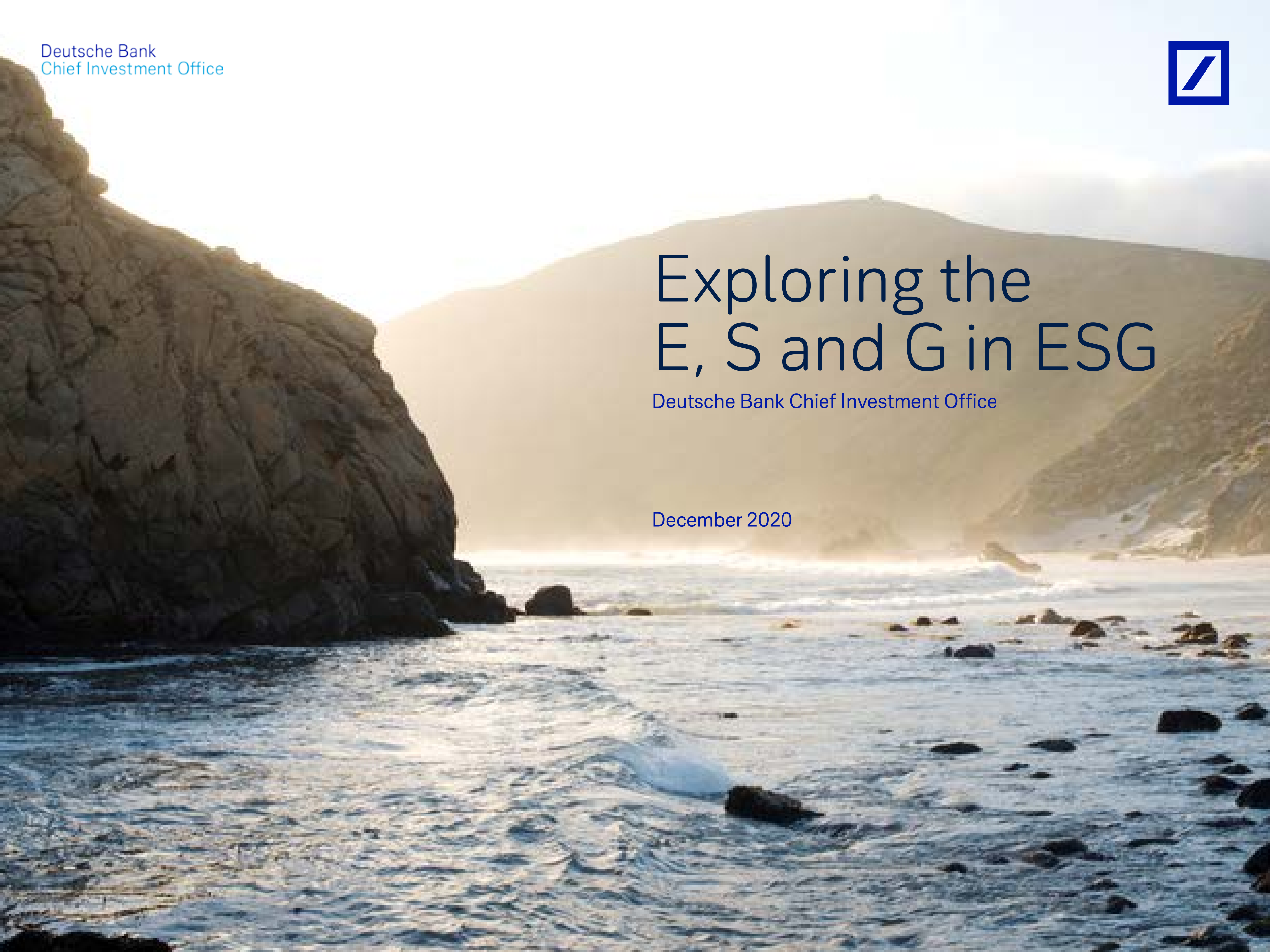


Deutsche Bank
Chief Investment Office

Exploring the E, S and G in ESG

Deutsche Bank Chief Investment Office

December 2020

Introduction to ESG

An overview of sustainability

The beginnings of sustainability

Founding of the interdisciplinary "Club of Rome" network in 1968 – a changing paradigm

"The problématique"

Environment

Inequality

Poverty

Criminality

Ill-health

Urban blight

Interconnected challenges that cannot be solved on their own

THE CLUB OF ROME

Reframing Economics

Rethinking Finance

Emerging new civilization

Holistic long-term thinking for a better future

Sources: The Club of Rome, Deutsche Bank AG. As of December 2020.

History of sustainability

Sustainable Finance and Investing

- **2004** – UN introduces the term "ESG" in a paper called "Who cares wins"
- **2006** – Introduction of the six principles for responsible investing (PRI)
- **2007** – Task force on climate-related financial disclosures is founded (TCFD)
- **2016** – UN agrees on 17 sustainable development goals (SDGs)
- **2017** – European Commission policy discussions on the financial risks of climate change
- **2017** – One Planet Summit demonstrates how financial flows could be shifted towards a low-carbon future
- **2018** – Founding of the investor alliance for human rights
- **2020** – Task force on nature-related financial disclosures is founded (TNFD)

Climate and Environmental Conferences

- **2020** – Aichi Biodiversity goals are extended until 2050
- **2015** – Adaptation of the Paris Agreement, bringing all nations to commit to climate goals
- **2013** – Adaptation of the Doha Amendment, launching a second commitment period of the Kyoto Protocol
- **2010** – The strategic plan for biodiversity, including the Aichi Targets for 2020, is signed
- **1997** – Adaptation of the Kyoto Protocol, the world's first greenhouse gas emissions reduction treaty
- **1993** – During the Earth Summit in Rio de Janeiro, world leaders devise plans to protect the environment
- **1968** – Founding of the Club of Rome network

Sources: United Nations Framework Convention on Climate Change, Deutsche Bank AG. As of December 2020.

From “Who cares wins” to sustainability

“Who cares wins“
2004

6 Principles
2006

17 SDGs
2016

From the first paper by the UN called “Who cares wins” in 2004, several steps have been taken to further specify the meaning of sustainability for the **financial sector** (Principles for Responsible Investment – PRI) **and society overall** (UN’s Sustainable Development Goals – SDGs).

Sources: United Nations Framework Convention on Climate Change, Deutsche Bank AG. As of December 2020.

"Who cares wins" – what does that mean?

E	S	G
Environmental	**Social**	**Governance**
Biodiversity	Consumer protection	Risk management
Climate change	Data security	Corporate ethics
Greenhouse gas emission	Working conditions	Incentive structure
Pollution	Diversity and integration	Accounting and Taxes
Water management	Compensation and services	CEO characteristics
Land degradation	Human rights (child labour)	Compensation/salary
Circular economy	Education	Board diversity/independence
...	...	...

"Caring" means taking into account environmental, social and governance factors in decision-making.

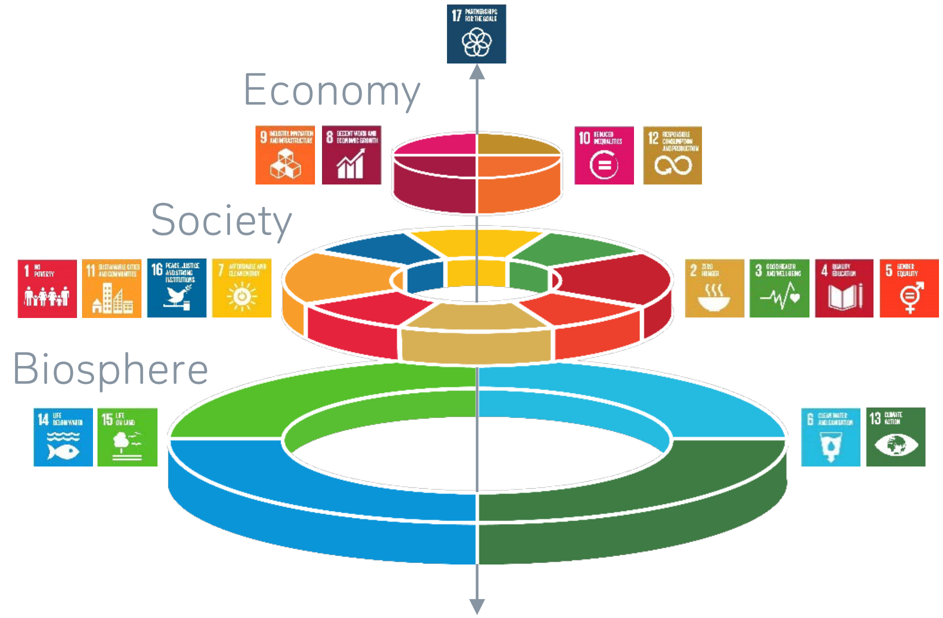
Sources: Principles for Responsible Investment (PRI) Initiative, CFA Institute, Deutsche Bank AG. As of December 2020.

UN's Sustainable Development Goals

E

S

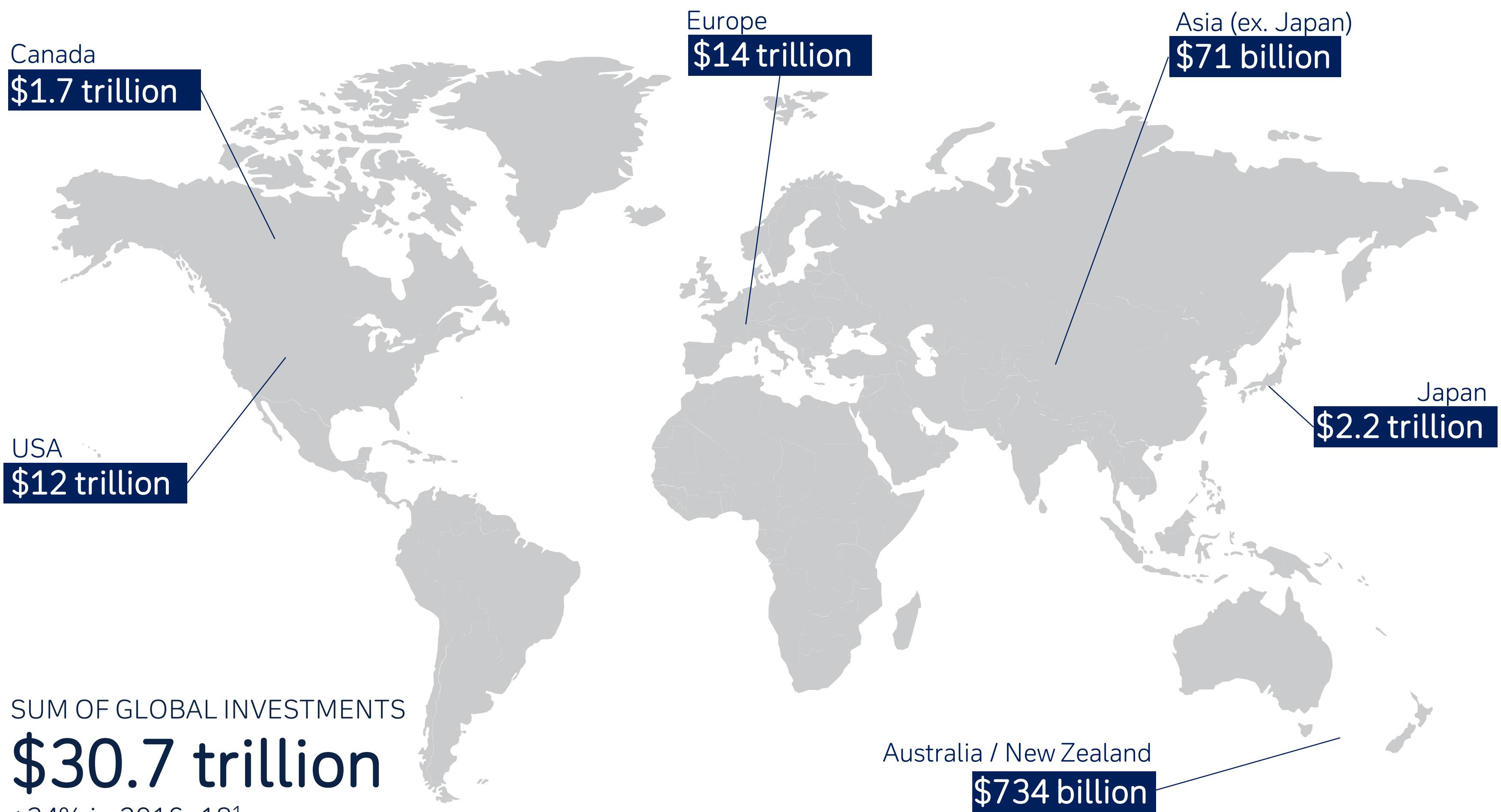
G



By considering environmental, social and governance related issues, investors are able to seek out opportunities that are synergistic with both **financial objectives** and the UN's long-term **sustainable development** goals.

Sources: United Nations, Deutsche Bank AG. As of December 2020.

Volume of ESG investments



SUM OF GLOBAL INVESTMENTS

$30.7 trillion

+34% in 2016–18[1]

1) Global growth of SRI assets from January 2016 to January 2018
Footnote: Past developments and forecasts are not reliable indicators of future developments.
Sources: 2018 Global Sustainable Investment Review, Global Sustainable Investment Alliance (GSIA), Deutsche Bank AG. As of October 2020.

Conclusion

ESG is a **steadily evolving concept** that will only become more relevant in the future. Global conferences and initiatives are at the forefront of its development, but ultimately **all decision-making** will have to consider sustainability issues.

For more information on the history of ESG, see our CIO publication:

E in ESG

How environmental changes will force investors to rethink

E stands for environment and promotes SDGs:

A healthy natural environment is of crucial importance to most aspects of human life. To form a sustainable world, many factors must be considered, including:

Biodiversity

Greenhouse gas emissions

Water management

Land degradation

. . .

Sources: United Nations, Deutsche Bank AG. As of December 2020.

Top 5 global risks over time

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Asset price collapse	Fiscal crisis	Financial failure	Financial failure	Fiscal crises	Water crisis	Climate action failure	Weapons of mass destruction	Weapons of mass destruction	Weapons of mass destruction	Climate action failure
Deglobalization (developed)	Climate change	Water Crisis	Water crisis	Climate action failure	Infectious diseases	Weapons of mass destruction	Extreme weather	Extreme weather	Climate action failure	Weapons of mass destruction
Oil price spikes	Geopolitical conflict	Food Crisis	Fiscal imbalances	Water crisis	Weapons of mass destruction	Water crisis	Water crisis	Natural disasters	Extreme weather	Biodiversity loss
Chronic disease	Asset price collapse	Fiscal imbalances	Weapons of mass destruction	Unemployment	Interstate conflict	Involuntary migration	Natural disasters	Climate action failure	Water crisis	Extreme weather
Fiscal crisis	Energy price volatility	Energy price volatility	Climate action failure	Infrastructure breakdown	Climate action failure	Energy price shock	Climate action failure	Water crisis	Natural disasters	Water crisis

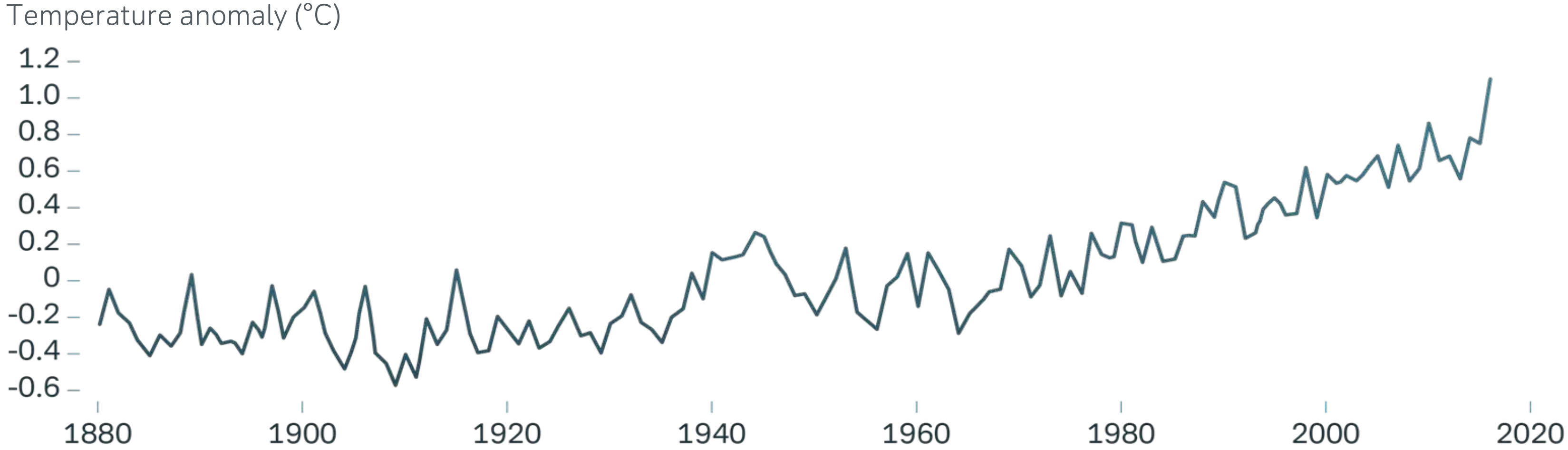
The importance of environmental risks is steadily growing.

Economic Environmental Geopolitical Societal Technological

Sources: The Global Risks Report, Deutsche Bank AG. As of January 2020.

The global temperature is rising

Estimated evolution of global temperatures since 1880




London


Barcelona


Madrid


Marrakech


Jakarta

Unknown

At least 77% of cities worldwide will experience a climate similar to cities that are currently in other climate zones. Many global cities will **shift towards the sub-tropical.**

How does this affect investors?

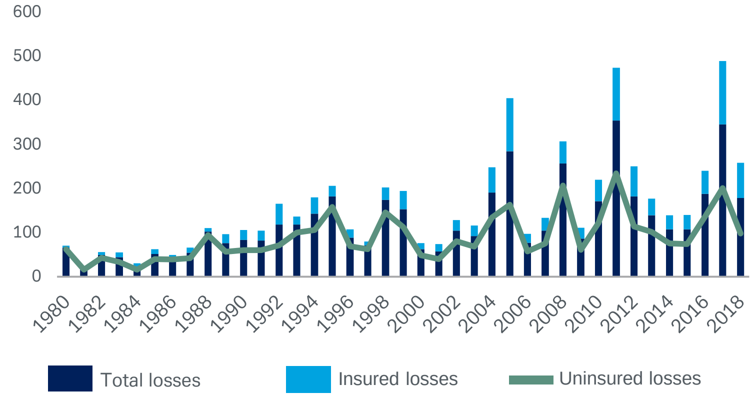
Climate change is leading to more extreme weather events and costs associated with higher average temperatures and sea levels.

Footnote: Global monthly and annual temperature anomalies, where the zero baseline represents the average global temperature from 1961 to 1990.
Sources: CDIAC, ETH Zürich, European Commission, Deutsche Bank AG. As of July 2019.

Economic consequences

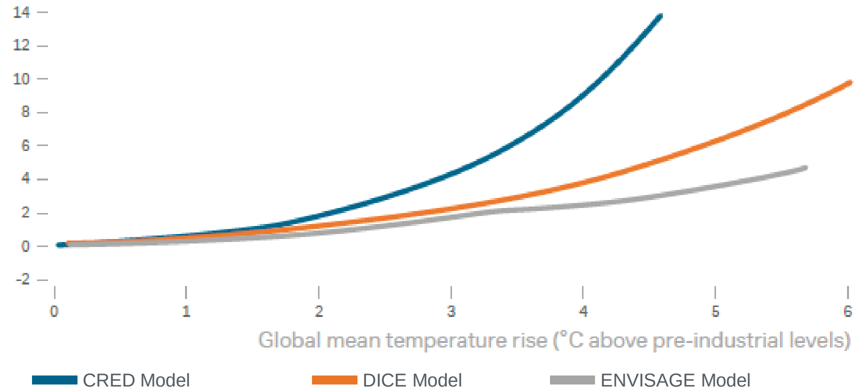
Rising costs due to extreme weather conditions

Inflation adjusted damages (billion USD)



Increasing damages from rising global temperatures

Damage (% global GDP)



Extreme weather is causing major disruptions in global supply chains and leads to an **ever growing cost** for corporates.

Failing to hinder the rise in the earth's average temperature will cause **severe impacts** on our nature, environment and economy.

Footnote: The three different models ("Environmental Impact and Sustainability Applied General Equilibrium" - ENVISAGE, "Dynamic Integrated model of Climate and the Economy" - DICE and "Climate and Regional Economics of Development" - CRED) shown in this figure give damage estimates that are similar at low to moderate levels of temperature change, but diverge at higher levels, reflecting different assumptions used in modelling.
Sources: Left: Munich RE, Deutsche Bank AG. As of January 2020. Right: Revesz et al. (2014), Deutsche Bank AG. As of 2019.

Biodiversity:

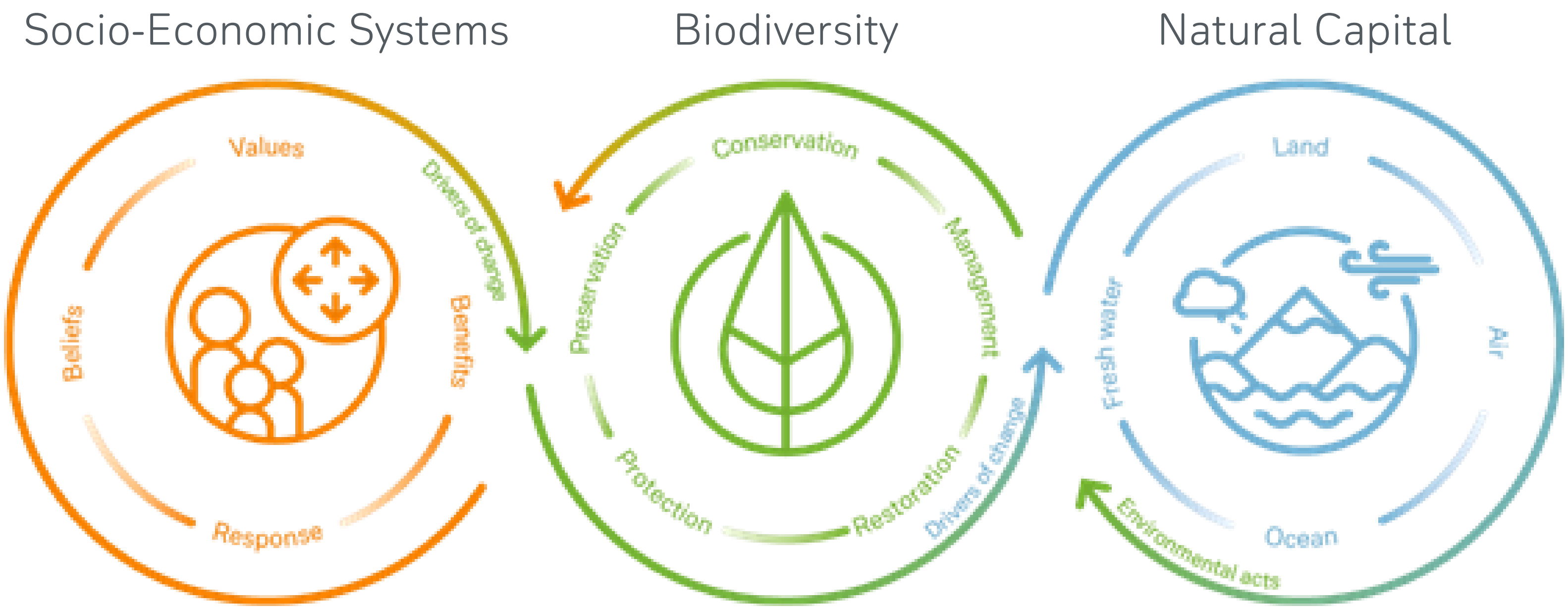
Biodiversity refers to the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems.

It forms the foundation of a vast array of ecosystem services that critically contribute to human wellbeing.

Sources: 1992 United Nations Earth Summit, Deutsche Bank AG. As of December 2020.

Biodiversity – a fundamental prerequisite

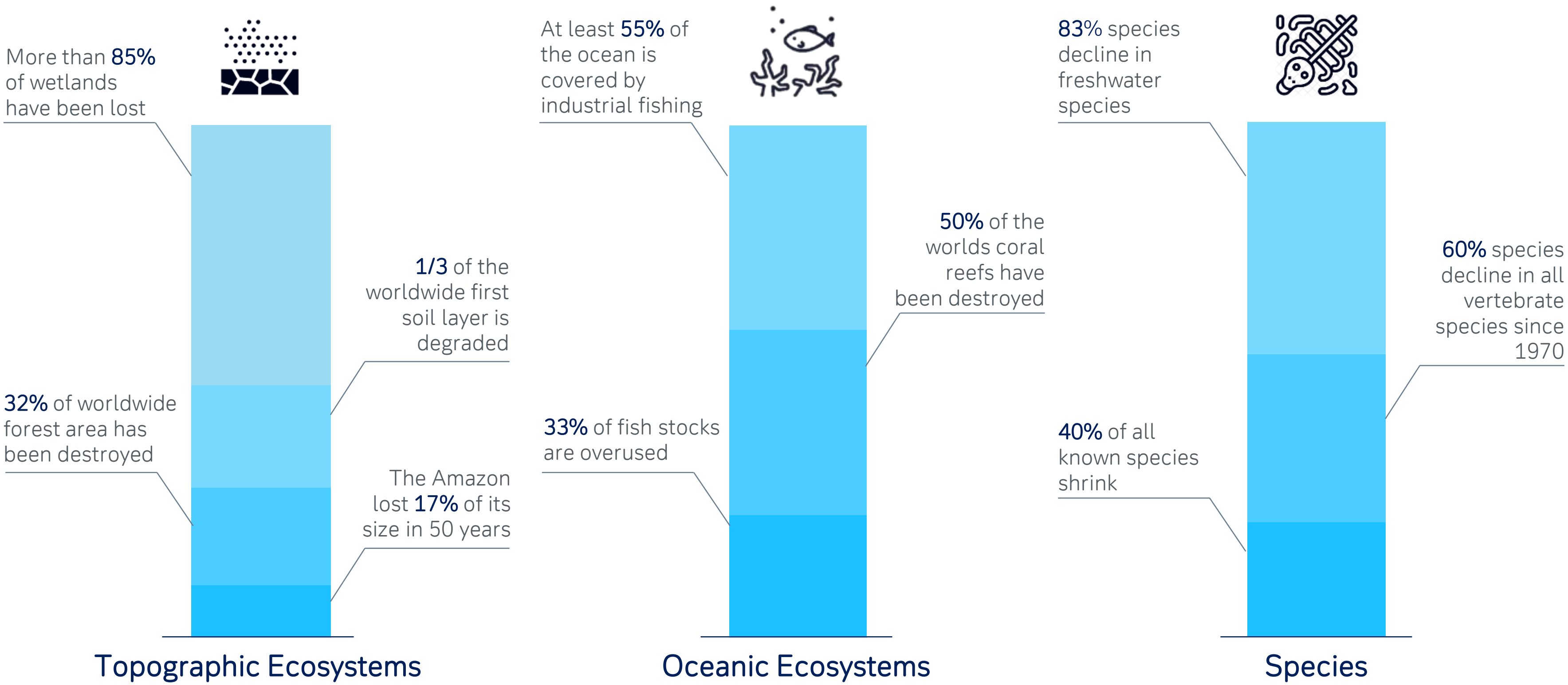
The linkage between socio-economic and environmental factors



The well-being of humankind is inherently linked to a **functioning natural environment.** Biodiversity, Natural Capital and Society are complex systems with **spillover effects**. Due to their **interconnectedness**, environmental factors are of key importance to all major sustainability issues.

Sources: Deutsche Bank AG. As of December 2020.

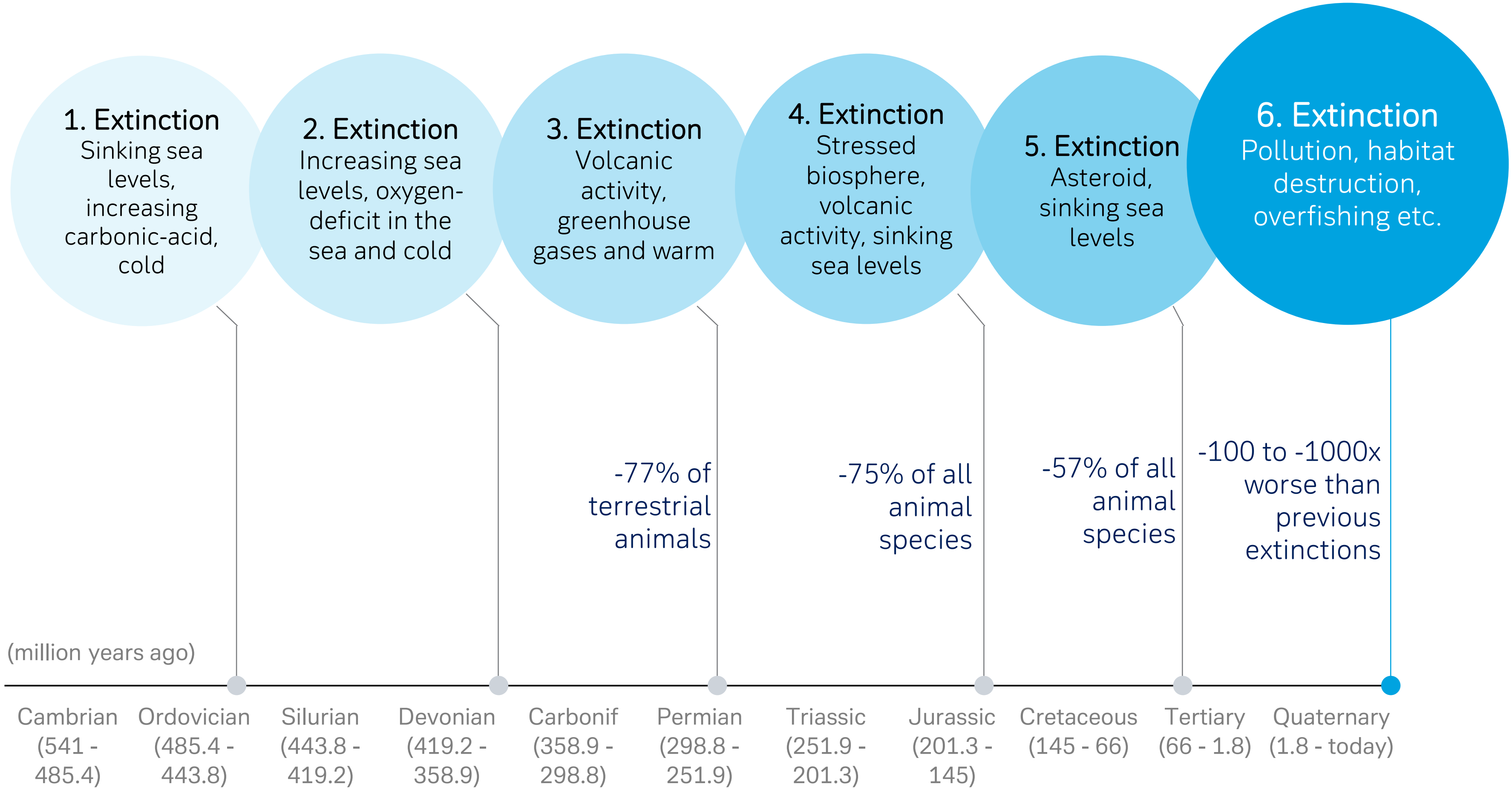
But – our ecosystems are in danger



Sources: IPBES, WWF, Deutsche Bank AG. As of July 2020.

5 large extinctions – 1 more to go?

Extinctions after the Cambrian explosion

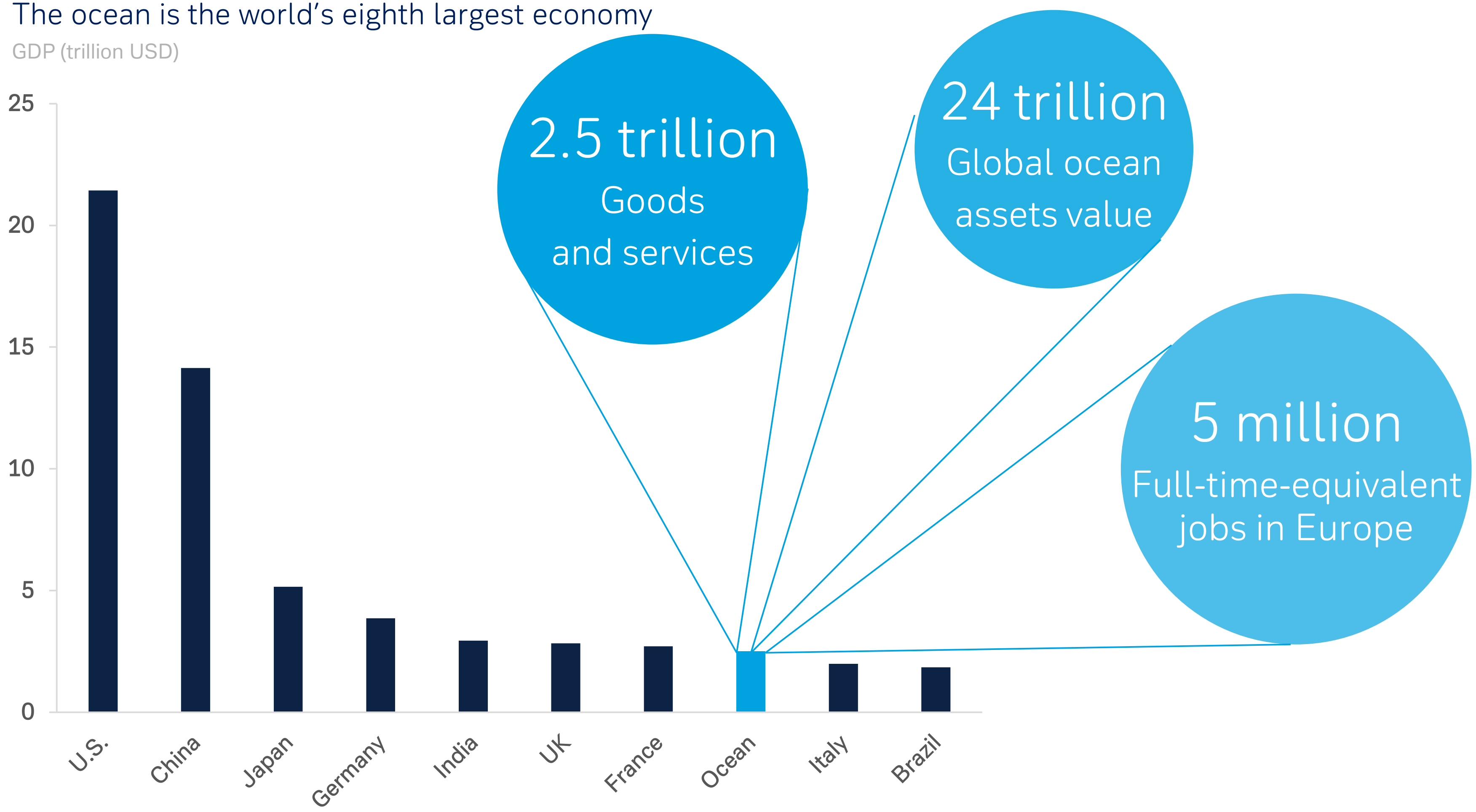


Sources: Reuters, National Geographic, International Union of Geological Sciences, Deutsche Bank AG. As of August 2020.

The importance of our blue economy

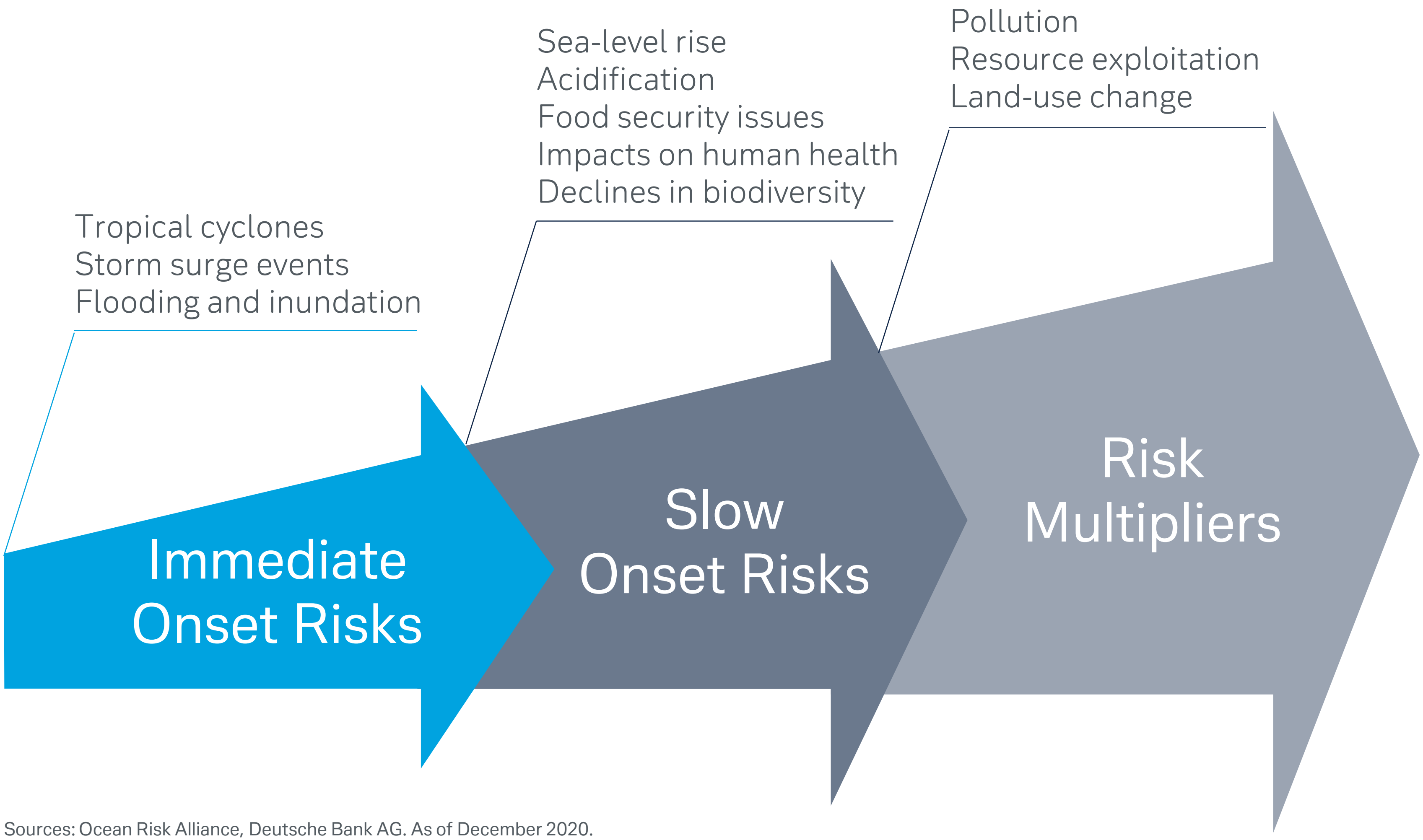
The ocean is the world's eighth largest economy

GDP (trillion USD)



Sources: IMF, WWF, OECD, Bloomberg, Destatis, Trading Economics, Deutsche Bank AG. As of October 2020.

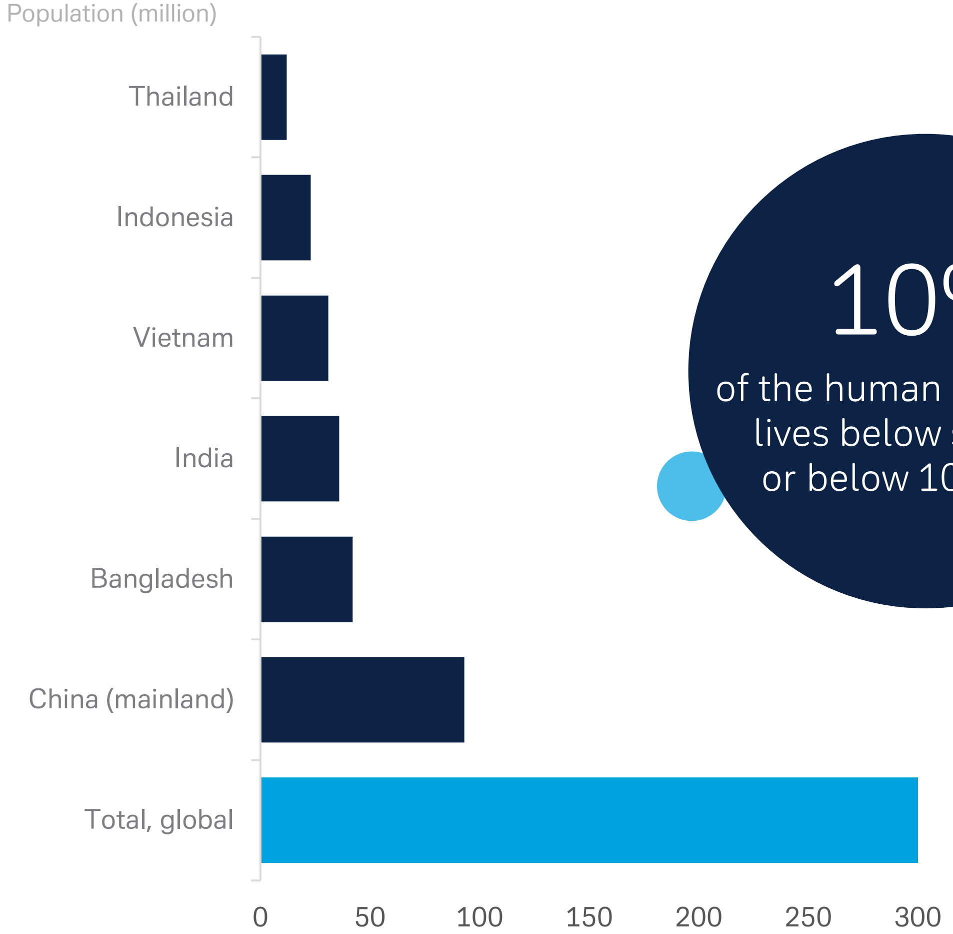
Global risks stemming from our oceans



Sources: Ocean Risk Alliance, Deutsche Bank AG. As of December 2020.

Consequences of rising sea levels

Population below the elevation of an average annual flood in 2050



10% of the human population lives below sea level or below 10 meters

300 million people on land will be disrupted by rising sea levels by 2050

2 billion people could become refugees by 2100 owing to rising sea levels

Sources: Asia Development Bank, IUCN, NASA, Deutsche Bank AG. As of October 2020.

Can technology be an answer?

Technology is responsible for **enhancing energy efficiency** and reducing the cost of environmental preservation.

ESG investment flows can and should be a key **catalyst** to make energy efficiency happen.

Technological innovation can help **reduce energy cost** by devising cheaper ways to obtain i.e. more efficient engines or better insulation.

Sources: Deutsche Bank AG. As of December 2020.

Conclusion

Money spent on environmental protection, such as clean air, biodiversity and the sustainable blue economy, is **not just a cost.** The environmental pillar includes the most fundamental factors for human life and economic growth.

For more information on the E in ESG and the blue economy, see our CIO publications:

Why the S in ESG is the key to improvement

S stands for society and promotes SDGs:

Societal factors are of crucial importance to the economy and the wellbeing of society overall.

These include for example:

Working conditions

Human rights (child labour)

Education

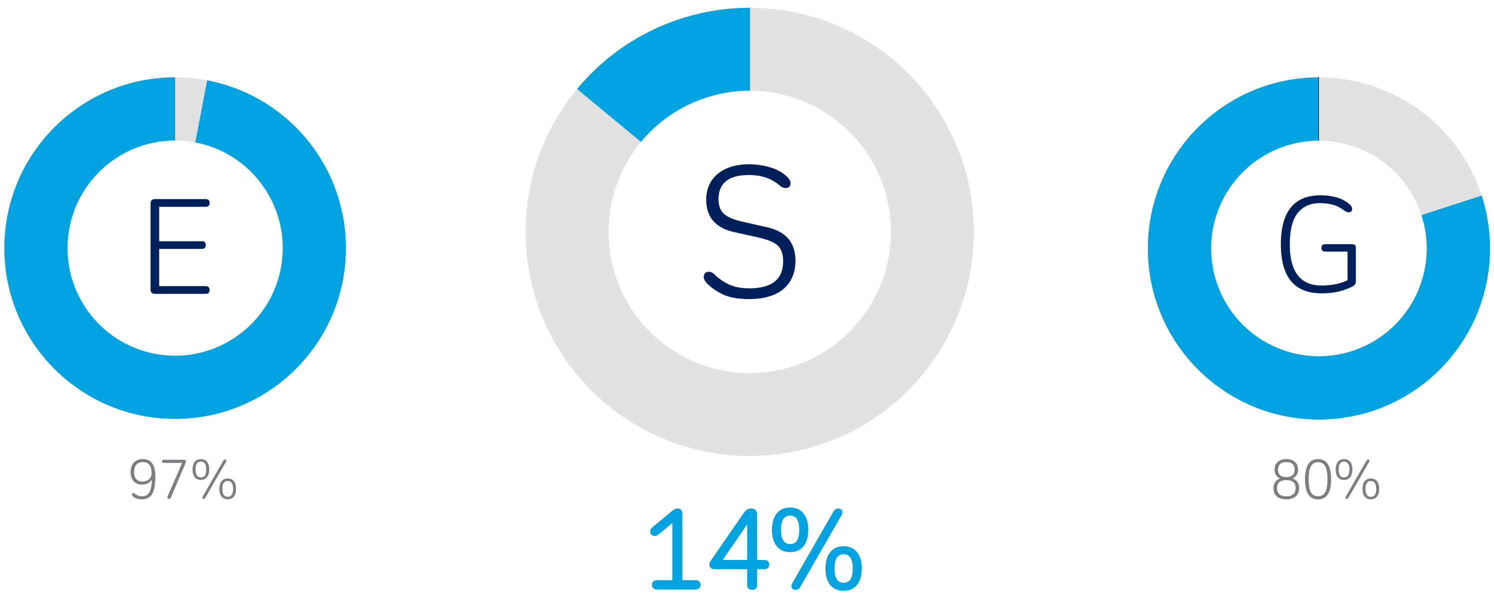
Consumer protection

Data security

Sources: United Nations, Deutsche Bank AG. As of December 2020.

S – The ugly duckling of investing?

Percentage of GRI ratings targeted at investors



Social sustainability is a term rarely heard in the context of investment management. **Only 14%** of “social” ratings compiled by the GRI are targeted at investors.

By contrast, **97%** of environmental ratings and **80%** of governance ratings have investors as their primary audience.

Sources: Global Reporting Initiative (GRI), Deutsche Bank AG. As of October 2020.

Failures of the social dimension

Short-term financial costs – Long-term reputational damage

Child labour

152 million children were engaged in child labour in 2018

2.3% of MSCI All-country World Index faced **child labour controversies** in 2019

Manufacturer

Concerns over supply chains and product safety

Security of licences and **reputational damage**

20% of the MSCI World universe is directly exposed to **transition risk**

Supply chain

In terms of human rights, many companies **do not** apply the same high standards to their **manufacturers** as to their own employees

Social dimension

Poor labour relations and strikes

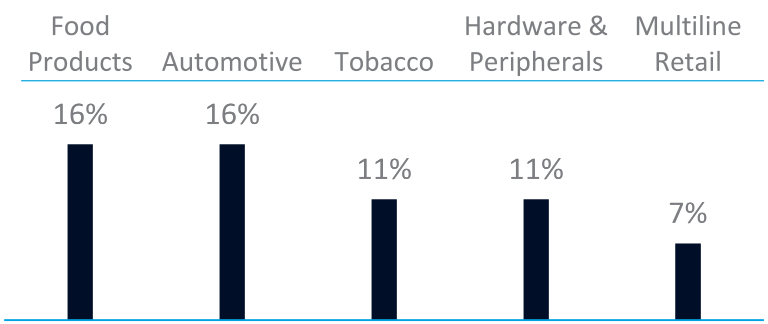
Sexual harassment and misconduct

Better treatment of employees and **social inequality**

Sources: International Labour Organisation (ILO), MSCI, Deutsche Bank AG. As of November 2020.

Time to rethink the social pillar

% of companies subject to child labour controversy



The social pillar significantly reduces systematic risk

Variable	Total Risk	Systematic Risk	Idiosyncratic risk
E	-0.008*	-0.001	-0.003**
S	-0.009**	-0.042**	-0.005**
G	-0.012***	-0.009	-0.002**

Social factors have a **great impact across many supply chains**. In order to assess a company holistically, the S should be a key ingredient in **risk analysis**.

Recent studies find that a company's adherence to social guidelines has a **different impact** on its risk profile than E and G criteria. S is the only pillar that **reduces systematic risk** at firm level.

Footnote: Left: Selection of the most affected sectors among companies within MSCI AC World Index with at least one child labour controversy (N=57). Right: The table results from regressing the Refinitiv ESG Index and control variables against total, systematic and idiosyncratic risk. ***,** and * denotes significance at the 1%, 5% and 10% level, respectively.
Sources: Left: SCI ESG Research, Deutsche Bank AG. As of December 2017. Right: Alfonso et al. (2019), Deutsche Bank AG. As of October 2019.

Conclusion

Although the social pillar is yet to be widely recognised, it is already a key for improvement and an important factor for **corporate productivity and investment returns.**

For more information on the S in ESG, see our CIO publication:

G in ESG

Governance is a powerful force for balance

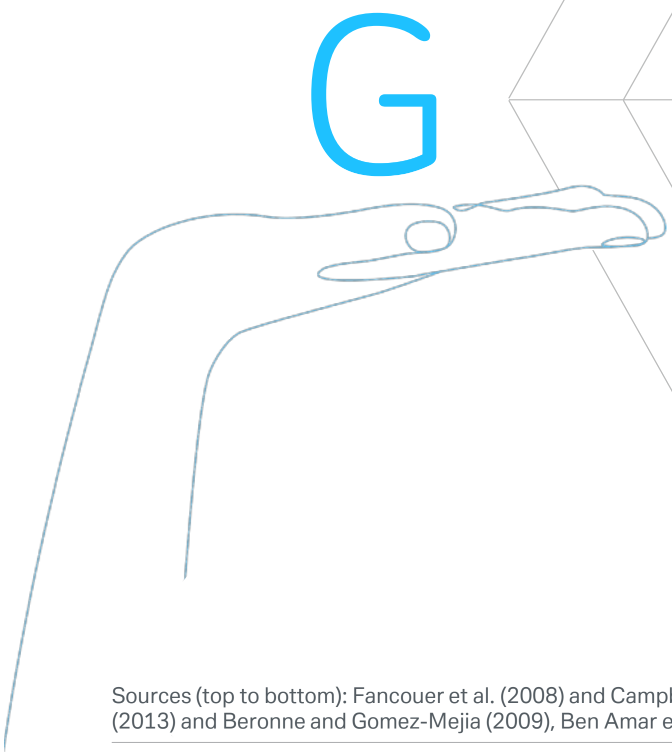
G stands for governance and promotes SDGs:

Governance refers to the system of rules, policies, and processes by which an organisation is directed and controlled.

Who Cares Wins report (2004): “Sound corporate governance and risk management systems are crucial prerequisites to successfully implementing policies and measures to address environmental and social challenges.”

Sources: United Nations, Deutsche Bank AG. As of December 2020.

"Good Governance" matters



Board diversity of gender, demographics and culture may lead to better performance in complex environments

Ownership structures have an impact on strategic decisions and need to be aligned

More **independent board members** improve the boards' objectivity and ability

Remuneration can be determined by non-financial criteria to meet regulatory requirements

Better **monitoring**, as measured by the proxy of board meeting frequency, can lead to higher performance

Combining the roles of **CEO** and **Chairman** may result in riskier outcomes

Sources (top to bottom): Fancouer et al. (2008) and Campbell and Mínguez-Vera (2008), Ben Amar et al. (2013), Kock et al. (2012) and Mallin et al. (2013), Rodrigue et al. (2013) and Beronne and Gomez-Mejia (2009), Ben Amar et al. (2013), Galema et al. (2012), Deutsche Bank AG. As of December 2020.

G – From control to guidance

17-19th Centuries
Controlling global trading companies

Late 19-20th Centuries
Antitrust to the fore

1970s onwards
U.S. Financial Reporting

1990s onwards
Europe catches up

2005 onwards
Multilaterals step in

2015 onwards
Governance and sustainable development

Desire to control

Focus on **not damaging other corporates** (e.g. monopolies) and paying adequate dues to governments

From 1970s: **limiting damage of shareholders** or other companies through mis-governance

Desire to guide

Desire to **guide corporates and governments towards objectives**, mostly environmental.

The COVID-19 Pandemic gave an additional impulse to the focus on **environmental issues**

Sources: Deutsche Bank AG. As of July 2020.

G in ESG

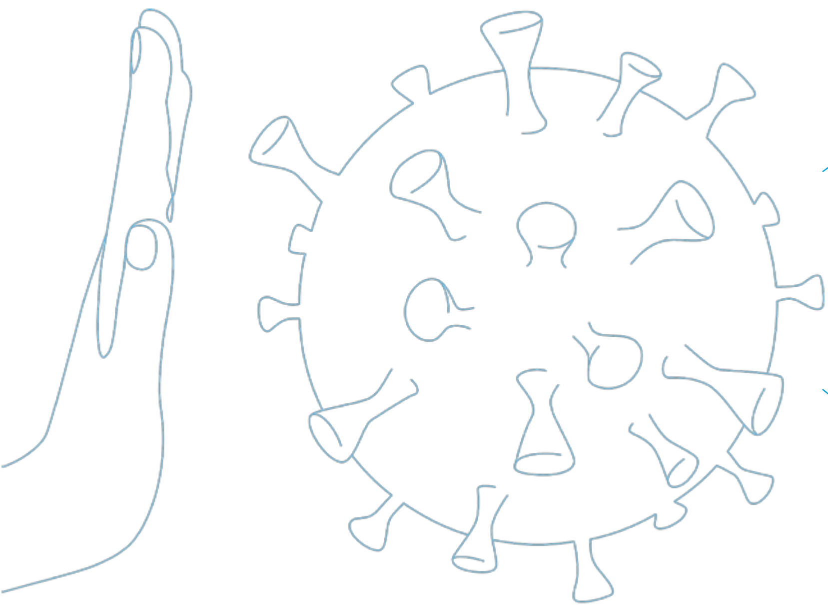
No ESG without the G

Modern governance manages the balance between E, S and G in corporations

Sources: Deutsche Bank AG. As of December 2020.

The importance of the G during a pandemic

Good governance is ever more important in a world shaken by COVID-19



Corporate governance will have to take on board the social impact of coronavirus pandemic, particularly on the most vulnerable groups in society

Social protection schemes and protecting workers are likely to become even more important governance issues

In order to adapt to the post-coronavirus world, we need to ensure that our economic, social and environmental systems are resilient. Investors will need to understand ESG and incorporate it into their decision-making

Sources: Deutsche Bank AG. As of December 2020.

Conclusion

Governance will remain a question of balance – **not just in terms of financial management** but also social and environmental issues – in search for a sustainable investment solution

For more information on the G in ESG, see our CIO publication:


ESG is a conscious and systematic approach
to change what we do and how we do it

ESG CIO publications

[Act today to ensure the future – understanding ESG]

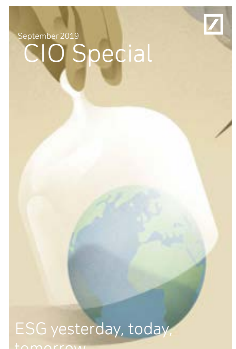
November 2017

[Making a positive impact – on financial performance and on society]

April 2018

[ESG Reflections – the "E" in ESG]

April 2019



[ESG yesterday, today, tomorrow – Sustainability across the centuries]

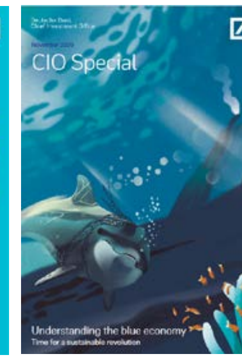
September 2019

[The "S" in ESG – the ugly duckling of investing]

November 2019

[The "G" in ESG – Governance – a question of balance]

August 2020



[Understanding the blue economy – time for a sustainable revolution]

November 2020

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CEO stands for Chief Executive Officer who oversees the operation of a company.

The **Club of Rome** is an interdisciplinary network of 100 members, including notable scientists, economists, business leaders and former politicians, who seek to find solutions to contemporary challenges of humankind.

The **Convention on Biological Diversity (CBD)** is a multilateral treaty focusing on the conservation and sustainable use of biological diversity.

ESG stands for Environment, Social, Governance, and is the acronym most commonly used for sustainable investments.

ESG investing pursues environmental, social and corporate governance goals.

The **European Commission (EC)** is the executive body of the European Union (EU), representing the interests of the European Union as a whole. It consists of 27 Commissioners (one from each EU Member State).

The **European Union (EU)** is an economic and political union consisting of 27 mostly European member states.

Greenhouse gas (GHG) refers to chemical elements and gases that cause the greenhouse effects on planets.

Gross domestic product (GDP) is the monetary value of all the finished goods and services produced within a country's borders in a specific time period.

Idiosyncratic risk refers to factors that can negatively impact specific securities.

MSCI is an independent provider of market indices and other analytical tools.

The **MSCI AC World Index** captures large- and mid-cap companies across 23 developed- and 23 emerging-market countries.

OECD stands for the Organisation for Economic Co-operation and Development, which stimulates economic progress and world trade.

The **Paris Agreement** refers to a 2015 agreement under the United Nations Framework Convention on Climate Change.

SDGs stands for Sustainable Development Goals. They are a collection of 17 global goals set by the United Nations General Assembly in 2015. They include 169 targets.

Systematic risk refers to factors that can negatively impact broad asset classes (such as macroeconomic factors)

UN stands for United Nations and is an international non-profit organisation to increase political and economic cooperation among its member countries.

USD is the currency code for the U.S. Dollar.

Volatility is the degree of variation of a trading-price series over time.

Important Information (1/5)

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