



AXA & EURASIA GROUP

Future Risks Report

October 2019



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Foreword by Thomas Buberl, *CEO of AXA*

Anticipating and understanding risks is precisely what insurance is all about. With societies undergoing profound and accelerated changes, our mission has never been so crucial. These complex trends prompt us to look into a world of uncertainty in which events are increasingly hard to anticipate.

Analyzing experts' perception of future risks provides a glimpse into this uncertain horizon. As we know, such feelings and concerns often determine the decisions we make, but also the laws and regulations which could and should be adopted in the midterm. We are especially proud to enrich the vision provided in the report by collaborating with Eurasia Group.

What do we learn from this report? As in recent years, climate change, risks associated with new technologies, and rising geopolitical instability are seen as the most urgent challenges for the future. Our report also underlines that all these risks are now interconnected, requiring protection to be considered through a global, interdisciplinary, and multi-stakeholder approach.

In a broader sense, there is growing concern about the consequences of human actions, from unsustainable growth damaging the environment, to new technologies threatening our private lives and the rise of populist politics challenging our ability to shape an inclusive destiny. In short, part of what has allowed us to live a better life in the past has turned into challenges for the future.

This situation entails a profound change in the way risks are approached. It obviously requires new expertise, but above all collective action by public authorities, companies, and citizens.



Foreword by Ian Bremmer, ***President & Founder of Eurasia Group***

We could not be launching our first ever *AXA-Eurasia Group Future Risks Report* at a more critical time. As the following pages make clear, the biggest risks facing the global economy today—from climate to technology and geopolitics—are all deeply interconnected. These are all urgent problems, and they are all hitting at the same time. Smart leaders need to be considering them *together* and not as a series of independent risks.

Taking a comprehensive approach to all these challenges reveals a complex series of trade-offs at virtually every turn; taken together, they create the most challenging global business risk environment of my lifetime. CEOs around the world still face the same short-term pressures to hit their bottom-line targets, but they now also need to respond to an expanding set of constituents and obligations relating to the environment, technology, ethics, and social responsibility. And all this comes against a global backdrop in which technology makes everything move faster, and where the increasingly volatile geopolitical environment makes taking global action—for companies and for governments—both harder and less effective.

Analysis alone cannot completely prepare business leaders to manage future risks. We need to start with understanding, but also move quickly toward action and execution. That's why this report is unique, and why it required the combined efforts of AXA and Eurasia Group—Eurasia Group brings unparalleled analysis and understanding of the global risk environment to AXA's deep insights and experience working with companies to manage business risk. Working together, we have produced not just a compelling think piece on risk, but a framework for thinking and *acting* to manage that risk.



Who we are: AXA

Risks are at the core of the AXA Group's mission to empower people to live a better life. We are present in more than 60 countries as one of the leading international insurance companies. Our employees apply their expertise to a range of products and services that are adapted to the needs of our 105 million clients across three major business lines: property & casualty insurance, life & savings, and asset management.

For more than forty years, the AXA Group has developed world-class expertise in risk management. Our tools for identifying, quantifying, and rigorously managing risks are designed to better protect our clients and anticipate new risks, while also being powerful tools for development. Our global network of risk managers works closely with our underwriters, claims handlers, lawyers, risk engineers, and prevention experts to provide best-in-class risk management to AXA clients.

Proactive risk management is a key principle that we live by. Since 2005, a dedicated team has been working on the identification, assessment, and management of emerging risks. The objective of the Emerging Risks team is to ensure that all new, ever evolving, and potentially disruptive risks are on the radar of the AXA Group. An important aspect of the team's work is raising awareness and making sure that we have a proper understanding of the challenges ahead. This foundation of strong risk knowledge and expertise is a prerequisite for strategic management of the risks of tomorrow.



Who we are: Eurasia Group

In 1998, Ian Bremmer founded Eurasia Group, the first firm devoted exclusively to helping investors and business decision-makers understand the impact of politics on risks and opportunities around the globe. Ian's idea—to bring political science to the investment community and to corporate decision-makers—launched an industry and positioned Eurasia Group as the world leader in political risk analysis and consulting. Eurasia Group's expertise encompasses developed and developing countries in every region of the world, a broad range of economic sectors, and the business and investment playing fields of the future.

Eurasia Group's client services include a comprehensive suite of geopolitics solutions, offering unique and integrated products and services that combine best-in-class political risk advisory with the tools required for success in a politically charged global economy. Eurasia Group's dynamic partnerships with leading firms in the investment, consulting, and broader professional services space complement our politics-first capabilities and expand our suite of client solutions. In 2017, Eurasia Group launched GZERO Media, a new kind of media company with a simple mandate: to help a broad, global audience make sense of today's increasingly volatile world.

Eurasia Group's businesses are built upon a research platform of leading political risk analysts and management consultants with deep country and sector expertise. Considered to be among the world's foremost experts in their respective subject areas, Eurasia Group analysts provide tailored support to the world's top investors, executives, and strategists, helping them navigate today's volatile political climate to build future value.

Executive summary

Preparing for the future requires an in-depth assessment of emerging risks. Technological revolution, climate change, and increasing international instability make it harder for policymakers, businesses, and individuals to anticipate coming changes, challenges, and opportunities. Perception shapes our collective vision of the world and influences decision-making.

Therefore, for the sixth consecutive year, AXA sought to highlight experts' perceptions of future risks by conducting a structured survey of more than 1,700 specialists from 58 countries, selected for their risk expertise. This year, in order to encompass global geopolitical trends and shifts in the analysis of the global risk landscape, AXA partnered with the advisory firm Eurasia Group. The insights coming from this panel of risk experts, combined with AXA's in-house risk management capabilities and Eurasia Group's unique take on geopolitical themes, offer an unparalleled vantage point to look at risks on the horizon.

Top risks

Experts in the 2019 survey identified the following ten major emerging risks:

1. Climate Change		2. Cybersecurity Risks	
3. Geopolitical Instability		4. Social Discontent and Local Conflicts	
5. Natural Resources Management		6. Artificial Intelligence and Big Data	
7. Pollution		8. Pandemics and Infectious Diseases	
9. New Threats to Security		10. Macroeconomic Risks	

Source: AXA 2019 emerging risks survey

Environmental risks: planning for mitigation and adaptation

Most environmental risks are caused or worsened by human activities. Climate change emerged as the top risk of the survey, reflecting the growing concern for and awareness that environmental risks have far-reaching consequences on society. Our experts stressed that climate change, biodiversity loss, and environmental degradation are interlinked and self-reinforcing. Demographic trends will further increase the pressure on natural resources and contribute to environmental degradation.

For instance, the threat of wildfires in the US is enhanced by a unique combination of climate change, human activities, and their respective ripple effects. This web of complex and connected risk factors leaves the environment increasingly vulnerable, with consequences ranging from business losses and property damages to declining forest biodiversity.

An important implication of climate change and environmental degradation is on supply chains. Shortages of raw materials and natural resources can drive up costs and reduce production capacity, in turn creating a variety of economic and business disruptions.

Geopolitics and domestic political constraints have prevented a sufficiently large and coordinated global response to climate change and other environmental risks. Multilateral action is likely to remain weak, suggesting that the path forward might remain a patchwork of initiatives led by different stakeholders around the world. An optimal response to climate change would benefit from positive synergies between adaptation and mitigation actions that must be complementary.

Technological risks: Beyond cyber

Cyber risks have long been a top concern for risk experts given the potential economic impact of a successful large-scale cyberattack. Technological risks today are rapidly evolving, becoming more complex, and are increasingly linked to geopolitical and societal risks.

Case studies on the future of data regulation, the challenges of artificial intelligence (AI) and the prospects of quantum technology stress the importance of the geopolitical context in identifying emerging technological risks. Geopolitical competition over emerging technologies is leading to more fragmented supply chains, increasing costs for businesses. Indeed, countries may eventually develop entirely separate technology ecosystems, raising the costs of compliance for businesses. These developments would create new risks and vulnerabilities, alongside new threats exposed by the eventual development of quantum computing.

The EU is leading the global debate on safety and ethics with the implementation of the General Data Protection Regulation (GDPR), which is influencing data privacy laws in several countries and US states. Moreover, a growing debate seeks to incorporate ethical principles into the development and deployment of AI. Nonetheless, conflict over—and excessive regulation of—data localization could substantially reduce the transfer of data, negatively affecting businesses and stifling innovation in machine learning and other data-intensive applications.

Political risks: the consequences of the “geopolitical recession”

Concern over geopolitical instability has risen in this year’s ranking of emerging risks. Experts fear the socioeconomic consequences of the decline in multilateralism—characterized in this report as a “geopolitical recession”—and the rise of populism. A potential corollary is the reduced ability of governments to monitor emerging risks, mitigate them, and manage crises when they hit. Governments across much of the world are also facing rising social discontent and political unrest driven by a variety of factors, including rising populism, dissatisfaction with socioeconomic inequalities and inadequate social safety nets, and demands for increased democratic representation.

Eurasia Group's outlook for regional political risks

No part of the world will be immune to these emerging risks. To better understand the regional dimension of risk, Eurasia Group analysts focus on a set of primary domestic political and geopolitical challenges for three of the world's major economic regions: Asia, Europe, and North America.

- Europe faces important challenges from internal economic and political forces, and in establishing its place and global voice in a world increasingly at risk of dividing into US- and China-led blocs.
- Asia's primary challenge is to balance the economic, commercial, and diplomatic rise of China with its historic postwar relationships with other global powers, including the US and Europe.
- North America's risk landscape will be largely shaped by two overarching trends: The rapidly changing role of the US in the world and the changes in US politics, which risk eroding the quality of crisis management and policy-making in the US.

The interconnectivity of risks

A central theme of this report is the growing interconnectivity between many of the emerging risks identified by surveyed experts. The complex links between risks demand a more transversal approach to risk identification, which must also translate into cohesive and integrated risk management. Risks must always be analyzed in their broader context, drawing expertise from an inter-disciplinary and multi-stakeholder approach.

The risks identified by the survey cannot be considered in isolation: many influence others or even trigger new, previously unanticipated risks. For instance, climate change can foster social discontent and local conflict that can lead to geopolitical instability. Sufficiently understanding and identifying risks means adopting a larger scope of analysis and studying the indirect implications of global changes.

To reflect this complex set of linkages, the *AXA-Eurasia Group Future Risks Report* undertakes a multifaceted risk analysis. The most urgent issues identified by survey experts are first sorted into three clusters: environmental, technological, and political. The risks are then considered in connection with one another, rather than in isolation as discrete risks.

Public authorities are not sufficiently prepared to face emerging risks, according to 83% of surveyed experts. Building resilience is key for all organizations, both public and private, and risk mitigation must not be left to governments only. Ultimately, private actors and civil society—in collaboration with policymakers—must step up to the challenge and play their part in preparing for the risks of tomorrow.

Risks under the radar: health risks

Several medical and health risks are directly connected to environmental, technological and political developments, even though they are not at the top of the survey's ranking. Exposure to harmful substances intersects with environmental degradation and pollution. The risk of pandemics—the only medical risk in the top ten—is amplified by an increasingly fragmented political landscape and by economic constraints. Growing competition between technology ecosystems could further hinder medical advances.

Introduction

The sheer number and complexity of risks on the horizon, many of which are intensifying at an unprecedented pace, create uncertainty and ambiguity that is difficult for governments and businesses to navigate.

Traditional business models, market-driven economic developments, classic forms of governance, diplomacy-based international relations, and familiar technologies are all changing in unexpected ways, transforming the nature of well-known risks and giving rise to new challenges.

In the era of big data and digital overload, the continuous flow of information and the central role of social media have reinforced online “echo chambers” and “fake news” filters, which inevitably limit the diversity of information people are exposed to and amplify the spread of misleading or inaccurate content. Experience suggests that people also tend to overestimate disruptions and extreme scenarios shaped by a long-standing cultural imagination, and simultaneously underestimate dormant underlying risks. This all leads to a paradox of too much information and not enough knowledge at the same time.

In this context, how can we pinpoint the risks that will matter most for society at large in the next decade? How can we identify emerging risks that will present major threats from those that arise from misconceptions or disinformation? How can we sail through uncharted waters, freed from personal biases stemming from past events and altering our perception of what is to come?

Our analysis is based on the results of AXA's Emerging Risks Survey, which indicates how risk experts perceive emerging risks that could have a significant impact in the next five to ten years. The insights coming from this panel of risk experts, combined with AXA's in-house emerging risk management capabilities and Eurasia Group's unique take on geopolitical themes, offer an unparalleled vantage point to examine emerging risks on the horizon.

The lessons to be drawn from the results of the Emerging Risks Survey are presented in the first section of the report. The following sections are dedicated to the interconnectivity of risks with cross-cutting analysis of environmental, technological, and political risks, as well as a deep dive into health risks that are currently under the radar. Looking at ongoing transformations at the regional level, Eurasia Group leverages its experience to forecast the evolution of the regional risk landscapes in Europe, Asia, and North America. Overall, the *AXA-Eurasia Group Future Risks Report* aims to provide insights into the future risk landscape in order to anticipate, prepare, and mitigate emerging and rising risks on the horizon.

Insights into the perception of future risks

What is the Emerging Risks Survey?

The survey's objective is to develop a better understanding of the future global risk landscape by carefully measuring and analysing expert perception of emerging risks.

Emerging risks are defined as new or evolving risks that may have a significant impact in the next five to ten years on society at large. Defining their characteristics and potential impact is challenging because of their uncertain nature. Unlike with many other types of risks, past experience is not a reliable guide to future potential impact; the absence of historical data makes it difficult to accurately predict the trajectory of emerging risks.

Yet anticipation is essential when it comes to emerging risks, for they have the potential to disrupt the global risk landscape. One approach is to focus on the *perception* of emerging risks, primarily because the perception of an emerging risk can influence the behavior and actions of regulators, policymakers, businesses, investors, researchers, and customers, in turn conditioning how a risk eventually materializes. Moreover, the awareness and knowledge of a given risk is a good indicator of its emergence.

The perception of risks shapes our understanding of the world. For this reason, AXA has made it a core topic of investigation since 2014 with the AXA Emerging Risks Survey. The survey is conducted every year to take the pulse of the trends and dynamics of emerging risks as perceived by professionals with strong expertise in risk-related matters. As a global insurer, AXA has a privileged perspective on the risk landscape, allowing this survey to leverage the combined experience of more than 1,700 internal experts, partners, clients, and peers. With their diverse backgrounds in risk prevention, underwriting and claims management, innovation, research, public policy, security, research, and corporate risk management, the surveyed experts all bring their own visions of future risks.

About the survey¹

The 1,726 experts who answered the AXA Emerging Risks Survey in May 2019 live in 58 countries, range in age from 20 to 76 years old, and have diverse professional backgrounds. They were invited to answer the survey based on their knowledge of risk-related matters. The sample of experts who participated in the 2019 survey is larger and more diverse than last year, with 40% more respondents.

More than 1,400 AXA experts participated in the survey: they mainly come from professional disciplines with a deep understanding of the evolving risk landscape, such as risk management, underwriting, distribution, claims management, actuarial function, etc.

We also collected the views of external stakeholders who brought their own perspective on future risks: 158 risk managers from large companies and insurance brokers, as well as 60 academic researchers, in addition to experts with risk and security backgrounds.

1726
respondents



+40%
compared
to 2018

from

58

countries in

North America Central America South America Africa Asia-Pacific Europe Middle East

43.8

years old (on average)



2/3 male

1/3 female

¹ Please refer to the Appendix for the methodology of the survey

After providing information about their countries of residence, age, gender and professional status, experts were asked with an open-ended question to identify the main emerging risk that may have the most significant impact on society. Respondents were then asked to select five out of 25 emerging risks and rank them based on their potential impact in the next five to ten years. For each selected risk, experts were asked specific questions about their main concern, the pace of emergence, the level of awareness, and the preparedness of public authorities to cope with the emerging risk. A final open-ended question allowed them to share their thoughts on emerging risks, blind spots, game changers, weak signals, and exaggerated risks or hype.

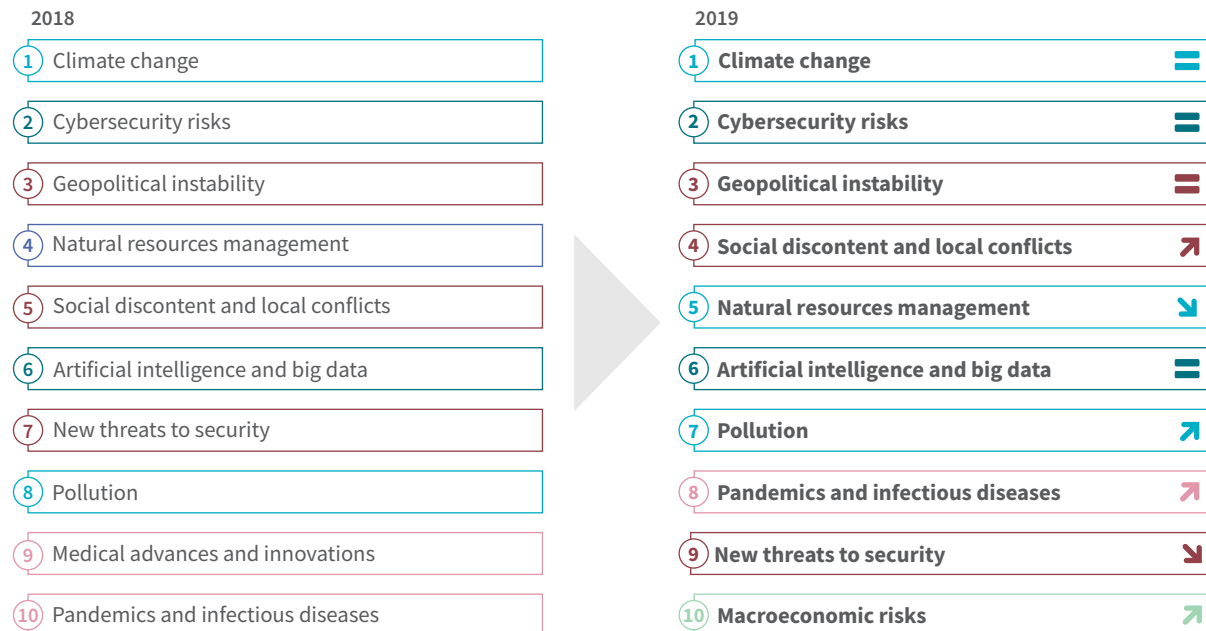
Top risks, evolutions, and trends

Environmental risks, technological risks, and political risks dominate the 2019 Emerging Risks Survey. The three risks at the top of the ranking—climate change, cyber security risks, and geopolitical instability—are emblematic of how experts prioritize emerging risks. Indeed, other top risks can be clustered around the top three, since they also arise from concerns related to the natural environment, new technologies, and the socio-political landscape.

Economic risks and health risks are comparatively less prominent. Risks related to the economy, finance, and the overall business environment have returned to the top ten after their surprising exit in 2018, ten year after the financial crisis. The relatively low position of macroeconomic risks appears counterintuitive, but these risks are likely embedded in others ranked higher by respondents, especially geopolitical instability. Risks related to medicine and health have risen in the survey this year, with the risk of pandemics and infectious diseases moving up to risk #8, but other health risks are ranked much lower.

Evolution of the top 10 emerging risks

■ Environment & Energy ■ Tech & Data ■ Society, Politics & Regulation
■ Medicine & Health ■ Economy, Finance & Business Environment

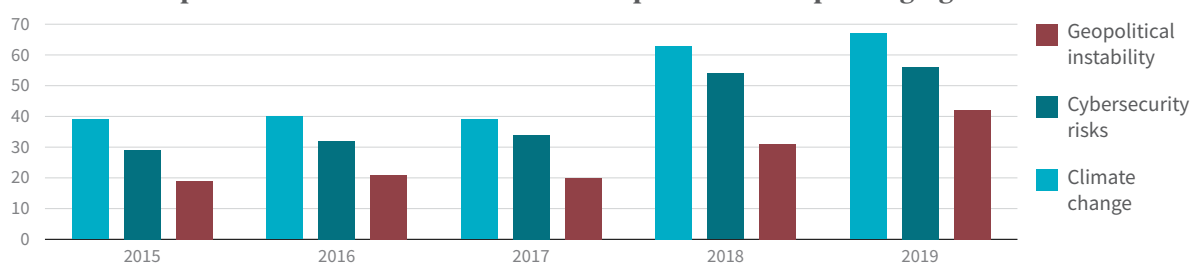


Source: AXA 2018 and 2019 Emerging Risks Survey

The evolution of risk perception among experts over time can reveal distinctions between long-term trends and one-off threats and weak signals. The persistence of the top risks from one year to the next indicates that experts are convinced of the risks' disruptive and even potential destructive impact on society at large. Results show that the consensus has been strengthening around the three main emerging risks over the past five years. Experts have selected them more and more with each new edition of the survey, leading to a well-established top three in 2019.

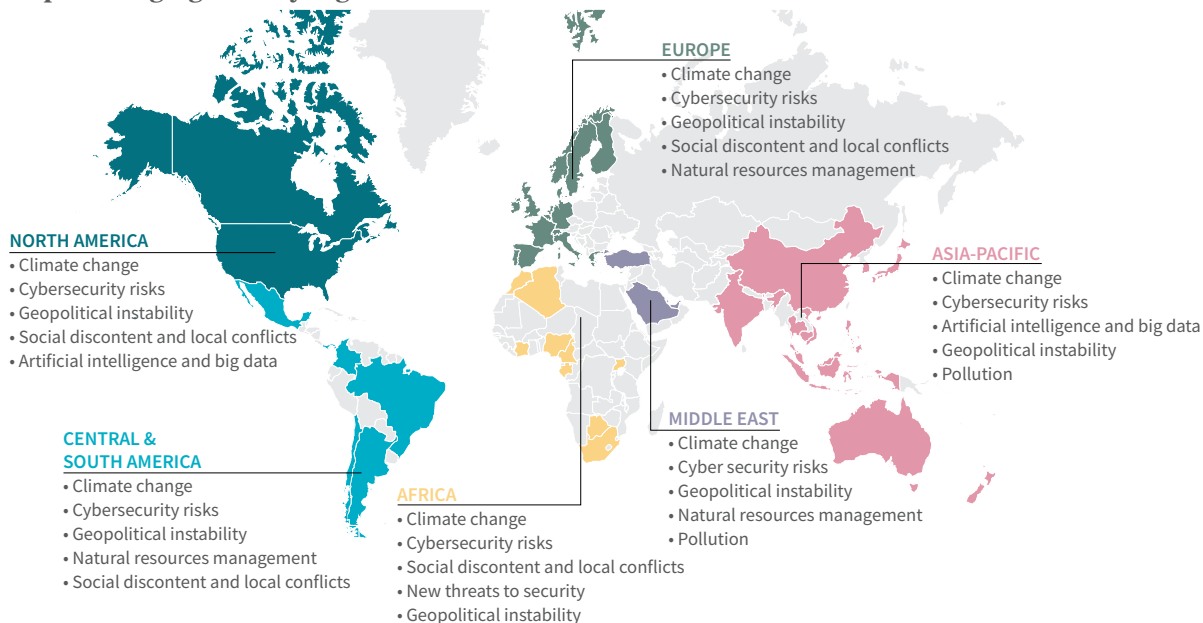
The consensus around climate change as risk #1 continues to solidify this year. Cybersecurity risks follow in second place, with more than half of surveyed experts ranking them again among the top emerging risks. These two risks have remained stable at the top of our survey ranking for four consecutive years, while the third emerging risk is more of a newcomer. Geopolitical instability joined the top three for the first time last year and has made yet another big jump—an 11-point increase—in this edition of the survey.

Percent of respondents who selected the 3 risks as part of their top emerging risks



Note: Data based on online information-seeking trends as an indicator of public opinion. Scale: 1-100, where 100 is the empirical max
Source: AXA Emerging Risks Survey

Top 5 emerging risks by region



Source: AXA 2019 Emergence Risks Survey

This year's survey also confirms a trend already observed last year: the perception of major emerging risks is rising and converging across the world, reinforcing the consensus around the main risks confronting societies across the globe. Even though the three main risks may not materialize in the same way and to the same extent in their respective regions, surveyed experts across the world recognize them as high-stakes, complex global risks.



Online sentiment analysis

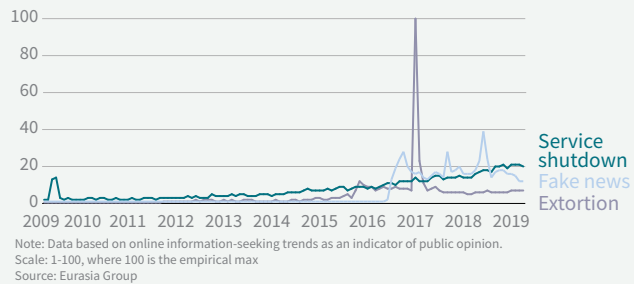
Big data can help us understand public perception and prioritization of the risks identified in the 2019 AXA Emerging Risks Survey. The online sentiment analysis here and throughout the report is based on a rigorous examination of online information-seeking trends on Google and Wikipedia.

Online sentiment analysis points to a broad alignment between expert and public assessment of top risks. Indeed, it suggests that for online users, geopolitical instability and climate change are the top two concerns among the five emerging risks identified by experts.

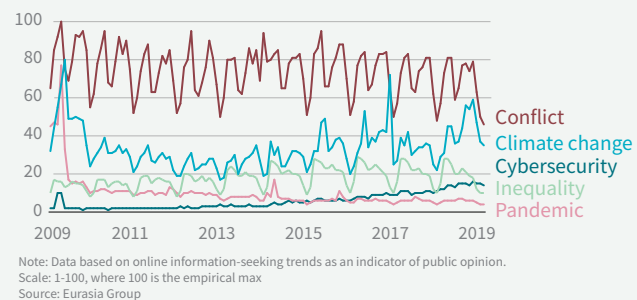
Moreover, there is a similar intra-region convergence in the perception of major emerging risks. For example, online information-seeking data for Europe for the past 15 years documents the variation in risk opinion within the major European sub-regions. It also underscores the persistence of geopolitical instability and climate change as the top concerns for most people living in Europe.

It is noteworthy, however, that cybersecurity appears to be a risk that is under the radar of the public and that inequality—a popular concern—is underappreciated by experts. In other words, as can be expected, people are paying much more attention than experts to risks with short-term, material impact on their well-being and day-to-day activities.

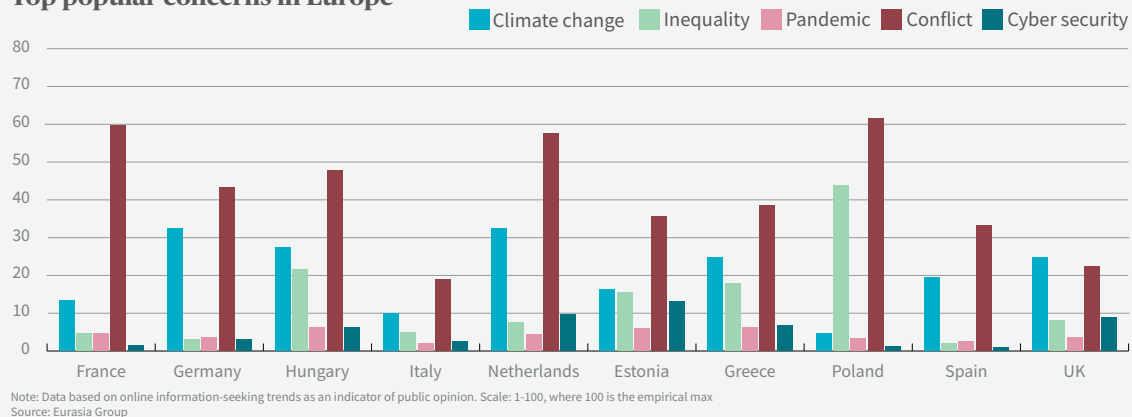
Popular cyber concerns worldwide



Top popular concerns worldwide



Top popular concerns in Europe



Demographics: a key risk driver

A large share of surveyed experts spontaneously named demographic issues as a serious risk that could affect society in the years to come. Shifting demographics are driving a unique set of risks, population aging being cited first by the respondents. Experts living in Europe and Asia are unsurprisingly more concerned than their global peers with the demographic dynamics driven by low birth rates and increased life expectancy in these regions.

“Aging population of developed countries will eventually result in declining competitiveness and economic activity”

49-year-old security manager from France

The decline in the number of people working will also affect businesses, since an aging workforce will have different features and needs than a younger one. These differences may also have implications in terms of customer behavior and expectations.

The aging of populations will have a wide range of long-term consequences on several emerging risks. Multi-morbidity and age-related chronic diseases will lead to soaring medical costs, which raises questions about the financing of public health systems and could eventually challenge their existence altogether. Having to take care of an aging population may also cause financial and mental strains for caretakers.

“Population growth, longevity and increased middle class population expecting higher standards of living leads to over consumption and presents significant threats”

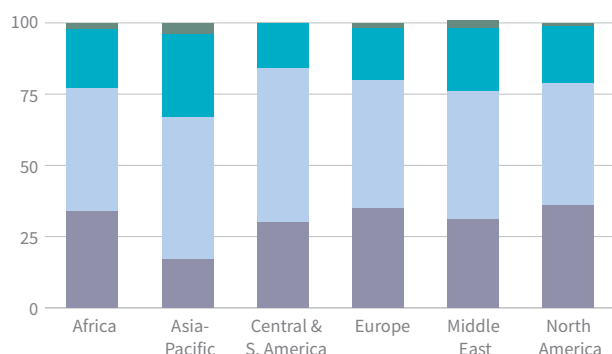
55-year-old security manager from the UK

Without sustainable pension schemes that redistribute wealth to the elderly, aging groups can become economically vulnerable, widening social divisions and worsening the lack of cohesion among generations. The latter is an important risk factor according to our respondents. Additionally, demographic differences between developed and developing countries may contribute to the intensification of migration flows, in turn affecting the political and social environments in countries that experience migration (both inbound and outbound).

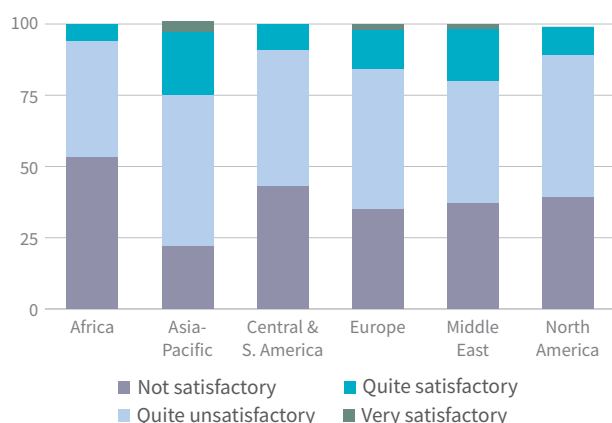
Pace of emergence, awareness, and preparedness for risks

The nature of emerging risks makes it especially challenging to predict the timing of their impact. Even if a risk has been identified and thoroughly assessed, there is still uncertainty about how quickly it will develop, which may in turn hinder timely risk mitigation and management. The risks on which there is the most consensus—those at the top of the ranking—are often thought to be more immediate, meaning that their impact is likely to be felt in less than five years. This illustrates the importance of time horizon when evaluating a risk. Yet, experts tend not to agree unanimously on the pace of emergence of risks.

Awareness of the general public (%)



Preparedness of public authorities (%)



Source: AXA 2019 Emerging Risks Survey

The survey also sought to evaluate the perceived preparedness of the general public and public authorities in facing emerging risks. Considerations included: Does the general public know about them? Are people's behaviors changing based on the expectation of an imminent impact? How are public authorities preparing for them? Surveyed experts are slightly more confident in the general public's awareness of emerging risks than in the preparedness of public authorities to cope with them, although both are considered less than satisfactory.

Most surveyed specialists are unsatisfied with the level of awareness of emerging risks in terms of risk knowledge and changes in behavior. On average, for all emerging risks considered in the survey, 76% of experts assessed the awareness of the general public as unsatisfactory, even though some of the risks are already present or rapidly emerging.

Public authorities are not sufficiently prepared, according to 83% of the experts surveyed. These results are particularly problematic because most of the emerging risks examined in the survey require regulatory frameworks and public policies to be created and/or implemented.

Consequently, the key elements for anticipating and preparing for the risks of the future appear to be missing. Insurers and risk experts must play a role in educating the public and raising awareness on emerging risks, in close collaboration with public authorities.

“Public authorities focus on present societal problems, which makes sense in order to fulfill the short-term expectations of citizens. However, raising awareness on emerging risks is also a priority, as ignoring them will only worsen current problems.”

47-year-old security manager from France

Risk interconnections and ripple effects

One of the major trends apparent in the survey is the increasing interconnection between risks and their ensuing ripple effects. Risks also influence each other, sometimes creating vicious circles. The last decade has been marked by examples of new and evolving risks that emerge from complex systems—such as the global financial system, biodiversity and ecosystems, and the international trade supply chain. Interconnected risks can trigger unexpected large-scale changes to complex systems or imply uncontrollable large-scale threats to them.²

2 [Systemic Risks in Society and Economics, International Risk Governance Council \(IRGC\)](#). 2010. Helbing, D.

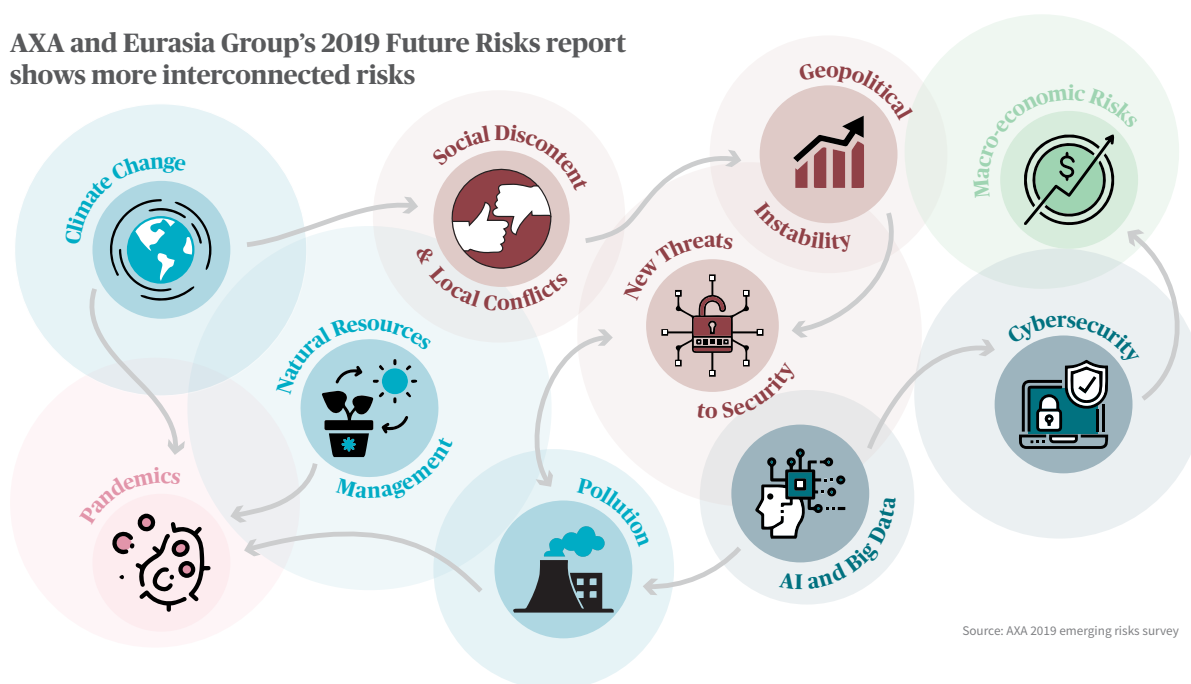
Surveyed experts thereby argue that a siloed approach—that is, risk management that focuses on single risks only—is insufficient. Rather, experts stress that they must not be thought of in isolation, otherwise risking missing or underestimating the secondary and compound effects of risks³. Proactive risk management must take into account the complexity and inherent uncertainty of emerging risks.

To achieve this ambitious objective, a constant dialogue between experts from different disciplines and fields is needed. Building resilience is also key for all organizations, be they public or private, and has become a crucial component of disaster risk reduction, including in the area of urban planning.

“We find ourselves at a point in history where many of the most serious emerging risks have the potential to either present solutions to one another or dramatically compound the negative effects of one another. Educating the public is key to ensuring our society can innovate and produce solutions to mitigate the most serious potential consequences presented by these emerging risks.”

35-year-old risk manager from the US

AXA and Eurasia Group’s 2019 Future Risks report shows more interconnected risks



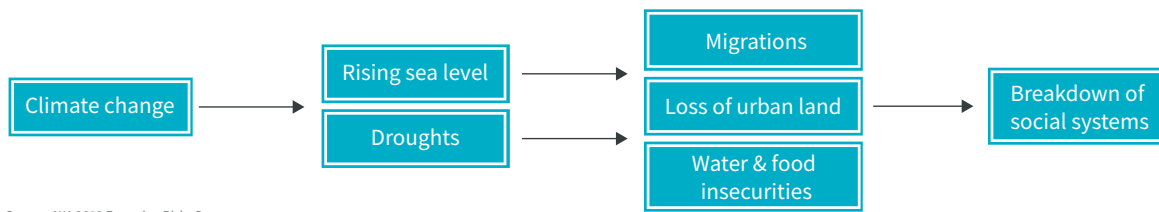
Source: AXA 2019 emerging risks survey

3 [Guidelines for the Governance of Systemic Risks](#). IRGC. 2018.

Environmental risks: planning for mitigation and adaptation

Risks related to the natural environment are the biggest concern for risk experts worldwide. Climate change is identified as the top emerging global risk by 67% of surveyed respondents—and natural resource management and pollution are also among the top ten risks in the survey. Many environmental risks, such as climate change and biodiversity loss, are caused or worsened by human activities, and in turn these interconnected risks have far-reaching consequences for society. Such risks are often considered to be more immediate than others, with tangible effects already perceived by respondents. Risk experts are particularly concerned with the long-term effects of climate change, on mankind as well as on the environment—notably fauna and flora. Consequently, they expect anthropogenic climate change to disrupt many parts of the world that we live in, sometimes in unexpected ways.

Example of ripple effect shared by 31-year-old risk manager from the United Arab Emirates



Source: AXA 2019 Emerging Risks Survey



Risk #1: Climate change

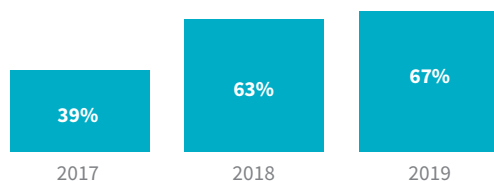
Climate change is the number one risk for the fourth year in a row; it has been selected by an increasing number of experts over the years. Respondents emphasize most the physical risks stemming from a changing climate. They are worried by increased exposure to and changing patterns of extreme weather events such as floods, storms, and rising sea levels, which are perceived as having more tangible effects than financial risks or liability risks related to climate change. Satisfaction with the level of awareness of the general public is higher for climate change than for most risks, even though it remains mostly negative. Conversely, the perception of public authorities' ability to cope with the most serious and immediate risk for society at large is among the worst for all the top risks. This gap adds to the frustration regarding the lack of global coordinated action by governments and international institutions, both in terms of mitigation and adaptation strategies.

“One of the greatest challenges in decision-making under climate change uncertainty is to determine the level of adaptation investment proportionate to the climate-related risks a particular system is facing.”⁴

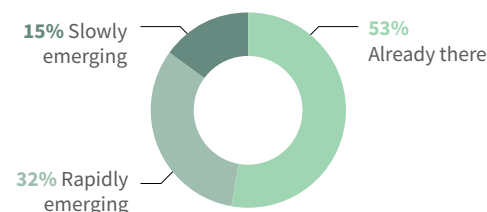
Marta Olazabal, AXA Research Fund grantee

⁴ [Are our cities effectively planning for climate change?](#) AXA Research Fund. Olazabal, Marta.

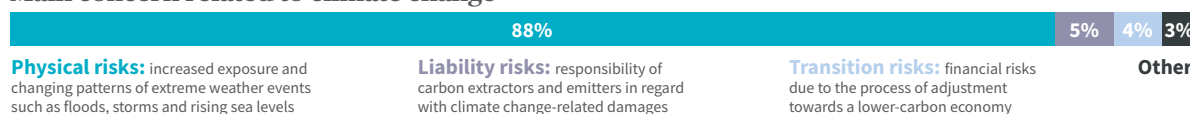
Respondents who selected climate change as part of their top emerging risks



Estimated pace of emergence of climate change



Main concern related to climate change



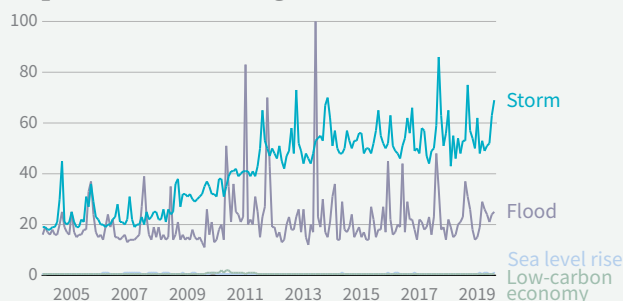
Source: AXA 2019 Emerging Risks Survey



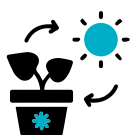
Online sentiment analysis – Climate change

In terms of the prioritization of the policy issues related to climate change, online sentiment analysis again finds broad alignment between experts and the global public, with the latter focusing more on risks with short-term material impact. Citizens across the globe are more concerned about the physical risks related to climate change, such as floods, storms, rising sea levels, rather than transitions risks on the path to a low-carbon economy. Online information seeking data for the past 15 years suggests that worldwide concern about this transition has consistently remained a distant third to the changing patterns of extreme weather events.

Popular climate change concerns



Note: Data based on online information-seeking trends as an indicator of public opinion. Scale: 1-100, where 100 is the empirical max. Source: Eurasia Group

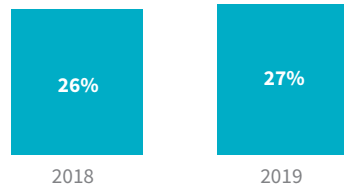


Risk #5: Natural resources management

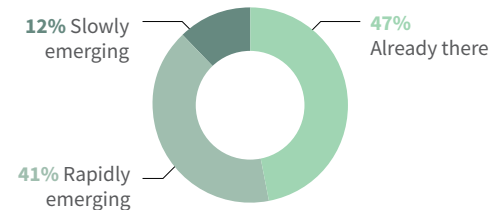
Half of the experts consider that the risk presented by natural resource management is already having an impact. They note two concerns: (i) loss of biodiversity, unsustainable land use, deforestation and desertification, and (ii) over-consumption of natural resources. Experts living in Europe tend to be more pessimistic than their counterparts worldwide. According to the 2019 Eurobarometer, most respondents living in Europe consider that humankind has a responsibility to look after nature, to tackle climate change, and to ensure food security.⁵ Specialists are also concerned by the relationship between population growth and unsustainable use of natural resources. Even though global population growth is slowing down, it is unlikely to stabilize by the end of the century. This will amplify environmental risks and heighten the pressure on natural resources management. Furthermore, it is quite alarming to see that for Central and South America and Africa, two regions that are extraordinarily rich in biodiversity and ecosystem services, respectively 97% and 92% of experts evaluate the level of preparedness of their governments to be not satisfactory, compared to 88% on average.

5 [An overwhelming majority of Europeans are concerned about the loss of biodiversity and support stronger EU action to protect nature.](#) European Commission. 2019.

Respondents who selected natural resources management as part of their top emerging risks



Estimated pace of emergence of natural resources management



Main concern related to natural resources management



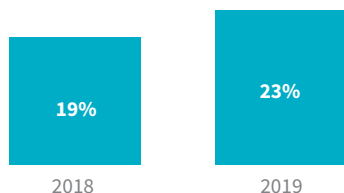
Source: AXA 2019 Emerging Risks Survey



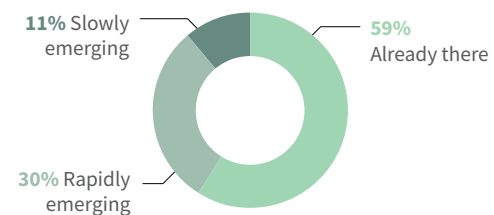
Risk #7: Pollution

Pollution has risen one position in this year's ranking of risks. Experts with a background in insurance claims management rank pollution risks higher than other risk professionals, stressing their apprehension about pollution risks. Asia-based experts are increasingly concerned about pollution, which they ranked fifth this year, compared to tenth last year. Pollution has the most consensus about the timing of its impact, with the largest number of experts considering it already present. Diffuse air, water, and soil pollution remains the main concern of experts, but plastic pollution and waste management is gaining momentum this year.

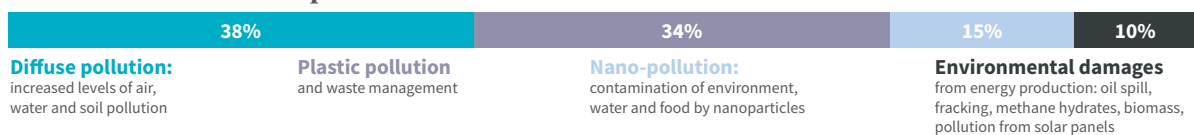
Respondents who selected pollution as part of their top emerging risks



Estimated pace of emergence of pollution



Main concern related to pollution



Source: AXA 2019 Emerging Risks Survey



AXA Group Risk Management: focus on natural catastrophe risks

Madeleine-Sophie Deroche is the head of Natural Perils R&D and Model Governance at AXA, where her main mission is to strengthen our in-house natural catastrophe (NatCat) modeling capabilities.

How would you describe your role within AXA?

At Group Risk Management, we develop AXA's internal models for natural catastrophes that leverage the latest innovation coming from research and AXA's deep knowledge and history of insurance claims. We have a very diverse team of risk analysts, actuaries, geoscientists, and data scientists, because our work requires profiles with unique expertise and skills to understand and model physical processes and their impact on human activities.

What are natural catastrophes?

They encompass catastrophic events such as hurricanes, windstorms, hailstorms, tornadoes, earthquakes, volcanic eruptions, freezes, droughts, floods, and wildfires that are not man-made. Modeling natural catastrophes is complex, as it requires modeling as closely as possible the whole chain of physical processes at stake. Especially, some of these physical processes evolve over time, either as part of the natural variability or because of an evolving environment (for example, changing climatic conditions). Integrating this evolution is a challenge for the years to come.

Why is natural catastrophe risk modeling so important for AXA?

By developing our own models, we bring added value to our customers and AXA colleagues over three main axes: (i) risk assessment to ensure the financial stability of our business operations and fast claims-payment capability; (ii) underwriting to refine pricing and alert on excessive growth in catastrophe-prone zones; and (iii) prevention to reinforce the protection of our clients towards natural hazards. The internalization of the modeling chain actually enables us to be more agile to identify and answer the future questions of our entities and our clients. We also believe that AXA has a societal role to play: by developing state-of-the-art catastrophe models and disseminating knowledge and research, AXA improves the resilience of society to natural catastrophes.

What have you been working on recently?

We are currently working on a worldwide tropical cyclone model to assess the risk on our exposures—notably in the US, Mexico, and in Asia. We have developed an innovative method based on atmospheric data and machine learning algorithms to simulate precipitations carried by tropical cyclones, one of the most complex variables to model and an increasing driver of damages. We also help analyze climate risks within our real estate investment portfolios, as described in our latest AXA Group 2019 Climate Report.

Any exciting challenges ahead?

There are many exciting challenges ahead! First, we are working hard to keep pace with the rapid increase of observation data available and the ongoing research that enables a better understanding and modeling of natural catastrophes. We have developed partnerships with start-ups—for example, REASK for the tropical cyclone model—and launched joint research initiatives supported by the AXA Research Fund.

Second, we want to ensure access for AXA entities and our clients to customized risk assessment on their portfolios. We are developing a tool that is used currently for risk assessment on AXA insurance portfolios and will be open to all AXA teams by the end of the year, notably for pricing, underwriting, and customer services—for example, AXA XL's "Portfolio Catastrophe Loss Modelling service" for clients.

Finally, we have started to integrate forward-looking simulations in our modeling of natural catastrophes in order to assess the impact of climate change on our business.

“We are in a climate crisis, and there’s a good, bad and ugly way out of it. The good way ends at no more than 1.5 degrees of warming and huge economic opportunities from green growth and development solutions. Our current commitments and policies put us on a bad path - well beyond 2 degrees of warming that will irreversibly alter physical systems and limit our ability to grow our economies and spread prosperity.”

Lord Mark Malloch-Brown, former UN Deputy Secretary General

Deep dive



Climate change effects on human activities: the example of global supply chains

Many of the most salient environmental risks are physical risks: the threat of damage and disruption to land, property, people, and human activities as a result of changes in the physical environment and extreme weather events. Environmental degradation implies a world of massive physical change, with important economic and geopolitical consequences, often for countries that have low baseline coping capacities. One obvious implication is on global supply chains.

Shortages of raw materials and natural resources affect production capacity and cost. Warmer temperatures, erratic rainfall patterns, invasive species, floods, and wildfires threaten the productivity and availability of raw materials needed to create basic inputs for more complex products, including agricultural inputs to food supply chains and feedstock for the development of high-value finished goods such as pharmaceuticals. Companies need to make decisions about establishing supply chains with environmental resilience in mind. Resilience can be improved in various ways, such as by securing the supply of strategic resources, anticipating new regulations, and improving reputations. In some cases, “climate-proofing” supply chains will increase short-term cost and complexity via (i) higher marginal costs of production relative to those today; (ii) the internalized cost of building out infrastructure needed to bring to market; and (iii) internalized charges for environmental impact. However, the greening of supply chains also reduces costs and enhances resilience for companies.⁶

Costs could in some cases hit the consumer via supply chains in the form of increased energy costs, such as in areas where carbon emissions are taxed. However, renewable energy—particularly wind and solar—is increasingly cheaper to produce and deliver to consumers in many parts of the world, so switching from fossil fuel-based to renewable sources for energy can save companies and individuals money from the outset in certain regions.

Manufacturing facilities and distribution systems often are in countries vulnerable to climate change; increased water stress and risk of natural disasters in key sourcing regions—for example, Asia and Latin America—are likely to affect the stability and continuity of company supply chains. Global logistics also are at risk from climate change. Weather systems, freak storms, affected sea routes, and environmental transformation will all have an impact on transportation and logistics.

6 [The Better Business, Better World report](#). Business & Sustainable Business Commission.

Deep dive

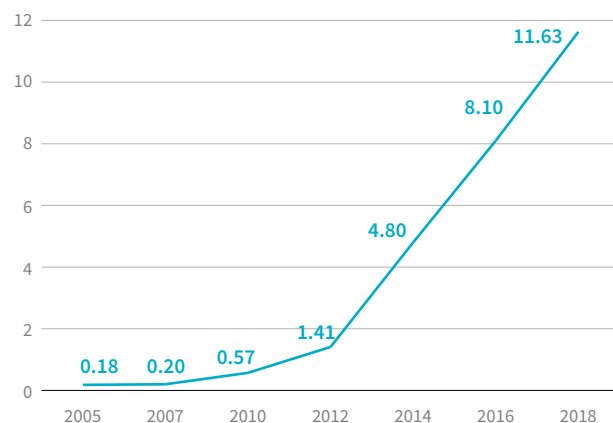


The need for coordinated global responses to climate change

Geopolitics and domestic political constraints have concurred to the relative lack of progress in coordinated global action on climate change. The current lack of coordinated global leadership—a by-product of the global “geopolitical recession”—suggests that prospects for well-coordinated global action are unlikely to improve in the near term.

Growth of Environmental, Social, and Governance (ESG) incorporation by US money managers

Total assets (in trillion USD)

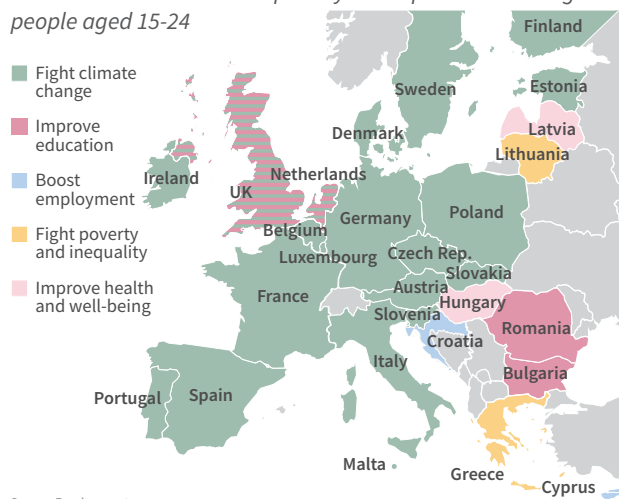


Source: US SIF

While the benefits of adaptation actions are felt immediately at the local level, their global impacts tend to be delayed. In addition, the implementation of certain mitigation actions can have negative outcomes from an adaptation standpoint at the local level, which can influence political decisions and put less emphasis on mitigation. For instance, though a hydroelectric station may reduce greenhouse gas (GHG) emissions, it may compete with local communities for water supply and have numerous detrimental impacts on biodiversity, possibly creating new vulnerabilities. Not surprisingly, many policymakers believe that at this point a more efficient response to the challenge would channel some resources away from mitigation and toward adaptation. Given the unprecedented scale of the climate change threat, measures aimed at both adaptation and mitigation are needed⁷. Furthermore, positive synergies emerge from the simultaneous implementation of mitigation and adaptation measures. For instance, reforestation activities increase carbon sinks while improving regional adaptive capacity.⁸ Exploiting this type of synergistic relationships, especially for urban design, could help highly vulnerable regions with high GHG emissions to cope with climate change, as well as with environmental risks in general.

European youth lean green

What should the EU's main priority be? Top answer among people aged 15-24



Source: Eurobarometer

Because of the sub-optimal response at the global and national levels, the initiative on climate action is shifting to other actors, including private firms, investors, states and municipalities, and civil society. For example, many companies are voluntarily cutting their own direct emissions and putting pressure on their supply chains to reduce emissions (even when not required by law) so that they can meet the voluntary emission reduction targets they have set for themselves. Investors also are a major force

⁷ AXA 2019 Climate Report. AXA. 2019.

⁸ Ibid.

for change, using environmental, social, and governance (ESG) performance assessments, pioneering new climate metrics, and resorting to divestments, shareholder engagement, and “impact investing” strategies to pressure companies—for example, energy companies—into taking more meaningful climate action. Even for investors who do not explicitly adapt ESG or impact investing principles, the potential scale of economic and physical disruption that climate change could bring has led to much greater scrutiny of the portfolio risks posed by climate change.

Cities, provinces, states, and municipalities are becoming important actors as well in responding to the threats from climate change.⁹ For example, several US states are including provisions of the Paris Accord in their laws and implementing related policies; the global C40 Group of Mayors is increasingly influential in a “race to the top” on climate action; and a number of sub-national governments in twelve different countries have declared “climate emergencies.”¹⁰ Civil society also has taken on an important role in response to climate change. NGOs are doubling down on their efforts, raising financial support, gaining influence with policymakers, helping corporates to act beyond “naming and shaming” campaigns, and mobilizing grassroots support on climate change issues.

“There is real economic opportunity in moving towards a sustainable energy supply world ... but there is greater opportunity in securing the well-being of marginalized and too often forgotten peoples and giving them the prospect of the dignity and freedom we too easily relish with scant insight to our collective responsibility. Pay it forward. Now is the time.”

Lord Dr. Hastings of Scarisbrick CBE, Chancellor, Regents University London

Deep dive



Interconnections between environmental risks: the example of wildfires

Environmental risks are closely interconnected: their impacts can be amplified by one another, so it is critical to adopt a holistic approach to tackle climate change, biodiversity loss, and pollution issues. The recent UN report from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) stresses that the decline in biodiversity should be at the top of the global agenda alongside climate change. At the same time, environmental damage has long-lasting effects on people’s living conditions.

Forest fires usually serve an important function in maintaining the health of forest ecosystems. However, under certain conditions, fire can also be deadly, destroying public and private properties as well as wildlife habitat and of course carbon sinks. The growing threat of forest fires can be explained by the combined effects of climate change and human activities. On the one hand, forests are drier because warmer temperatures and changing rainfall patterns caused by climate change, which have increased the frequency and intensity of wildfires. On the other hand, human logging contributes to the creation of fire corridors.

In addition, the impact of these two factors is enhanced by a little-known third variable: the bark beetle, an invasive larva responsible for decreasing the moisture content of trees, turning them into “fire

9 [Are our cities effectively planning for climate change?](#) AXA Research Fund. Olazabal, Marta.

10 The C40 Cities Climate Leadership Group is a group of 94 cities focused on tackling climate change and taking action at the city level to reduce greenhouse gas emissions and climate risks.

bombs.”¹¹ Between 1994 and 2010, more than 30 billion trees have died in California and Canada; other infestations also have occurred in Siberia and Europe.¹² The scale of this outbreak is intimately linked to the shifting temperature gradient stemming from climate change, which creates favorable conditions for propagation and infestation of trees.

At the same time, decisions to allow logging are partly driven by the hope that crawlspaces would stop future bark beetle proliferation. Therefore, embracing a comprehensive approach to risks enables a better understanding of the cascade of related consequences, ranging in this case from the loss of forest-dependent plant and animal species to the loss of tourism and water supplies, since repeated wildfires alter forests’ ability to collect and filter natural water.



AXA Climate use case - water level protection

80% of economic sectors are frequently affected by weather anomalies¹³. In western Germany, inland barge transportation accounts for a significant level of industrial transit. As the country’s main waterway, the Rhine is an efficient, cost-effective and environmentally friendly shipping route. The river is particularly important for transporting agricultural products, commodities such as coal and oil, and chemicals. As such, it is crucial not only for Germany’s industrial production but also for global supply chains relying on bulk goods transported on the Rhine.

During the fall of 2018, the river experienced historically low water levels. It reached less than 30 centimetres in some parts, making the Rhine unnavigable for cargo barges. It was below two meters—the level at which authorities begin to trigger navigation restrictions—for more than six months at Kaub, a strategic hub located near several industrial sites.

Because of low water levels, 38.2 million tonnes were transported during the third quarter of 2018, representing 18% less cargo transport than in the same period in the previous year¹⁴. It was cited as responsible for a meaningful share of German GDP underperformance, accounting for a 0.2-point decrease in the third quarter of the year. This issue is likely to persist and worsen owing to hotter summers and shorter winters. Indeed, less time is left for snow to accumulate, which increases the risk of abnormal water levels.

“With our water-level parametric solution, we fill in protection gaps on non-damage business interruption. We offer a fast, transparent and highly adjustable way to manage Acts of God and help our clients become more resilient when it comes to climate risks.

Antoine Denoix, CEO of AXA Climate

AXA Climate, the specialist parametric risk transfer division of the AXA Group, has been developing cutting-edge expertise on climate risk insurance since 2014. The challenges faced by industrial companies during the Rhine drought are exactly what AXA Climate strives to address. With its diverse team of experts—meteorologists, agronomists, data scientists, and engineers—AXA Climate designs tailor-made solutions to meet growing client needs in terms of climate risk protection in over 40 countries. AXA’s parametric unit offers a broad range of products, from Nat Cat

¹¹ [Small Pests, Big Problems: The Global Spread of Bark Beetles](#), Yale Environment 360. 2017. Katz, Cheryl.

¹² [Bark Beetles Are Decimating Our Forests. That Might Actually Be a Good Thing. They gobble up trees and send politicians into a frenzy. But do the bugs know more about climate change than we do?](#) Mother Jones. 2015. Oatman, Maddie.

¹³ [Opportunities and Priorities in a New Era for Weather and Climate Services](#), American Meteorological Society. 2002. Dutton, J.

¹⁴ [Market Insight: Inland navigation in Europe](#), Central Commission for the Navigation of the Rhine. 2019.





protection solutions—for example, for cyclone, wildfire, hail—to non-damage business interruption protection—for example, for water level, wave level, heatwave, and drought.

Parametric insurance works in a simple way: it relies on indices that are correlated to the client's actual losses (temperature, rainfall, wind speed, yield, magnitude, etc.). If the index reaches a predefined threshold, the client receives an immediate pay-out of a predefined amount. In the case of the Rhine drought, AXA Climate worked with an industrial company based in western Germany to strengthen its protection against further risks from low water levels. Last year's experience led the client to seek additional insurance coverage: the low water level meant that it had to ship its goods by train and roads, which caused significant operating losses and additional transportation costs.

By monitoring public indicators of water levels, AXA Climate can trigger the pay-out in a fast and transparent manner whenever the water level goes below the predefined threshold. This solution provides instant relief for companies that are increasingly vulnerable to climate risks. Even though it was first developed for the Rhine river, it can be adapted to other rivers such as the Danube, the Mississippi, or even the Panama Canal, which are also economically important and subject to climate risks.

Lower water level affects businesses - the example of the Rhine River in Germany

The river is particularly important for transporting:

 Oil  Coal  Chemical  Agricultural products

Because of low water levels,

38.2 million

tonnes were transported during
the third quarter of 2018, representing

18% LESS
cargo transport

than in the third quarter of 2017

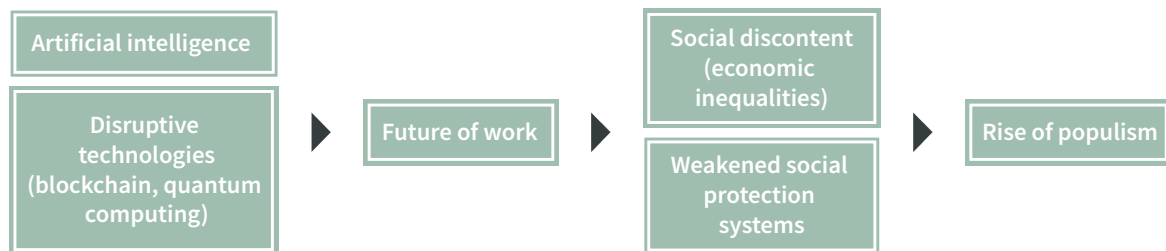
Source: Central Commission for the Navigation of the Rhine



Technological risks: cyber and beyond

Cybersecurity risks continue to be the second-most important emerging issue highlighted by risk experts, which comes as no surprise given the potential economic impact of a successful large-scale cyberattack. Surveyed respondents are also quite concerned by a risk closely related to cybersecurity: AI and big data. Beyond the traditional technologies, a larger set of risks at the intersection of technology and society are rapidly emerging. Risk experts have highlighted the disruptive potential of new technologies, which could play a role in the transformation of existing economic and social structures. As such, they expect significant ripple effects from the technological sphere to the socio-political sphere.

Example of ripple effect shared by 58-year-old insurance broker from Spain



Source: AXA 2019 Emerging Risks Survey



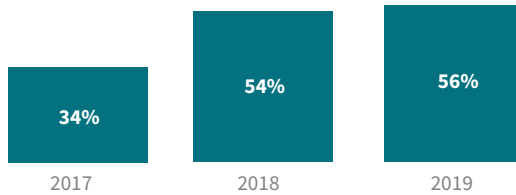
Risk #2: Cybersecurity risks

Cybersecurity risks hold the second position for the fourth consecutive year and is among the top five risks for an ever-increasing number of experts. There is more expert consensus this year that a shutdown of essential services and critical infrastructure is the main issue related to cyber. The next biggest concerns are cyber extorsions and ransomware, as well as identity theft. Most specialists agree that the full-scale implications of cyber threats are yet to be experienced, especially since technology is rapidly evolving. Cybersecurity risks are perceived to be a near-term threat, with just a few experts considering them as slowly emerging, by far the smallest share among all emerging risks. Satisfaction with the preparedness of public authorities to cope with cybersecurity risks was slightly higher than for other threat fields. Respondents living in Asia are more confident in the ability of their governments to cope with cyber risks.

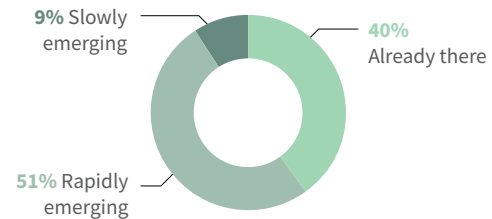
“One of the biggest threats we will face comes from our growing dependence on the use of technology in our lives, and the ease at which third parties with malicious intent can gain access to them.”

30-year-old underwriter from Singapore

Respondents who selected cybersecurity risks as part of their top emerging risks



Estimated pace of emergence of cybersecurity risks



Main concern related to cybersecurity risks



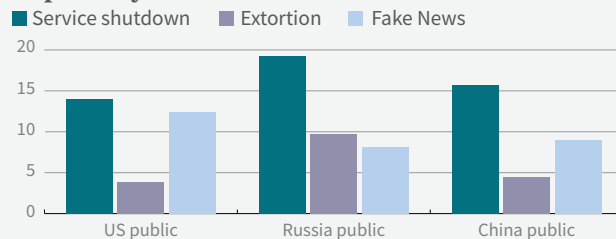
Source: AXA 2019 Emerging Risks Survey



Online sentiment analysis – cybersecurity risks

In relation to cybersecurity risks, the shutdown of essential services and critical infrastructure has slowly but steadily become the top concern among online information seekers. Despite relative expert underappreciation of the dangers posed by fake news, misinformation and loss of media independence have become a close second to cyber-shutdowns, propelled to headlines in the past two to three years with media and governments raising awareness about this issue.

Popular cyber concerns, 2014-2019



Note: Data based on online information-seeking trends as an indicator of public opinion. Scale: 1-100, where 100 is the empirical max. Source: Eurasia Group



AXA Group Risk Management: focus on information risks

Benjamin Ducos is the head of Group Information Risk Management at AXA, where his mission is to promote a strong risk-oriented mindset in the areas of cybersecurity, data, and new technologies.

How would you describe your role within AXA?

Our aim is to ensure that our organization is well-prepared to face any type of information risks. Today, organizations can encounter major losses if technology is not properly used. Our team focuses on managing and mitigating information risks: We rely on our technical expertise and in-depth knowledge of AXA's operations. It is also extremely important to develop the awareness and the ownership of these issues at the highest level of the organization.

What are information risks?

Information risks arise from the use of technologies in our organization. They encompass data-related projects, information systems, as well as technological innovations—cybersecurity risks are a significant focus. For instance, when end users are not aware or vigilant, social media and social engineering also create new opportunities for hackers to access large amounts of personal information.

Why is information risk management so important?

While cybersecurity is the responsibility of every employee, it is important to have an overall strategy to protect AXA against information risks. Our team works in close collaboration with the IT and security experts who implement the strategy in all aspects of our operations as first line of defense. As a second line of defense, we bring an independent view that is necessary to anticipate, assess and prioritize major information risks and to challenge the status quo. We regularly provide second opinions on things that matter most for us, such as large transversal programs or new tech arising such as blockchain.

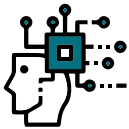
What would you recommend to a large corporation in terms of cyber risk management?

First things first, technical homogeneity is key. To avoid a contagion effect throughout the whole company, we need to achieve a very homogeneous level of protection, or to decouple systems! Second, cross-functional dialogue is essential since silos in security means chaos in security! A joint governance body must be in the driving seat to make informed, accurate, and legitimate risk-based decisions.

Last but not least, combining the near term and long term may be as hard as walking a tightrope, but there is no other way. Cyber threats foresight and risk anticipation must be strategically associated while keeping ready a supervised cyber reaction capability.

Any exciting challenges ahead?

In an interconnected world, partnerships are crucial for businesses. But working with third parties also requires careful definition, negotiation, commitments, and evidence that controls are at the right level. In that respect, managing the risks with our vendors is as important to us as demonstrating to our customers how AXA contributes to secure their own success.



Risk #6: AI and big data

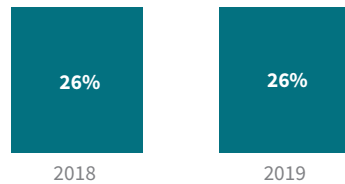
Expert concern with AI has been stable over the past year. Experts living in Asia, and to a lesser extent North America, tend to be more concerned about AI and big data. The ubiquity of this risk lies in the fact that it is the only one in the top 10 that remains relatively far from materialization. Indeed, although algorithms are already changing our lives and shaping existing risks, experts anticipate new AI-related risks and challenges to arise. There seems to be no consensus regarding the main concern related to AI and big data. Respondents equally highlight liability challenges and the lack of interpretability of AI. Experts living in North America are more concerned by the “existential threat” posed by AI than their counterparts worldwide. Respondents, especially those living in Africa and Europe, estimate public awareness on this risk is the lowest. They also express dissatisfaction with the preparedness of public authorities to cope with this emerging risk.

“The absence of a regulatory framework is in part due to a lack of awareness about the impact and consequences of diffusion in society, and in part also due to the fear of taking precautionary measures too early, which would hinder innovation.”¹⁵

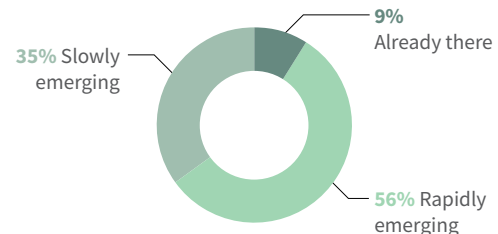
Raja Chatila, AXA Research Fund grantee

¹⁵ [Artificial Intelligence: fostering trust through research](#), AXA Research Fund.

Respondents who selected artificial intelligence and big data as part of their top emerging risks



Estimated pace of emergence of artificial intelligence and big data



Main concern related to artificial intelligence and big data



Source: AXA 2019 Emerging Risks Survey

Deep dive



The future of data regulation

More than a year after implementation of the GDPR—aimed at regulating personal data—its tangible effects are coming into focus. Consumers’ awareness of their rights in terms of data protection has increased exponentially. While the vast majority of GDPR fines amounted to hundreds of thousands of euros, some companies have had to pay even higher fines calculated as a percentage of their annual turnovers.

The GDPR has the potential to reshape global data protection by serving as a model. Many of the EU’s major trading partners—including Japan, Canada, New Zealand, or Australia, among others—are interested in adopting their own GDPR-style regulation.¹⁶ For instance, the GDPR has been a catalyst for data privacy laws in Brazil, Turkey, and Thailand and state-level legislation in the US, especially in California and Vermont. The California Consumer Privacy Act of 2018, scheduled to take effect on 1 January 2020, intends to give Californians control over how businesses collect and use their personal data, as the GDPR does.¹⁷ Meanwhile, Vermont’s “data broker” legislation requires businesses that collect and sell personal data to register with and disclose business practices to the state, as well as to develop comprehensive data security programs.¹⁸

Whereas some states may view the GDPR as an inspiration, the US is likely to push back against any attempts to enshrine its strong privacy protections in international trade agreements. Europe, for its part, is likely to insist that the US’s preferred approach—the voluntary privacy framework of APEC’s Cross-Border Privacy Rules—does not offer enough protections to its citizens to be an acceptable workaround.

As these or other different positions on data localization conflict over the next few years, there is a growing risk that international data flows Liu He could suddenly stop or slow, with unknown consequences for the global economy. A future court decision shredding Privacy Shield and its main backup—standard contractual clauses—could leave US-EU data transfers without a real legal basis. A broader breakdown in cross-border data flows would present problems; for example, companies running factories or power plants in China from data centers overseas could suddenly find their businesses at risk.

Social networks and search engines could unexpectedly find they have no legal basis to transfer

¹⁶ [How GDPR is shaping global data protection](#). PrivSec Report. 2018. Baxter, Michael.

¹⁷ [Assembly Bill No. 375 Privacy : personal information: businesses](#). California Legislative Information. 2018.

¹⁸ [H.764 : An act relating to data brokers and consumer protection](#). General Assembly of the State of Vermont. 2018.

abroad the personal information they rely on to sell ads. India could wall itself off from the rest of the world, seeking to protect its domestic tech industry from global competitors by preventing Silicon Valley or Chinese companies from collecting its citizens' data—only to quickly find it has lost access to services on which people have come to rely.

Deep dive



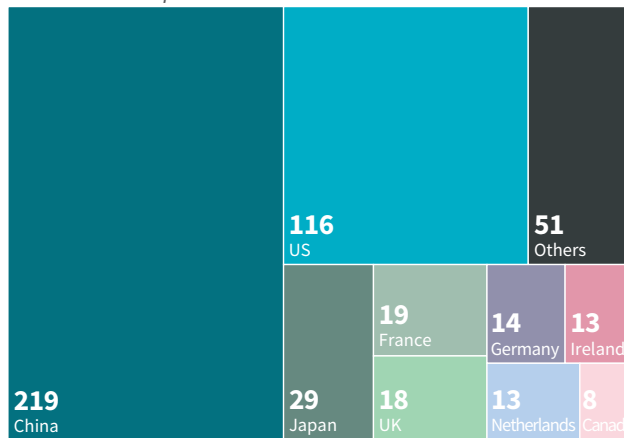
The challenges of AI

As AI makes the jump from technical curiosity to real-world applications, the risks of an accident are rising, with two major potential implications. First, the immediate fallout from a large-scale power outage or industrial accident attributable to AI could cause economic damage or loss of life. Moreover, the political reaction to such an event could cast a regulatory and policy chill over the sector as governments strengthen and review their approach to AI ethics and safety. Examples of potential accidents include an AI-augmented malware that can rewrite its own code and is accidentally (or intentionally) released into the wild, and AI used in a sensitive control system that suffers an unexpected failure, causing an industrial accident.

In the critical areas of information technology hardware, software, and AI, Europe faces competition from both the US and China. The US-China technology race and broader trade conflict could in theory open space for European providers of technology in third and fourth markets, but given the current level of AI research and development in Europe and reliance on components and intellectual property from either the US or China, the space for Europe to accomplish this may be limited.

Top 500 global tech companies

Number of companies



Source: the list

Governments, the private sector, and civil society are all grappling with challenging ethical issues posed by AI such as transparency, fairness, and explainability (that is, ensuring that the results of any AI solution can be understood by human experts). For instance, algorithms might produce biased outcomes in healthcare, the judicial system, or finance. There are two potential important biases of algorithms: They can reproduce the inherent biases of their database and or of their developers.

Over the past two decades, governments have taken a cautious approach toward regulating technology out of fear that over-regulation would stifle innovation. The EU's policy push in AI is intended to establish a regulatory framework for the technology and influence the US and Chinese firms at the forefront of AI to take it into consideration as they develop AI algorithms and applications. This would be a similar process to the development of the GDPR, which has set the global regulatory agenda on privacy issues since its adoption in May 2018. While EU ethics guidelines or legislation could increase pressure on US and China over standards, the creation of even a basic framework of international standards remains challenging amid US-China technology tensions.

Europe is not the only power seeking to regulate AI. Chinese technology policy groups organized by the Ministry of Industry and Information Technology (MIIT) have also cited a need to develop ethical standards for AI as part of a broader push by China to play an active role in technical standards-setting for AI and related data and applications.

In the absence of global cooperation, there is the risk of creation of multiple standards for AI, thereby increasing fragmentation and complexity and raising compliance costs for businesses. For instance, the modus operandi of European firms has traditionally been to follow the US-led Western order. Now, not only with the direct influence of China as a business counterparty, but also with other third countries adopting (to varying degrees), Chinese norms and standards, European firms will face a more bifurcated system of global commerce.

Deep dive



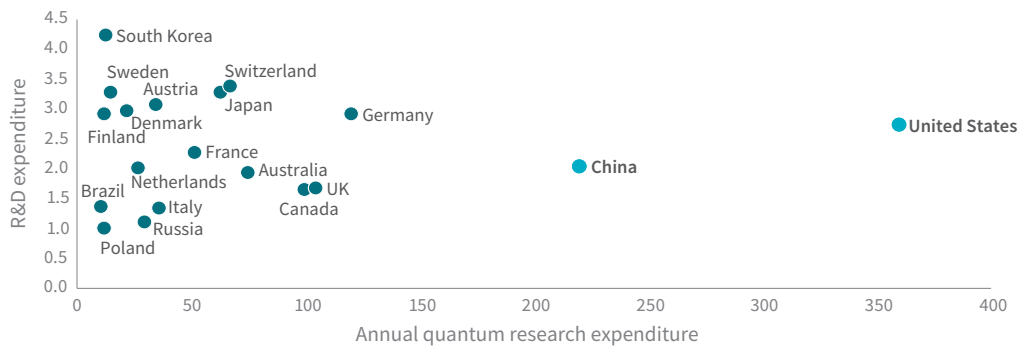
Quantum surprise: why cryptography is at risk

Quantum technology has become a hot topic in the computing field but remains relatively unknown to the general public. Tech companies, governments, and research institutes are all investing large sums to push the frontiers of technology. Standard computers use information stored as bits, or sequences of 1s and 0s, to perform calculations. Quantum computing uses qubits—which through a quirk of quantum physics can be ones, zeros, or anything in between—allowing them to process exponentially more information than traditional machines over the same time period.

If researchers can figure out how to make enough qubits work reliably together, the massive increase in computing power has the potential to crack problems that the world's fastest traditional computers have not been able to solve. That could lead to new breakthroughs in drug design and other fields where massive computing power can help unlock innovation. However, quantum computing would also bring a new set of security risks ranging from new supercomputers to model nuclear weapons to cracking the codes that keep national secrets and bank data safe.

US and China spend the most on quantum technology research

R&D expenditure (% of GDP) and annual quantum research expenditure (€ millions) by country, 2015



Source: McKinsey, World Economic Indicators

In the world of quantum technology, one of the most important questions—and the subject of intense national security interest in the ongoing US-China tech cold war—is the future of cryptography. Quantum computers can now crack a 2048-bit RSA encryption in eight hours, a task that would take a traditional computer billions of years.¹⁹ This will have profound consequences for the balance of military power, since the country that achieves a quantum breakthrough would gain the upper hand in cracking the codes of its rivals.

The growing competition between the US and Chinese technology might result in decreasing collaboration between Chinese and US researchers, and eventually in the development of strict controls of dual-use technologies. Reduced collaboration and communication between leading tech powers might ironically increase the risk of a “quantum surprise”—an unexpected and potentially undetected quantum breakthrough.

¹⁹ [How a quantum computer could break 2048-bit RSA encryption in 8 hours](#), MIT Technology Review. 2019.

A quantum surprise would heighten geopolitical tensions and have damaging side effects for global businesses. For example, if a government were to create a quantum computer powerful enough to crack industry-standard encryption widely used by banks and other financial services firms to keep customer data secure, that could create a major negative confidence shock for the global financial sector and other industries. If customers were to doubt of the reliability of the financial system, it could potentially spark a run on banks to withdraw deposits, potentially putting financial stability at risk, with subsequent effects for the economy and consumer and business confidence. For these reasons, technology and business experts must cooperate with governments to closely monitor and prepare for such possibilities.

“Incompatible technology standards could mean firms would need to design different products for the US and China, not just in these two countries, but in markets around the world as governments picked vendors with which to align. Interoperability will be an increasing obstacle.”

Samm Sacks, Cybersecurity Policy Fellow, New America



AXA XL use case - cyber insurance protection

Technology enables innovation and opens new opportunities, but it also brings many risks. Digital transformation and the increasing use of data means that organizations are becoming more and more vulnerable. Interconnections between devices and systems are increasing cyber exposure, with the development of the Internet of Things and the use of cloud services. Social media also creates new opportunities for hackers, in terms of access to large amounts of personal information.

Managing cyber risks and securing digital assets is no longer solely an IT concern; it has become one of the biggest risks faced by companies, governments, and individuals. Massive cyberattacks and data breaches against well-known organizations have made headlines in recent years, making the threat more tangible. Cyberattacks are often conducted for opportunistic economic reasons, with criminal individuals or organizations targeting vulnerable systems, but they can also be driven by geopolitical and strategic motives.

“The increasing prevalence of data in our lives means our communities, our schools, our companies, and our governments are all vulnerable to cyberattacks.”

John Coletti, Chief Underwriting Officer, Cyber - North America at AXA XL

Preparing and protecting their organizations against cybersecurity risks should be at the top of global leaders' lists of priorities. The nature and extent of cyber risks are constantly evolving, making them extremely challenging to tackle. AXA XL has built a strong expertise over the past years to support all clients in terms of prevention, anticipation, mitigation and risk transfer. By providing pre-breach and post-breach services, AXA XL specialized cyber risk underwriters and risk consulting experts help organizations to cope with the ever-evolving cyber landscape.

Besides the corporate world, public institutions are also increasingly targeted by hackers. During the summer of 2019, a police department on the US East Coast was targeted by a cyberattack; its IT network was compromised and it lost access to some of its data. AXA XL provided swift assistance by enlisting prequalified breach experts to evaluate response options. Backups and data recovery procedures allowed the department to get its data back and resume normal business operations within a week of the attack.

Political risks: the consequences of “geopolitical recession”

Socio-political risks are at the forefront of experts’ perception of the future risk landscape; with geopolitical instability ranking as the third top emerging risk. Even if national politics play a big role in the experts’ perception of risks, results show that geopolitical instability is a major concern for all respondents, regardless of where they live. The four main risks related to the socio-political landscape—geopolitical instability, social discontent and local conflicts, new threats to security, macroeconomic risks—fare better among the experts surveyed than every other issue in terms of satisfaction with the awareness of the general public. The perception of public authorities’ preparedness is also more positive than for other risks.

“The US-China ‘cold war’ will create macroeconomic instability and lead to rising nationalism”

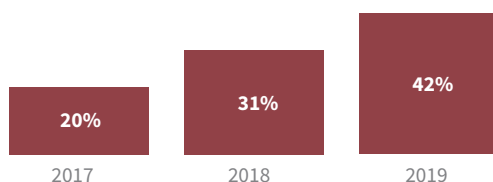
56-year-old risk management senior executive from France



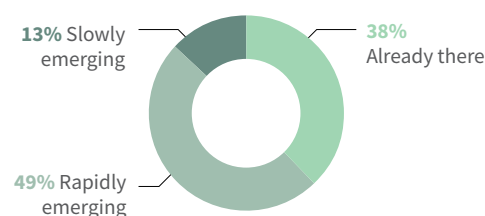
Risk #3: Geopolitical instability

Geopolitical instability gained more prominence in this year’s survey. This change of perception resonates with the geopolitical events of the past 12 months. Experts living in Europe, Central and South America, and North America are mainly worried about the rise of nationalism and populism, whereas respondents residing in Asia, Africa, and the Middle East are first concerned with tensions between nation states. This reflects the last US presidential election, the European election results, and recent political developments in Latin America, especially in Brazil and Colombia. Moreover, respondents in North America stress the risk of declining multilateralism much more than others; 16% of them chose it as primary concern, compared to 6% for the global average.

Respondents who selected social discontent and local conflicts as part of their top emerging risks



Estimated pace of emergence of social discontent and local conflicts



Main concern related to social discontent and local conflicts



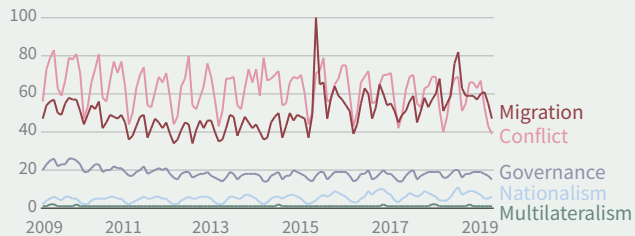
Source: AXA 2019 Emerging Risks Survey



Online sentiment analysis – geopolitical instability

Another example comes from the public's prioritization of the cluster of geopolitical risks. An analysis of online information searches highlights that overall world public concern is higher for conflicts and migration than for nationalism and multilateralism. Migration has slowly taken over as the top concern over the past five years. This is in sharp contrast to expert prioritization of the rise of nationalism and populism as the top geopolitical risks.

Popular governance concerns worldwide



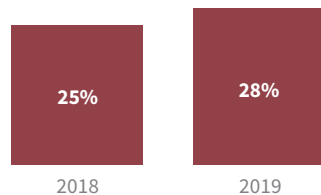
Note: Data based on online information-seeking trends as an indicator of public opinion.
Scale: 1-100, where 100 is the empirical max
Source: Eurasia Group



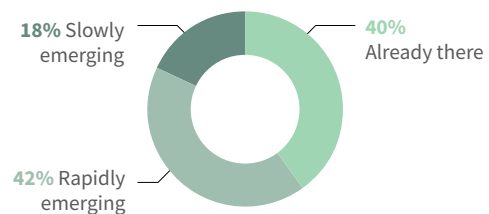
Risk #4: Social discontent and local conflicts

This risk of social discontent was among the top five risks in 2018 and rose another place in the ranking this year. Experts residing in the Middle East rank this risk significantly lower than average (7th versus 4th). Almost half of all surveyed experts consider income gap and wealth disparities to be the most worrisome concern. There are, however, notable disparities between regions on the last issue, ranging from 35% in the Middle East to 70% in Africa. Migration and territorial concerns have also been highlighted by respondents, especially those residing in the Americas.

Respondents who selected social discontent and local conflicts as part of their top emerging risks



Estimated pace of emergence of social discontent and local conflicts



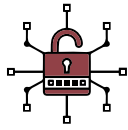
Main concern related to social discontent and local conflicts



Source: AXA 2019 Emerging Risks Survey

“While most emerging threats are at least recognized, the threat posed by income inequality and eroding social welfare programs is an unaddressed ticking time bomb.”

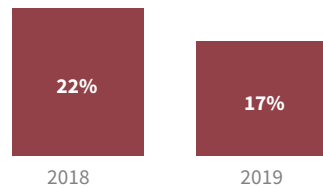
42-year-old finance executive from the Czech Republic



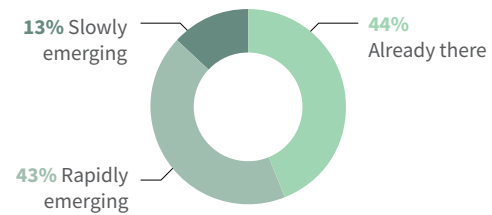
Risk #9: New threats to security

New threats to security fell two places in the ranking from 2018. This decline likely reflects the downward trend in terrorist attacks in most regions.²⁰ Respondents are equally worried about evolving terrorist attacks by smaller groups and lone wolves, and of cyber warfare triggered by to nation state-sponsored cyberattacks. Interestingly, experts living in the Middle East ranked new threats to security significantly lower than the average (13th versus 9th).

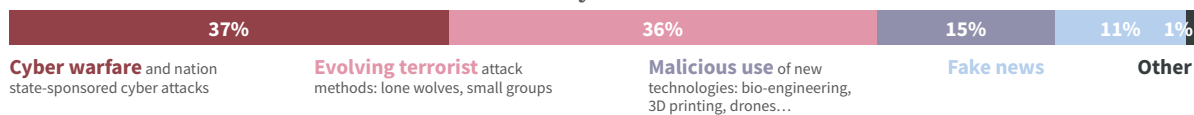
Respondents who selected new threats to security as part of their top emerging risks



Estimated pace of emergence of new threats to security



Main concern related to new threats to security



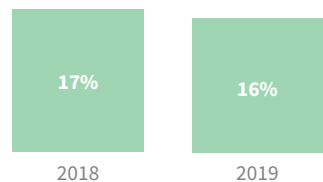
Source: AXA 2019 Emerging Risks Survey



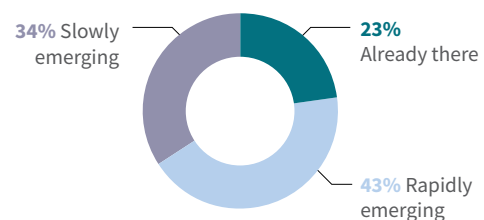
Risk #10: Macroeconomic risks

Macroeconomic risks come in the last position of the ranking of top risks. It should be noted, however, that other risks highlighted by respondents—such as climate change, geopolitical instability, and social discontent—touch on aspects of macroeconomic risks. Moreover, dissatisfaction with the level of preparedness of public authorities to cope with macroeconomic risks is lower than average. There seems to be a gender divide on this topic: Men rank macroeconomic risks nine positions higher than women do (9th versus 18th). More generally, male experts on average estimate economic and financial risks to be stronger than female experts do.

Respondents who selected macroeconomic risks as part of their top emerging risks



Estimated pace of emergence of macroeconomic risks



Main concern related to macroeconomic risks



Source: AXA 2019 Emerging Risks Survey

²⁰ [Will terrorism continue to decline in 2019?](#) The Conversation. 2019. LaFree, Gary.

“The past few decades have seen unprecedented wealth creation in the United States. The next few decades could see mounting pressure for wealth redistribution.”

Robert D. Kaplan, Managing Director, Eurasia Group

Deep dive



The era of geopolitical recession

The present era is defined by deteriorating relations between traditional allies and the development of an alternative international political and economic architecture. Unlike economic recessions, punctuated by frequent boom and bust cycles, geopolitical recessions play out over much longer cycles; the current geopolitical recession likely will shape the global risk landscape for many years to come. The implications are more fragmented global governance, an increase in geopolitical tail risks, and a reduced ability to respond effectively to major international crises when they hit.

Stalemate persists despite multiple rounds of trade talks



Source: Peterson Institute for International Economics (PIIE)

An extended geopolitical recession increases the likelihood that a serious global political crisis will erupt at some point over the next several years, resulting from lower trust between international actors, unclear policy decisions open to (mis)interpretation as threatening, and accidents that could escalate into serious confrontation. In the near term, the most likely crisis triggers are related to global trade issues—as already seen in the numerous international trade confrontations with the US—or to tensions and diverging interests over geopolitical hotspots and in proxy wars.

There are disintegrative forces currently at work in many of the world’s existing democracies that give rise to two main scenarios. A more negative one would be a geopolitical crisis that erupts and causes large economic dislocations; a more positive one would be the emergence of countervailing forces in a crisis that lead to the configuration of a new—and possibly more multi-polar—order.

The more negative scenario looks somewhat analogous to 1914-1945—the last time a geopolitical recession became a geopolitical depression—although major economies are far more integrated now and nuclear capabilities deter great power conflict to a much greater degree. Still, a negative scenario is possible and would most likely begin with a sudden unintended geopolitical crisis that escalates out of control. Remarkably, there have not been any significant crises in the current geopolitical recession, even as the tail risks of geopolitical conflict are steadily increasing. Despite the absence of serious crises, it is easy to imagine where major geopolitical crises could erupt. One plausible tail risk

is a US-led military confrontation with Iran leading to broader war across the Middle East, \$150 oil, and a major refugee crisis. Another tail risk is a US-Russia or US-China cyber conflict affecting critical infrastructure and causing major damage to the people or structure of a US city, a crisis in market confidence, and digital retaliation that results in widespread damage to the attacker's economy.

Despite these risks, there are also more benign scenarios for how the geopolitical recession unfolds. A significant geopolitical crisis could instead become a powerful lesson of the imminent dangers to global security of a world without cooperation.

Deep dive

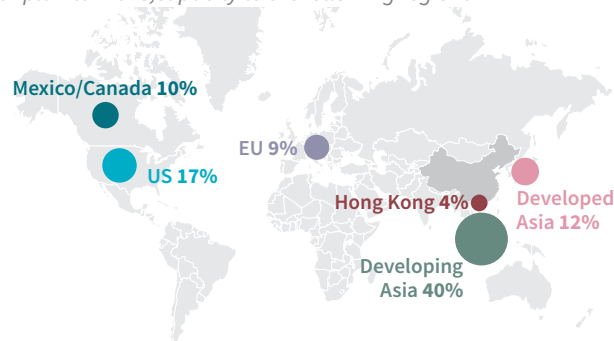


The threat of a digital iron curtain

Leadership over emerging technologies, including 5G, AI, and quantum computing, will most likely heighten geopolitical competition. These disruptive technologies come along with major economic opportunities, which exacerbate underlying political tensions.

Trade war could create opportunities for developing Asia

% surveyed US companies operating in China who have moved, or plan to move, capacity to the following regions



Source: American Chamber of Commerce China; 2019 China Business Climate Survey

Yet over the past two years, the US has moved decisively to restrict China's access to technology that it considers important to the "national security innovation base"—the network of knowledge, capabilities, and people critical to the US's long-term competitive advantages.²¹ Moreover, US firms have begun to shift parts of their tech supply chains out of China.

The US has moreover sought to prevent Chinese technology giant Huawei from deploying its 5G architecture by barring Chinese companies from access to US hardware and software in May.²² These developments pose real risks to businesses (and entire business

models) around the globe. For example, the US campaign against Huawei and others undermines China's efforts to accelerate autonomous vehicle (AV) development, as the planned rollout of the next-generation 5G network—and by extension its goals for its domestic AV sector—may be delayed or even derailed. Nonetheless, Huawei recently announced it started building 5G base stations without US components, planning to build 1.5 million in 2020.²³

Supply chain shifts are likely just the start of a broader separation of the US and Chinese tech ecosystems as the two countries begin "designing out" each other's technologies. This could result, in the long run, in separate technology ecosystems. In this scenario, separate frequencies for 5G and connected devices, separate tech standards for the technology underpinning next-generation applications like driverless cars and smart cities, and separate ethical and legal frameworks for the free flow of data all become likely. A schism in global standards setting—up to now a largely meritocratic and technical process in which the best technology has been chosen as the basis for a standard—could result in the US and China going their separate ways, with third countries pulled into one or the other's tech orbits. Under this scenario, devices, software, and entirely different technology ecosystems would eventually be unable to easily communicate with each other.

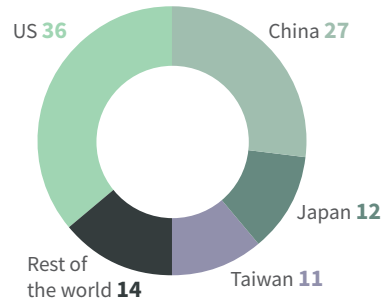
²¹ [National Security Strategy of the United States of America](#). White House. 2017.

²² [Addition of Entities to the Entity List](#). Federal Register. 2019.

²³ [Huawei says it has begun producing 5G base stations without U.S. parts](#). Reuters. 2019.

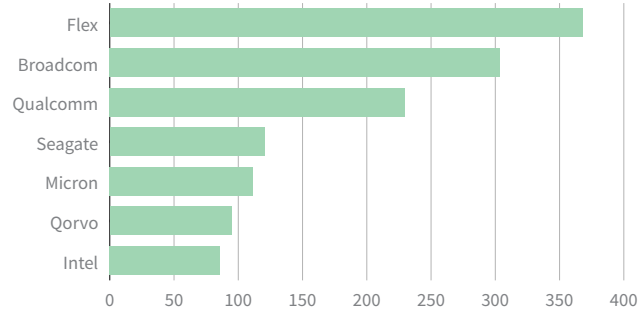
Huawei ban threatens to undermine a potential trade truce

Huawei's global suppliers, 2018
Percentage of firms by country



Source: Goldman Sachs, Jefferies, Bloomberg

Huawei's top US suppliers
Total revenue from Huawei, \$ millions



For businesses, such a scenario would sharply raise the costs and complexity of technology procurement, regulatory and legal compliance, and cross-border investment more generally. The emergence of a digital iron curtain between the US and China could also result in a broader fragmentation of the internet itself. For instance, the former chief executive of Google, Eric Schmidt, argues that the internet could split in two by 2028, with a US-led version and a China-led version.²⁴ Moreover, countries such as Iran and Russia have chosen to implement their own national internet systems, enabling public authorities to filter and monitor data.

²⁴ [Google's ex-CEO Eric Schmidt says the internet will split in two by 2028](#). Business Insider. 2018. Hamilton, Isobel Asher.

Eurasia Group's outlook for regional political risks

All regions may be affected to various extents by the risks highlighted in this report. This section focuses on three world regions where the risk landscape is likely to radically evolve in the next five to ten years. First, Europe will have to find its way in the trade war between US and China while managing its own political tensions. Second, Asia will be confronted by uncertainty, compromising its efforts for regional integration. Third, North American domestic politics are increasingly polarized, which jeopardizes the current order and dependent economies.

The EU at a crossroads: Is there a future global role for Europe?

It has become common to describe the EU as “at a crossroads” following a decade that began with a financial crisis and is ending with mounting domestic political challenges stemming from populism and nationalism. And indeed, Europe faces important challenges, not only from internal economic and political forces, but also in establishing its place and voice in a world increasingly at risk of splitting between US- and China-led blocs.

“European imagination is conditioned by the last 40 years of relative social and economic stability. Consequently, we are largely unprepared for what will come when the societal and economic structures start to break down in the face of tightening pressure on natural resources.”

54-year-old security expert from France

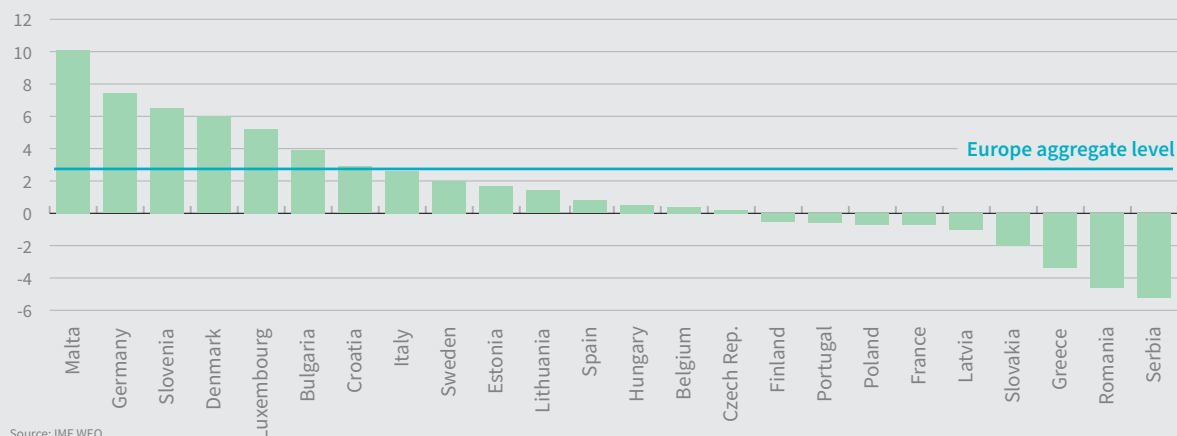
Skeptics about Europe's future role as a global power point to the shortcomings of the Eurozone and of a two-speed economy that exacerbates fissures in the economic union, disunity resulting from the migration pressures, domestic terrorism, as well as the increasing influence of Russia to suggest that the continent may be incapable of effectively responding to 21st century challenges.

These criticisms are overblown, but the EU will continue to face critical challenges to remain cohesive and globally competitive in the years ahead. These include achieving greater economic and financial integration to make the EU and Eurozone more resilient to financial crises; reducing the EU's dependence on external demand as a driver of growth; maintaining competitiveness in emerging technologies such as AI; and strengthening EU institutions. Moreover, all these challenges come against the backdrop of a deepening US-China rivalry and the erosion of the post-war economic and security order, further complicating Europe's task in the years ahead.

Skeptics about Europe's desire or ability to play a larger role as a global power focus on three separate issues—its limited willingness to do so until now, an aging population, and low trend growth. These are undoubtedly fundamental challenges but not necessarily insurmountable ones. On the first point, Europe has thus far showed limited willingness to shoulder the burden of maintaining international order, in turn leading to increased US complaints about Europe free-riding on the post-war economic and geopolitical order. These complaints also come at a time when the US increasingly views the Pacific Rim as the focus of its economic and geopolitical policymaking, potentially creating a need for Europe to step in with more deterrent and diplomatic power in its near abroad.

Europe remains largely reliant on external demand

Current account (% of GDP) balance by country, 2018



The economic challenges for Europe are also significant but might be overstated. It clearly faces demographic headwinds, but its situation is different from that of China. European demographics are already influenced by immigration, a trend that is likely to continue; European growth would be helped by better integration of migrant labor and of the large pools of underemployed and unemployed in Mediterranean countries. At least in economic (if not political) terms, these are easy solutions to boost growth. There is also room for progress on the technological front, where much of Europe finds itself far behind the US and East Asia in leveraging the potential of ICT. This suggests room for investment that delivers both a cyclical push to growth and structurally positive externalities for trend growth.

The EU's responses to recent challenges have shown the bloc's fundamental strengths. Most strikingly, the combination of political compromise and institutional innovation between 2010 and 2015 allowed the Eurozone to survive its financial crisis. More recently, contrary to expectations that Brexit would lead to an acceleration of centrifugal forces elsewhere in the EU, the bloc has retained a high degree of cohesion in the Brexit process.

Europe's role in a more polarized world between the US and China

Europe is the largest trading partner of both the US and China, and it remains a key player in the economic and security spheres. As a result, it has a crucial role to play in the competition between the US and China. In the meantime, the EU cannot position itself equidistant between the US and China. Cultural ties, shared democratic traditions, and sheer habit will place it in the Western camp for years to come. The EU shares the US diagnosis on China on many issues, including trade, intellectual property, and market access. Moreover, notwithstanding the noticeable deterioration in US-EU relations that began in the early 2000s, EU leaders will not want to jeopardize the deep cultural, political and security linkages between the two, especially given the EU's high dependence on the US for its own security and defense. Despite China's growing importance in the global economy, the US still represents a more important export market, and access to deep US capital markets remains crucial for a European economy otherwise very dependent on bank funding.

But while the EU is taking an increasingly assertive posture to address imbalances in market access and trade practices, its ability to coordinate with the US is hampered by the poor state of transatlantic relations. Since President Donald Trump's administration imposed its first batch of tariffs on EU steel and aluminum, the scope for cooperation has narrowed.

In the near term, EU countries may reap some limited benefits from the worsening of the US-China trade conflict. These will primarily stem from import substitution opportunities, as the EU is a key trade partner of both countries: European firms could edge out products made more expensive by tariffs and gain market share in both US and Chinese markets. This would mainly benefit those sectors in which Europe already has a presence, as it would not require significant investment in additional capacity.

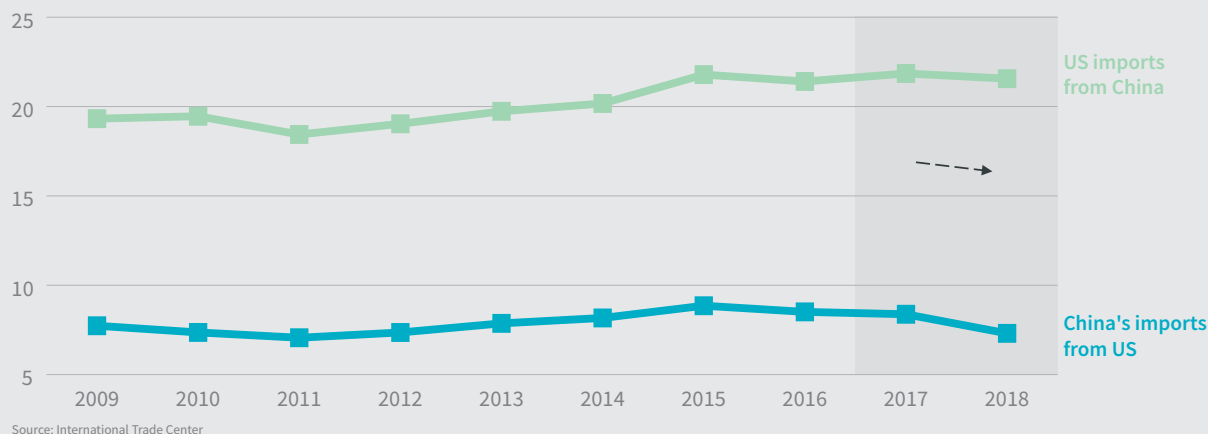
“Europe faces a choice between becoming a power and production centre on its own or remaining divided and becoming an irrelevance which subcontracts for the US and China.”

*Radosław Sikorski, Member of the European Parliament,
Former Foreign and Defense Minister of Poland*

In the long term, a lengthy US-China conflict will likely hurt the European economy. First, any near-term gains will be offset by the negative macroeconomic spillovers of rising trade barriers between the US and China on global markets and the economy. Second, the EU will be unable to “play both sides” or maintain a somewhat neutral stance for very long. A worsening standoff will see the US raise pressure on Europe. That could take the form of political and diplomatic pressure, or economic means such as tariffs. Finally, rifts within the EU itself will be exacerbated: different member states, particularly member of the so-called 17+1 group, will be exposed to retaliation from the US and China to different degrees, and the ability of the EU to develop unified positions on China will be increasingly stymied.

Bilateral trade between US and China has declined since 2017

Imports value as % share of total imports from the world



Domestic European risks and opportunities amid the geopolitical recession

The EU faces a set of domestic challenges that will play out over the next five to ten years against the backdrop of the current geopolitical recession. Broadly, these include: maintaining the stability and viability of the Eurozone across member states with varying macro-fiscal conditions; upholding the territorial integrity of the EU; managing emerging migration pressures; sustaining the political contract between member states and Brussels, and managing existential threats to that contract through events like Brexit; and ensuring the competitiveness of the EU, especially in emerging technologies.

The future of the Eurozone

From an economic perspective, Europe has spent much of the last decade navigating the shortcomings of the Eurozone's construction and their negative financial and economic consequences. It has emerged with a solid demonstration of consensus on the need to do "whatever it takes" to enable it to retain global influence in a world in which the US and China loom ever larger. But much remains to be done on the economic front, and the EU has fallen further behind the US and China in economic terms in the past decade.

Challenges to further economic integration will continue to loom large over the next five to ten years. An embryo Eurozone budget focused on infrastructure investment and funds for structural convergence should be expected over this period. Politically nuanced decisions by the European Commission on single country fiscal policies and targets will likely remain available as a tool in the Eurozone's economic policy arsenal. Finally, it is possible that the combination of increasing US opposition to the Eurozone's fiscal and monetary mix and threats to Eurozone growth from a Chinese slowdown and a mercantilist US trade policy create pressure for a more expansive fiscal policy in large European economies.

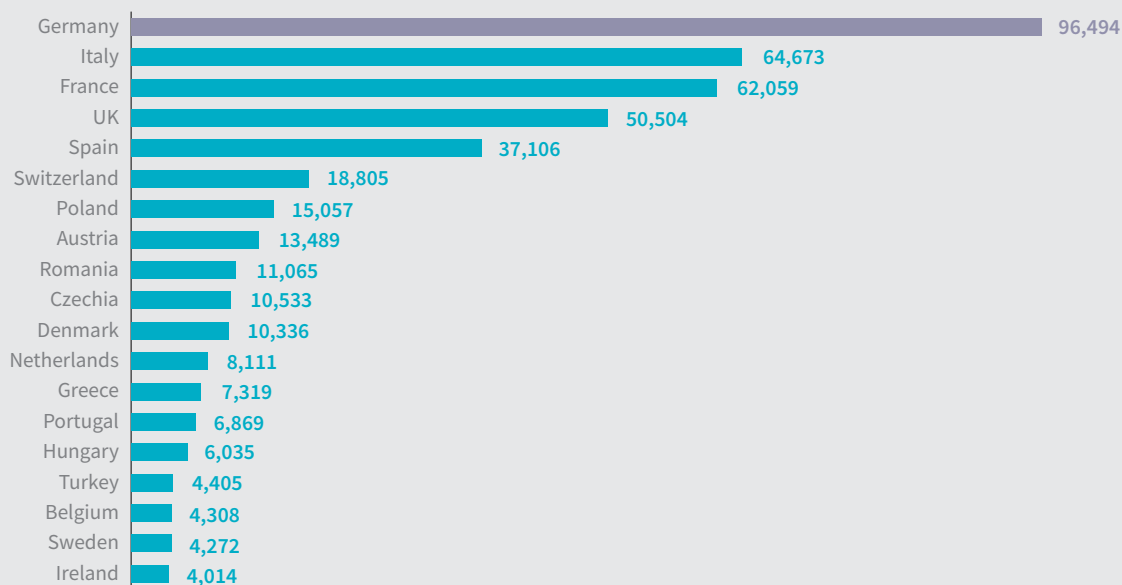
Consequences of climate change for Europe

The EU will continue to face serious economic risks from climate change, but Europe has also emerged as a global leader on the issue. It has set the benchmark for high-ambition emission reduction policies and for enhancing its resilience to climate change. The EU has set itself the target of reducing greenhouse gas emissions by 80%-95% by 2050 from 1990 levels, and a commitment has been made to transform Europe into a highly energy-efficient, low carbon economy²⁵.

Spillovers from other regions into Europe may pose the greatest set of economic, political, and social risks associated with climate change. Europe is geographically close to some of the largest concentrations of people who will be negatively affected by climate change. The Middle East, North Africa, and the Sahel region are all areas with low state capacity and where political and economic distress will be compounded by climate change, potentially forcing increasingly large migratory flows into Europe.

Germany stands out as the most vulnerable to climate change

Estimated losses from climate change across EU members (million Euros)



Source: European Environment Agency

²⁵ [EU climate action](#), European Commission.

Less than five years ago, the arrival of migrants in Europe exposed rifts between and within member states and prompted a surge in support for right-wing parties and of nationalist rhetoric. But while the European political landscape continues to change, these changes have been more in peripheral countries and less in those at the core, and the outlook for further change over the next five to ten years may be more benign than often assumed.

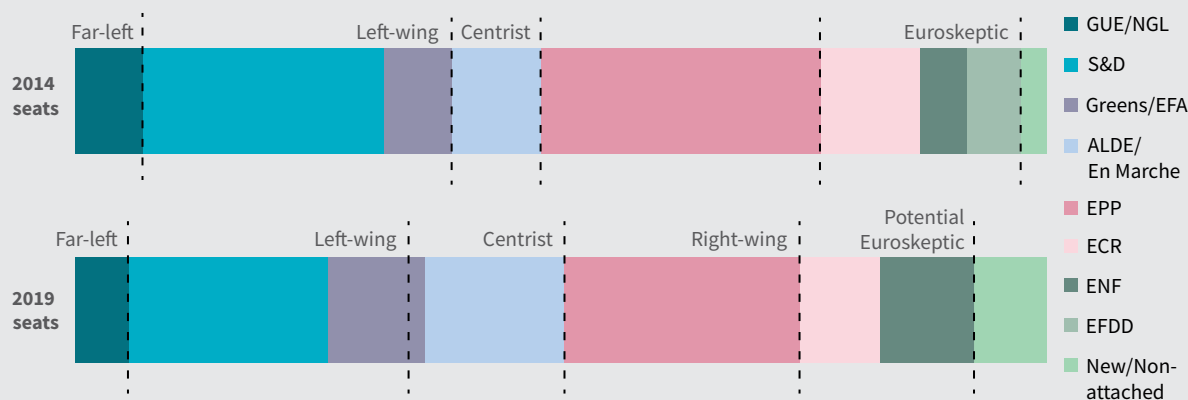
The threat of nationalism in Europe

Since this year's European Parliament elections, the informal coalition of the European People's Party and the Socialists and Democrats no longer has a majority. Instead, the two groupings will have to ally with smaller pro-EU parties to advance legislation. In particular, the rise of the Greens in the 2019 elections has been significant and holds important implications for European policy.

Despite the fears of a euroskeptical wave sweeping the EU, nationalist parties remain relatively isolated in parliament. That is not to say that euroskeptical parties will not influence the direction of travel in the EU in the years to come: In Italy for example, the League remains well-supported, and right-wing parties and politicians are a serious political force in many other member states. However, the full-scale sweep of European institutions by populist parties that had been the subject of fears until recently is unlikely to occur in the short or medium term.

Majority parties face steeper competition from new political parties in European Parliament

European Parliament seats by party, as of 2 July 2019



Asia: How can the region balance the rise of China with traditional ties with other powers?

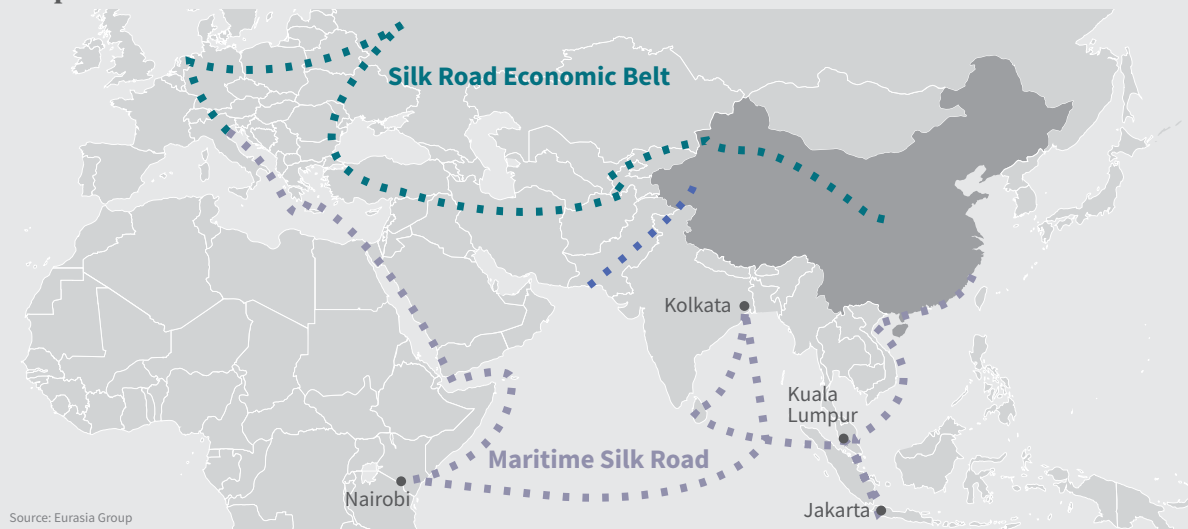
As the US-China conflict intensifies, the rest of Asia fears that it will be caught in the middle. Most countries will pursue “hedging” strategies, seeking to benefit from relationships with both sides while avoiding getting too close to either country.

China, meanwhile, will continue to deploy strategic and economic tools, positioning itself as a provider of global public goods by contributing to regional trade, investment, and infrastructure building. While China will likely remain on a “rising” path, its journey will be marked by economic dislocations, financial risk, and domestic uncertainty. For Asia, whose economic and commercial fortunes have increasingly become linked to the Chinese economy, this period will be marked by persistent uncertainty.

Opportunity, instability, and insecurity will define Asia's next decade

Over the past six years, China's President Xi Jinping has used his country's growing economic strength as leverage to pursue a larger regional and global role for China. Given its comprehensive “Belt and Road” strategy and ambitious diplomatic and military programs, China's influence globally and its relative weight regionally will continue to rise. Nowhere is more important to China than Asia—its own neighborhood.

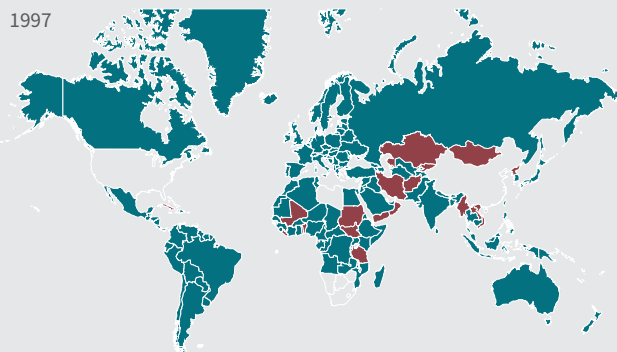
Proposed Belt and Road Initiative



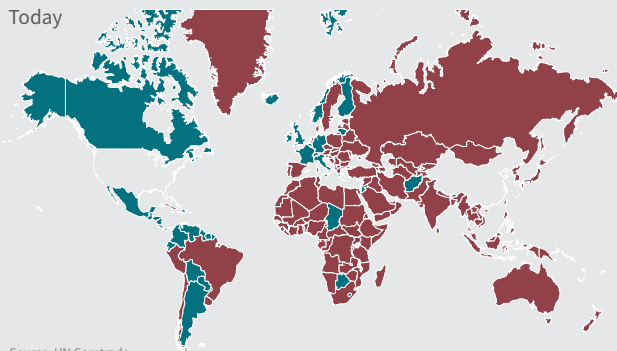
US vs China

Blue-colored countries trade more with US than with China;
red-colored countries trade more with China

1997



Today



Source: UN Comtrade

Asian countries will prioritize their own independent security and defense capabilities to deal with rising instability. They will also increasingly chart their own paths on regional trade and economic integration. Asian powers also will look for ways to incorporate China into regional architecture. For example, Japan has considered working with China on joint infrastructure projects in the region. The Comprehensive and Progressive Agreement for Trans-Pacific Partnership will enlarge its membership, building out a rules-based trade architecture in Asia and beyond. Regional countries will concurrently negotiate the Regional Comprehensive Economic Partnership (RCEP), while Japan and South Korea will continue to explore a China-Japan-South Korea trade agreement.

China's regional policy

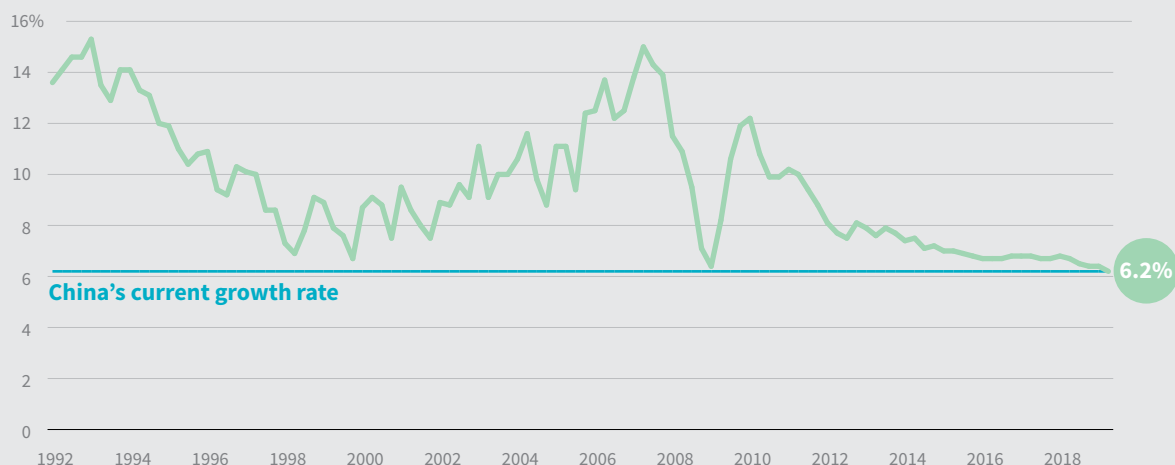
China's ambition is to take on a preeminent leadership role in the region and reduce the influence of the US. These goals will remain overriding features of China's foreign policy for the next decade. Part of this will entail improving China's relationships with its neighbors both through diplomacy and the use of economic influence, including infrastructure financing through the Belt and Road Initiative (BRI). China has also promoted regional trade initiatives including most prominently the RCEP.

The second half of China's strategy for regional power involves flexing its economic and military muscles. China has already bolstered its military presence on reclaimed features in the South China Sea and successfully threatened stakeholder countries to suspend oil drilling in contested areas. China has also suspended tourism, economic dialogues, and held up imports to gain concessions on areas like technology investment.

China will continue to use these incentives to push and pull other regional countries into its orbit. But success is far from guaranteed. Despite the enticements of infrastructure investment, larger regional economies will push back on China's attempts at overt economic influence: India has repeatedly turned down offers to join BRI, for example, and South Korea stood firm in the face of Chinese economic pressure over its deployment of the US Terminal High Altitude Area Defense missile battery. An economic slowdown in China, along with supply chain decoupling from the US and rising labor costs, may also make the offer of economic engagement less obviously appealing.

China's registers its slowest GDP growth since 1992

Real GDP growth, % change, y-o-y

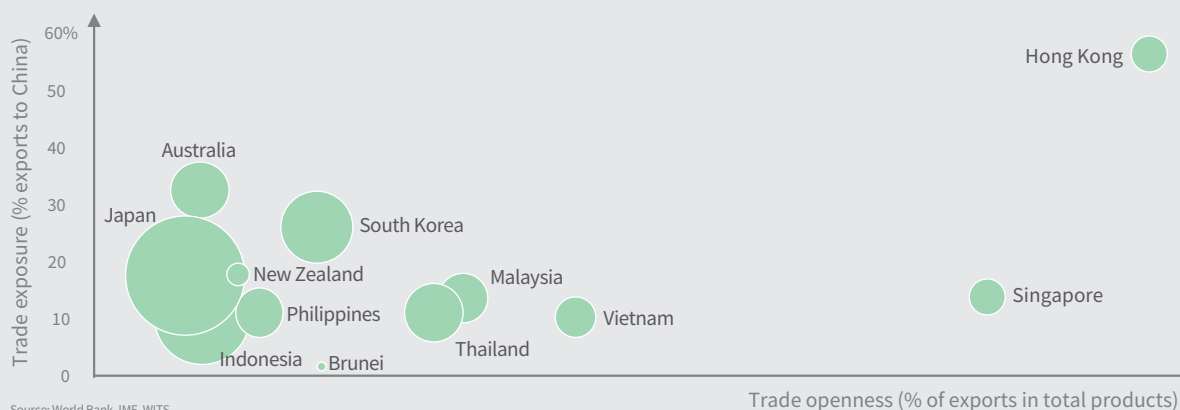


Source: Bloomberg

As China grows it will be less tolerant of challenges to what it describes as its “core interests,” including Taiwan. The risk of a reaction from China when its interests are challenged will be heightened during this period. Fundamentally, China's rise will be uneasy, unsteady, and marked by internal and external political risks. For international business and investment, a stronger regional buffer to counter this uncertainty would be welcomed, but the region does not appear well-prepared to offer one in the near term.

Asia's trade exposure to China

Trade exposure to China and trade openness, bullets sized by % of global GDP, 2018



Source: World Bank, IMF, WITS

US influence in Asia will gradually decline

Asia will remain the most intense area of geopolitical competition between the US and China over the next decade, and the US likely will see only a modest decline in its influence in Asia.

“Asia remains the vital engine for global growth and poverty alleviation. The US push to decouple from China is forcing nations to choose. This will fuel uncertainty and significant risk for China, the US, and the global economy.”

Josette Sheeran, President and CEO, Asia Society

The US has been the dominant external power in the region for 70 years, with five allies, substantial forward-deployed military forces, and a strong track record of involvement. Even if the US substantially shrinks its role as security guarantor in Asia, it will not leave China as the uncontested regional hegemon; other countries in the region will increase their own defense postures (Japan, India, Australia, Indonesia) and expand their economic and commercial diplomatic capabilities to create a counterbalance.

The re-emergence of the “Quad” partnership between the US, Japan, India, and Australia will not offer a credible alternative to Chinese investment, but it does signal to the region that it will not need to choose between the US and China anytime soon. In economic terms, the US has little answer for China’s BRI or trade diplomacy. The rise in US protectionism makes a return to the Trans-Pacific Partnership unlikely in the near term. In the longer term, the key risk is that the US more actively steps away from its alliances in the region, raising levels of insecurity.

Asia’s other large economies will help shape the future risk landscape in Asia

The region’s other large and influential economic powers—notably Japan, South Korea, and India—share common concerns and challenges about how to constructively engage with China and balance this relationship with those they have with the US and other powers.

These challenges are perhaps most acute for Japan, which increasingly worries about becoming more isolated in Asia while increasingly debating the value and sustainability of the US-Japan security alliance. Looking ahead, Japan’s view of China will be split between the foreign policy and defense communities, preoccupied with Japan’s ability to manage China’s growing regional influence, and a business community that also wants to take advantage of opportunities to do business with and in China. At the same time, Japan’s aging and shrinking population creates enormous risks that it will have fewer resources (including people) in the future; heading off secular economic decline remains the primary challenge for any Japanese government.

Japan will also lead the region in sponsoring alternative regional economic and financial architecture, looking for opportunities to expand efforts to construct a rules-based trade architecture in Asia and beyond. Japan will continue to participate actively in negotiations on RCEP and discussions on a China-Japan-South Korea trade agreement.

Much like Japan, South Korea will seek to benefit from the trade and commercial opportunities China presents without becoming overly reliant. South Korea is heavily dependent on trade with China but its business community will seek greater economic diversification, especially by enforcing economic and political ties with ASEAN countries.

Unlike Japan and South Korea, India has ambitions to be a regional superpower. And yet, despite greater economic liberalization efforts, it is still hesitant to engage in regional trade, limiting its ability to expand its regional sphere of influence. Over the next five to ten years, India will seek to incrementally counter Chinese influence and push back against China’s BRI in South Asia by funding infrastructure projects and offering lines of credit for social and economic

development, especially in neighboring countries. India's current focus on US engagement will continue, led primarily by the defense relationship and a recognition that India needs US investment to grow. Nevertheless, it will continue to rely on tariffs and technical barriers to trade to protect domestic industry and move slowly on the RCEP agreement.

Japan looks outward on trade

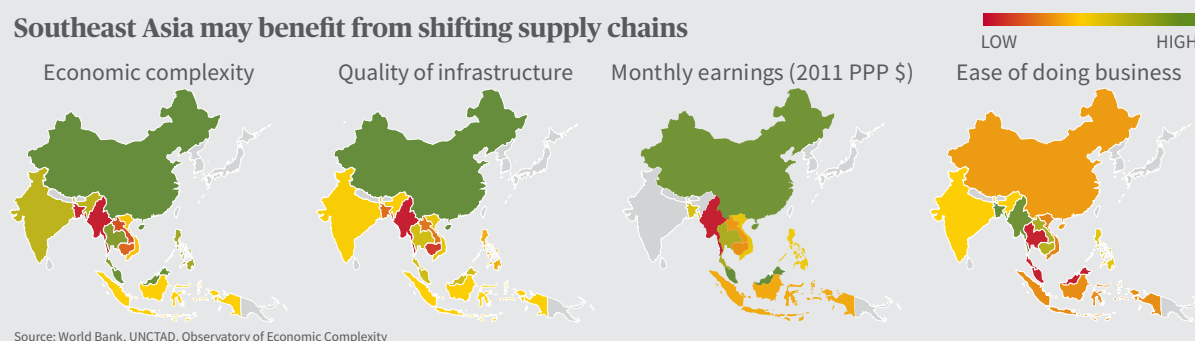
Status of CPTPP implementation, as of January 2019



ASEAN is also strengthening its regional trade and economic framework

ASEAN countries will respond to commercial confrontation between the US and China by intensifying efforts to integrate commercially. On the positive front, the region benefits from being of strategic importance for the US, China, and Japan, creating opportunities for investment. But integration will be impeded by the significant disparities in levels of development among ASEAN states and the domestic political imperative to protect sensitive industries.

Southeast Asia may benefit from shifting supply chains



At the same time, ASEAN countries fear that in the coming years they will face more pressure to pick sides in the US-China dispute, and they also worry about the undermining of the current rules-based trade and financial architecture. The geopolitical uncertainty driven by these issues creates headwinds for growth, though longer-term

US-China tensions could benefit Southeast Asia by expediting the shifting of supply chains southward from China. These dynamics will play out slightly differently in each ASEAN country, making it difficult for the bloc to form unified positions on issues such as the South China Sea or more broadly on relations with China and the US.

US faces strained relations with traditional allies in Europe and in Asia

Share with a favorable view in selected countries by administrations



North America: What are the consequences of declining US influence on the multilateral order and rising political polarization?

The risk landscape for North America over the next decade will be largely shaped by two overarching trends. The first is the rapidly changing role of the US in the world, which has ushered in a multi-year period of geopolitical recession. Second, US domestic politics are changing dramatically, eroding the quality of the policymaking environment.

Moreover, these trends may unfold against a backdrop of soft economic growth. One of the distinguishing features of the US economic recovery after the 2009 recession has been its weakness in comparison to previous ones, giving rise to the theory of secular stagnation, a term coined by former US Treasury secretary Larry Summers. Despite the record length of the recent economic expansion, US trend growth rates show a steady decline over the last few decades. When compared with average real per capita GDP growth at or above 2.0% in the 1980s and 1990s, growth in the 2000s (even excluding the Great Recession) was just 1.7%. The subsequent recovery in the 2010s from the deepest recession of the post-war era was even more subdued, with average growth of only 1.6%.

The steady deceleration in real growth rates has been attributed by various observers to a combination of financial, social and technological factors. On the financial and economic front, one factor may be the decision by the Federal Reserve and other central banks to move to historically low interest rates following the financial crisis. This allowed troubled entities, including governments, corporations and households, to roll over debt and prevented a deeper liquidation crisis with potentially grave social consequences. At the same time, however, low rates have kept marginally productive excess capacity online for longer, potentially suppressing productivity gains. On the social front, potential causes include heightened inequality, which directs income gains away from those with the highest marginal propensity to consume and results in disparities in education, health, and mobility, with an adverse impact on labor productivity.

Geopolitical recession and the shifting global role of the US

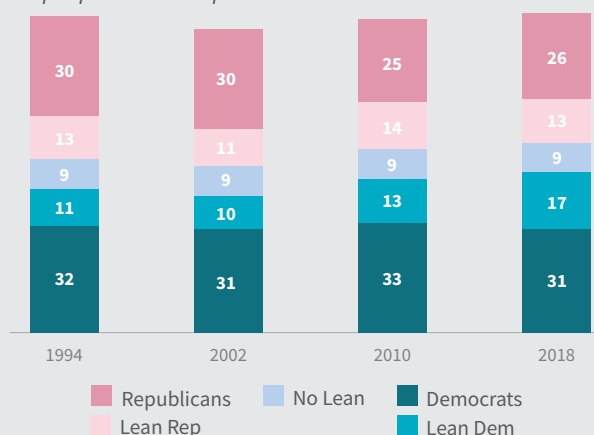
The external risk landscape for North America is being reshaped by major geopolitical shifts and the changing role of the US within the international order. China, and to some extent Russia, are challenging the geopolitical status quo, helping push the world toward more geopolitical, economic, and industrial fragmentation over the next several years.

To some extent this process will also play out *within* North America, as Canada faces a more uncertain geopolitical outlook that creates significant political and economic risks. As an export-driven economy, uncertainties about its relationship with the US (centering on trade disagreements and Canada's position in the middle of the US-China conflict), global trade, and economic growth are of great significance. Canada is being forced to grapple with questions on how to better position itself for a changing relationship with the US.

Economic anxiety, polarization, and voter discontent will raise policy risks and crisis vulnerability

US has seen increased signs of partisanship

% of people identified political



Source: Pew Research

Despite a long and sustained economic expansion in the US, economic insecurity continues to shape the US political landscape and post-financial crisis political discourse. This anxiety is likely to persist over the next decade, and the political polarization and anti-establishment mood will drive the US politics. Social inequities and policy excesses drove deep dissatisfaction with elected officials, moving the goalposts again for politically possible solutions. Polarization has come to define American politics, with important implications for the policy environment and for resiliency and crisis response, which will shape the risk landscape in the coming decade.

Voter discontent remains at high levels in the US, fueling antiestablishment candidates and adding a more populist dimension to American politics. The political spectrum in the US will evolve in the coming decade, and both the Republican and Democratic parties will continue to struggle to ef-

fectively address newfound grassroots pressure to move toward the extremes of the political spectrum. Interestingly, there are now areas of overlap between the major parties that did not exist previously, particularly around trade policy. Republicans are gravitating toward Democratic positions as they discover that the traditional conservative platform of free trade, smaller government, and less regulation are increasingly unpopular among demographics critical for winning national elections.

The political breakdown poses a three-fold risk to the business environment across North America:

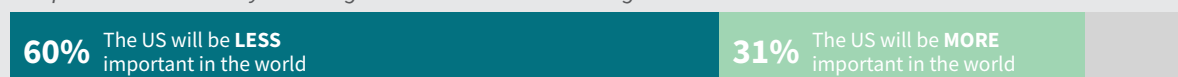
First, polarization and decreasing consensus means that electoral changes in party control can result in significant policy swings. This oscillation diminishes the ability of investors and companies to form a stable base of expectations that would minimize political risk to markets and operations. This is true of foreign policy as well: successive US administrations may swing from isolationist to interventionist.

Second, antiestablishment politics continue to drive US debates and decision-making. The 2020 election cycle will test whether this is now firmly anchored or whether a return to the center might be the next swing of the pendulum. Populist politics impede the US willingness and ability to act at a time when new threats demand a response. Inertia will continue to deepen the risks outlined above.

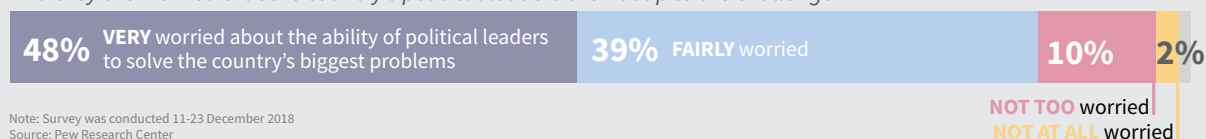
Third, the inability to respond quickly and decisively to a crisis poses the risk that serious ruptures can materially alter the business landscape without firmly anchored expectations that policymakers can minimize fallout and rebuild swiftly.

When considering the future of the US over the next 30 years ...

The public sees a country declining in stature on the world stage



And they are worried that the country's political leaders are not up to the challenge



Note: Survey was conducted 11-23 December 2018
Source: Pew Research Center

Under the radar: health risks

In 2019, only 5% of experts selected a medical risk as their top emerging risk. The only exception this year is the risk related to pandemics and infectious diseases. Experts fear a new influenza virus transmitting from animals to humans and potentially causing a pandemic, which was deemed to be a real risk by the WHO in March 2019.²⁶ Many health issues relate to the other top risks of the *AXA-Eurasia Group Future Risks Report*. The growing concern with exposure to harmful substances over the long run is a consequence of environmental pollution. Women are more concerned than men about this risk; they rank it 12th (versus 20th), in line with the average higher concern women have about health risks. Technological competition in the context of a “digital iron curtain” affects the risks stemming from medical advances. The rising threat of pandemics and infections is compounded by increasingly complex economic and political landscapes.

“I believe we are on the cusp of a revolution. Tomorrow’s medicine will be much more personalized, targeted, connected, and evolutionary. This will happen due to the application of cutting-edge technologies to medical products such as 3D bioprinting, nanoscience, flexible electronics, machine learning, fast computing, and connected devices.”²⁷

Abdul Barakat, AXA Research Fund grantee



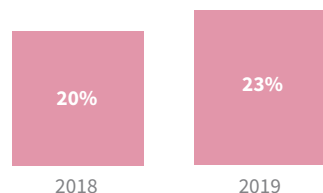
Risk #8: Pandemics and infectious diseases

This is the only medical risk featured in the top 10 ranking this year. At the global level, there is no clear consensus on the main concerns related to pandemics and infectious diseases. Experts highlight three different main areas: new strains of infectious diseases—for example, Ebola and Zika—antimicrobial resistance and “super bugs,” and changing patterns of infectious diseases caused by the impact of climate change and global travel. Interestingly, Experts living in Africa provide significantly different answers from the rest of the sample. They are mostly worried of new strains of infectious diseases. They are also more positive than average about the level of public awareness regarding this risk. This echoes the fact that Africa has recently been confronted by massive outbreaks of infectious diseases resulting in worldwide impacts such as Ebola, Zika, and Chikungunya viruses.

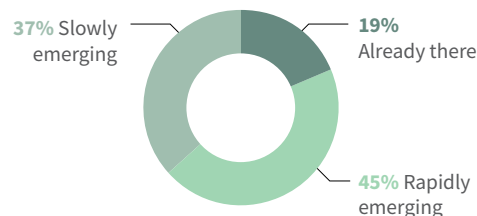
²⁶ [Silver Age: aging better](#), AXA Research Fund, 2019.

²⁷ [WHO launches new global influenza strategy](#), World Health Organization, 2019.

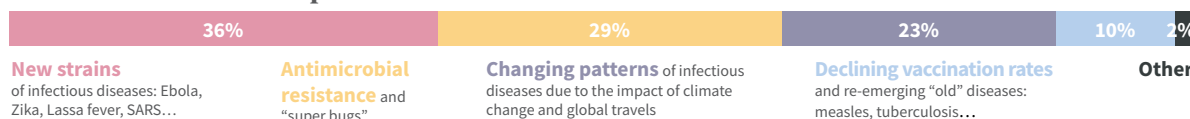
Respondents who selected pandemics and infectious diseases as part of their top emerging risks



Estimated pace of emergence of pandemics and infectious diseases



Main concern related to pandemics and infectious diseases



Source: AXA 2019 Emerging Risks Survey



AXA Group Risk Management: focus on life and health risks

Marine Habart is the chief risk officer for Life, Savings & Health at AXA. Her main mission is to ensure the management of health-related risks that people can be exposed to throughout their lives.

How would you describe your role within AXA?

In Group Risk Management, we anticipate future demographic trends to make sure that we are well-prepared to help our insured clients live better lives. In addition to this long-term view, we also consider biometric risks, such as pandemic events, that can occur suddenly with huge consequences for the global population.

What are life and health risks?

They relate to human life conditions, such as death, birth, disability, age. We look at both the medical implications and the economic consequences, as our objective is to be able to offer an adequate protection to our clients when they need it.

What have you been working on recently?

We know that a massive pandemic event is likely to have catastrophic outcomes. The Spanish Flu for instance killed between 50 million and 100 million people worldwide between 1918 and 1920. New factors such as climate change and permafrost thawing could unleash long-gone deadly viruses, potentially opening a Pandora's box and triggering future pandemic events. To assess the potential impact of such a disaster, we have developed an advanced pandemic risk model that is fully adapted to our customers and that takes into account climate change.

Any exciting challenge ahead?

The prediction of long-term health risks themselves is a very interesting challenge that requires combining many areas of expertise such as medical advances and innovation, economic and political evolutions, as well as actuarial expertise. At AXA, we jointly work with academics in collaboration with AXA Research Fund to understand in advance those future trends. Our aim is to help our clients to live longer and healthier lives, for example thanks to long term care and critical illness insurance guarantees, teleconsultations, home automation, and Internet of Things applications.

Deep dive



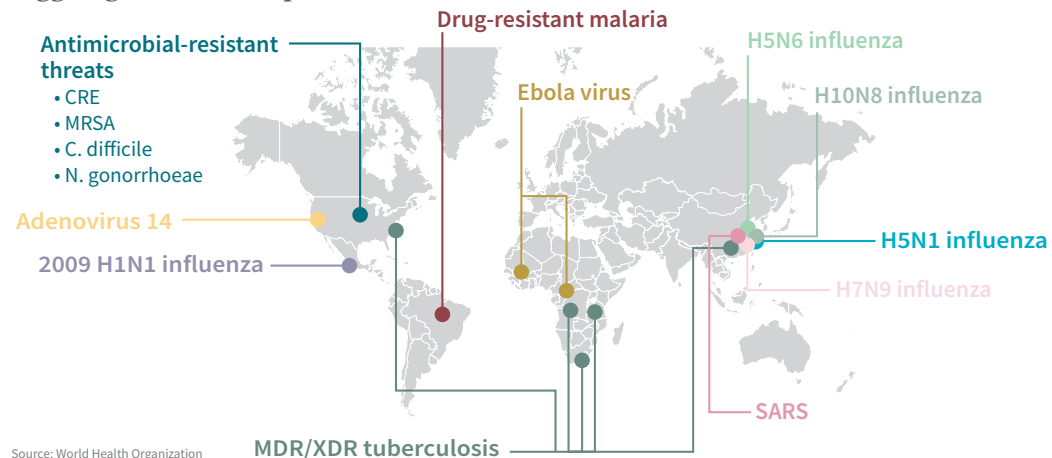
The risk of pandemics in a changing political and economic context

The risks of pandemics and the spread of infectious diseases perennially command mindshare due to regular flare-ups of communicable disease around the world. Over the past year, the Ebola epidemic centered in the Democratic Republic of Congo has received the most media attention because of its scope and the challenges in combating it—most notably, violence in the affected areas and resistance to medical interventions. Additional examples over the past year include transcontinental travel by febrile Hajj participants, ongoing cases of Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV), and a re-emergence of old conditions, such as measles.

One major risk posed by epidemics and infectious disease is macro dislocation: an economic slowdown due to lost productivity from illness, slower trade, or halting of corporate activities in affected regions. While the WHO is typically very conservative about recommending regional shutdowns such as border closures and quarantines, countries have often not heeded its guidance.

Notably, supply chain challenges are becoming more acute in the healthcare space, even outside the context of a global health emergency. Over the past two years, medicine and device shortages have affected markets of all sizes—from Qatar and Egypt, to France and the US, and potentially to a post-Brexit UK. With several high-value trade arrangements hanging in the balance, supply chains of medicines and devices could be poised for even more disruption.

Biggest global risks of pandemics



By and large, governments are unprepared for a serious global health emergency. Corporations might be expected to take on some of the responsibility of safeguarding their personnel. Failure to do so could have negative repercussions. Healthcare firms are at particular risk if they are unable to develop or deliver therapeutics to address a health emergency, especially if they are justifying their pricing based on innovation and productivity.

Pandemic risk is rising primarily because of political and social factors, including the increased presence of nationalist politics. While even epidemiologists cannot predict with certainty the likelihood of a pandemic or serious epidemic, vulnerability to epidemics has gone up in a more nationalist global context. Support and resources have decreased for international organizations that provide pandemic planning and support. Furthermore, a more nationalist orientation heightens the risk that countries will employ measures that are domestically motivated and perhaps not in the global interest. Such measures might include: an unwillingness to deploy resources abroad to deal with global health issues, an unwillingness to collaborate on cross-border research initiatives such as sample sharing, and steps taken to block the movement of people and commerce. Populism and anti-institutional sentiment are also driving vaccine skepticism, which contributes to the worrying trend of decreased vaccination rates in local so-called hotspots that suffer outbreaks of preventable illnesses.

“My main concerns are related to any health uncontrolled new diseases that could impact or kill dozens of millions of people around the world.”

52-year-old risk manager in the US

Deep dive



Medical advances and threats to innovation

In line with other forms of innovation, biotechnology has rapidly advanced and is expected to revolutionize medicine. Advances in genomics, nanoparticles, microfluid, and messenger ribonucleic acid (RNA) technologies are particularly promising. For instance, CRISPR, the most well-known genomics application, allows genes to be added or removed to develop human disease models, develop therapeutics, and genetically modify organisms. CRISPR has been used to change mosquitos so they cannot transmit diseases such as malaria.

Vaccine delivery could moreover be transformed by using nanoparticles, allowing a slower release of vaccines, thus enabling injections that today require several administrations to be delivered in only one. Messenger RNA technologies can also improve the creation of vaccines and drugs by setting temporary protein factories inside the human body instead of having protein fragments to be manufactured in large bioreactors. Finally, microfluidic technology, by enabling biologists to control the cellular environments of their experiments, allows testing of the development of antibiotic resistance.

More broadly, AI can automate the interpretation of imaging, enabling doctors to use a second diagnosis based on algorithms. Other AI applications might include the automation of some aspects of telemedicine. These advances may allow healthcare professionals to focus on higher-value tasks.

However, these opportunities also come with new risks. Innovation in the biotech space is being jeopardized by three main issues. First, in a more nationalist political climate, there is a risk that finite resources will be devoted to defense rather than to scientific research.

Second, there are considerable ethical barriers associated with these innovations. Several dilemmas have emerged as entrepreneurs and regulators attempt to modulate the power of new technologies in healthcare. Examples include the birth of genetically modified babies in China, European regulators' warning about the incompatibility of the GDPR with existing clinical trials protocols, and debates over genomic sovereignty—that is countries' rights to the genetic code discovered within their borders.

Third, innovation is particularly at risk in preeminent markets such as the US, the UK, and France amid elevated political tensions and increasing reluctance to follow the guidelines of multilateral institutions. For instance, US-China tensions have already contributed to a reduction in biotech venture capital funding in the US.

Finally, as with other applications, technologies that were once the privilege of sophisticated labs are now becoming accessible to larger audiences—for example, do-it-yourself genetic sequencing kits. Such democratization comes with a higher chance of adverse events that would drive mistrust in these products. Relatedly, malevolent applications of “dual-use” technologies, such as in the event of bioterror attack, can create economic, social, and political challenges.

“The world faces major global risks from a naturally occurring or human induced pandemic. We are better prepared biomedically than ever in history, but the risks are ever greater today due to mass travel, migration, crowded urban centers, climate change, and governments’ failure to prepare for infectious disease outbreaks.”

Lawrence O. Gostin, Director, World Health Organization Collaborating Center on National & Global Health Law; Founding O’Neill Chair in Global Health Law, Georgetown University

Deep dive



Exposure to harmful substances over the long run

One area of concern is the long-term exposure to substances that may be harmful to human health, for both current and future generations. Sustained economic growth and industrial development have created externalities with adverse consequences for the health of current and future generations. Contamination of air, water, and soil has broad consequences for all humans and other living organisms.

The consequences for human health vary from one substance to another, notably depending on intensity and duration of exposure. Regarding air pollution, even short-term exposure is linked to increased cardiovascular and respiratory death rates.²⁸ Contamination from harmful substances is often associated with long latency periods. One of the most infamous cases is asbestos, which is linked to respiratory diseases that can often take forty years or longer to be diagnosed. Another example is dichlorodiphenyltrichloroethane, or DDT, a pesticide that is correlated with recently diagnosed cancers even though it has been banned for decades in most places.

Harmful substances, including suspected endocrine-disrupting compounds such as pesticides or PFAS chemicals, are widely used worldwide. Between 1990 and 2016, the average use of pesticides increased by 25% in Europe, 71% in Asia, 113% in the Americas, and 297% in Oceania. Several scientific studies allege that glyphosate-based herbicides may cause cancers, in particular non-Hodgkin lymphoma, liver diseases, birth defects and reproductive problems. Similarly, PFAS substances may provoke liver damage, thyroid disease, decreased fertility, high cholesterol, obesity, hormone suppression, and cancer. However, establishing a clear causation between exposure to the substances and adverse health effects is a long and difficult process.

This is all the more worrisome given the world demographic trends. In the next 30 years, the world’s population of 60-year-olds will double and that of 80-year-olds will triple. For particularly vulnerable aging populations, the development of illnesses related to lifelong exposures to harmful substances could increase the burden of chronic diseases such as diabetes, obesity, cancers. In addition, it could also heighten the issue of fertility decline in developed countries, since pesticides and PFAS substances are linked to reproductive problems.

Even though concerns are longstanding, lengthy legal battles and scientific controversies create an inertia effect and few significant regulatory decisions have been made so far to mitigate emerging risks related to potentially harmful substances, even with the development of the “precautionary principle” in the EU. Simultaneously, public scrutiny of harmful substances has increased over the past years. For instance, since 2015 and the publication of the International Agency for Research on Cancer’s study classifying the herbicide glyphosate as “probably carcinogenic to humans,” glyphosate has received a lot of media attention.

28 [Ambient Particulate Air Pollution and Daily Mortality in 652 Cities](#). The New England Journal of Medicine. 2019.

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Appendix

Methodology of AXA Emerging Risks Survey

The survey was conducted in May 2019 through an online questionnaire, which was developed by AXA and refined following the recommendations of an independent consultancy firm specialized in surveys. The questionnaire was made available in English, French, and Spanish.

Increases and decreases in the ranking reflect the respondents' perception of the risk, not actual changes in assessment of the risk itself. A perceived risk may not have changed at all, but another risk is perceived to be higher or lower and that affects the other risks.

The overall ranking of emerging risks depends on both the number of votes for a given risk and its risk score. Formally, for any given risk i , the risk score is derived as follows:

$$risk\ score_i = \sum_{i=1}^n (point_i * n)$$

Where n is the number of respondents sharing the same concern about the risk i and $point_i$ corresponds to the number of points assigned to the ranked position of the risk i .

1 st rank	5 points
2 nd rank	4 points
3 rd rank	3 points
4 th rank	2 points
5 th rank	1 points

We recognize that the survey presents potential limits:

- Language may influence respondents to interpret the question in a certain way. To limit such biases, the survey questions use short and simple language that leaves little space for different interpretations. Such concerns are nonetheless limited in the case of an online written questionnaires in comparison to interviews conducted by a person, whether on the phone or face-to-face.
- Respondents were asked to rank 25 emerging risks, thus foreclosing the possibility of including other risks in their top 25. However, this is compensated by the fact that the first open-ended question asked respondents to write down a risk they consider will have the most significant impact on society at large in the next five to ten years.
- Certain socio-demographic groups are overrepresented in the sampled population because of the profile of risk experts.

Methodology of Eurasia Group online = sentiment analysis

Big data can be used to understand public perception and prioritization of the risks identified in the 2019 AXA Emerging Risks Survey. Instead of relying on data from social media platforms, which tend to over-represent extreme points of view, we sampled online information-seeking trends. We sampled the two most established global sources for broad and deep information-gathering: Google and Wikipedia. We constructed local-language queries based on the risk sets identified by surveyed experts. To understand how public perception evolved over time and to compare public to expert prioritization of those risks, we normalized and then aggregated all data. To that end, we used a standard procedure to establish a scale defined by the empirical information-seeking maximum. This allowed us to construct a public sentiment index that ranges from 0-100.

The advantages of this approach include faster and more rapidly updatable data collection compared to conventional opinion polling. Socially generated data also can avoid classic biases inherent in asking people to report their opinions, especially individuals being limited in their answers by the choices provided by the survey designers and selecting among those answers deemed “socially desirable.”

At the same time, the use of this type of big data has limitations. First, we do not understand well how online information seekers around the globe differ in demographic characteristics from the general population. These differences are believed to be largest in the least developed countries and among the most disadvantaged socioeconomic groups. Internet use, rather than social media platform use, is however believed to be most representative. Second, internet information seeking is also believed to be least prone to another limitation of “socially generated data” of widespread concern — malicious distortions by bots and fake news reports. Third, studies have demonstrated that while internet information-gathering offers little insight into absolute levels of issue support, it does offer good information about relative changes of support over time and across different issues.

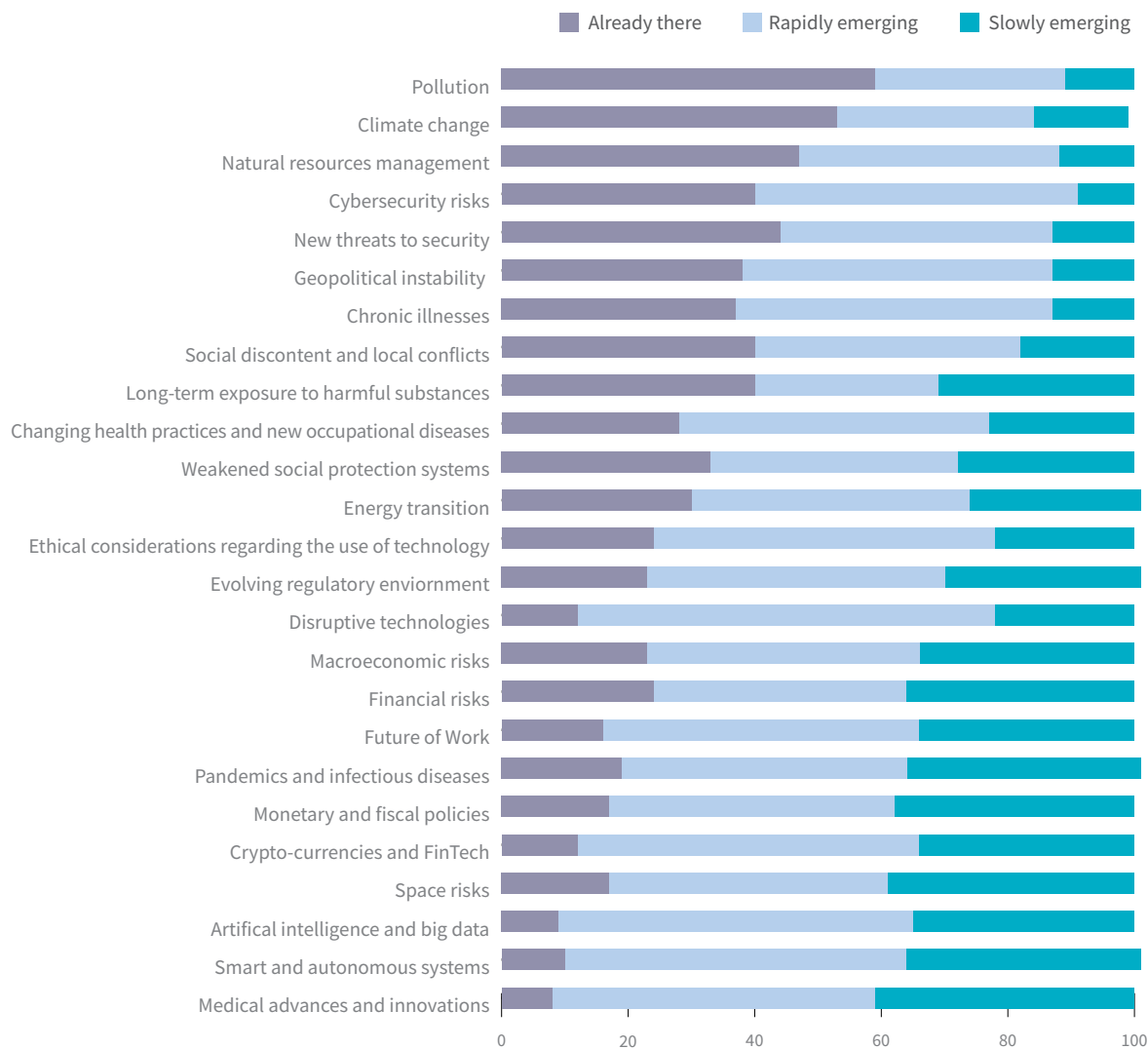
Detailed results of the Survey

#	2018 Ranking	2019 Ranking	Trend
1	Climate change	Climate change	=
2	Cybersecurity risks	Cybersecurity risks	=
3	Geopolitical instability	Geopolitical instability	=
4	Natural resources management	Social discontent and local conflicts	↗
5	Social discontent and local conflicts	Natural resources management	↘
6	AI and big data	AI and big data	=
7	New threats to security	Pollution	↗
8	Pollution	Pandemics and infectious diseases	↗
9	Medical advances and innovations	New threats to security	↘
10	Pandemics and infectious diseases	Macroeconomic risks	↗
11	Macroeconomic risks	Financial risks	↗
12	Future of work	Future of work	=
13	Chronic illnesses	Medical advances and innovations	↘
14	Disruptive technologies	Ethical considerations regarding the use of technology	↗

15	Crypto-currencies and fintech	Disruptive technologies	↘
16	Ethical considerations regarding the use of technology	Weakened social protection systems	↗
17	Financial risks	Chronic illnesses	↘
18	Smart and autonomous systems	Long-term exposure to harmful substances	↗
19	Weakened social protection systems	Smart and autonomous systems	↘
20	Energy transition	Energy transition	=
21	Changing health practices and new occupational diseases	Monetary and fiscal policies	↗
22	Long-term exposure to harmful substances	Changing health practices and new occupational diseases	↘
23	Evolving regulatory environment	Crypto-currencies and fintech	↘
24	Monetary and fiscal policies	Evolving regulatory environment	↘
25	Space risks	Space risks	=

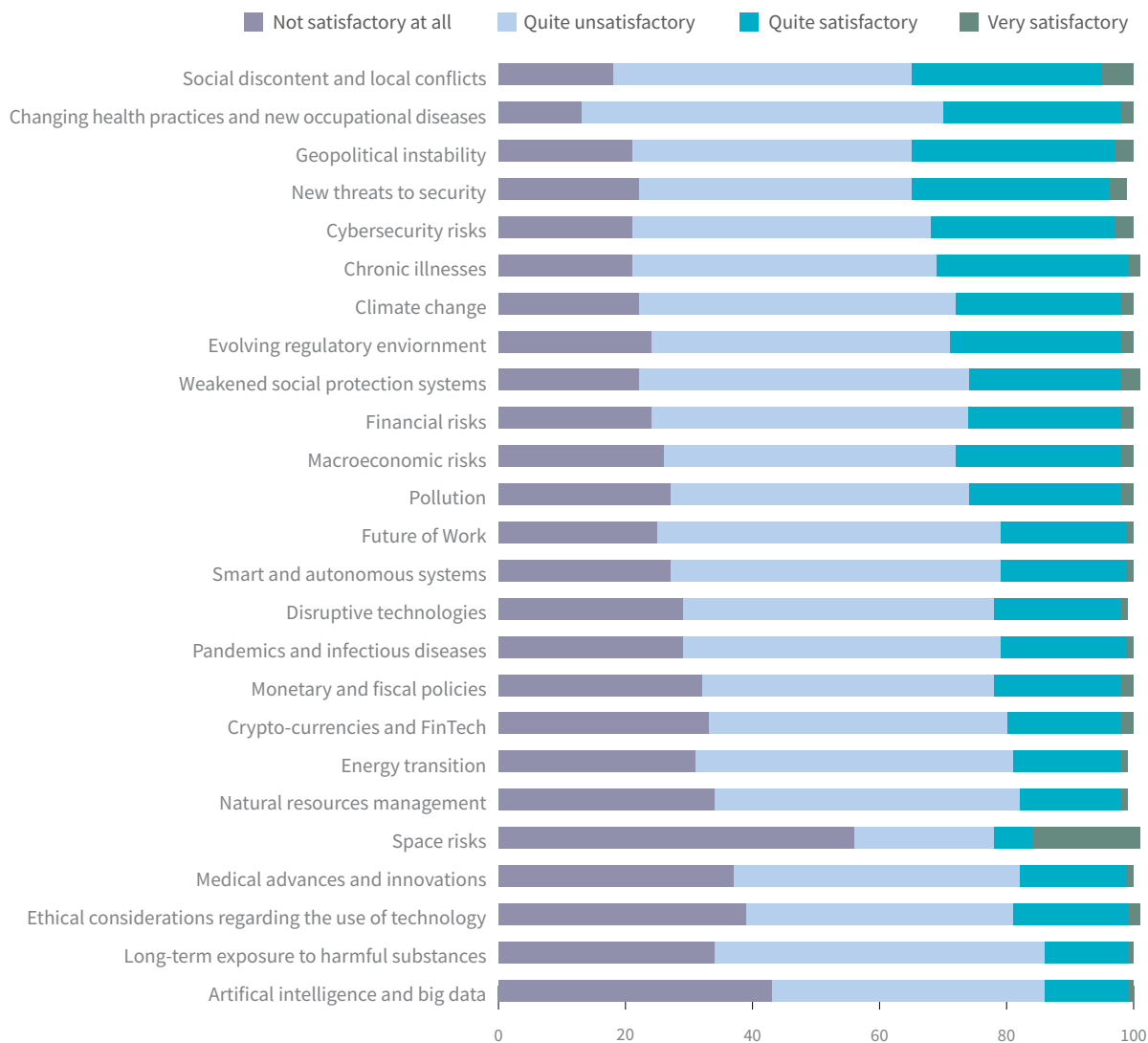
Peceived pace of emergence of risks

Risks are listed in descending order, from most immediate to most distant.



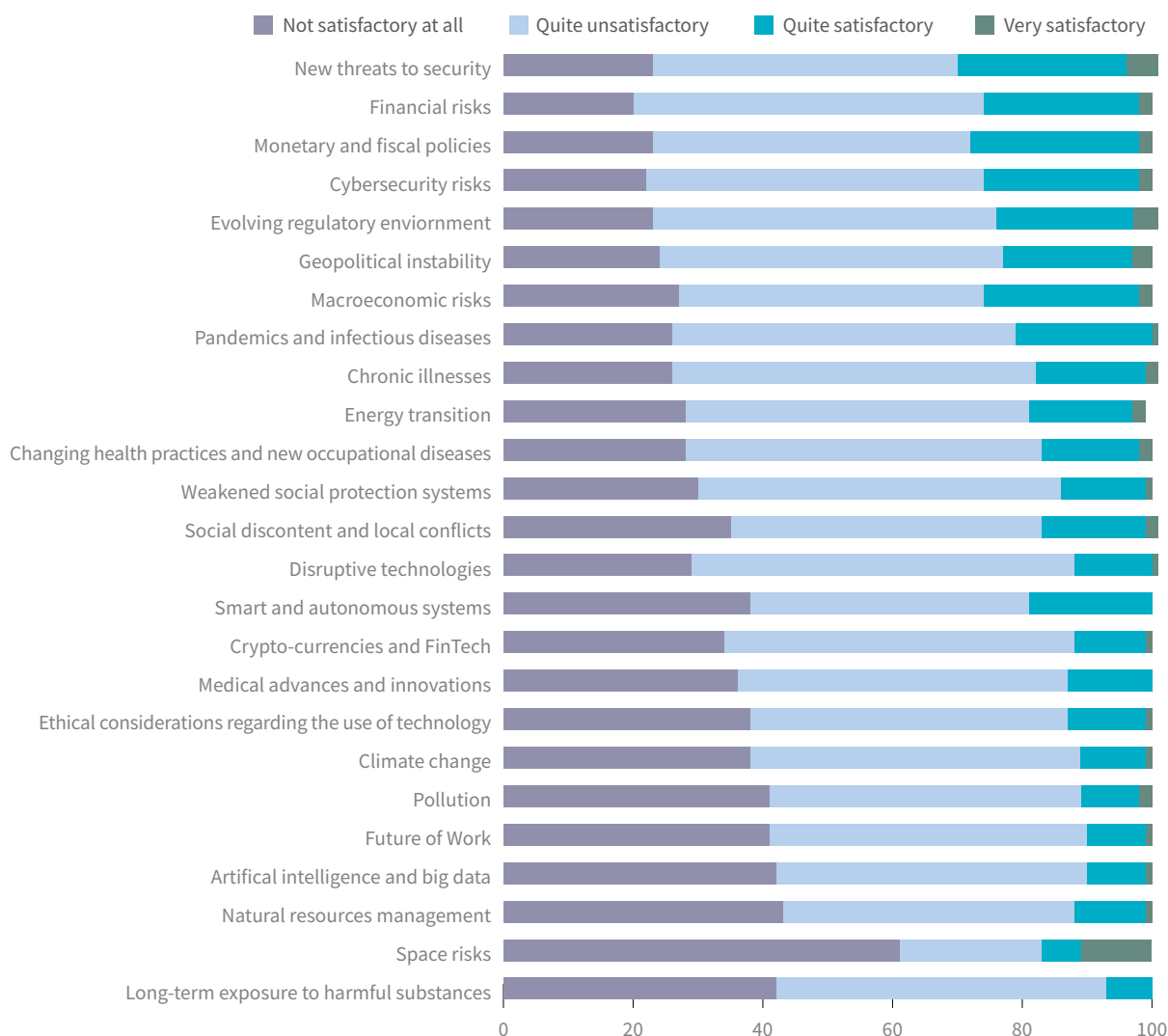
Satisfaction with the perceived level of awareness of the general public

Risks are ranked in descending order, from most satisfactory to least satisfactory in terms of awareness of the general public according to surveyed experts.



Satisfaction with the perceived level of preparedness of public authorities

Risks are ranked in descending order, from most satisfactory to least satisfactory in terms of preparedness of public authorities according to surveyed experts.



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