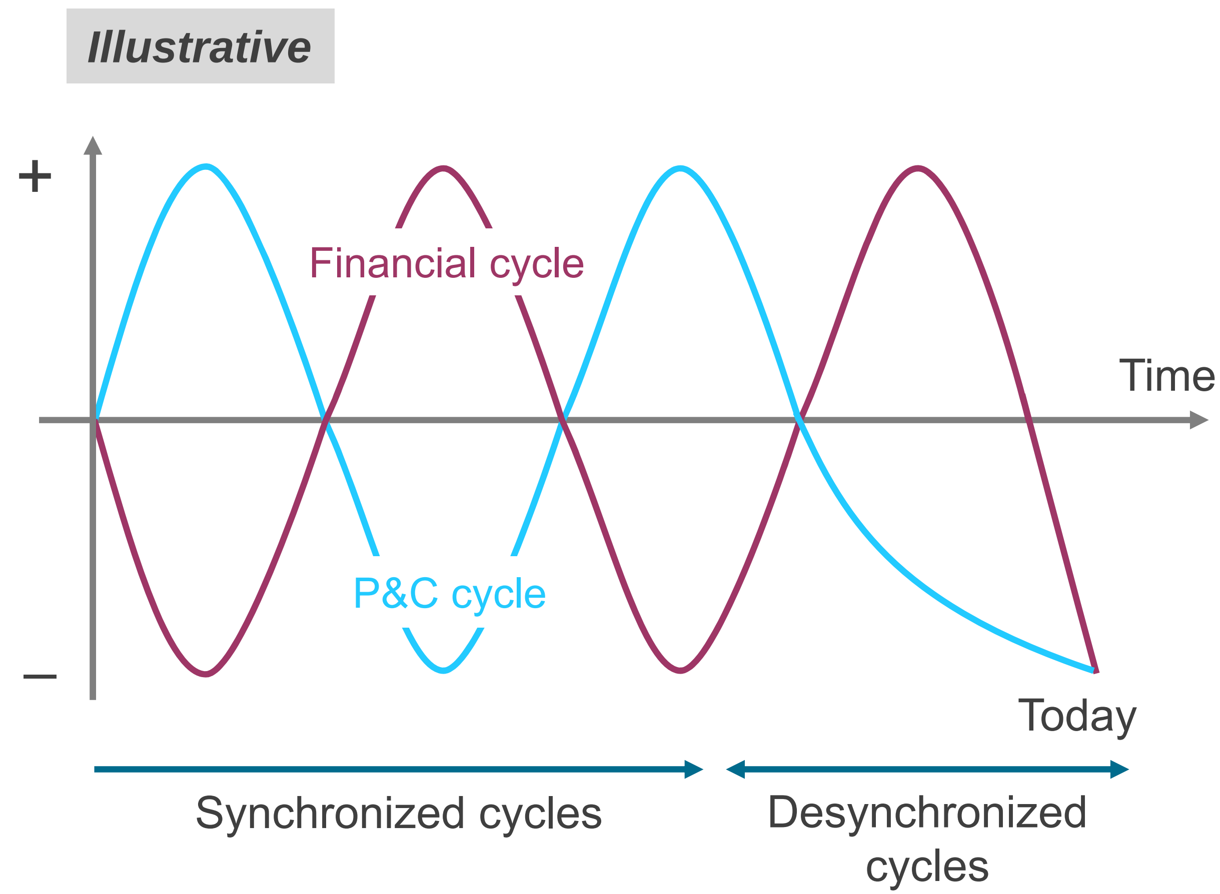
10-year government rates (%)



SCOR
The Art & Science of Risk

5 … which means, given the decrease of P&C rates, that reinsurers are confronted with the combined effects of two negative cycles!

- Historically, the financial / monetary cycle and the P&C underwriting cycle have been in “opposition of phase“, with compensating effects between the technical result contribution and the financial result contribution to reinsurers’ bottom lines
- What’s new is that both cycles have been negatively synchronized for almost ten years now
- After this harsh period of “negative synchronization”, reinsurers may soon enter a new period of “positive synchronization”, in which they will benefit from the reversal of both negative cycles



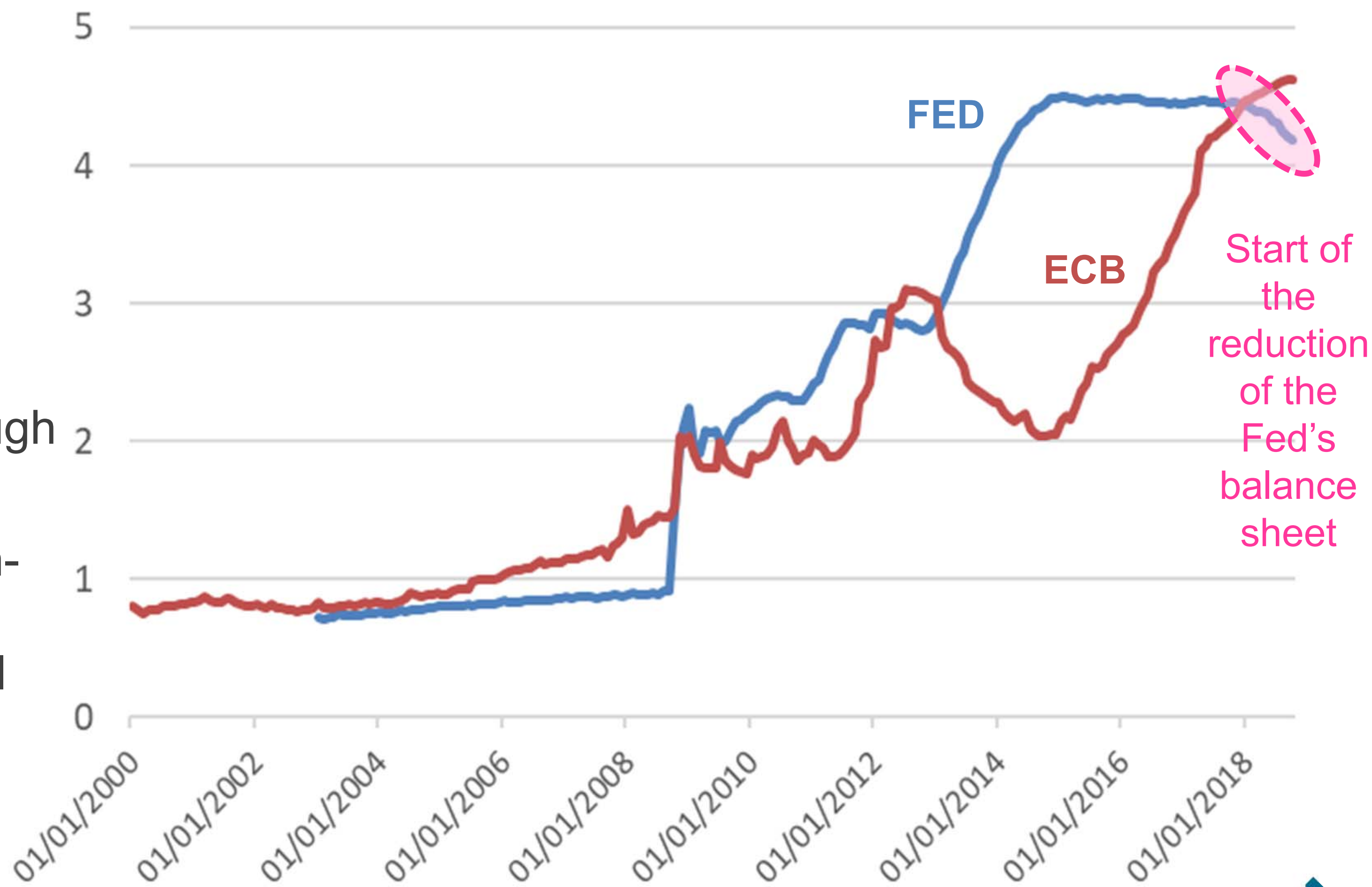
6 The specter of inflation and market crash is spreading: removing the QE "perfusion" by Central Banks is a risky fording

- QE has strongly inflated Central Banks' balance sheets and generated persistent bubbles in various asset classes
- The level of world leverage is historically high
- QE exit strategies have started to be announced in the US[1)] (not yet in the EU)
- Exiting the current situation can be either:

→ Well-managed and controlled, with inflation and rates progressively renormalizing, through small and paced incremental increases

→ Chaotic, following a quicker and higher-than-anticipated increase in inflation, leading Central Banks to decide on sharp and brutal rates increases and resulting in an asset crash that hampers growth and recovery

Total assets of Central Banks (in 10^{12} USD or EUR)

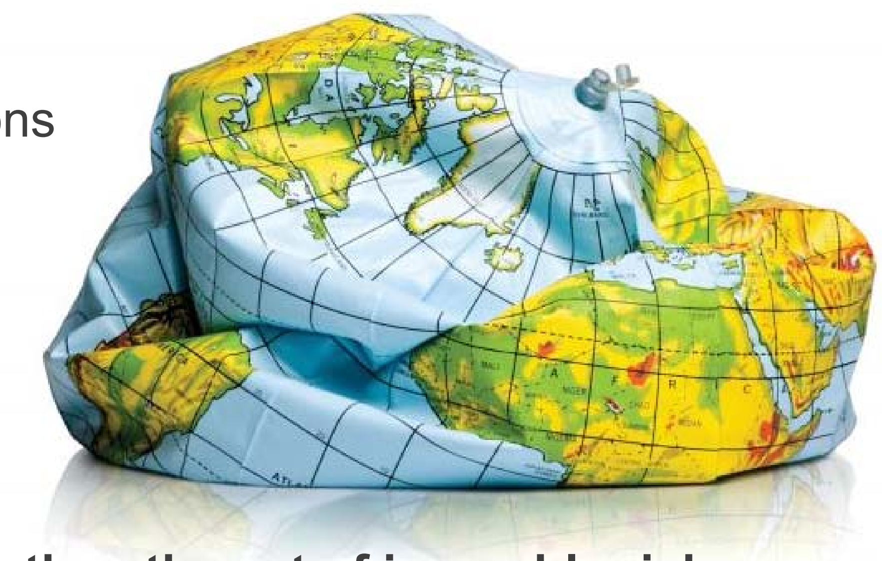


SCOR The Art & Science of Risk

1) Start of the gradual reduction of the Fed's balance sheet up to 600 billion USD per year announced on June 14, 2017, with an end planned in 2022

7 Demand for re-insurance is subject to opposing forces

- On the one hand, **visibility on the macroeconomic side is limited and long-term growth expectations remain subdued, which weighs on re-insurance demand**
  - Economic growth structurally fuels re-insurance
    - Growth increases exposures and the value of insurable assets
    - Risk aversion is positively correlated with income and wealth
    - A troubled economic outlook favors cost-cutting from corporations
  - The *secular stagnation* hypothesis cannot be ruled out
    - Will productivity grow less than in the past?
    - Could we enter a prolonged period of low inflation and slow growth, absent any extraordinary (e.g. fiscal) stimulus?



- On the other hand, **there is a huge protection gap to be bridged globally; in other words, the set of insured risks is much smaller than the set of insurable risks**

- Many people / corporations are underinsured or uninsured, in both emerging and developed countries
- Bridging this protection gap requires strong partnerships between re-insurers, supranational bodies, international organizations, public authorities, and scientists

8 Re-insurance regulatory requirements and reporting have become increasingly burdensome and complex…

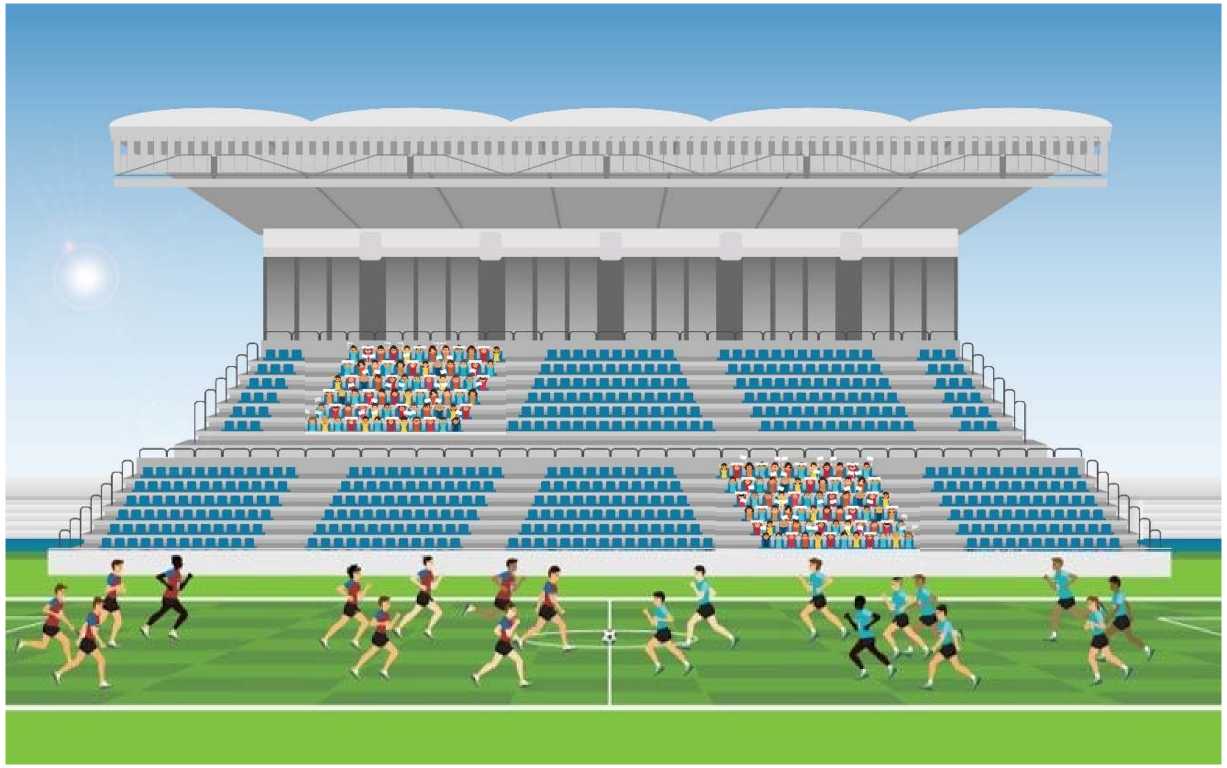
- In the aftermath of the financial crisis, the regulatory oversight of the whole financial sector has become much more stringent, in the name of "*stability*"
- Re-insurance regulatory developments have been – and still are – burgeoning…
  - Solvency II (which will be reviewed in 2018 in 2020)
  - Gold plating of some supervisors, especially in Europe
  - Increased powers to EIOPA e.g. with regard to the oversight and benchmarking of internal models
  - ComFrame and the Insurance Capital Standard (ICS)
  - Prudential regulation for systemic risk: from an entity-based approach (designation of G-SIIs[1)]) to an activity-based approach
  - Recovery and resolution planning
  - Etc.

SCOR The Art & Science of Risk

1) Global Systemically Important Insurers

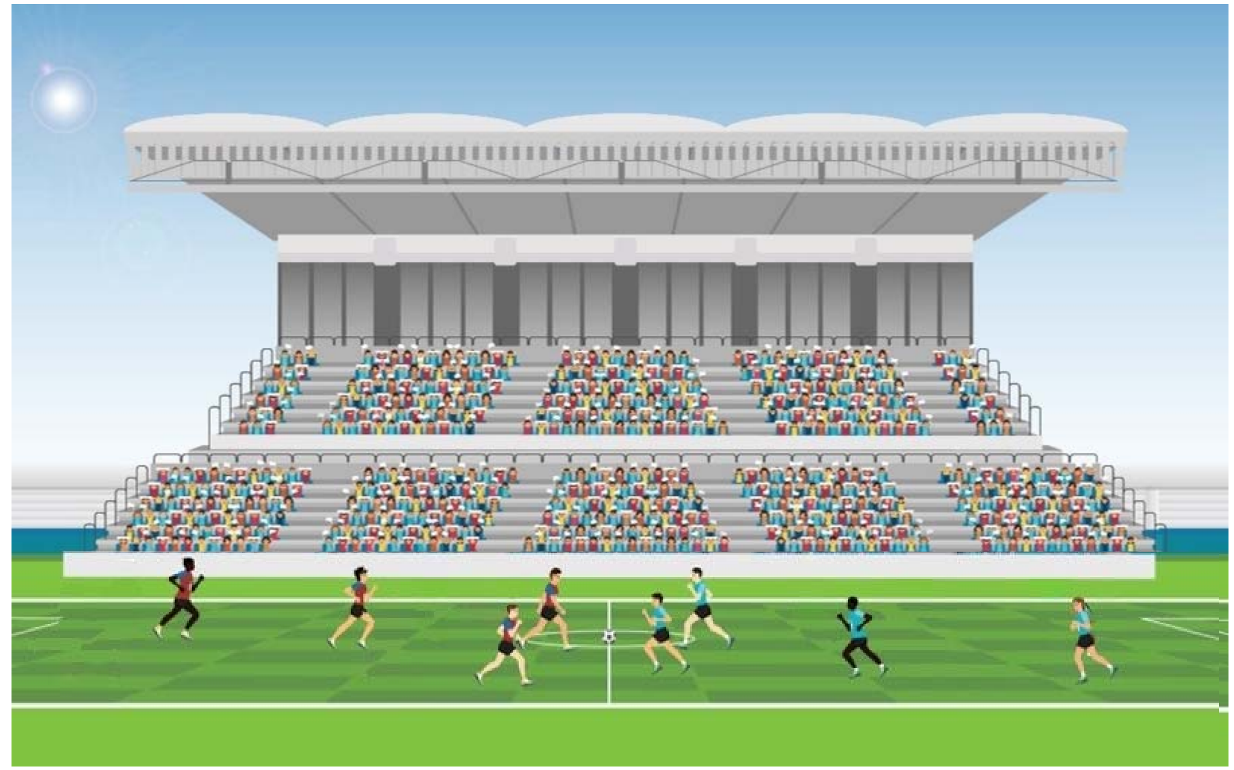
8 … which is distracting re-insurers' attention from business matters and increasing their running costs everything else being equal

Re-insurance in the early 2000s



A few people on the field, a few people in the stands

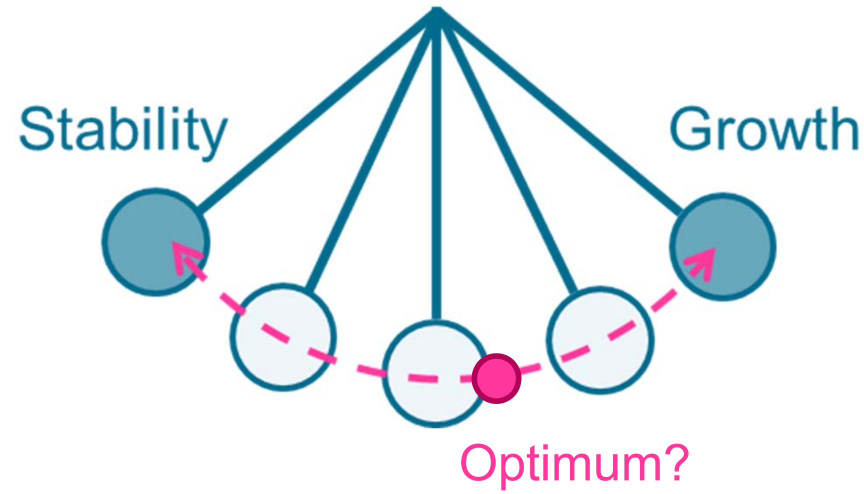
Re-insurance in 2018



Fewer people on the field… and a lot more people in the stands!

8 The challenge is to achieve optimal regulation – i.e. regulation that strikes the right balance between growth and stability

- The optimal situation from the perspective of the social "common good" is not maximum solvency: increasing capital requirements increases the resilience of the financial system but has an economic cost. Beyond a certain level, it hampers economic growth by creating a suboptimal resource allocation
- The collective utility function is evolving over time
- A tipping point may have been reached
  - There is a growing feeling that the regulatory wind is fading
  - The trade-off between *stability* and *growth* seems to be revisited
  - Is the "regulatory pendulum" halting and, if so, will it swing back?



- There is a sweet spot to target i.e. a trade-off to calibrate in order to define the optimal arbitrage in terms of
  - Insurance penetration
  - Reserving levels and solvency levels
  - Data protection stringency
  - Etc.

The key question of the years to come is that of *optimality*

9 Technological contestability in the re-insurance industry has appeared on the radar screen and is gaining momentum

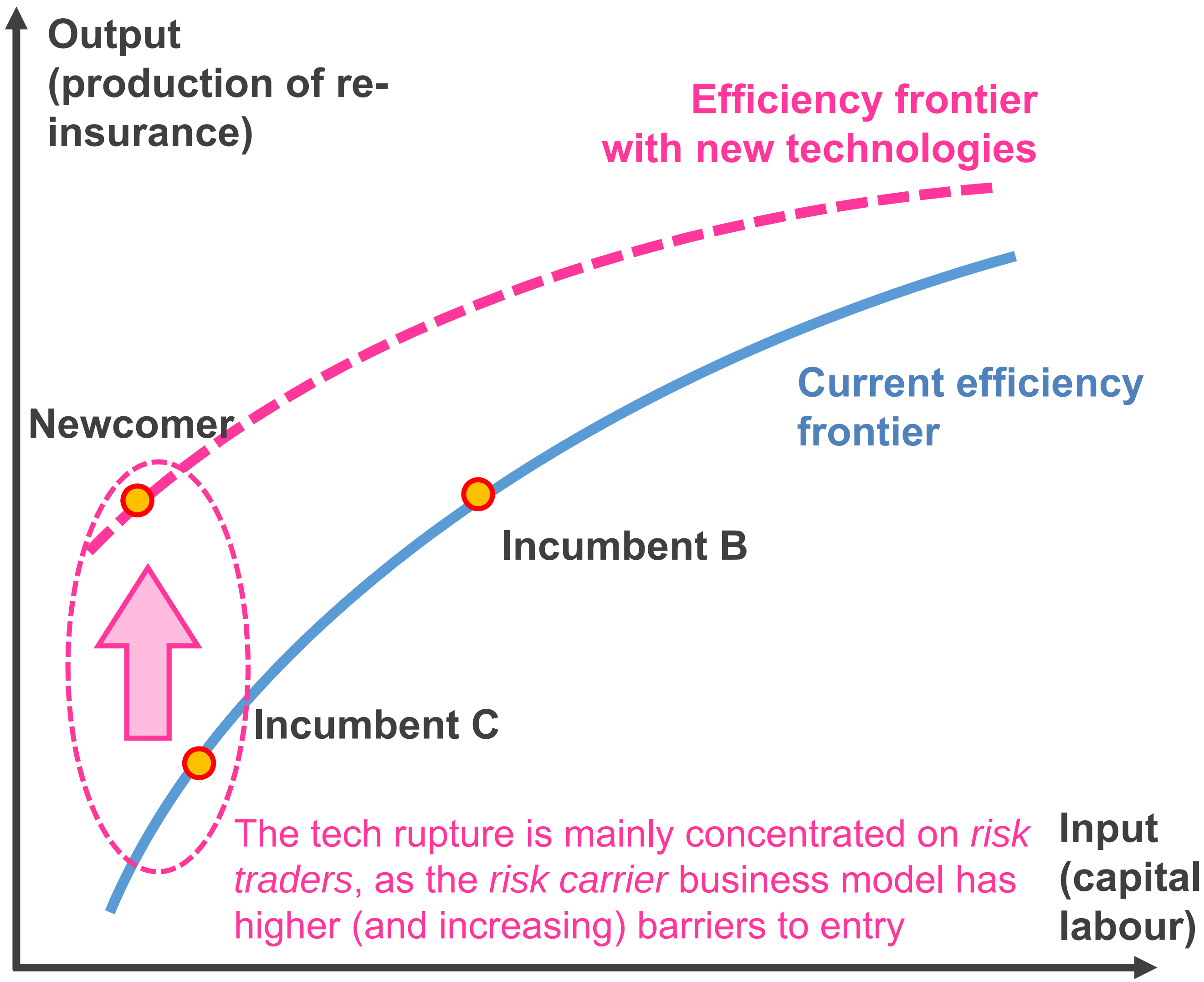
- Disruptive technologies (Artificial Intelligence, Blockchain, Robotic Process Automation, Augmented underwriting etc.) are transforming the risk transfer ecosystem and re-insurers' production function

→ Increased efficiency at each stage of the insurance risk-to-capital chain : modelling, product distribution, customer experience, underwriting, claims processing…

→ Reduction of operational costs

- They result in a positive shift of the re-insurance industry's efficiency frontier: we (will) produce the same with less (or more with the same)

- Adaptability and timely investment in technology are key factors of competitive positioning. Failing this, incumbents face huge transition costs to reach the (new) efficiency frontier.



SCOR
The Art & Science of Risk

9 At a time when the production function of re-insurance is being revisited, every re-insurer should re-explore fundamental questions

1. **Risk trader vs. risk carrier business model**
   - What will be the respective role and place of risk traders and risk carriers in the risk transfer ecosystem?
   - Will the frontier between both blur or become more marked?
   - Will contestability increase?
   - Should we aim to be the best at mastering a few functions or the best at assembling all functions in the risk transfer ecosystem?
2. **Economies of scale**
   - Are economies of scale on the rise?
   - Will the tiering of the market continue to the benefit of the market leaders with the critical size?
3. **Economies of scope**
   - Are economies of scope on the rise?
   - Will the tiering of the market continue to the benefit of highly diversified players that have a global franchise to write “everything, everywhere”?

10 Technological developments are completely redefining how data is accessed and processed, redefining the basics of the re-insurance sector

Information yesterday Incomplete and static observability	Information today and tomorrow (era of sensors) Full and dynamic observability
Limited and incomplete	Comprehensive from multiple sources
Low granularity	High granularity
Static	Dynamic and ranked in quality
Time lags	Real-time
Costly to obtain	Cheap to obtain
Costly to process	Cheap to process (AI)

- Developments in data collection and processing capabilities are a game changer for a highly information-driven industry like re-insurance:
  - Allowing comprehensive and dynamic observability and monitoring
  - Significantly reducing information asymmetry between insurers and insureds, revisiting the very concepts of adverse selection and moral hazard which have historically shaped re-insurance
  - Changing how supply and demand of re-insurance are matched both quantitatively and qualitatively
  - Providing another level of possible analytics and enhancing risk knowledge
  - Improving comparability and resulting in sharper competition!

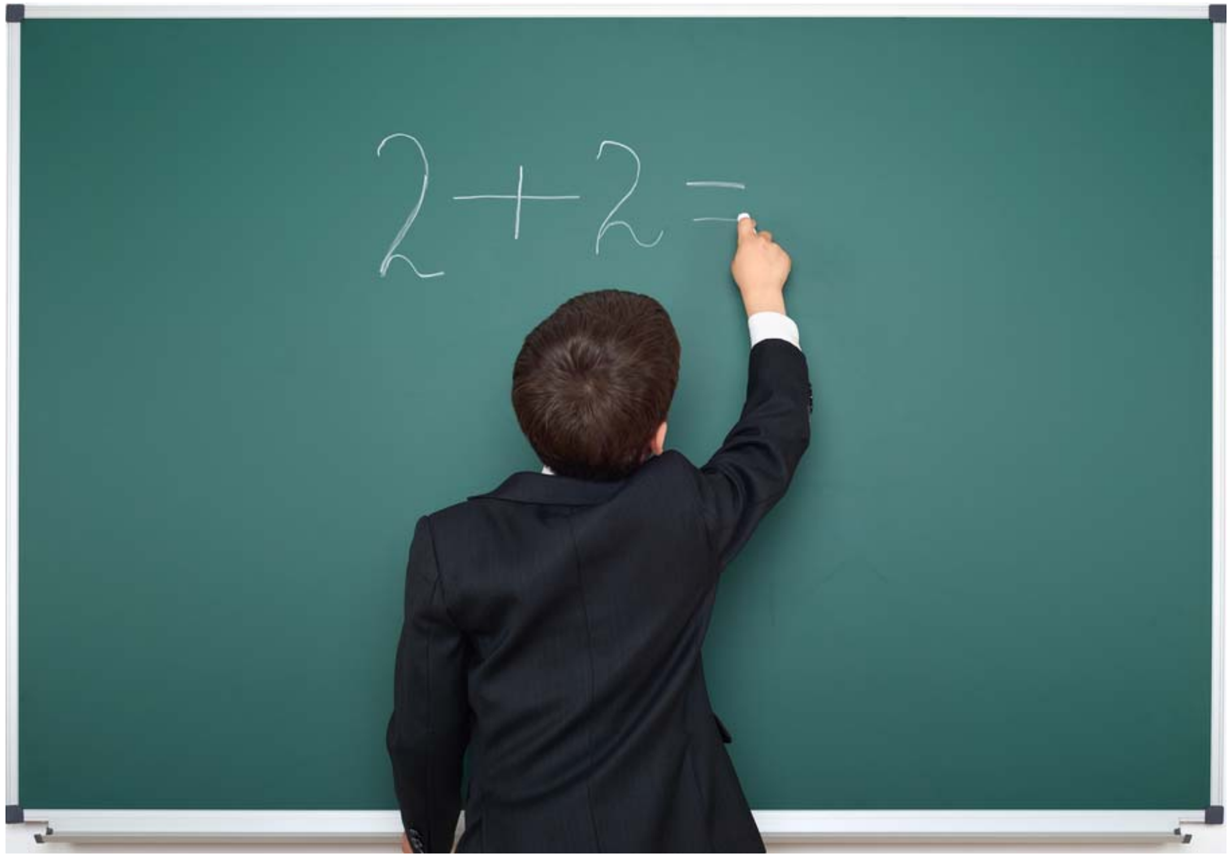
11 Re-insurers are increasingly under the spotlight with respect to shifting social expectations

- All stakeholders turn to the re-insurance industry, asking questions and calling for action with respect to CSR topics: regulators, policymakers, international bodies, rating agencies, investors, NGOs…
  - Committing to contribute to the **fight against climate change** and supporting the energy transition
    - Increased scrutiny on underwriting and on investments criteria (exclusions or limits)
    - Expectation to disengage from key sustainability risks
  - Contributing to a **healthier society**
  - Ensuring the highest standards for the **handling, privacy and protection of personal data**
    - The GDPR[1)] took effect in all 28 EU member states in May 2018, introducing principles and requirements in respect of the processing of personal data of individuals residing in the EU

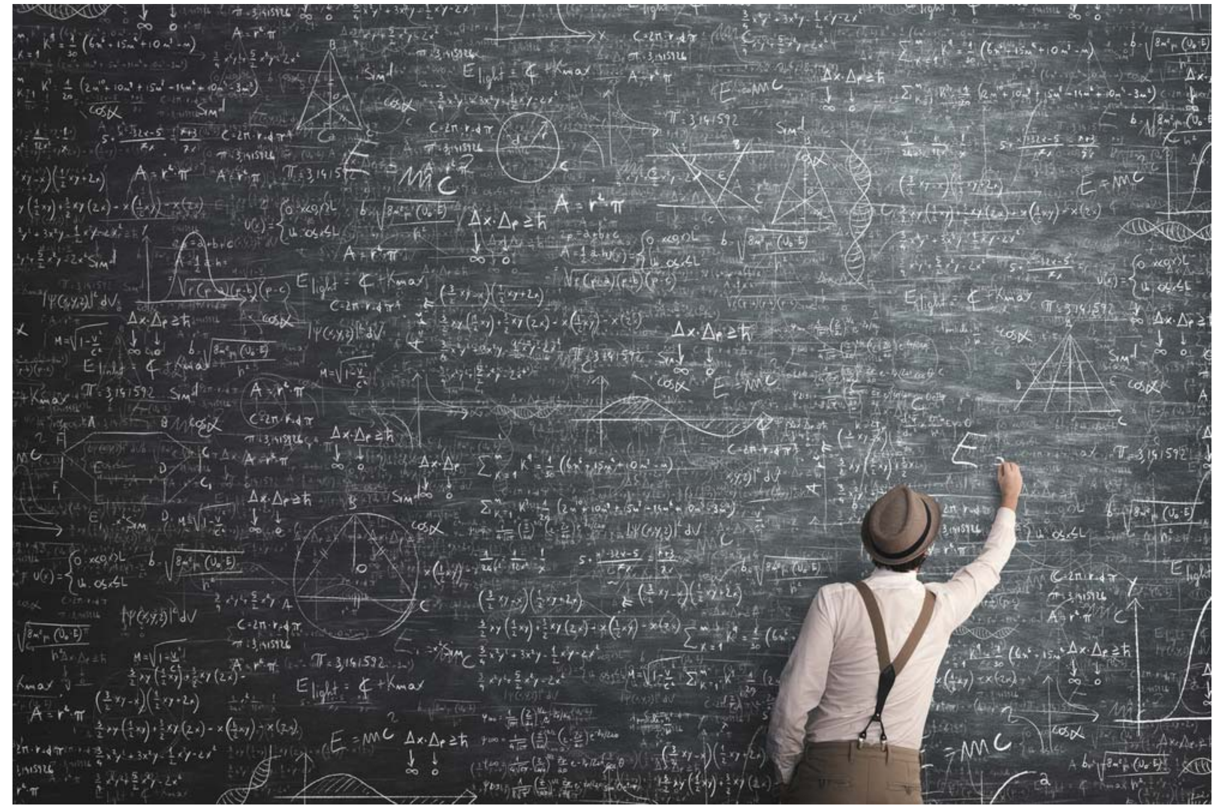
1) General Data Protection Regulation

In a nutshell, what has changed?

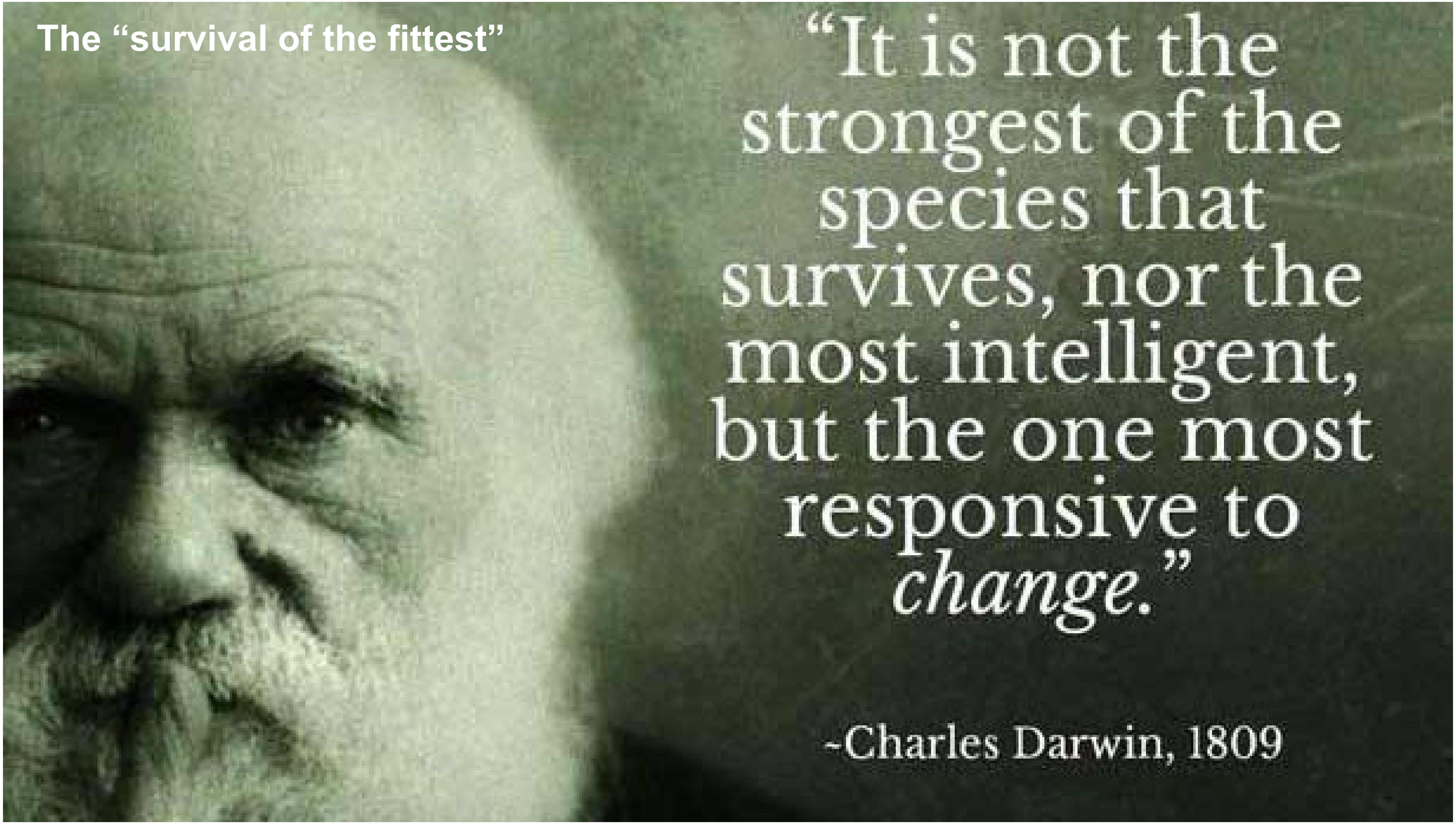
Re-insurance in the early 2000s



Re-insurance in 2018



The current environment is more challenging : more uncertain, more chaotic, more complex, more competitive, more contestable and more fragmented


The "survival of the fittest"
"It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to *change*."
-Charles Darwin, 1809

Dispelling rating myths

Simon Ashworth
Mark Button
Taos Fudji

S&P Global
Ratings

Agenda

- Myth busting:
  - Section 1: Rating drivers: capital, size and diversification
  - Section 2: Ratings for start-ups, run-offs and closed fund consolidators
  - Section 3: Issue ratings, M&A, ESG factors & rating above the sovereign
- Brexit: No Deal Moving Into Sight

Myth 1: Size determines rating level

- Scale does not usually determine the rating level

- $250m - $5bn capital range:
  - Limited correlation between rating outcome and scale

- Low absolute capital levels increase vulnerability to exogenous shocks

- High absolute capital levels usually proxy for large levels of diversity

Myth 2: Capital model is the driver

- Capital and earnings analysis is based on a forward-looking assessment
- In only 1 out of 6 cases is our balance sheet assessment the same as the capital model result
- Our assessment of competitive position is a key differentiating factor
- Role of regulatory ratios

Myth 3: Low diversification credit

- Should not compare diversification benefits
- Material implicit allowance for diversification exists in our model
- Diversification also captured in many ways outside of the model and driver for many rating actions
- Importance of value creating diversification

Myth 4: Start-up rating caps

- Standalone credit profiles generally limited at ‘bbb’
  - Track record of past performance typically lacking

- A "block of business" or subsidiary that was separately established, where the management team, competitive position, and track record are clear and demonstrable

- Highest levels of Group Support can apply in specific situations
  - Entities set up to serve important existing customers, or has been created as a separate legal entity due to regulatory or tax considerations
  - Internal group captives

Myth 5: Run-offs always BBB range

- Run-offs generally limited to bbb+ but could reach a-
- Strong and compelling management incentives to maintain financial strength
- Rating higher than ‘A-’ possible with Group support

Myth 6: Consolidators are run-offs

A more highly rated closed-fund consolidator has:

- A clearly defined acquisition strategy (in a favourable consolidation environment)
- A track record of successful execution
- Strong and compelling management incentives to maintain strong levels of financial strength

- Financial strength ratings higher than BBB range are not precluded

Myth 7: 4 notches for RT1s

- Potential for 3 notches below ICR of the issuer but could be 4 or more
- Based on solvency level, potential volatility and external capital management commitments / track record
- Track record since end 2016:
  - 3 notches: SCOR, Aegon (proposed issuance)
  - 4 notches: ASR, CNP, Gjensidige, RSA, Direct Line, If P&C, CCR Re (proposed issuance)

Myth 8: Acquisitions are favourable

- Over two-thirds of insurance M&A deals since 2000 failed to improve financial strength enough to warrant an upgrade for the buyer

- By year 5, 38% of acquirers' ratings are at least one notch below where they were on announcement date (30% >1 notch above, 32% even)

- Short term 22% negative outlook/CWN
  - ½ downgraded in subsequent 5 years
  - 14% positive outlook/CWP

- 1 in every 8 saw a divestment of the target

S&P Global
Ratings

Myth 9: ESG factors do not feature

- **Industry & Country Risk**
- **Competitive Position**
- **Capital & Earnings**
- **Risk Position**
- Financial Flexibility
- **Enterprise Risk Management**
- **Management & Governance**
- Liquidity

S&P Global
Ratings

Myth 10: Ratings do not > sovereign

- In rating an insurer above the sovereign, we are expressing our view that the company's willingness and ability to service debt is superior to the sovereign

- We expect many domestic-focused insurers to be rated no higher than the sovereign because of the following risks common to the sector:
  - Asset risk / Regulatory risk / Potential direct government intervention

- More than 90 insurance companies are rated above the sovereign due to:
  - Support of foreign parent
  - Passing sovereign stress test due to international asset/business diversification

Brexit – No-Deal Moving Into Sight

Paul Watters, CFA
Chair of EMEA Credit Conditions Committee

S&P Global Ratings

Brexit: Still Expect An Agreement

- **Base case: we still anticipate political agreement to be reached**
  - On the Withdrawal Agreement that includes a compromise on the N. Ireland border issue
  - On a political declaration between the EU and U.K. on the future relationship
  - The European and U.K. Parliament to ratify the Withdrawal Agreement.

This is required for an orderly Brexit on Mar. 30, 2019 and a 21-month status quo transition to end-Dec 2020 to negotiate the details of the future relationship

Brexit Timeline

….But No-Deal Brexit Increased In Likelihood

- Where U.K. leaves EU abruptly in March 2019 with no Withdrawal Agreement and no transition period and reverting to World Trading Organisation (WTO) rules
  - "High" risk level and likelihood has increased in recent months.

- Several ways this could happen:
  - No agreement between the U.K. and EU
  - Inability to ratify in U.K. Parliament.

This risk is now a "relevant" rating consideration

EMEA Top Risk Sept. 2018		Risk level	3-month Δ	Risk trend	3-month Δ
No-deal Brexit	The next three-six months will be critical in the transition to Brexit, with little evidence of any meeting of the minds over the future relationship.	Very high **High** Elevated	=	**Worsening** Unchanged Improving	=

Source: Credit Conditions EMEA: Looking over the Edge on Trade and Brexit, Sept. 27, 2018

What Would That Mean?

Key Figures From The No-Deal Brexit Scenario

GDP	Unemployment	Households lose	Inflation peaks at	House prices down
5.5%	7.4%	£2,700	4.7%	10%
below our baseline fore-cast by 2021	by 2021	in income per year 2019-2021	in mid-2019	by 2020

U.K. Economic Indicators in the No-deal Scenario versus our Base-case Forecast

	No-deal scenario			Base-case forecast			
	2019	2020	2021	2018	2019	2020	2021
GDP (% year)	-1.2	-1.5	1.2	1.3	1.3	1.5	1.2
Unemployment rate	4.8	7.1	7.4	4.1	4.3	4.5	4.6
CPI (% year)	3.6	2.1	2.2	2.4	1.9	1.7	2.6
USD per GBP	1.18	1.31	1.32	1.34	1.35	1.46	1.47
BoE policy rate	0.21	0	0	0.6	0.84	1.31	1.59
House prices (% year)*	-6.2	-3.3	3.8	0	2.5	3.5	4.5
Share prices (% year)	-13.1	6.4	8.9	-	-	-	-
Expenditure components (% year)							
Private consumption	-1.8	-2.7	1.4	1.1	1.1	1.4	1.2
Government consumption	3.3	0.4	-0.1	1.2	0.8	0.9	1.2
Fixed investment	-1.4	-2.5	2.5	0.8	2.1	3.6	3.1
Exports	-3.3	0.4	2.1	-0.1	2.7	2.6	1.9
Imports	-1.9	-1.9	2.5	0.2	2.6	2.9	2.7

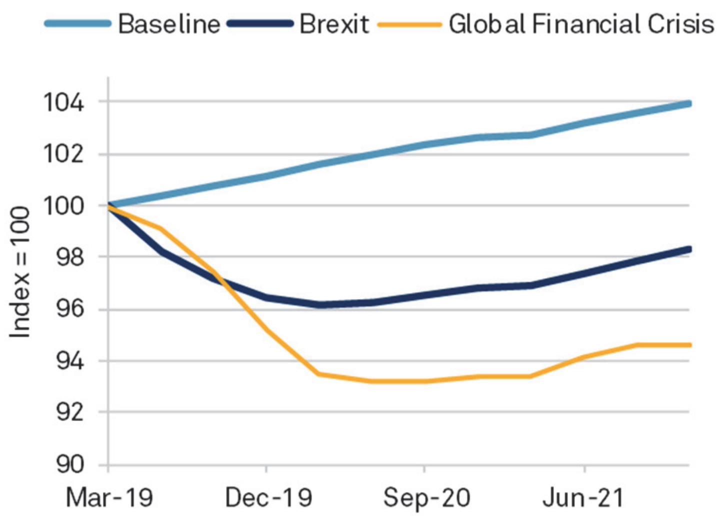
* -- year-on-year for the fourth quarter. Sources: Oxford Economics, Office for National Statistics, Bank of England, S&P Global Economics & Research.

S&P Global Ratings

What Would That Mean?

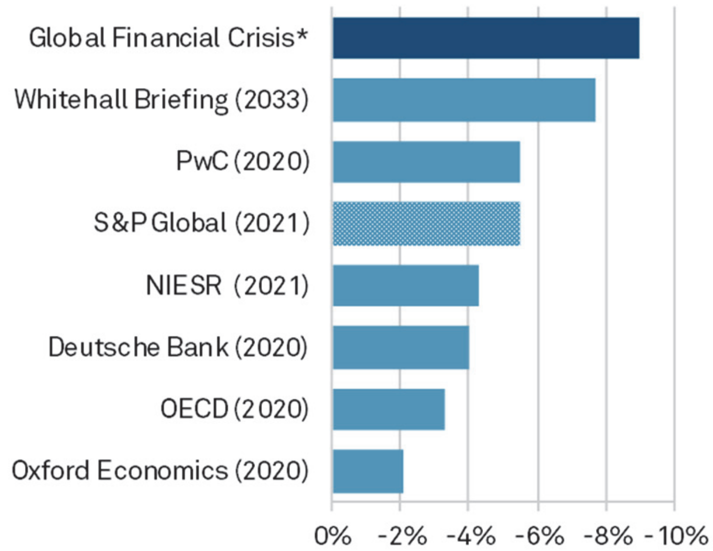
- Moderate recession lasting 4-5 quarters
- Most of 5.5% economic loss over the first three years would be permanent
- Economy’s long-term growth potential could be lower.

No-deal Brexit 60% as Damaging as GFC*



*--GFC – global financial crisis. Sources; ONS, S&P Global Economics & Research

No-deal Brexit Scenarios Compared



% deviation from baseline GDP unless otherwise stated. The date in brackets shows the end of the scenario horizon. *Imputed. Source: S&P Global Economics & Research

S&P Global Ratings

How Is This Factored Into Ratings?

Where:

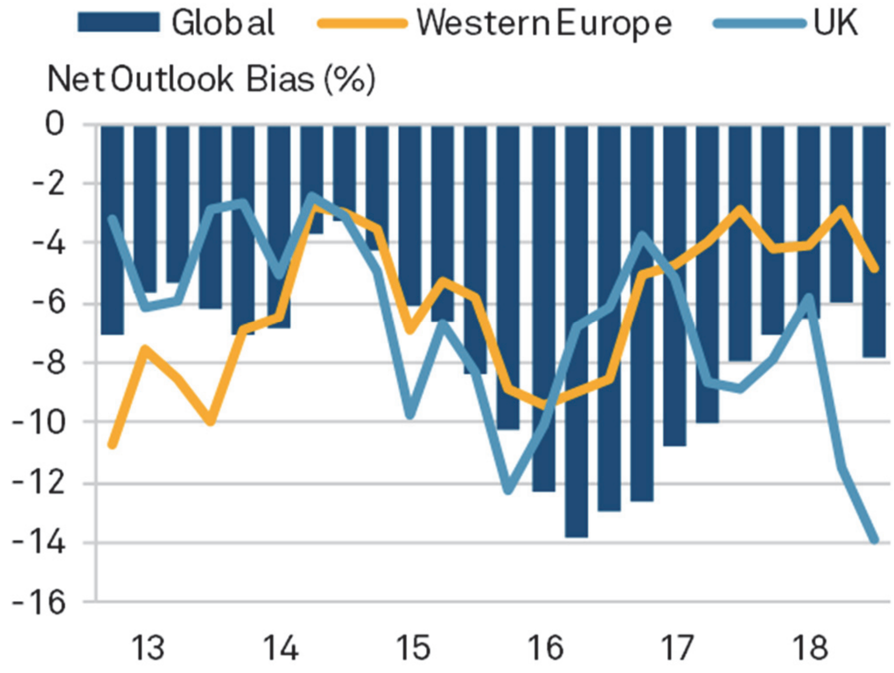
- Entity has material exposure to UK markets

- Contingency plans not expected to insulate an entity from disruption – for instance, where bottlenecks develop (including “cliff” effects)

- Rating headroom is insufficient

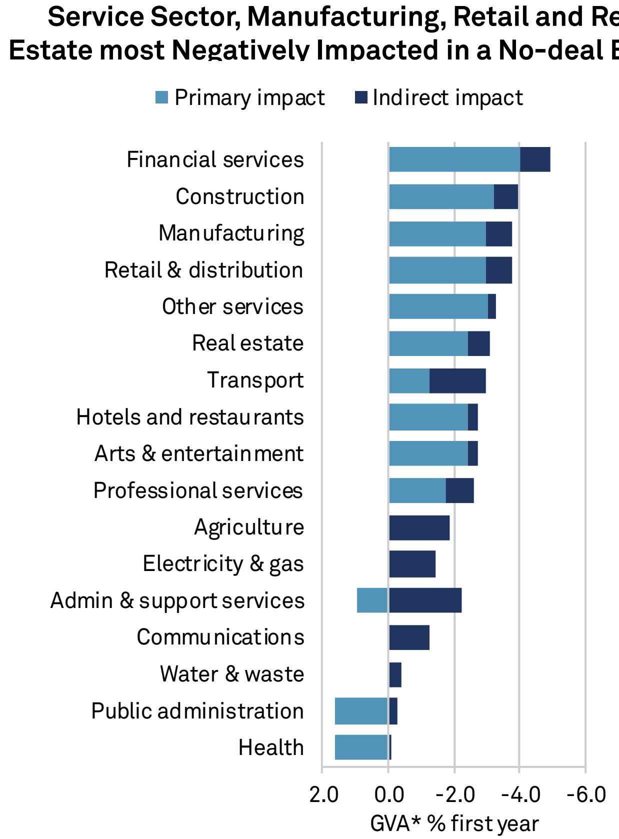
➔ **Rating outlooks** could reflect this increased risk.

Negative NFC* Outlook Bias in the U.K.



* NFC – non-financial corporate. Source: S&P Global Ratings, Oct 2018

Real Estate Sector Exposed to Negative Rating Actions



* GVA --Gross value added. Sources: ONS, S&P Global Economics & Research

- London office market: We already incorporate a 10% fall in valuations over a 2-year period, but a further 10% fall could be expected in a no-deal scenario
- U.K. REITS: an average 20% drop in asset values would likely result in downgrades, probably by a notch
- Social housing: ~50% of U.K. social housing providers might see lower ratings if housing prices dropped by 10% over 2019-20 mainly due to increased reliance on market sales to fund social housing developments.

S&P Global Ratings

U.K. Affirmed at AA; Outlook Remains Negative

October 26, 2018

Outlook: The negative outlook reflects the risk of sustained economic weakness and a deterioration in government finances if merchandise and services exports from the U.K. lose access to key European markets, external financing diminishes, or sterling's status as a reserve currency comes under pressure due to a loss of confidence in the U.K. economy.

Outlook to stable: if negotiations with the EU provide greater certainty for the U.K. economy, and if key sectors retain access to European markets without penalizing tariffs or significant nontariff barriers.

Lower the ratings: under a scenario in which a disorderly Brexit is increasingly certain we could lower the ratings. We define a disorderly Brexit as one which would either significantly limit U.K. manufacturing and services access to key European markets, or subject them to tariffs and nontariff barriers high enough to reduce their ability to compete.

Source: « Ratings On The United Kingdom Affirmed At 'AA/A-1+'; Outlook Remains Negative» - October 26, 2018

Panel: Regulating the Risks of Tomorrow

Moderator:
Dennis Sugrue
Senior Director,
S&P Global Ratings

Carlos Montalvo Rebuelta
EMEA Insurance Risk and Regulatory Leader,
PricewaterhouseCoopers

David Rule
Executive Director, Insurance Supervision,
UK Prudential Regulatory Authority

Prof. Karel Van Hulle
KU Leuven and Goethe University Frankfurt

Dimitris Zafeiris
Head of Risks and Financial Stability Department,
EIOPA

S&P Global
Ratings

Panel: IFRS 17 – Good or Bad?

Moderator:
Mark Nicholson
Director,
S&P Global Ratings

Jo Clube
Group Technical Accounting Director,
Aviva

Sue Lloyd
Vice Chair,
IASB

Joachim Kölschbach
Partner
KPMG

S&P Global Ratings

IFRS17 & Ratings

- Will not require fundamental change – we already adjust for accounting differences
- Operating Performance based on peer review
- Profit development could be delayed
- Capital could shrink on introduction
- Insurers could bolster capital in advance
- Welcome the insight & move to market-consistency
- Challenging and costly for insurers

2018 European Insurance Conference:
Low Rate Fog Lifts, But is the Future Clear?

Tuesday, 6th November 2018
London

S&P Global
Ratings

ESG in Ratings

Miroslav Petkov

6 November 2018

S&P Global Ratings

ESG Defined

ENVIRONMENTAL

- Greenhouse gas emissions
- Climate change impacts
- Water use, scarcity, efficiency, & decontamination
- Waste, pollution, and toxicity
- Land use and biodiversity

SOCIAL

- Human capital management
- Consumer behaviour
- Safety management
- Social cohesion
- Demography

GOVERNANCE

- Board composition & incentives
- Ethical values & transparency
- Bribery & corruption

ESG Considerations Are Now Mainstream

$81.7 trillion

of assets under management signatories of the United Nations Principles for Responsible Investment[1]

23%

annual rate of growth of assets invested under an ESG mandate from 2014 to 2016 versus an industry average of about 5%[2]

2020

$24 trillion is expected to be under the control of values-driven millennials prompting the largest inter-generational wealth transfer we've ever seen[3]

[1] UN PRI Database
[2] UBS, Millenials- the global guardians of capital, 22 June 2017
[3] Morgan Stanley, Audrey Choi

S&P Global Commitment To ESG

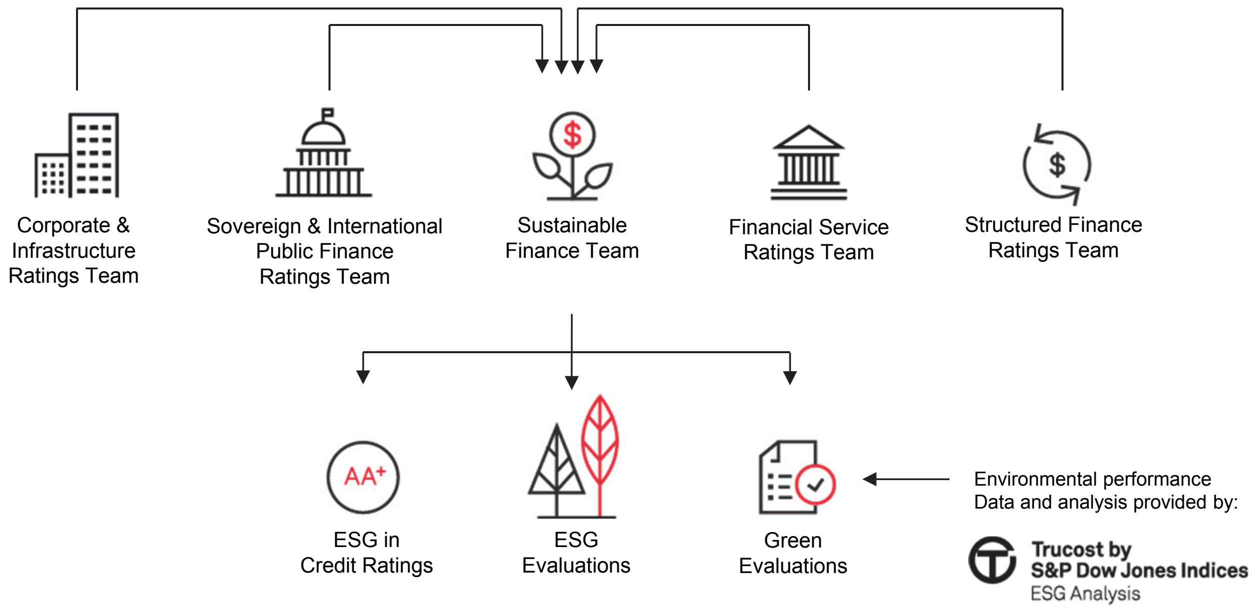
S&P Global has been publishing research on the link between ESG and credit ratings, contributing to key industry initiatives, and tracking the green bond market for a number of years.

- 2000: S&P has been actively assessing companies' corporate governance practices since 2000
- 2005: S&P Global Ratings began publishing articles highlighting climate change and environmental risks
- 2012: S&P Global Ratings introduced its Management & Governance methodology
- Dec 2015: S&P Global Ratings becomes a contributing member of the FSB Taskforce on Climate - Related Financial Disclosures (ongoing)
- May 2016: S&P Global expressed support for UN-PRI initiatives.
- Oct 2016: S&P Dow Jones Indices acquires Trucost - a carbon and environmental data specialist
- Apr 2017: Green Evaluation launched
- Nov 2017-Jan 2018: European Union High Level Expert Group membership
- Nov 2017: FAQ on How S&P incorporates ESG factors in its Credit Ratings
- Nov-2017-2018: S&P Global Ratings reports on how ESG risks & opportunities impacted Corporate ratings (multiple reports)
- Sept. 2018: S&P Global Ratings publishes its ESG Evaluation Proposal
- Oct 2018: S&P Global Ratings reports on how ESG risks and opportunities impacted Financial Services and Sovereign credit ratings.

S&P Global Ratings

S&P Global Ratings Sustainable Finance Team

Embedded into our company's organizational structure



ESG Reaches Fixed Income

1. Risks More Visible and Material
2. Regulatory Pressure
3. Growing Investor Demand

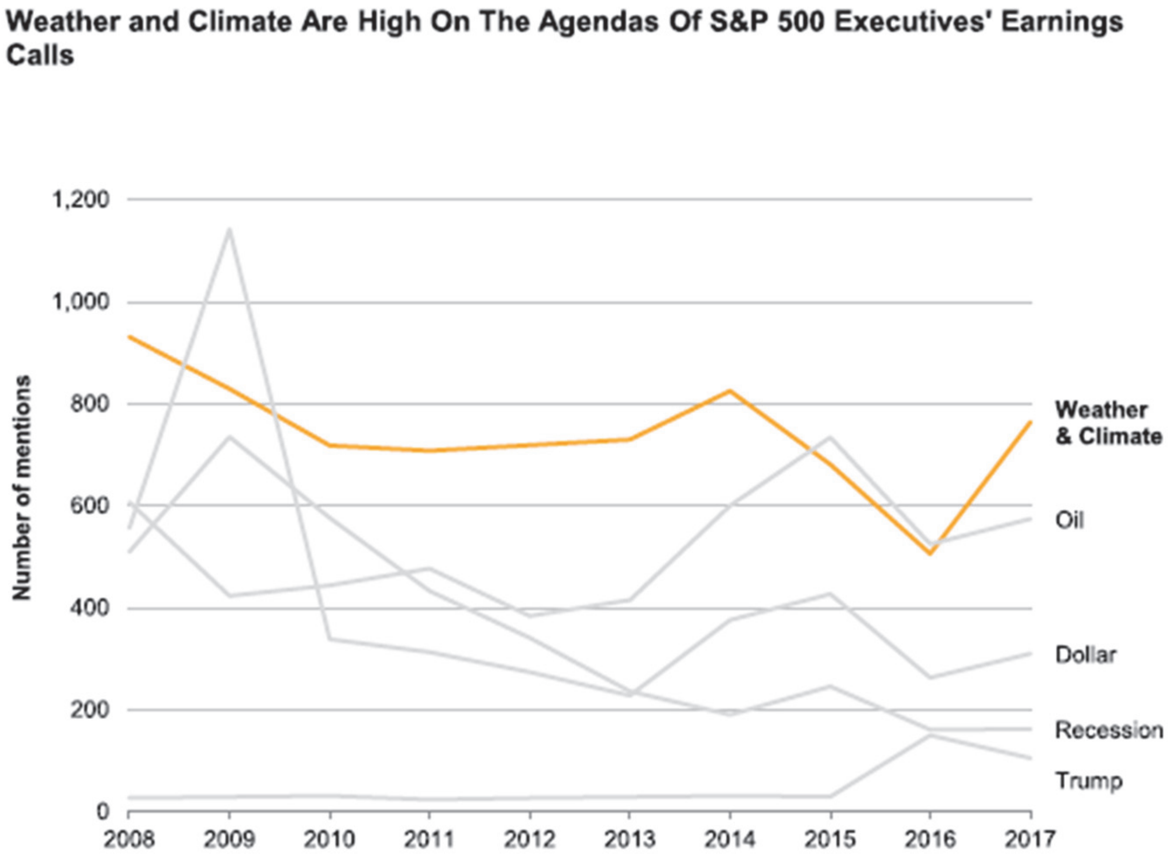
Risks More Visible & Material

Top 10 risks in terms of Impact

2008		2018	
1	Asset Price Collapse	1	Weapons of Mass Destruction
2	Retrenchment from Globalization (developed)	2	Extreme Weather Events
3	Slowing Chinese Economy	3	Natural Disasters
4	Oil & Gas Price Spike	4	Failure of Climate Change Mitigation and Adaptation
5	Pandemic	5	Water Crisis

According to the World Economic Forum's Global Risks Report 2018

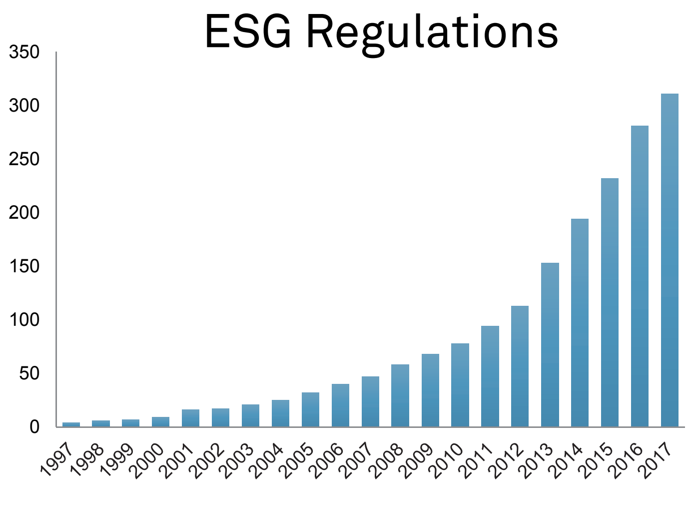
Executive Focus on Climate Impact Grows

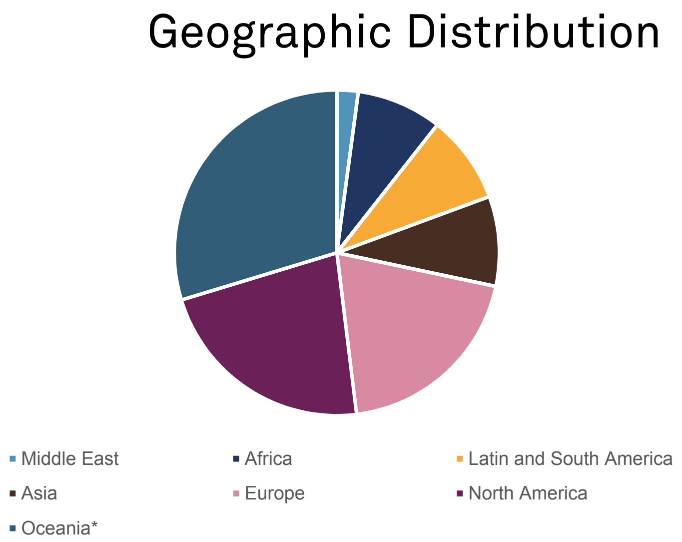


Source: S&P Global, The Effects of Weather Events on Corporate Earnings Are Gathering Force, June 2018

Regulatory Pressure Mounts

In the largest 50 global economies, there are over **300 policy instruments** which support the consideration of ESG factors. Over **half were implemented between 2013 and 2016**





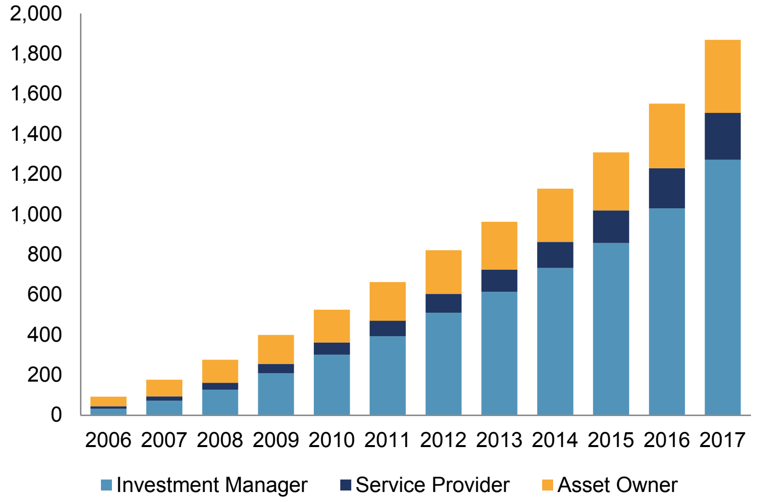
*Only includes Australia

Source: UN Principles for Responsible Investment

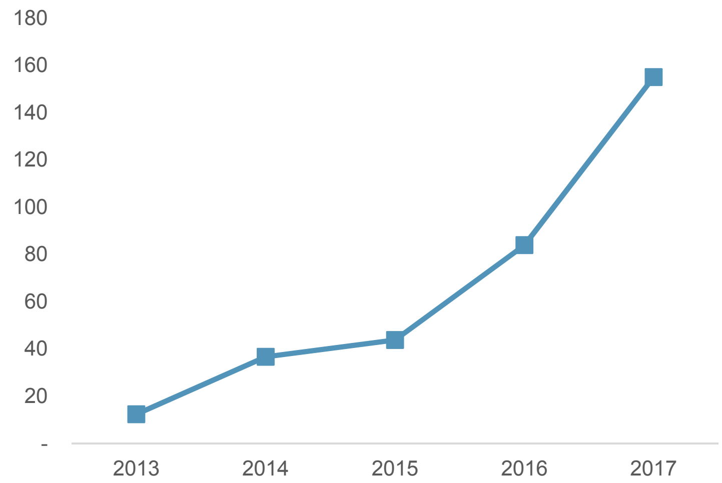
Investor Demand for ESG Grows

Investors believe that **ESG have real and quantifiable impacts** over the long run & that generating sustainable returns over time requires a sharper focus on ESG factors

# of UN PRI Signatories



Green Bond Market Issuance



S&P Global Ratings

Proposed ESG Evaluation

ENVIRONMENTAL | **SOCIAL** | **GOVERNANCE**

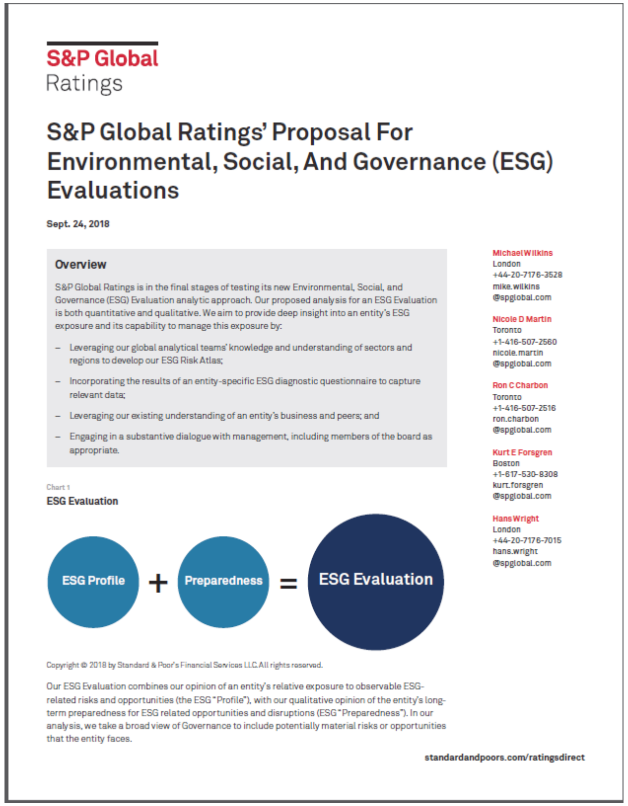
ESG Evaluation proposal is a **cross sector ranking** of a company's **ability to operate successfully in the future** and **optimize long-term stakeholder value** in light of an entity's natural and social environment & the quality of its governance.

ESG Evaluation Process

1. Risk Atlas – Sector and Geography
2. ESG Diagnostic
3. E, S & G Profile
4. Preparedness
5. Final Score

ESG Evaluation – Key Concepts

- **Financial Materiality**: the potential to have a financial impact, either directly or indirectly on stakeholder value, or the sustainability, of an entity. Extends beyond credit risk.
  - Material: > 5% of revenues
- **Stakeholder Value** incorporates the needs of shareholders as well as other stakeholders such as:
  - Employees
  - Local community
  - Governments
  - Regulators
  - Customers
  - Suppliers



S&P Global
Ratings

S&P Global Ratings' Proposal For Environmental, Social, And Governance (ESG) Evaluations

Sept. 24, 2018

Overview

S&P Global Ratings is in the final stages of testing its new Environmental, Social, and Governance (ESG) Evaluation analytic approach. Our proposed analysis for an ESG Evaluation is both quantitative and qualitative. We aim to provide deep insight into an entity's ESG exposure and its capability to manage this exposure by:

- Leveraging our global analytical teams' knowledge and understanding of sectors and regions to develop our ESG Risk Atlas;
- Incorporating the results of an entity-specific ESG diagnostic questionnaire to capture relevant data;
- Leveraging our existing understanding of an entity's business and peers; and
- Engaging in a substantive dialogue with management, including members of the board as appropriate.

Michael Wilkins
London
+44-20-7176-3528
mike.wilkins
@spglobal.com

Nicole D Martin
Toronto
+1-416-507-2560
nicole.martin
@spglobal.com

Ron C Charbon
Toronto
+1-416-507-2516
ron.charbon
@spglobal.com

Kurt E Forsgren
Boston
+1-617-530-8308
kurt.forsgren
@spglobal.com

Hans Wright
London
+44-20-7176-7015
hans.wright
@spglobal.com

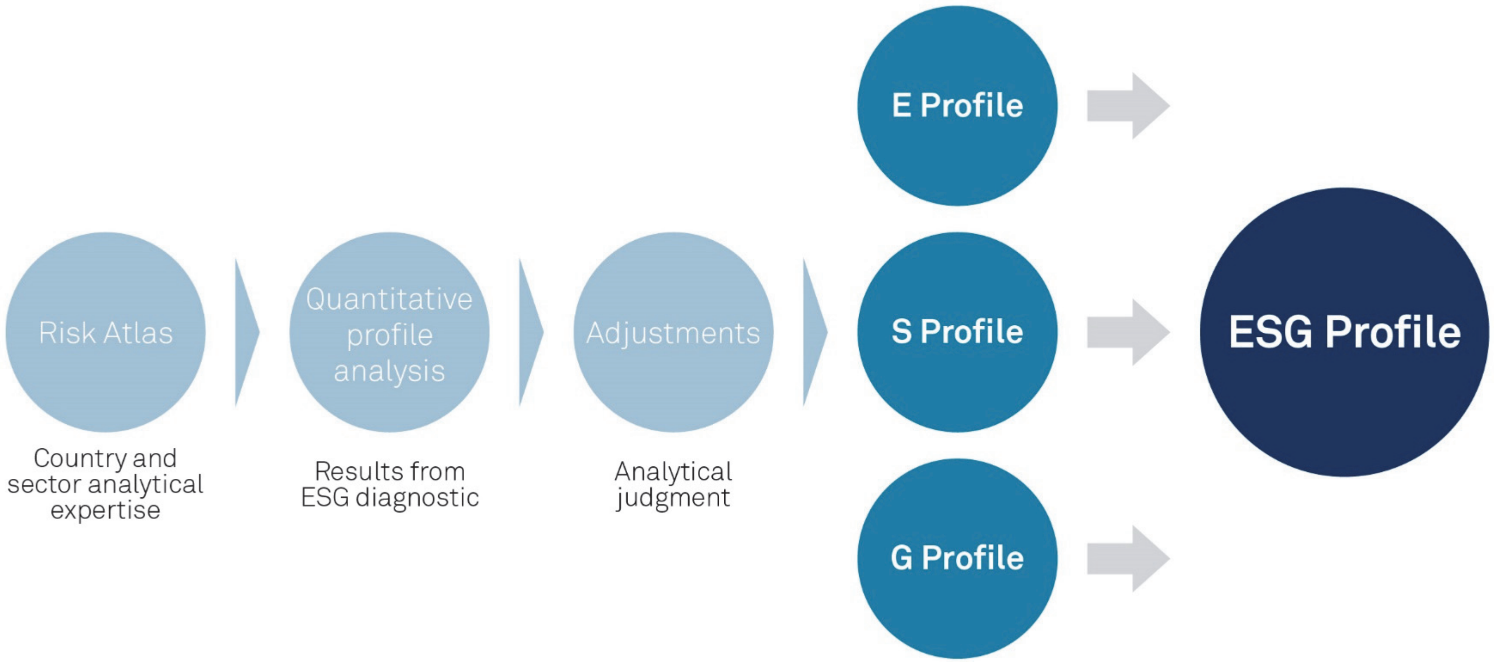
Chart 1
ESG Evaluation

ESG Profile + Preparedness = ESG Evaluation

Our ESG Evaluation combines our opinion of an entity's relative exposure to observable ESG-related risks and opportunities (the ESG "Profile"), with our qualitative opinion of the entity's long-term preparedness for ESG related opportunities and disruptions (ESG "Preparedness"). In our analysis, we take a broad view of Governance to include potentially material risks or opportunities that the entity faces.

standardandpoors.com/ratingsdirect

ESG Evaluation - Profile



S&P Global Ratings

Preparedness- Emerging & Strategic Risks

- **Emerging Risks**: a new risk, or a familiar risk that becomes apparent in new or unfamiliar conditions. Often, large-scale events or circumstances that arise from global trends, that are beyond any party's capacity to control, and may have impacts not just on the organization but also on multiple parties across geographic borders, industries, and/or sectors, in ways difficult to imagine today
- **Strategic Risks**: directly influences a companies strategic goals.
- Examples:
  – Failure of climate change adaptation
  – Biodiversity loss and ecosystem collapse
  – Technology enablers & disruptors such as social, mobile & big data

Preparedness – Examples of Megatrends

Climate Change	Energy & Fuel	Water Scarcity	Wealth Distribution
Urbanization	Material Resource Scarcity	Ecosystem Decline	Deforestation
Food Security	Cyber Security	Childhood Obesity	Ageing & Wellbeing

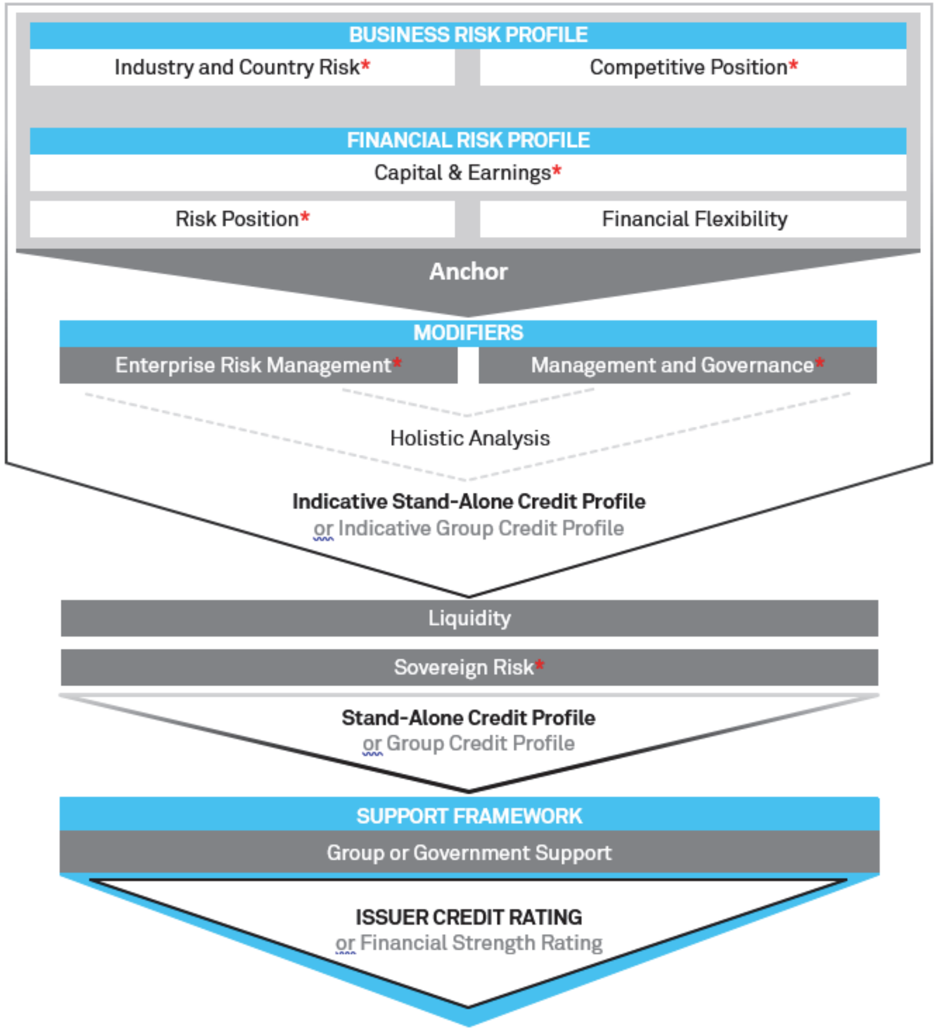
1. Risk Atlas – Sector and Geography → 2. ESG Diagnostic → 3. E, S & G Profile → 4. Preparedness → 5. Final Score

S&P Global Ratings

ESG Evaluation

S&P Global Ratings

ESG in Insurance Rating Criteria



*Factors most likely to include consideration of environmental, social, and governance risks.

S&P Global Ratings

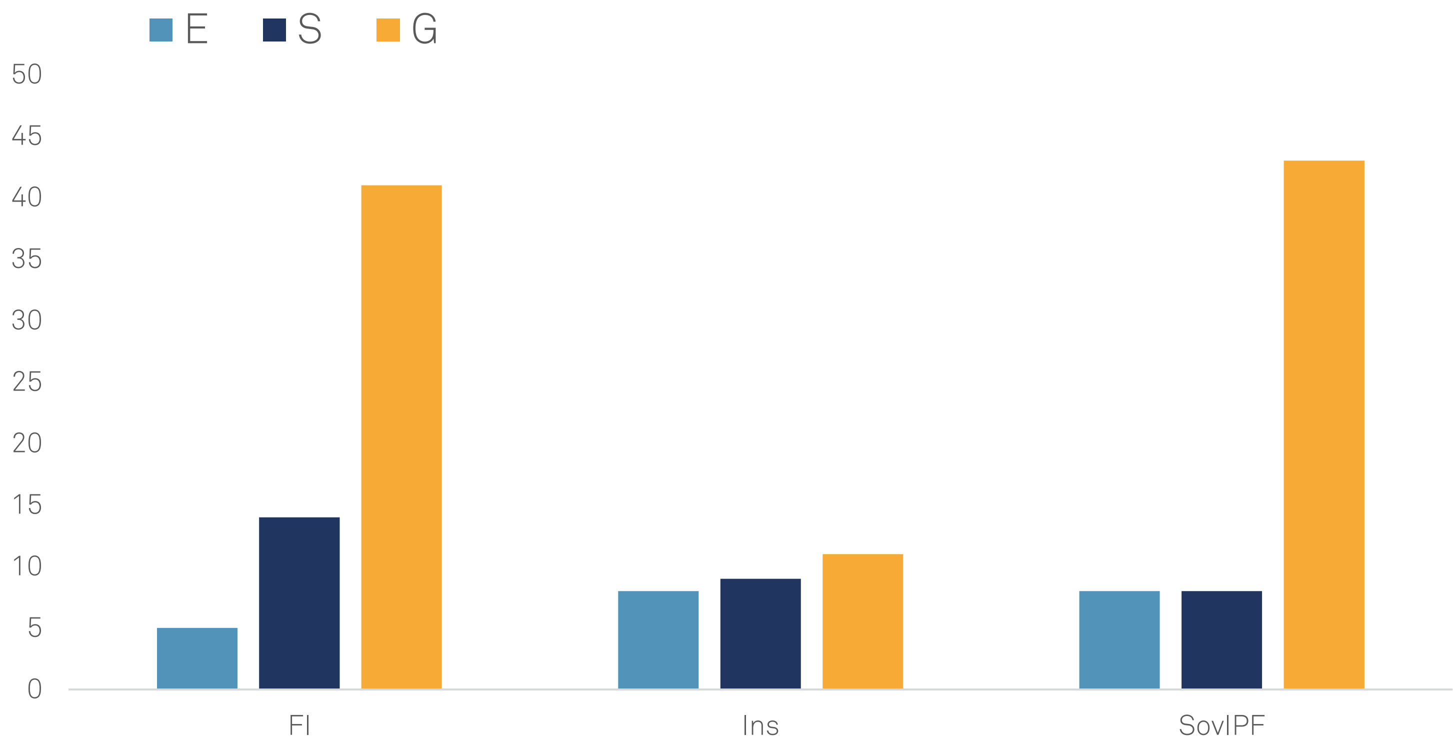
ESG and Insurance Credit Ratings

- Our insurance methodology typically considers ESG factors in
  - the assessment of industry and country risk;
  - our analysis of the insurer's competitive position;
  - our capital analysis; and
  - the assessment of management and governance and enterprise risk management (ERM)

- We also explicitly incorporate a risk charge to capture the impact of one-in-250-year annual catastrophe losses in our capital analysis.

ESG Factors impact broken out by Asset Class

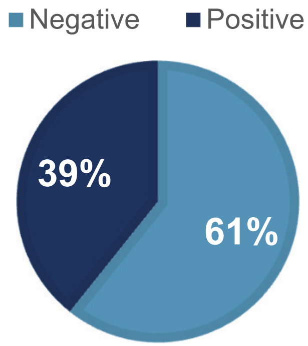
- Our review has identified 147 cases where ESG factors resulted in a rating action* for Sovereigns, Local & Regional Governments, Financial Institutions, or Insurers during the two years to end-July 2018.



ESG for Insurance

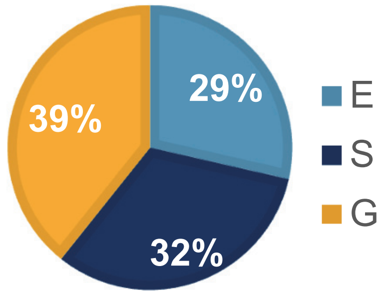
- Key Takeaways—28 rating actions

- Observation of ESG impacts were more muted in the insurance sector, accounting for 19% of total rating actions. These actions skewed slightly negative.



- Unlike other sectors, ESG-related rating actions in the insurance sector were more balanced with no factor clearly dominating rating change rationales..

- Insurance accounted for ~40% of total rating actions associated with E factors.



S&P Global Ratings

Insurance

Some examples

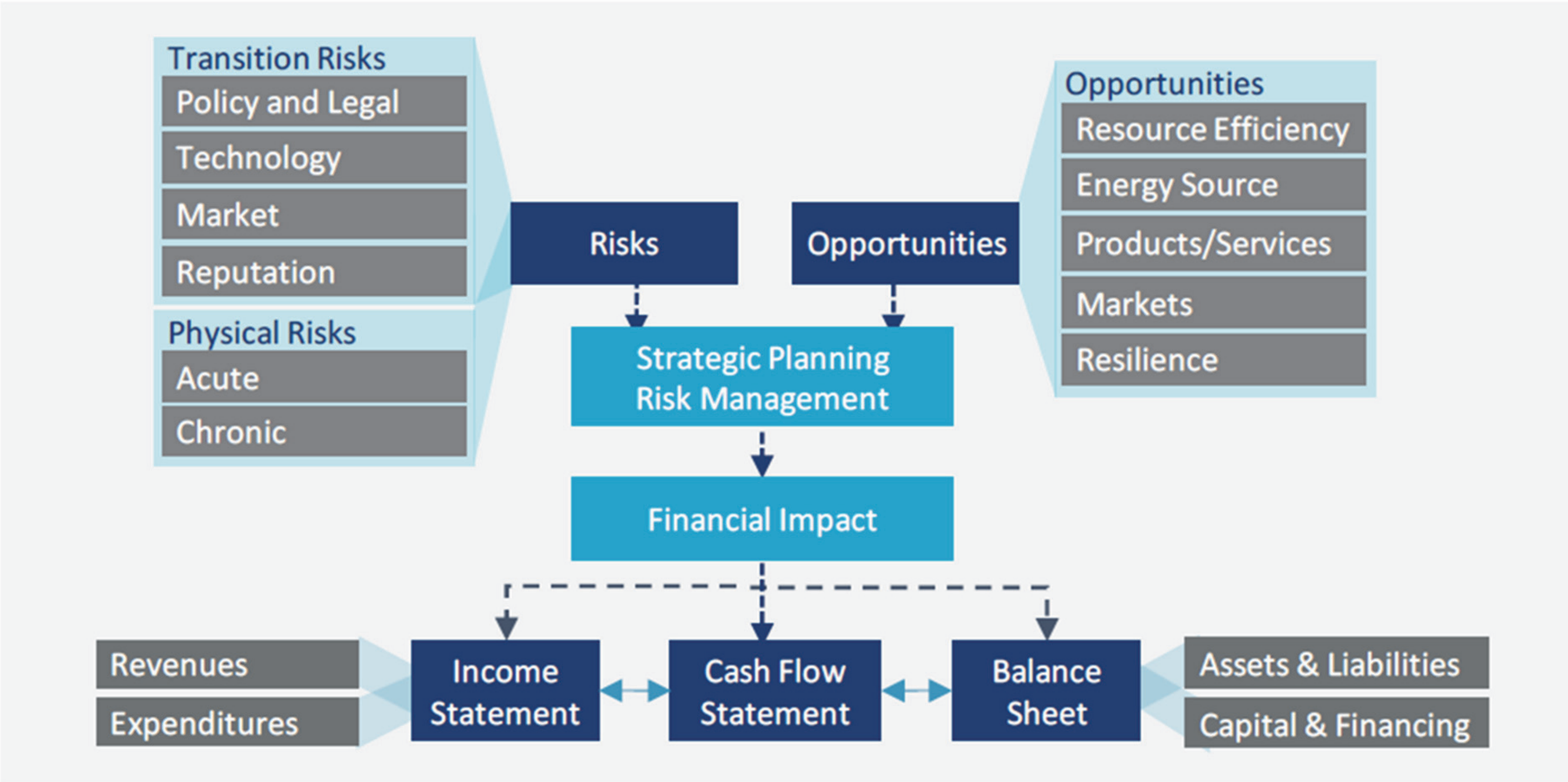
Wethaq Takaful Insurance (June 2018)
Rating Downgrade to ‘B/CW Negative/B’ from ‘B+/CW Negative/B’

External auditors issued qualified opinion on the insurer's interim financial statements at end-March ‘18, highlighting that approximately Kuwaiti dinar (KWD) 1.6 million in accounts and premiums receivable have been outstanding for more than one year and have not been provided for.

Lloyd’s of London Ltd. (October 2017)
Outlook revised to negative

The hurricane losses suffered by Lloyd's in third quarter 2017 have made it more challenging for the market to restore its capitalization to a level consistent with the current rating.

Types of Climate Change Risks
(source: TCFD)



S&P Assessment of the Impact of Climate Change on Insurers' Capital Position

S&P assessed the impact based on what we consider quantifiable:

- Impact on investment returns on Mercer study
- Impact on extreme weather based on RMS analysis

Our results are only indicative because of:

- Inherent modelling uncertainty
- Unquantified impacts:
  - litigation claims;
  - life and health;
  - systemic shocks

What This Means for Insurers’ Capital Management

- If the impact of climate change is gradual, it will erode insurers' capital adequacy by about 0.5% per year.
- We consider it manageable, potentially at the expense of 5-10% lower dividends.
- However, insurers could be tested if climate change leads to abrupt shifts, e.g.,
  - Financial markets corrections;
  - Systemic shocks;
  - Reaching climatic tipping points;

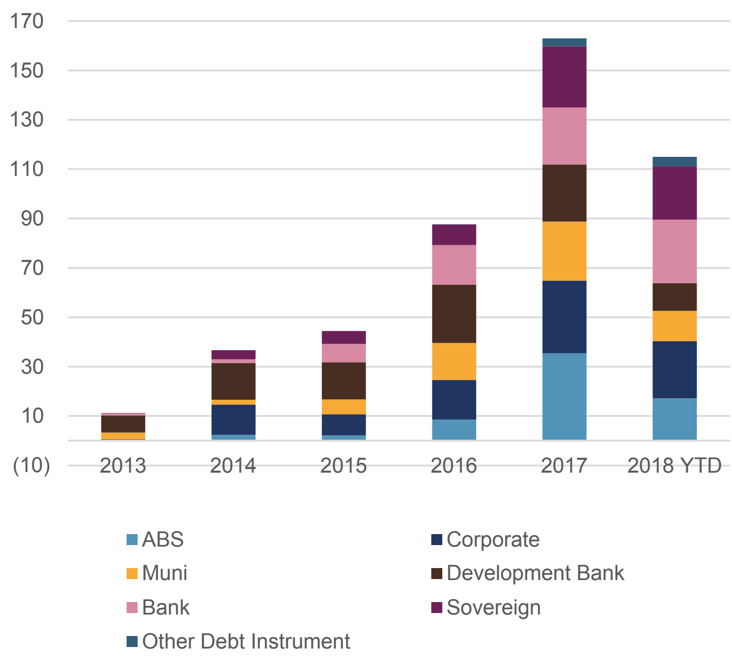
How Climate Change Can Impact Financial Services

- Direct financial impact unlikely to be material in the short term.
- Reputational, regulatory, and litigation risks may represent greater threats
- The most material impact is likely to come from a macroeconomic shock triggered by a climate change driver
- If authorities delay taking the necessary policy steps the negative long-term effects could be profound
- But climate change also offers opportunities

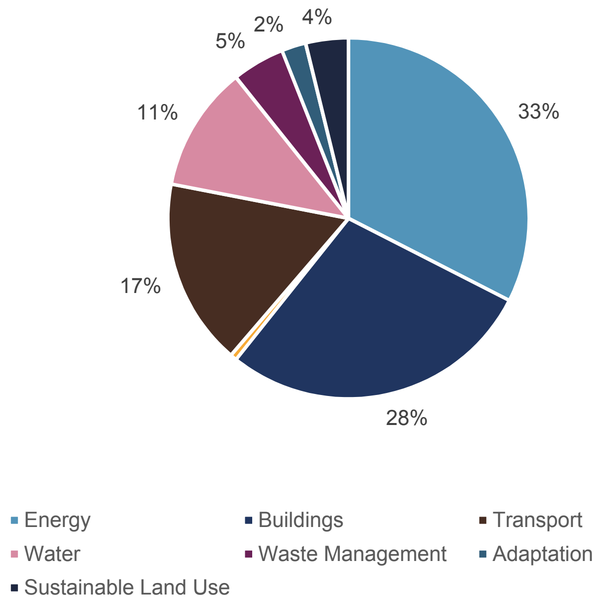
Growth in Issuance of Green Bonds

The green bond market increased by 85% in 2017, driven notably by ABS and sovereign issuance

Annual Issuance By Issuer Type ($ BN)



Split By Project Categories

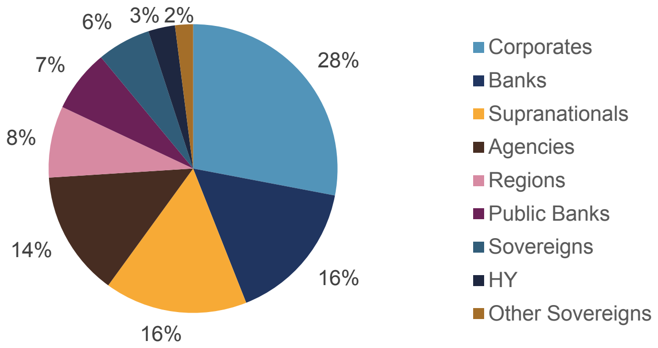


Source: Climate Bonds Initiative

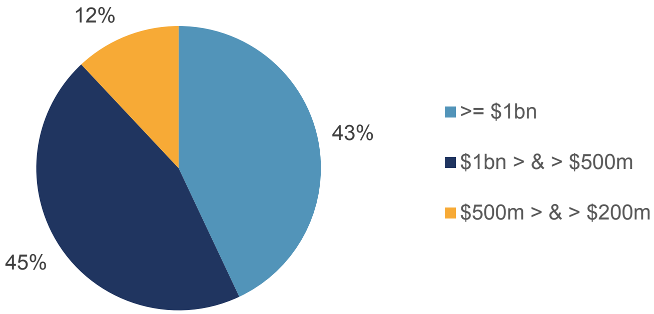
Green Bonds Market Overview

Well diversified market by issuer type, but mostly focused on investment grade credit quality and developed markets. Rising issuances in China and India may move the needle.

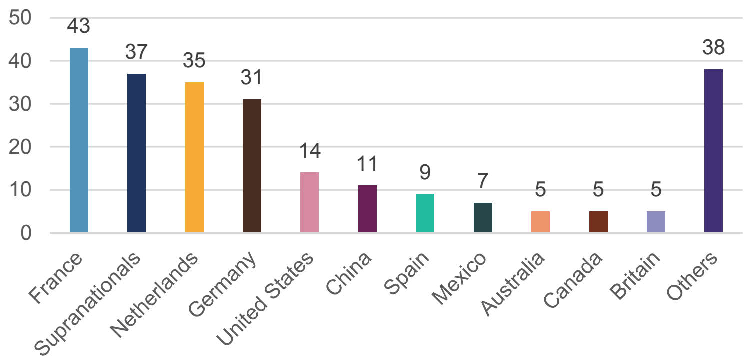
By Type Of Issuer



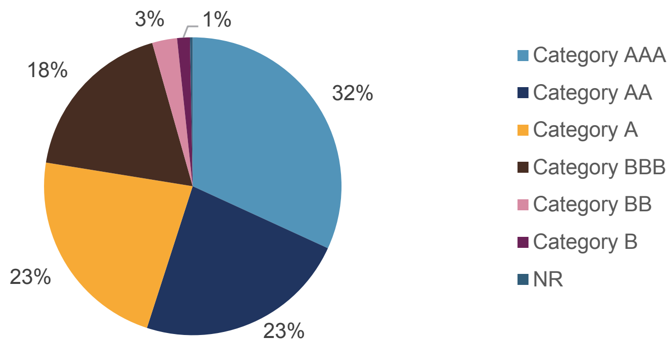
By Issue Size



By Country Of The Issuer ($BN)



By Rating Category



Source: Natixis

Positive pricing signs in the primary market

Some key observations from CBI study:

01 In the sample the spread benefit for USD and EUR corp. green bonds vs Initial Price Talk (IPT) were healthy and broadly in line with the vanilla bond market.

02 USD green bonds achieve higher oversubscription levels in the sample at 2.7x vs 2.2x for similar vanilla bonds. EUR green bonds were similar to the market.

03 Diversification of investor base and occasional upsizing – extra investor interest may lower cost of funding

04 One third of green bonds in the sample exhibited tighter spreads than vanilla equivalents in the secondary market.

05 The Greenium: some bonds in the sample priced inside their own yield curves.

Source: Climate Bonds Initiative Study ‘Green Bond Pricing in the Primary Market: October – December 2017’, published May 2018

Please note: The information presented on this slide are a high level summary of certain key observations of the CBI study. It does not constitute an endorsement of the CBI study, any of its observations or conclusions or the methodology used to conduct the study. Please consult the CBI study for important information on the size and composition of the sample and the methodology, data and assumptions on which the study was based, as well as the limitations of the CBI study.

Green Evaluation Analytical Approach

Weighted aggregate of three:

Transparency + Governance + Mitigation or Adaptation = Green Evaluation

Transparency
- Use of proceeds reporting
- Reporting comprehensiveness

Governance
- Management of proceeds
- Impact assessment structure

Mitigation
Buildings, industrial efficiencies, energy infrastructure, transport, and water

Net benefit ranking
eKPIs:
Carbon emissions, water use, waste creation

Hierarchy applied

Environmental impact

Mitigation score

Adaptation
Resilience capex such as flood defenses, asset protection, etc.)

Cost benefit ranking
Resilience benefit ratio
Estimate of reduction in damages if event occurs

Resilience level

Adaptation score

Final Green Evaluation (E1- E4 or R1- R4)

* eKPI – Environmental Key Performance Indicator

Green Evaluations delivered to date

Broad range of sectors and issuers with wide global reach

24 Green Evaluations made public to date

US$>40bn

Total financing value evaluated

Public Evaluations by technology type

Green Energy	Green Buildings
13	5
Water	**Multi-sector**
3	3

(as of October 10, 2018)

S&P Global Ratings

S&P Green Finance Involvement

Publicly released Green Evaluations

Green Evaluation	Evaluation Date	Financing Value	Green Labelled	Overall score (0-100)	Overall score (E1-E4)
Royal Schiphol Group N.V.	Oct-01	€500 million	Yes	74	E2
DZ Bank	Sept-17	€250 million	Yes	85	E1
Denver Airport System	Aug-06	US$2.28 million	No	87	E1
Greenalia Biomass Power Curtis Teixeiro	July-23	€125 million	No	77	E1
Ygrene Energy Fund Inc.	Apr-10	US$340.47 million	Yes	76	E1
ACS Servicios Comunicaciones y Energia S.L	Apr-03	€750 million	Yes	83	E1
Eolica Mesa La Paz S. de R.L de C.V	Apr-02	US$303 million	No	91	E1
Modern Land (China) Co. Ltd.	Feb-28	US$350 million	Yes	84	E1
BIF III Holtwood LLC	Feb-12	US$350 million	No	90	E1
Landsea Green Group Co., Ltd.	Jan-09	US$200 million	Yes	84	E1
Ence Energia	Nov-24	€220 million	No	79	E1
Bazalgette Finance Tideway	Nov-15	£10 billion	No	95	E1
Hannon Armstrong	Oct-20	US$163.75 million	No	80	E1
Province of La Rioja	Oct-13	US$200 million	Yes	85	E1
Brookfield Power New York Finance	Oct-04	US$305 million	No	91	E1
TenneT Holding	Aug-31	€1 billion	Yes	95	E1
Greater Orlando Aviation Authority	Aug-23	US$997 million	No	78	E1
Capital Region Water	Aug-15	US$44 million	No	87	E1
Mexico City Airport Trust	Jul-27	US$6 billion	Yes	77	E1
DC Water & Sewer Authority	Jul-20	US$100 million	Yes	92	E1
Brookfield White Pine Hydro	Jul-10	US$475 million	No	90	E1
Three Gorges Finance II	Jul-10	€650 million	Yes	83	E1
Gotenborg (City of)	Jun-19	SEK 1 billion	Yes	67	E2
Cross Sound Cable	May-04	US$120 million	No	87	E1

SEK – Swedish krona

As of 10.10.2018

Green Evaluation Outputs

Example

S&P Global Ratings

Green Evaluation

DZ BANK AG €250 Million Fixed-Rate Preferred Senior Notes

Transaction Overview

DZ BANK AG Deutsche Zentral-Genossenschaftsbank, Frankfurt am Main (DZ BANK) has issued €250 million of fixed-rate preferred senior notes due October 2023 as part of its ongoing debt issuance program (ISIN Code: DE000DDA0NB1). The issuance represents DZ BANK's first labelled green bond.

DZ BANK has allocated the issuance proceeds to a portfolio of loans originated for operational onshore wind power projects in Germany. The portfolio currently consists of 60 projects across 11 different federal states with a total installed capacity of about 738 megawatts (MW). DZ BANK's total credit exposure to the portfolio is currently about €433 million by way of non-recourse project finance loans to these projects. In 2017 the portfolio avoided greenhouse gas emissions amounting to the equivalent of about 790,000 tons of CO_2, as estimated by DZ BANK based on emissions factors published by the German Environment Agency. In our opinion, this transaction is aligned with the Green Bond Principles 2018 (GBP).

Entity:	DZ BANK AG Deutsche Zentral-Genossenschaftsbank, Frankfurt am Main
Subsector:	Renewable Electricity
Location (HQ):	Germany
Financing value:	€250 million
Amount evaluated:	100%
Evaluation date:	Oct. 2, 2018
Contact:	Joest Bunse + 44 20 7176 3430 joest.bunse @spglobal.com

Green Evaluation Overview

Transaction's Transparency – Use of proceeds reporting – Reporting comprehensiveness	84
Transaction's Governance – Management of proceeds – Impact assessment structure	78
Mitigation **Sector** Renewable Electricity → **Net Benefit Ranking** Onshore Wind Power → **Hierarchy Adjustments** Carbon	87
Adaptation	NA

100

E1

E2

E3

E4

0

Overall Score

E1/85

Weighted aggregate of three (Transparency + Governance + Mitigation)

S&P Global Ratings

Q&A

Panel: View From The Street

Moderator:
David Masters
Director,
S&P Global Ratings

Rötger Franz
Director,
Credit Research – Insurance,
Societe Generale

Gabriel Kadasi
Vice President,
Fixed Income,
Morgan Stanley

Pierre Le Bihan
Director,
Fundamental Fixed Income,
BlackRock

Tiago Parente
Senior Credit Analyst,
Fidelity International

S&P Global
Ratings

Panel: Future of Insurance

Moderator:
Volker Kudszus
Sector Lead Insurance,
S&P Global Ratings

Dr Trevor Maynard
Head of Innovation
Lloyd's

Ivan De La Sota
Chief Business
Transformation Officer,
Allianz

Giovanni Guiliani
Group Chief Strategy,
Innovation and Business
Development Officer,
Zurich

Dr Paul Mang
General Manager,
Analytics and Data Services,
Guidewire

S&P Global
Ratings