A PUBLICATION
OF THE NATIONAL
INTELLIGENCE COUNCIL

MARCH 2021

GLOBAL TRENDS 2040

A MORE CONTESTED WORLD

GLOBAL TRENDS

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"Intelligence does not claim infallibility for its prophecies. Intelligence merely holds that the answer which it gives is the most deeply and objectively based and carefully considered estimate."

Sherman Kent

Founder of the Office of National Estimates

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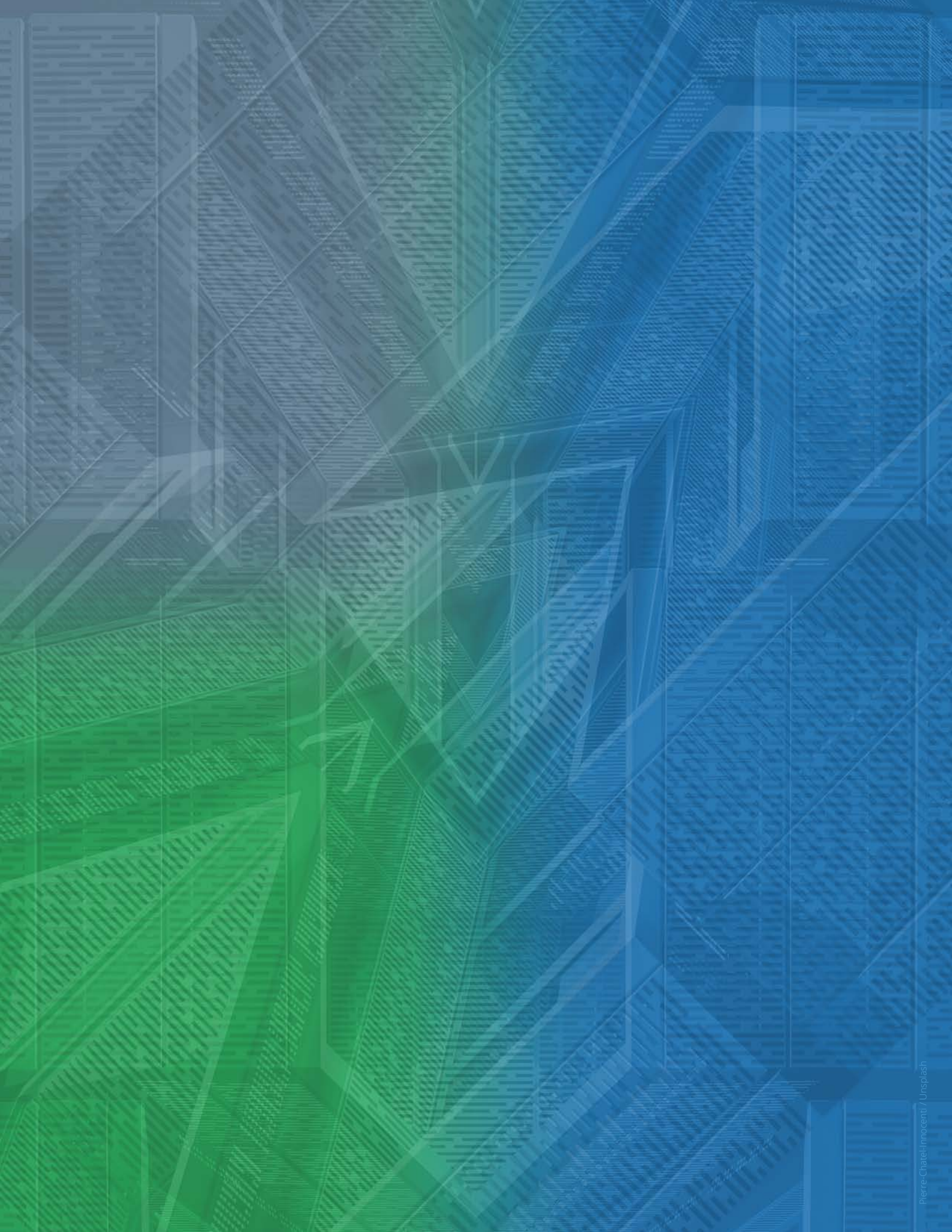

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GLOBAL TRENDS 2040

A MORE CONTESTED WORLD

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FOREWORD

Welcome to the 7th edition of the National Intelligence Council's Global Trends report. Published every four years since 1997, Global Trends assesses the key trends and uncertainties that will shape the strategic environment for the United States during the next two decades.

Global Trends is designed to provide an analytic framework for policymakers early in each administration as they craft national security strategy and navigate an uncertain future. The goal is not to offer a specific prediction of the world in 2040; instead, our intent is to help policymakers and citizens see what may lie beyond the horizon and prepare for an array of possible futures.

Each edition of Global Trends is a unique undertaking, as its authors on the National Intelligence Council develop a methodology and formulate the analysis. This process involved numerous steps: examining and evaluating previous editions of Global Trends for lessons learned; research and discovery involving widespread consultations, data collection, and commissioned research; synthesizing, outlining, and drafting; and soliciting internal and external feedback to revise and sharpen the analysis.

A central component of the project has been our conversations with the world outside our security gates. We benefited greatly from ongoing conversations with esteemed academics and researchers across a range of disciplines, anchoring our study in the latest theories and data. We also broadened our contacts to hear diverse perspectives, ranging from high school students in Washington DC, to civil society organizations in Africa, to business leaders in Asia, to foresight practitioners in Europe and Asia, to environmental groups in South America. These discussions offered us new ideas and expertise, challenged our assumptions, and helped us to identify and understand our biases and blind spots.

One of the key challenges with a project of this breadth and magnitude is how to organize all the analysis into a story that is coherent, integrated, and forward looking. We constructed this report around two central organizing principles: identifying and assessing broad forces that are shaping the future strategic environment, and then exploring how populations and leaders will act on and respond to the forces.

Based on those organizing principles, we built the analysis in three general sections. First, we explore **structural forces** in four core areas: demographics, environment, economics, and technology. We selected these areas because they are foundational in shaping future

dynamics and relatively universal in scope, and because we can offer projections with a reasonable degree of confidence based on available data and evidence. The second section examines how these structural forces interact and intersect with other factors to affect **emerging dynamics** at three levels of analysis: individuals and society, states, and the international system. The analysis in this section involves a higher degree of uncertainty because of the variability of human choices that will be made in the future. We focus on identifying and describing the key emerging dynamics at each level, including what is driving them and how they might evolve over time. Finally, the third section identifies several key uncertainties and uses these to create five **future scenarios** for the world in 2040. These scenarios are not intended to be predictions but to widen the aperture as to the possibilities, exploring various combinations of how the structural forces, emerging dynamics, and key uncertainties could play out.

When exploring the long-term future, another challenge is choosing which issues to cover and emphasize, and which ones to leave out. We focused on global, long-term trends and dynamics that are likely to shape communities, states, and the international system for decades and to present them in a broader context. Accordingly, there is less on other near-term issues and crises.

We offer this analysis with humility, knowing that invariably the future will unfold in ways that we have not foreseen. Although Global Trends is necessarily more speculative than most intelligence assessments, we rely on the fundamentals of our analytic tradecraft: we construct arguments that are grounded in data and appropriately caveated; we show our work and explain what we know and do not know; we consider alternative hypotheses and how we could be wrong; and we do not advocate policy positions or preferences. Global Trends reflects the National Intelligence Council's perspective on these future trends; it does not represent the official, coordinated view of the US Intelligence Community nor US policy.

We are proud to publish this report publicly for audiences around the world to read and consider. We hope that it serves as a useful resource and provokes a conversation about our collective future.

Finally, a note of gratitude to colleagues on the National Intelligence Council and the wider Intelligence Community who joined in this journey to understand our world, explore the future, and draft this report.

The Strategic Futures Group
National Intelligence Council
March 2021

INTRODUCTION

Key Themes

DURING THE PAST YEAR, THE COVID-19 PANDEMIC HAS REMINDED THE WORLD OF ITS FRAGILITY AND DEMONSTRATED THE INHERENT RISKS OF HIGH LEVELS OF INTERDEPENDENCE. IN COMING YEARS AND DECADES, THE WORLD WILL FACE MORE INTENSE AND CASCADING GLOBAL CHALLENGES RANGING FROM DISEASE TO CLIMATE CHANGE TO THE DISRUPTIONS FROM NEW TECHNOLOGIES AND FINANCIAL CRISES.

These challenges will repeatedly test the resilience and adaptability of communities, states, and the international system, often exceeding the capacity of existing systems and models. This looming disequilibrium between existing and future challenges and the ability of institutions and systems to respond is likely to grow and produce greater contestation at every level.

In this more contested world, communities are increasingly fractured as people seek security with like-minded groups based on established and newly prominent identities; states of all types and in all regions are struggling to meet the needs and expectations of more connected, more urban, and more empowered populations; and the international system is more competitive—shaped in part by challenges from a rising China—and at greater risk of conflict as states and nonstate actors exploit new sources of power and erode longstanding norms and institutions that have provided some stability in past decades. These dynamics are not fixed in perpetuity, however, and we envision a variety of plausible scenarios for the world of 2040—from a democratic renaissance to a transformation in global cooperation spurred by shared tragedy—depending on how these dynamics interact and human choices along the way.

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FIVE THEMES APPEAR THROUGHOUT THIS REPORT AND UNDERPIN THIS OVERALL THESIS.

GLOBAL CHALLENGES

First, shared **global challenges**—including climate change, disease, financial crises, and technology disruptions—are likely to manifest more frequently and intensely in almost every region and country. These challenges—which often lack a direct human agent or perpetrator—will produce widespread strains on states and societies as well as shocks that could be catastrophic. The ongoing COVID-19 pandemic marks the most significant, singular global disruption since World War II, with health, economic, political, and security implications that will ripple for years to come. The effects of climate change and environmental degradation are likely to exacerbate food and water insecurity for poor countries, increase migration, precipitate new health challenges, and contribute to biodiversity losses. Novel technologies will appear and diffuse faster and faster, disrupting jobs, industries, communities, the nature of power, and what it means to be human. Continued pressure for global migration—as of 2020 more than 270 million persons were living in a country to which they have migrated, 100 million more than in 2000—will strain both origin and destination countries to manage the flow and effects. These challenges will intersect and cascade, including in ways that are difficult to anticipate. National security will require not only defending against armies and arsenals but also withstanding and adapting to these shared global challenges.

FRAGMENTATION

Second, the difficulty of addressing these transnational challenges is compounded in part by increasing **fragmentation** within communities, states, and the international system. Paradoxically, as the world has grown more connected through communications technology, trade, and the movement of people, that very connectivity has divided and fragmented people and countries. The hyperconnected information environment, greater urbanization, and interdependent economies mean that most aspects of daily life, including finances, health, and housing, will be more connected all the time. The Internet of Things encompassed 10 billion devices in 2018 and is projected to reach 64 billion by 2025 and possibly many trillions by 2040, all monitored in real time. In turn, this connectivity will help produce new efficiencies, conveniences, and advances in living standards. However, it will also create and exacerbate tensions at all levels, from societies divided over core values and goals to regimes that employ digital repression to control populations. As these connections deepen and spread, they are likely to grow increasingly fragmented along national, cultural, or political preferences. In addition, people are likely to gravitate to information silos of people who share similar views, reinforcing beliefs and understanding of the truth. Meanwhile, globalization is likely to endure but transform as economic and production networks shift and diversify. All together, these forces portend a world that is both inextricably bound by connectivity and fragmenting in different directions.

DISEQUILIBRIUM

The scale of transnational challenges, and the emerging implications of fragmentation, are exceeding the capacity of existing systems and structures, highlighting the third theme: **disequilibrium**. There is an increasing mismatch at all levels between challenges and needs with the systems and organizations to deal with them. The international system—including the organizations, alliances, rules, and norms—is poorly set up to address the compounding global challenges facing populations.

The COVID-19 pandemic has provided a stark example of the weaknesses in international coordination on health crises and the mismatch between existing institutions, funding levels, and future health challenges. Within states and societies, there is likely to be a persistent and growing gap between what people demand and what governments and corporations can deliver. From Beirut to Bogota to Brussels, people are increasingly taking to the streets to express their dissatisfaction with governments' ability to meet a wide range of needs, agendas, and expectations. As a result of these disequilibriums, old orders—from institutions to norms to types of governance—are strained and in some cases, eroding. And actors at every level are struggling to agree on new models for how to structure civilization.

CONTESTATION

A key consequence of greater imbalance is greater **contestation** within communities, states, and the international community. This encompasses rising tensions, division, and competition in societies, states, and at the international level. Many societies are increasingly divided among identity affiliations and at risk of greater fracturing. Relationships between societies and governments will be under persistent strain as states struggle to meet rising demands from populations. As a result, politics within states are likely to grow more volatile and contentious, and no region, ideology, or governance system seems immune or to have the answers. At the international level, the geopolitical environment will be more competitive—shaped by China's challenge to the United States and Western-led international system. Major powers are jockeying to establish and exploit new rules of the road. This contestation is playing out across domains from information and the media to trade and technological innovations.

ADAPTATION

Finally, **adaptation** will be both an imperative and a key source of advantage for all actors in this world. Climate change, for example, will force almost all states and societies to adapt to a warmer planet. Some measures are as inexpensive and simple as restoring mangrove forests or increasing rainwater storage; others are as complex as building massive sea walls and planning for the relocation of large populations. Demographic shifts will also require widespread adaption. Countries with highly aged populations like China, Japan, and South Korea, as well as Europe, will face constraints on economic growth in the absence of adaptive strategies, such as automation and increased immigration. Technology will be a key avenue for gaining advantages through adaptation. For example, countries that are able to harness productivity boosts from artificial intelligence (AI) will have expanded economic opportunities that could allow governments to deliver more services, reduce national debt, finance some of the costs of an aging population, and help some emerging countries avoid the middle-income trap. The benefits from technology like AI will be unevenly distributed within and between states, and more broadly, adaptation is likely to reveal and exacerbate inequalities. The most effective states are likely to be those that can build societal consensus and trust toward collective action on adaptation and harness the relative expertise, capabilities, and relationships of nonstate actors to complement state capacity.

This edition of Global Trends constructs its analysis of the future in several stages.

First, we examine structural forces in demographics, environment, economics, and technology that shape the contours of our future world.

Second, we analyze how these structural forces and other factors—combined with human responses—affect emerging dynamics in societies, states, and the international system.

Third, we envision five plausible scenarios for the distant future in 2040.

The key themes discussed previously appear across these sections.

STRUCTURAL FORCES

DEMOGRAPHICS AND HUMAN DEVELOPMENT

Slowing global population growth and a rising median age will help some developing economies, but rapidly aging and contracting populations will weigh on many developed economies. Decades of progress in education, health, and poverty reduction will be difficult to build on or even sustain. Pressure for migration is likely to increase.

EMERGING DYNAMICS

SOCIETAL

Many populations are increasingly pessimistic and distrustful as they struggle to deal with disruptive economic, technological, and demographic trends. Newly prominent identities, resurgent established allegiances, and a siloed information environment are exposing fault lines within communities and states, undermining civic nationalism, and increasing volatility. Populations are more informed and have greater ability to express their demands.

SCENARIOS FOR 2040

RENAISSANCE OF DEMOCRACIES

The world is in the midst of a resurgence of open democracies led by the United States and its allies. Rapid technological advancements fostered by public-private partnerships in the United States and other democratic societies are transforming the global economy, raising incomes, and improving the quality of life for millions around the globe. In contrast, years of increasing societal controls and monitoring in China and Russia have stifled innovation.

ENVIRONMENT

Climate change will increasingly exacerbate risks to human and national security and force states to make hard choices and tradeoffs. The burdens will be unevenly distributed, heightening competition, contributing to instability, straining military readiness, and encouraging political movements.

ECONOMICS

Several global economic trends, including rising national debt, a more complex and fragmented trading environment, the global spread of trade in services, new employment disruptions, and the continued rise of powerful firms, are shaping conditions within and between states. Calls for more planning and regulation will intensify, particularly of large platform, e-commerce corporations.

TECHNOLOGY

The pace and reach of technological developments will increase, transforming human experiences and capabilities while creating new tensions and disruptions for all actors. Global competition for the core elements of technology supremacy will increase. Spin off technologies and applications will enable rapid adoption.

STATE

Governments will face mounting pressures from the combination of economic constraints; demographic, environmental, and other challenges; and more empowered populations. A growing gap between public demands and what governments can deliver will raise tensions, increase political volatility, and threaten democracy. The mismatch may also spur new or shifting sources and models of governance.

INTERNATIONAL

Power in the international system will evolve to include a broader set of sources, but no single state is likely to be positioned to dominate across all regions or domains. The United States and China will have the greatest influence on global dynamics, forcing starker choices on other actors, increasing jockeying over global norms, rules, and institutions, and heightening the risk of interstate conflict.

A WORLD ADRIFT

The international system is directionless, chaotic, and volatile as international rules and institutions are largely ignored. OECD countries are plagued by slower economic growth, widening societal divisions, and political paralysis. China is taking advantage of the West's troubles to expand its international influence. Many global challenges are unaddressed.

COMPETITIVE COEXISTENCE

The United States and China have prioritized economic growth and restored a robust trading relationship, but this economic interdependence exists alongside competition over political influence, governance models, technological dominance, and strategic advantage. The risk of major war is low, and international cooperation and technological innovation make global problems manageable.

SEPARATE SILOS

The world is fragmented into several economic and security blocs of varying size and strength, centered on the United States, China, the EU, Russia, and a few regional powers, and focused on self-sufficiency, resiliency, and defense. Information flows within separate cyber-sovereign enclaves, supply chains are reoriented, and international trade is disrupted. Vulnerable developing countries are caught in the middle.

TRAGEDY AND MOBILIZATION

A global coalition, led by the EU and China working with NGOs and revitalized multilateral institutions, is implementing far-reaching changes designed to address climate change, resource depletion, and poverty following a global food catastrophe caused by climate events and environmental degradation. Richer countries shift to help poorer ones manage the crisis and then transition to low carbon economies through broad aid programs and transfers of advanced energy technologies.

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INTRODUCTION

Executive Summary

STRUCTURAL FORCES SETTING THE PARAMETERS

Trends in demographics and human development, environment, economics, and technology are laying the foundation and constructing the bounds of our future world. In some areas, these trends are becoming more intense, such as changes in our climate, the concentration of people in urban areas, and the emergence of new technologies. Trends in other areas are more uncertain—gains in human development and economic growth are likely to slow and may even reverse in some areas, although a mix of factors could change this trajectory. The convergence of these trends will offer opportunities for innovation but also will leave some communities and states struggling to cope and adapt. Even apparent progress, such as new and advanced technologies, will be disruptive to many people's lives and livelihoods, leaving them feeling insecure and forcing adaptation.

The most certain trends during the next 20 years will be major **demographic** shifts as global population growth slows and the world rapidly ages. Some developed and emerging economies, including in Europe and East Asia, will grow older faster and face contracting populations, weighing on economic growth. In contrast, some developing countries in Latin America, South Asia, and the Middle East and North Africa benefit from larger working-age populations, offering opportunities for a demographic dividend if coupled with improvements in infrastructure and skills. **Human development,** including health, education, and household prosperity, has made historic improvements in every region during the past few decades. Many countries will struggle to build on and even sustain these successes. Past improvements focused on the basics of health, education, and poverty reduction, but the next levels of development are more difficult and face headwinds from the COVID-19 pandemic, potentially slower global economic growth, aging populations, and the effects of conflict and climate. These factors will challenge governments seeking to provide the education and infrastructure needed to improve the productivity of their growing urban middle classes in a 21st century economy. As some countries rise to these challenges and others fall short, shifting global demographic trends almost certainly will aggravate disparities in economic opportunity within and between countries during the next two decades as well as create more pressure for and disputes over migration.

In the **environment**, the physical effects of climate change are likely to intensify during the next two decades, especially in the 2030s. More

extreme storms, droughts, and floods; melting glaciers and ice caps; and rising sea levels will accompany rising temperatures. The impact will disproportionately fall on the developing world and poorer regions and intersect with environmental degradation to create new vulnerabilities and exacerbate existing risks to economic prosperity, food, water, health, and energy security. Governments, societies, and the private sector are likely to expand adaptation and resilience measures to manage existing threats, but these measures are unlikely to be evenly distributed, leaving some populations behind. Debates will grow over how and how quickly to reach net zero greenhouse gas emissions.

During the next two decades, several global **economic trends,** including rising national debt, a more complex and fragmented trading environment, a shift in trade, and new employment disruptions are likely to shape conditions within and between states. Many governments may find they have reduced flexibility as they navigate greater debt burdens, diverse trading rules, and a broader array of powerful state and corporate actors exerting influence. Large platform corporations—which provide online markets for large numbers of buyers and seller—could drive continued trade globalization and help smaller firms grow and gain access to international markets. These powerful firms are likely to try to exert influence in political and social arenas, efforts that may lead governments to impose new restrictions. Asian economies appear poised to continue decades of growth through at least 2030, although potentially slower. They are unlikely to reach the per capita gross domestic product (GDP) or economic influence of existing advanced economies, including the United States and Europe. Productivity growth remains a key variable; an increase in the rate of growth could alleviate many economic, human development, and other challenges.

Technology will offer the potential to mitigate problems, such as climate change and disease, and to create new challenges, such as job displacement. Technologies are being invented, used, spread, and then discarded at ever increasing speeds around the world, and new centers of innovation are emerging. During the next two decades, the pace and reach of technological developments are likely to increase ever faster, transforming a range of human experiences and capabilities while also creating new tensions and disruptions within and between societies, industries, and states. State and nonstate rivals will vie for leadership and dominance in science and technology with potentially cascading risks and implications for economic, military, and societal security.

EMERGING DYNAMICS

These structural forces, along with other factors, will intersect and interact at the levels of societies, states, and the international system, creating opportunities as well as challenges for communities, institutions, corporations, and governments. These interactions are also likely to produce greater contestation at all levels than has been seen since the end of the Cold War, reflecting differing ideologies as well as contrasting views on the most effective way to organize society and tackle emerging challenges.

Within **societies**, there is increasing fragmentation and contestation over economic, cultural, and political issues. Decades of steady gains in prosperity and other aspects of human development have improved lives in every region and raised peoples' expectations for a better future. As these trends plateau and combine with rapid social and technological changes,

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large segments of the global population are becoming wary of institutions and governments that they see as unwilling or unable to address their needs. People are gravitating to familiar and like-minded groups for community and security, including ethnic, religious, and cultural identities as well as groupings around interests and causes, such as environmentalism. The combination of newly prominent and diverse identity allegiances and a more siloed information environment is exposing and aggravating fault lines within states, undermining civic nationalism, and increasing volatility.

At the **state level**, the relationships between societies and their governments in every region are likely to face persistent strains and tensions because of a growing mismatch between what publics need and expect and what governments can and will deliver. Populations in every region are increasingly equipped with the tools, capacity, and incentive to agitate for their preferred social and political goals and to place more demands on their governments to find solutions. At the same time that populations are increasingly empowered and demanding more, governments are coming under greater pressure from new challenges and more limited resources. This widening gap portends more political volatility, erosion of democracy, and expanding roles for alternative providers of governance. Over time, these dynamics might open the door to more significant shifts in how people govern.

In the **international system**, no single state is likely to be positioned to dominate across all regions or domains, and a broader range of actors will compete to shape the international system and achieve narrower goals. Accelerating shifts in military power, demographics, economic growth, environmental conditions, and technology, as well as hardening divisions over governance models, are likely to further ratchet up competition between China and a Western coalition led by the United States. Rival powers will jockey to shape global norms, rules, and institutions, while regional powers and nonstate actors may exert more influence and lead on issues left unattended by the major powers. These highly varied interactions are likely to produce a more conflict-prone and volatile geopolitical environment, undermine global multilateralism, and broaden the mismatch between transnational challenges and institutional arrangements to tackle them.

ALTERNATIVE SCENARIOS FOR 2040

Human responses to these core drivers and emerging dynamics will determine how the world evolves during the next two decades. Of the many uncertainties about the future, we explored three key questions around conditions within specific regions and countries and the policy choices of populations and leaders that will shape the global environment. From these questions, we constructed five scenarios for alternative worlds in the year 2040.

- How severe are the looming global challenges?
- How do states and nonstate actors engage in the world, including focus and type of engagement?
- Finally, what do states prioritize for the future?

In **Renaissance of Democracies**, the world is in the midst of a resurgence of open democracies led by the United States and its allies. Rapid technological advancements fostered

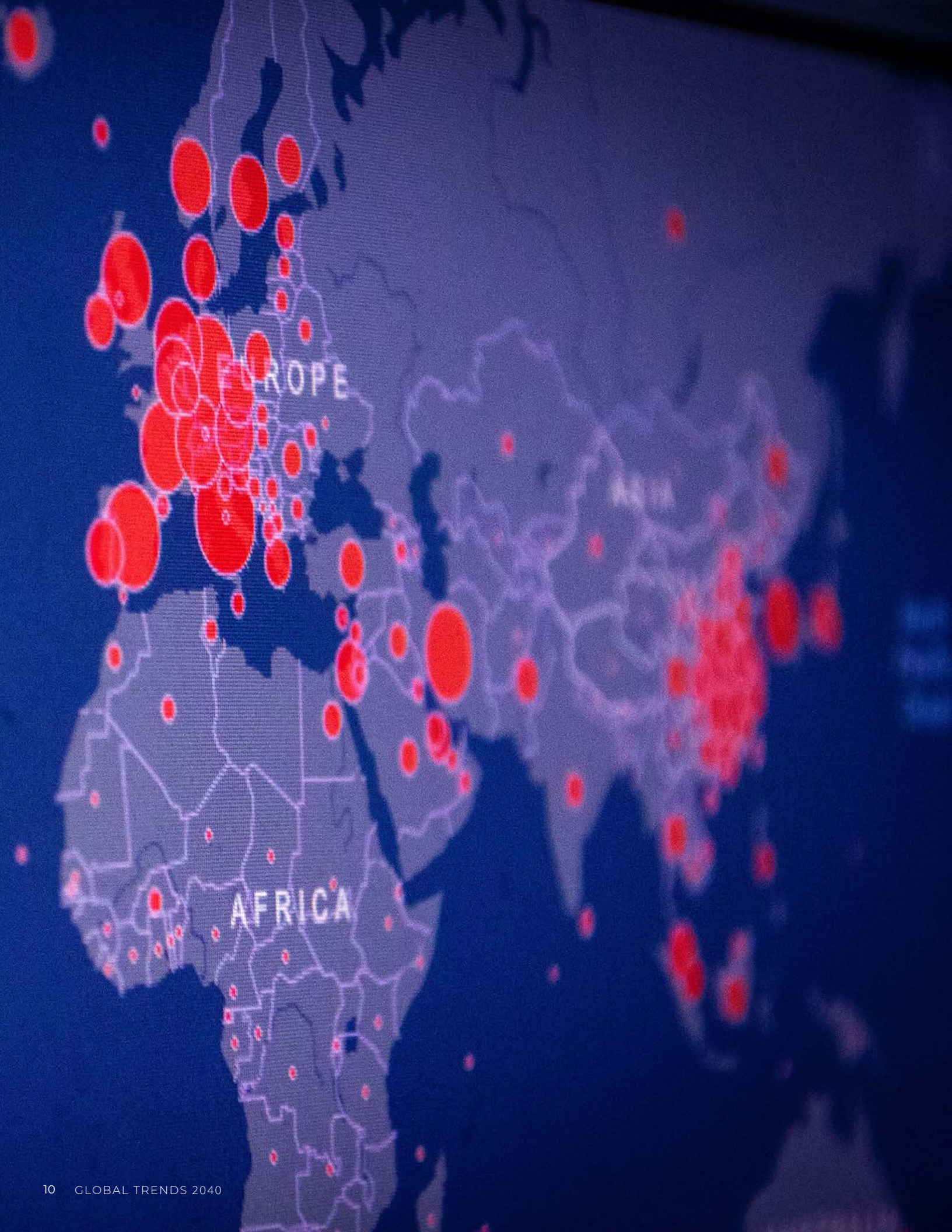
by public-private partnerships in the United States and other democratic societies are transforming the global economy, raising incomes, and improving the quality of life for millions around the globe. The rising tide of economic growth and technological achievement enables responses to global challenges, eases societal divisions, and renews public trust in democratic institutions. In contrast, years of increasing societal controls and monitoring in China and Russia have stifled innovation as leading scientists and entrepreneurs have sought asylum in the United States and Europe.

In **A World Adrift**, the international system is directionless, chaotic, and volatile as international rules and institutions are largely ignored by major powers like China, regional players, and nonstate actors. Organization for Economic Cooperation and Development (OECD) countries are plagued by slower economic growth, widening societal divisions, and political paralysis. China is taking advantage of the West's troubles to expand its international influence, especially in Asia, but Beijing lacks the will and military might to take on global leadership, leaving many global challenges, such as climate change and instability in developing countries, largely unaddressed.

In **Competitive Coexistence**, the United States and China have prioritized economic growth and restored a robust trading relationship, but this economic interdependence exists alongside competition over political influence, governance models, technological dominance, and strategic advantage. The risk of major war is low, and international cooperation and technological innovation make global problems manageable over the near term for advanced economies, but longer term climate challenges remain.

In **Separate Silos,** the world is fragmented into several economic and security blocs of varying size and strength, centered on the United States, China, the European Union (EU), Russia, and a couple of regional powers; these blocs are focused on self-sufficiency, resiliency, and defense. Information flows within separate cyber-sovereign enclaves, supply chains are reoriented, and international trade is disrupted. Vulnerable developing countries are caught in the middle with some on the verge of becoming failed states. Global problems, notably climate change, are spottily addressed, if at all.

In **Tragedy and Mobilization**, a global coalition, led by the EU and China working with nongovernmental organizations and revitalized multilateral institutions, is implementing far-reaching changes designed to address climate change, resource depletion, and poverty following a global food catastrophe caused by climate events and environmental degradation. Richer countries shift to help poorer ones manage the crisis and then transition to low carbon economies through broad aid programs and transfers of advanced energy technologies, recognizing how rapidly these global challenges spread across borders.


ROPE
AFRICA

The COVID-19 Factor: Expanding Uncertainty

THE COVID-19 PANDEMIC EMERGED GLOBALLY IN 2020, WREAKING HAVOC ACROSS THE WORLD, KILLING MORE THAN 2.5 MILLION PEOPLE AS OF EARLY 2021, DEVASTATING FAMILIES AND COMMUNITIES, AND DISRUPTING ECONOMIES AND POLITICAL DYNAMICS WITHIN AND BETWEEN COUNTRIES. PREVIOUS GLOBAL TRENDS EDITIONS FORECASTED THE POTENTIAL FOR NEW DISEASES AND EVEN IMAGINED SCENARIOS WITH A PANDEMIC, BUT WE LACKED A FULL PICTURE OF THE BREADTH AND DEPTH OF ITS disruptive potential. COVID-19 has shaken long-held assumptions about resilience and adaptation and created new uncertainties about the economy, governance, geopolitics, and technology.

To understand and assess the impact of this crisis, we examined and debated a broad range of our assumptions and assessments related to key global trends. We asked a series of questions: Which existing trends will endure, which trends are accelerating or decelerating because of the pandemic, and where are we likely to experience fundamental, systemic shifts? Are the disruptions temporary or could the pandemic unleash new forces to shape the future? Much like the terrorist attacks of 11 September 2001, the COVID-19 pandemic is likely to produce some changes that will be felt for years to come and change the way we live, work, and govern domestically and internationally. How great these will be, however, is very much in question.

ACCELERATING, SHARPENING SOME TRENDS

The pandemic and corresponding national responses appear to be honing and accelerating several trends that were already underway before the outbreak. COVID-19 brought global health and healthcare issues into sharp relief, exposed and in some cases widened social fissures, underscored vast disparities in healthcare access and infrastructure, and interrupted efforts to combat other diseases. The pandemic also highlighted weaknesses in the international coordination on health crises and the mismatch between existing institutions, funding levels, and future health challenges.

Giacomo Carra / Unsplash

Catalyzing Economic Trends. Lockdowns, quarantines, and the closing of international borders have catalyzed some pre-existing economic trends, including diversification in global supply chains, increased national debt, and greater government intervention in economies. Moving forward, the character of globalization may retain some of the changes from this crisis period, and debt, particularly for developing economies, will strain national capacities for many years.

Reinforcing Nationalism and Polarization. Nationalism and polarization have been on the rise in many countries, especially exclusionary nationalism. Efforts to contain and manage the virus have reinforced nationalist trends globally as some states turned inward to protect their citizens and sometimes cast blame on marginalized groups. The response to the pandemic has fueled partisanship and polarization in many countries as groups argue over the best way to respond and seek scapegoats to blame for spreading the virus and for slow responses.

Deepening Inequality. The disproportionate economic impact of COVID-19 on low-income earners has caused them to fall further behind. When COVID-19 is finally controlled, many families are likely to have experienced further setbacks, especially those working in the service or informal sectors or who left the workforce to provide dependent care—predominantly women. The pandemic has exposed the digital divide within and between countries while spurring efforts to improve Internet access.

Straining Governance. The pandemic is straining government capacity for services and contributing to already low levels of trust in institutions in countries that have not effectively handled the response. The pandemic is exacerbating the confusing and polarized information environment that is undermining public confidence in health authorities, particularly in open societies. Illiberal regimes in some countries are using the pandemic as a pretext to more severely crack down on dissent and restrict civic freedoms, conditions that may outlive the disease.

Highlighting Failed International Cooperation. The COVID-19 pandemic exposed the weaknesses and political cleavages in international institutions, such as the World Health Organization (WHO) and United Nations, and called into question countries' ability and willingness to cooperate multilaterally to address common challenges beyond infectious disease, particularly climate change. The WHO, which has faced significant funding difficulties and resistance to mandatory surveillance regimes, is facing its gravest shock in nearly two decades. The crisis, however, may ultimately lead actors to make deeper reforms, standardize data collection and sharing, and forge new public-private partnerships.

Elevating the Role of Nonstate Actors. Nonstate actors, ranging from the Gates Foundation to private companies, have been crucial to vaccine research or retrofitting equipment to mass produce medical supplies and personal protective equipment. Nonstate networks will complement national and intergovernmental action in future health crises, including early warning, treatment, facilitation of data-sharing, and vaccine development.

WHILE OTHERS DECELERATE OR REVERSE

COVID-19 is slowing and possibly reversing some longstanding trends in human development, especially the reduction of poverty and disease and closing gender inequality gaps. The longest lasting reversals may be in poverty reduction across Africa, Latin America, and South Asia, followed by losses in gender equality. The resources devoted to fighting COVID-19 and social restrictions could reverse years of progress against malaria, measles, polio, and other infectious diseases by consuming key financial, material, and personnel resources.

The COVID-19 emergency may bring regions together in ways that previous crises have not.

Although European countries early in the crisis imposed restrictions on border traffic and exports of critical medical supplies, the European Union has rallied around an economic rescue package and other emergency measures that could bolster the European integration project going forward. COVID-19 could also lead to redirection of national budgets toward pandemic response and economic recovery, diverting funds from defense expenditures, foreign aid, and infrastructure programs in some countries, at least in the near term.

MORE QUESTIONS THAN ANSWERS

The unanticipated second- and third-order effects of the COVID-19 pandemic have reminded us how uncertain the future is—both in the long and short term. As researchers and analysts, we must be ever vigilant, asking better questions, frequently challenging our assumptions, checking our biases, and looking for weak signals of change. We need to expect the unexpected and apply the lessons of this pandemic to our craft in the future.

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STRUCTURAL FORCES

Setting the Parameters

Demographic, environmental, economic, and technological developments will shape the contours of the world we will live in during coming decades. These structural forces—both individually and collectively—will offer new benefits and opportunities for individuals, communities, and governments in every region to improve how we live, work, and prosper. In addition, the acceleration and intersection of these trends are fostering new or more intense challenges, straining the capacity of societies and governments to manage and adapt.

After several decades of extraordinary gains in human development, many countries are likely to struggle to build on and even sustain these successes because moving beyond the basics in education and healthcare is harder, especially with larger populations and tighter resources. In addition, the physical effects of more extreme weather events, hotter temperatures, changing precipitation patterns, and rising sea levels will touch all countries but disproportionately will hurt the developing world and poorer regions. The pace and reach of technolog-

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ical developments during this period are likely to increase and accelerate, transforming and improving a range of human experiences and capabilities while also creating new tensions and disruptions within and between societies, industries, and states. During the next two decades, several global economic trends, including rising sovereign debt, new employment disruptions, a more complex and fragmented trading environment, and the rise of powerful companies, are likely to shape conditions within and between states.

These structural drivers may redound in unpredictable ways, affording some countries the opportunity to rise to these challenges and even prosper, while others, burdened by a confluence of less supportive trends, will struggle. Shifting global demographic trends almost certainly will aggravate disparities in economic and political opportunity within and between countries, strain governance, and fuel pressure for global migration during the next 20 years—a pressure that will increase friction between states. State and nonstate rivals will compete for dominance in science and technology with potentially cascading risks and implications globally for economic, military, diplomatic, and societal security. Many governments may find they have reduced flexibility as they navigate greater debt burdens, diverse trading rules, and a broader range of powerful state and corporate actors exerting influence. Meanwhile, Asian economies appear poised to continue decades of growth, at least through 2030, and are looking to use their economic and population size to influence international institutions and rules.

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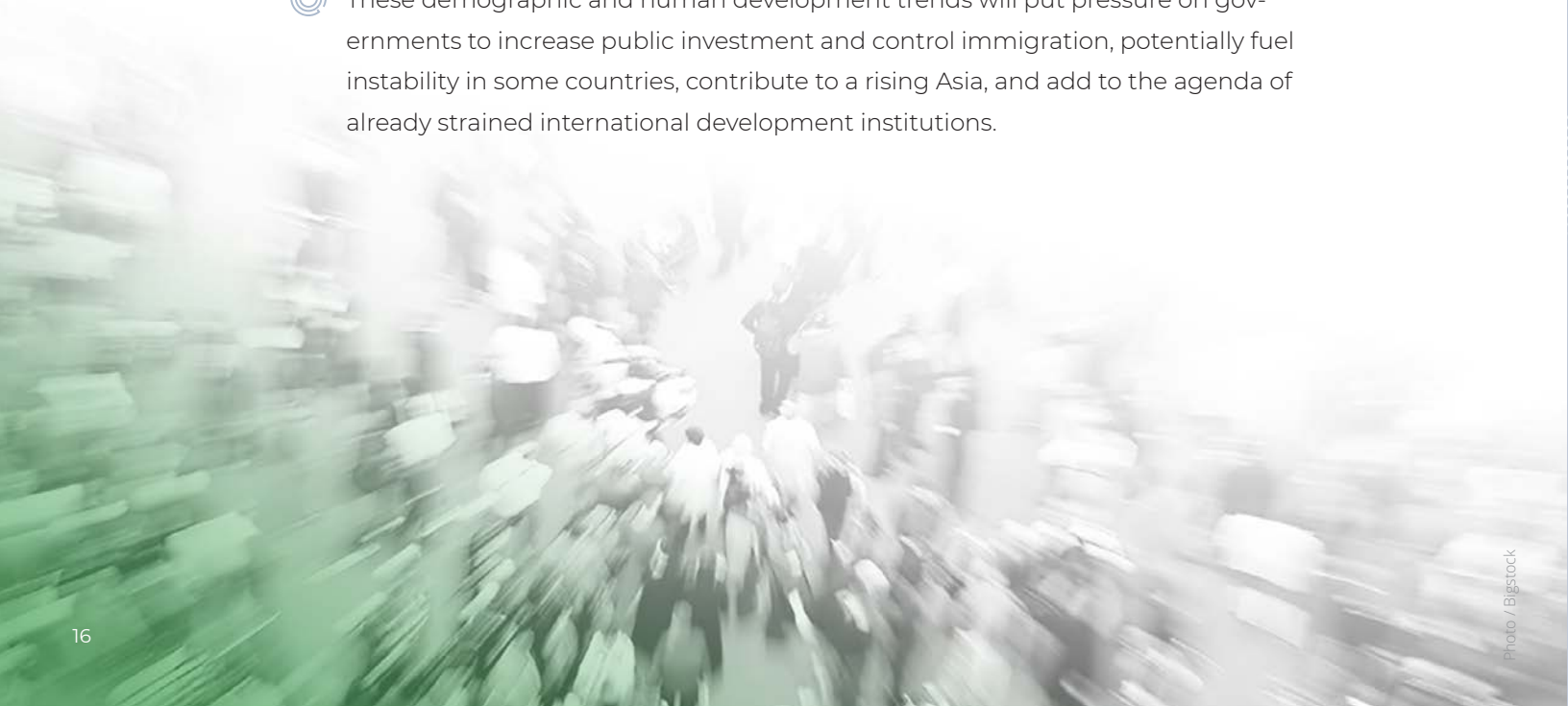
STRUCTURAL FORCES

DEMOGRAPHICS AND HUMAN DEVELOPMENT

Key Takeaways

- Slowing population growth and a rising global median age are presenting potential economic opportunities for some developing economies, but rapidly aging and contracting populations in some developed economies and China will weigh on economic growth.
- Relatively poor countries in Sub-Saharan Africa and South Asia will account for almost all global population growth during the next two decades and will be rapidly urbanizing at the same time, most likely overwhelming their capacity to provide the infrastructure and education systems necessary to fully harness their economic growth potential.
- During the next two decades, demographic shifts and economic incentives are likely to increase pressure for migration out of developing countries, mostly from Sub-Saharan Africa, and primarily into aging, developed countries. Conflict and climate disruptions will compound these broader migration trends.
- These demographic and human development trends will put pressure on governments to increase public investment and control immigration, potentially fuel instability in some countries, contribute to a rising Asia, and add to the agenda of already strained international development institutions.



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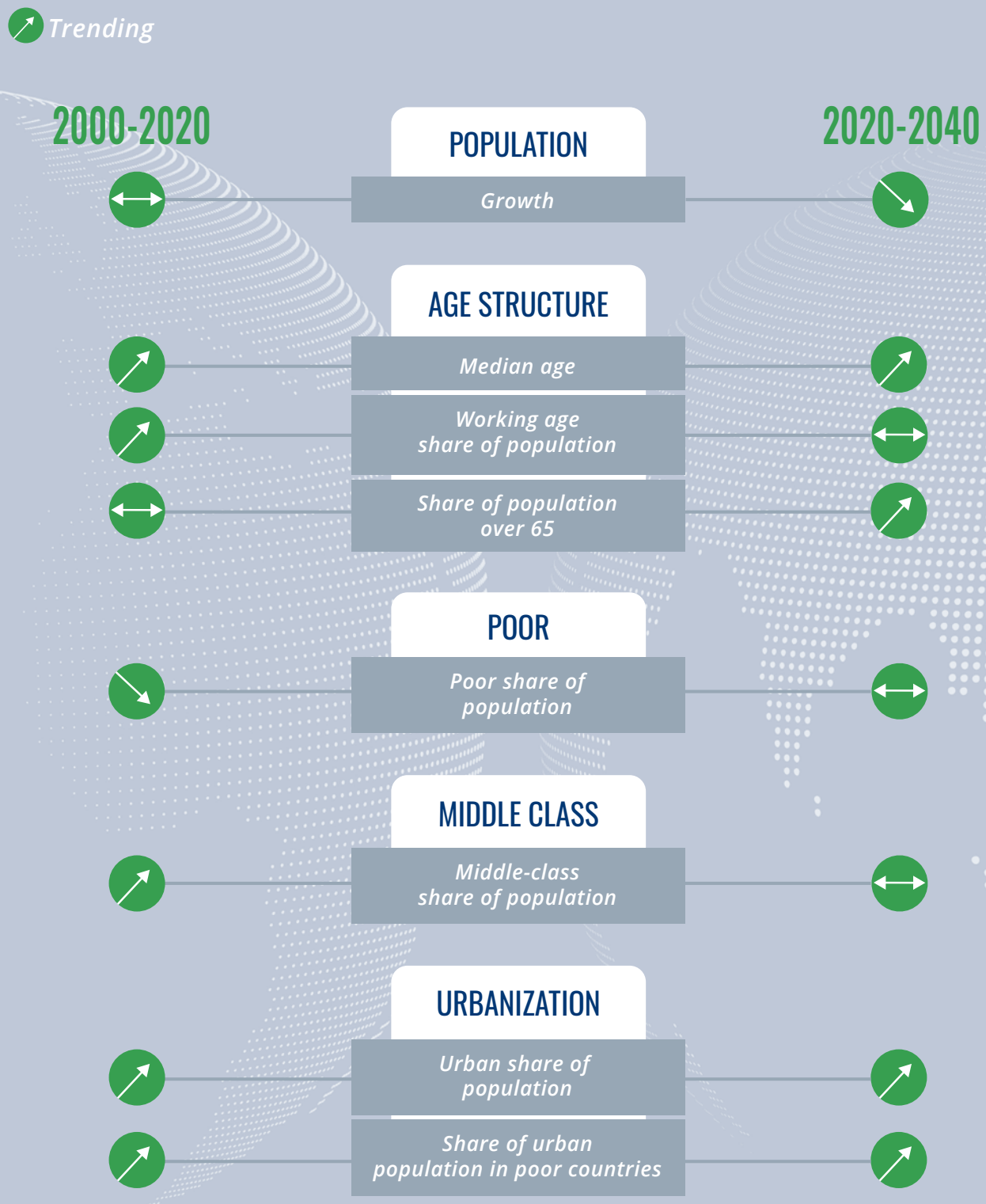

Trending
2000-2020
2020-2040
POPULATION
Growth
AGE STRUCTURE
Median age
Working age share of population
Share of population over 65
POOR
Poor share of population
MIDDLE CLASS
Middle-class share of population
URBANIZATION
Urban share of population
Share of urban population in poor countries

As birth rates remain low and the median age rises, most developed and many emerging economies will see their populations peak and then start to shrink by 2040.

SLOWING POPULATION GROWTH, AGING POPULATIONS

During the next 20 years, the world's population will continue to increase every year, adding approximately 1.4 billion people to reach an estimated 9.2 billion by 2040, but the rate of population growth will slow in all regions. Population growth in most of Asia will decline quickly, and after 2040, the population will begin to contract. Although India's population growth is slowing, it will still overtake China as the world's most populous country around 2027. As birthrates remain low and the median age rises, most developed and a handful of emerging economies will see their populations peak and then start to shrink by 2040, including China, Japan, Russia, and many European countries. In contrast, Sub-Saharan Africa will account for around two-thirds of global population growth and is poised to nearly double its current population by 2050, portending extensive strains on infrastructure, education, and healthcare.

Aging: An Opportunity and a Burden

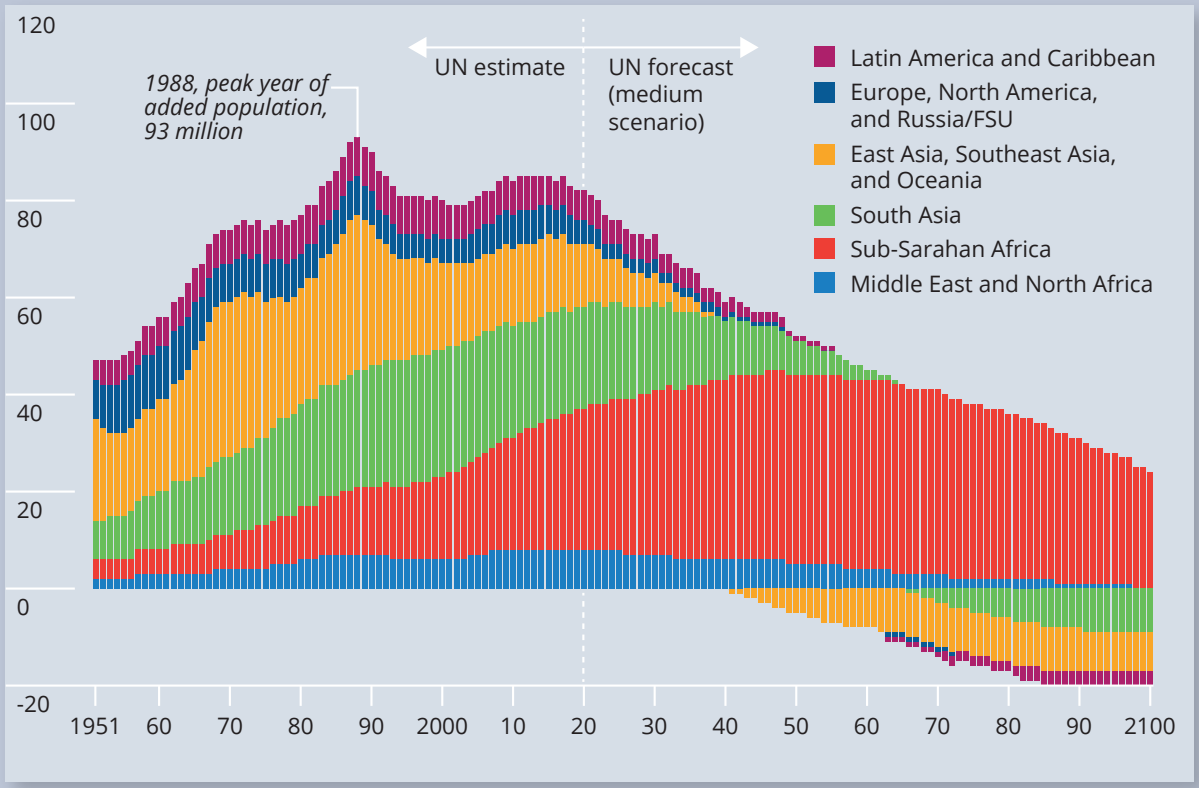
The combination of fewer children per woman and people living longer will see the global population age rise from a median of about 31 years in 2020 to 35 in 2040. In middle-income countries, falling birthrates and older populations can facilitate human development improvements through an increased share of working age adults in the population, more female participation in the workforce, and increased social stability associated with older cohorts. However, shifting age structures will challenge some governments, including some developing countries that are aging before reaching higher incomes, such as China and Eastern Europe, and poor countries with surging youth cohorts that will struggle to build sufficient infrastructure.

Older Populations. Rising old-age dependency ratios—the population age 65 and older relative to the working-age population—can weigh on growth even with adaptive strategies, such as automation and increased immigration. In many older countries, including a number of advanced economies, the cohort over 65 is likely to approach 25 percent of the total population by 2040, up from only 15 percent as recently as 2010. Japan and South Korea are likely to reach median ages of more than 53 in 2040, up from 48 and 44 respectively. Europe is not far behind with a projected average median age of 47, and Greece, Italy, and Spain are likely to age faster. These countries are likely to see further productivity slowdown in the coming decades because older workers usually show fewer productivity gains and a greater share of national income will be diverted to pensions and health care for seniors.

Working Age Populations. Countries with large working-age cohorts and relatively few young and old dependents have the potential for higher household savings that can be directed to investment in human development. During the next 20 years, South Asia, Latin America, and the Middle East and North Africa will be in this window of high working-age populations relative to below-working-age and retired dependents. Sixty-eight percent of South Asia's population will be of working

SUB-SAHARAN AFRICA LIKELY TO DOMINATE POPULATION GROWTH IN COMING DECADES

WORLD POPULATION: ANNUAL CHANGE BY REGION, 1951-2100
Million persons



Source: United Nations Population Division.

age in 2040, up from an already elevated 66 percent in 2020. Latin America and the Middle East and North Africa probably will also benefit from peak working-age population proportions of above 65 percent in the coming 20 years. These opportunities for higher potential economic growth will occur only if those workers are adequately trained and can find jobs. South Asia's ongoing challenges in job creation, technology adoption, and skills training suggest that it will have difficulties fully leveraging its potential labor force.

Youthful Populations. During the next two decades, most countries with large youth populations will be challenged to meet the basic needs of their populations, particularly in light of the social volatility often associated with youth bulges. In Sub-Saharan Africa, the median age is likely to rise only slightly to 22 by 2040, still well short of the median age threshold of 30 which is often associated with higher levels of human development. More than one-third of Sub-Saharan Africa's population will be younger than 15 in 2040, compared with only 14 percent of the population in East Asia. Other populous countries that most likely will still be below the median age threshold in 2040 are Afghanistan, Egypt, and Pakistan.

URBANIZATION CHANGING DEVELOPMENT NEEDS

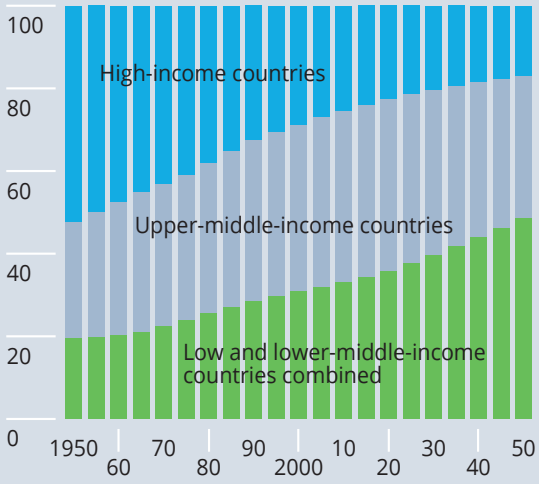
During the next 20 years, the success or failure of cities will shape opportunities and quality of life for a growing share of the world's population. The urban population share is expected to rise from 56 percent in 2020 to nearly two-thirds by 2040, with nearly all of the growth in the developing world. Globally, large cities of more than 1 million residents have been growing at twice the rate of the overall population, and nearly 30 percent of the world's

URBANIZATION BY COUNTRY INCOME LEVEL

Urban centers in poor countries are expanding much more quickly than those in wealthier countries. In 1950, more than half of the world's city-dwellers were in high-income countries; by 2050, nearly half will be in poor countries.

SHARE OF TOTAL GLOBAL URBAN POPULATION BY INCOME GROUP, 1950-2050

Percent share of global urban population



Source: United Nations.

population will live in such a large city by 2035, up from 20 percent in 2020, according to the United Nations' (UN) projection. Some of the world's least developed countries will have the world's fastest growing urban populations. The number of urban residents in poor countries is likely to rise by 1 billion to more than 2.5 billion by 2040, according to UN Population Division projections. Sub-Saharan Africa and South Asia will contribute nearly half and one-third respectively of the increase in poor country urbanization.

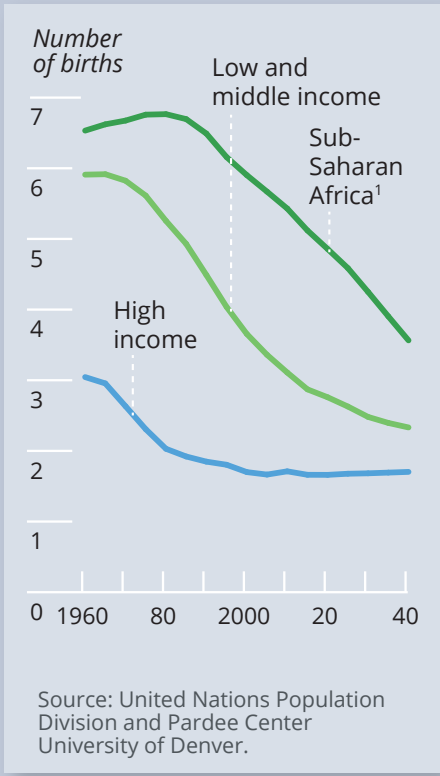
Urbanization has historically been a key driver of economic development, as workers move into more productive jobs in cities and urban families benefit from better education and infrastructure. However, poorer countries that are rapidly urbanizing are likely to see a lower payoff from this virtuous cycle of development. Many developing country governments—even working with the private sector and nongovernmental organizations (NGOs)—will be challenged to fund the necessary urban transportation, public services, and education infrastructure. A 2017 World Bank study documented how urban areas in Sub-Saharan Africa often become stuck in a poverty trap in which insufficient worker skills and poor transportation networks have resulted in higher costs but lower incomes for workers. In addition, birth rates in Sub-Saharan Africa's cities are higher than in other developing regions, potentially aggravating unemployment over time by increasing the labor supply in cities more quickly than jobs can be created.

These low- and lower-middle-income countries will also be at greater risk for food insecurity as they urbanize. They currently produce only one-third of the food per capita that upper-middle- and high-income countries produce, leaving many dependent on imports. Food distribution systems in these countries are under greater strain and are less resilient to shocks such as droughts or floods, and urban households lack access to subsistence farming opportunities.

Environmental events are likely to have a greater human impact on newly urbanizing regions where dense populations are located on coasts and in other vulnerable areas, but protective infrastructure—most importantly flood control and storm-hardy housing—has not kept pace. Booming cities of middle-income East, Southeast, and South Asia as well as the low-income urban areas of eastern and southern Africa are already exposed to the highest number of disasters per capita, based on statistics from the Emergency Events Database.

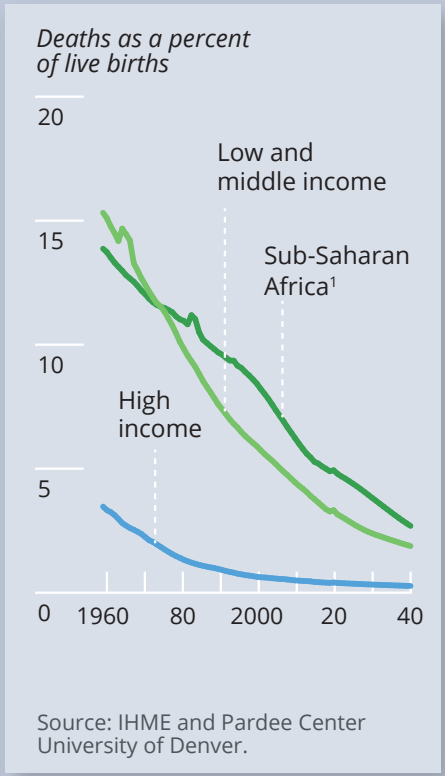
PROGRESS ON HUMAN DEVELOPMENT

BIRTHS PER WOMAN OF CHILD-BEARING AGE (TOTAL FERTILITY RATE), 1960-2040



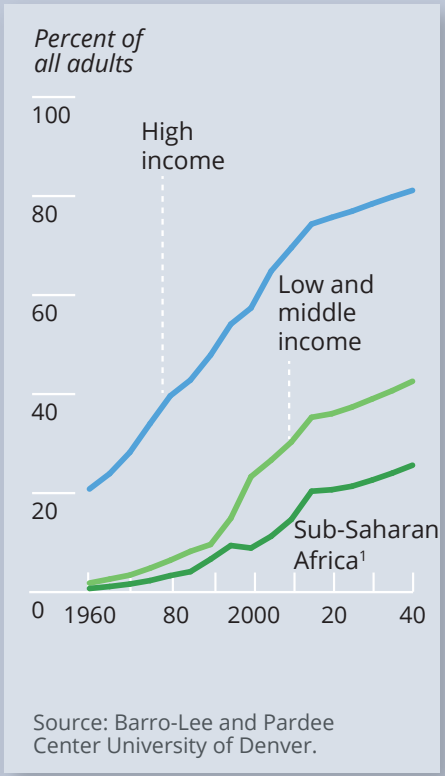
Source: United Nations Population Division and Pardee Center University of Denver.

INFANT DEATHS IN THE FIRST YEAR, 1960-2040



Source: IHME and Pardee Center University of Denver.

SECONDARY EDUCATION COMPLETION RATES, 1960-2040



Source: Barro-Lee and Pardee Center University of Denver.

[1]Sub-Saharan Africa is also included in low- and middle-income countries' data.

ASSOCIATED HUMAN DEVELOPMENT CHALLENGES

Many countries will struggle to build on or even sustain decades of significant improvements in education, health, and poverty reduction. During the past 20 years, at least 1.2 billion people were lifted out of poverty—that is their income surpassed $3.20 a day, which is equivalent to the average poverty line in low-income countries. In addition, nearly 1.5 billion reached the middle-class income level of at least $10 a day through a virtuous cycle of economic growth and human development in every region. Basic improvements in healthcare, education, and gender equality generated rising per capita incomes and, in turn, the fiscal capacity for households and governments to fund further improvements, especially in less developed countries.

However, sustained progress in some countries is likely to be more difficult during the coming two decades, particularly given the potential for slower and uneven economic growth. Many of the next levels of human development, including secondary and higher education and digital skills training, networked and efficient urban infrastructure, and improved opportunities for women and minority groups, require overcoming social impediments, improving political stability, and increasing government or private

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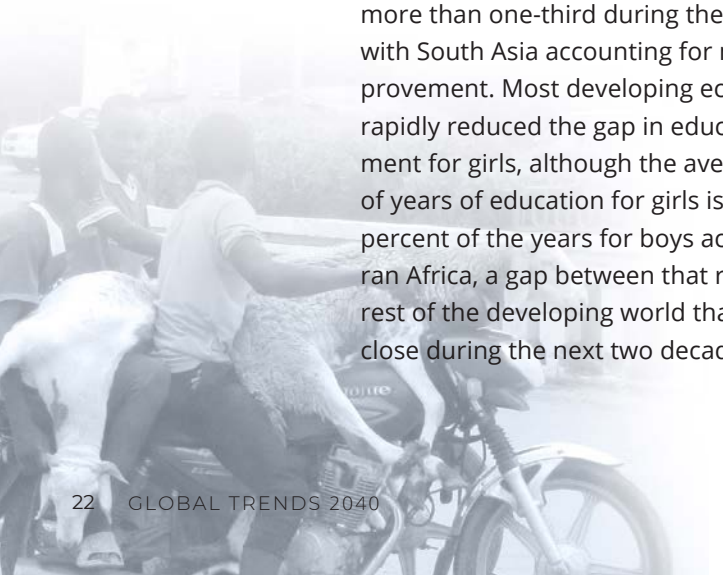
investment in public services. In much of the developing world, initial gains in human development focused on moving people out of subsistence farming into wage-earning jobs and making basic progress on health, education, and gender equality. In middle-income countries, these easier targets have already been achieved—infant mortality, for example, is minimal and almost everyone receives primary education—but complex new challenges, such as pollution and noncommunicable disease, are arising. Given the rapid expansion of middle-income households during the past two decades, governments may struggle to meet the needs and expectations of a more urbanized, connected, and vastly expanded global middle class.

Progress for Women. The world has seen remarkable progress in women's basic health and education in recent decades as well as an expansion of legal rights in many countries. Birthrates in most developing economies dropped to less than three children per woman of child-bearing age by 2020, and the age of first birth has risen, increasing the opportunities for education and work outside the home. Sub-Saharan Africa continues to be the greatest outlier on this metric: birthrates have decreased in recent years but still averaged 4.9 in 2020 and are likely to remain high. Maternal mortality has been reduced by more than one-third during the past 20 years, with South Asia accounting for most of the improvement. Most developing economies have rapidly reduced the gap in educational attainment for girls, although the average number of years of education for girls is still only 81 percent of the years for boys across Sub-Saharan Africa, a gap between that region and the rest of the developing world that is unlikely to close during the next two decades.



The patriarchal societies of the South Asia region and the Arab states exhibit the greatest gaps in overall gender equality in the home, at the workplace, and for medical care, and this shortfall is likely to continue for the next 20 years. Although women are the primary producers of food globally, they have limited or no rights to land ownership in many parts of the world. Subordination of women to men regardless of educational level is enshrined in family law in many parts of the Middle East, South Asia, and Sub-Saharan Africa. According to a 2020 UN review, women held only 25 percent of seats in national legislatures in 2020—although that is twice the level in 2000—held one quarter of corporate managerial positions, and accounted for less than one-tenth of chief executive officers of major companies.

Improved Childhood Survival and Welfare. In many countries the past two decades saw rapid advances in reducing malnutrition and infant mortality, which is mostly because of decreases in preventable communicable disease; there is little room for further dramatic improvements on this front. Progress will be especially slow in areas where conflict and crisis are on the rise. In the 1960s, 13 percent of infants died in the first year of life throughout the developing world; today it averages just over 3 percent in the developing world. The region with the greatest continuing challenges is Sub-Saharan Africa, where 5 percent of infants die within the first year, in large part because poverty and communicable disease rates remain high.

Expanding Access to Education. Educational attainment is an extremely powerful, slow-moving driver of human development, with expanding education contributing to lifetime expected earnings. Globally, the pro-

FUTURE GLOBAL HEALTH CHALLENGES

Advances in basic healthcare during the past few decades, such as wider availability of medicines and vaccines and improvements in medical procedures, have reduced disease, improved overall health outcomes, and extended longevity for large numbers of people globally. During the next two decades, however, several health challenges are likely to persist and expand, in part because of population growth, urbanization, and antimicrobial resistance.

Stalled Progress on Combating Infectious Disease

International progress against tuberculosis and malaria has stalled in recent years. From 2015-19, the number of cases of drug-resistant tuberculosis worldwide increased, and malaria cases declined just 2 percent, compared to 27 percent in the preceding 15 years, in part because of the leveling of international investments. Looking forward, longstanding, emerging, and re-emerging infectious diseases will continue to endanger individuals and communities. The incidence of new pandemics also is likely to grow due to increased risk of new animal pathogens infecting humans and factors that enable spread, such as human mobility and population density.

Growing Antimicrobial Resistance

Resistance to antibiotic treatment is rising globally, due in part to overuse and misuse of antibiotics in livestock and antimicrobials in human medicine. Drug-resistant infections cause more than half a million deaths annually, and the cumulative economic cost could reach $100 trillion between 2020 and 2050 because of productivity loss and the high cost of extended hospital stays or treatment.

Rising Levels of Noncommunicable Disease

Noncommunicable diseases now cause the majority of deaths worldwide—principally because of diabetes, cardiovascular disease, cancer, and chronic respiratory conditions such as asthma. Health experts project that by 2040, noncommunicable diseases could cause 80 percent of deaths in low-income countries, up from 25 percent in 1990, due in part to longer life expectancies but also to poor nutrition, pollution, and tobacco use. In many countries, health systems are not adequately equipped to respond to this shift, which could increase human suffering. Periods of economic slowdown exacerbate those risks by straining public health systems and putting downward pressure on foreign assistance and private health investments.

Increasing Strains on Mental Health, Especially Among Youth

Mental health and substance abuse disorders increased 13 percent during the past decade, principally because of increases in population and life expectancy but also because of the disproportionate prevalence of mental illness among adolescents. Currently, between 10 and 20 percent of children and adolescents globally suffer from mental health disorders, and suicide is the third leading cause of death among people between 15 and 19 years old.

Health experts project that the economic cost of mental illness worldwide could exceed $16 trillion during the next 20 years, with much of the economic burden resulting from lost income and productivity as a result of chronic disability and premature death. Preliminary research suggests that because of the pandemic, people in every region will experience increased rates of mental distress caused by economic losses and social isolation stress disorder.

Vera Davidova / Unsplash

portion of adults who have completed primary education reached 81 percent in 2020, reflecting a rapid increase across most regions and income groups since the 1960s. This level of attainment varies across developing countries, from up to 92 percent of all adults in developing countries in Latin America, East Asia and Pacific, and Europe down to only 60 percent in Sub-Saharan Africa.

Expanding access to secondary education, however, is likely to be harder for developing countries because of its relatively higher costs, higher dropout rates as some students choose work over education, and cultural factors such as early marriage that pull women away from formal education. Educating a majority of the workforce to the secondary school level has historically been a driver for countries to achieve upper-middle-income status. Currently, this majority threshold is reached in developing countries in Europe and Central Asia, East Asia and the Pacific, and Latin America, but only a quarter of the Sub-Saharan workforce has a secondary school education. Moreover, Sub-Saharan Africa is not likely to reach the threshold during the coming two decades because government, religious, and other private sector investment will struggle to keep up with population growth. This struggle will also dampen economic growth as workers, particularly those who choose early entry into the workforce over education, will lack the skills for higher paying jobs. South Asia is making better progress than Sub-Saharan Africa on this front and has the potential to reach the key development threshold for secondary education by around 2040.

RISING, SHIFTING GLOBAL MIDDLE CLASSES

Globally, the number of households falling into a broad definition of the middle class has soared in the past two decades, raising expectations for continued improvements. In 2020, approximately 36 percent of the global population was in the middle class with annual incomes of $4,000-$40,000, up 13 percentage points from 2000, judging from a World Bank database of income surveys. The largest growth in middle-class populations during 2000-18 (the latest survey data available) by percentage of population occurred in Russia, Turkey, Thailand, Brazil, Iran, China, Mexico, and Vietnam, in descending order.

During the next two decades, the middle class is unlikely to grow at a similar pace, and developing-country middle-income cohorts could well perceive that their progress is slowing. Across many countries, the high per capita income growth of the past 20 years is unlikely to be repeated, as global productivity growth falls and the working-age population boom ends in most regions. Global models of household income suggest that, under a baseline scenario, the middle class share of the global population will largely remain stable during the next twenty years, although this outcome will be contingent on social and political dynamics.

East Asia, and to a lesser extent South Asia, appear better positioned to achieve further increases in per capita income relative to other regions, thereby reducing to some extent their income, education, and life expectancy gap with advanced economies. These regions benefit from effective education systems, generally stable social networks, and competent governance. On the other hand, some developing countries, including several in Latin America, are at high risk of falling into the middle-income trap in which inflation of take-home pay outpaces worker productivity, leading to a stagnation of economic growth. The problems in Latin America's outlook stem in part from poor infrastructure and technology adoption and inadequate education systems.

MIDDLE CLASS AND HOUSEHOLD DEBT IN THE 30 MOST POPULOUS COUNTRIES, 2000 AND 2018

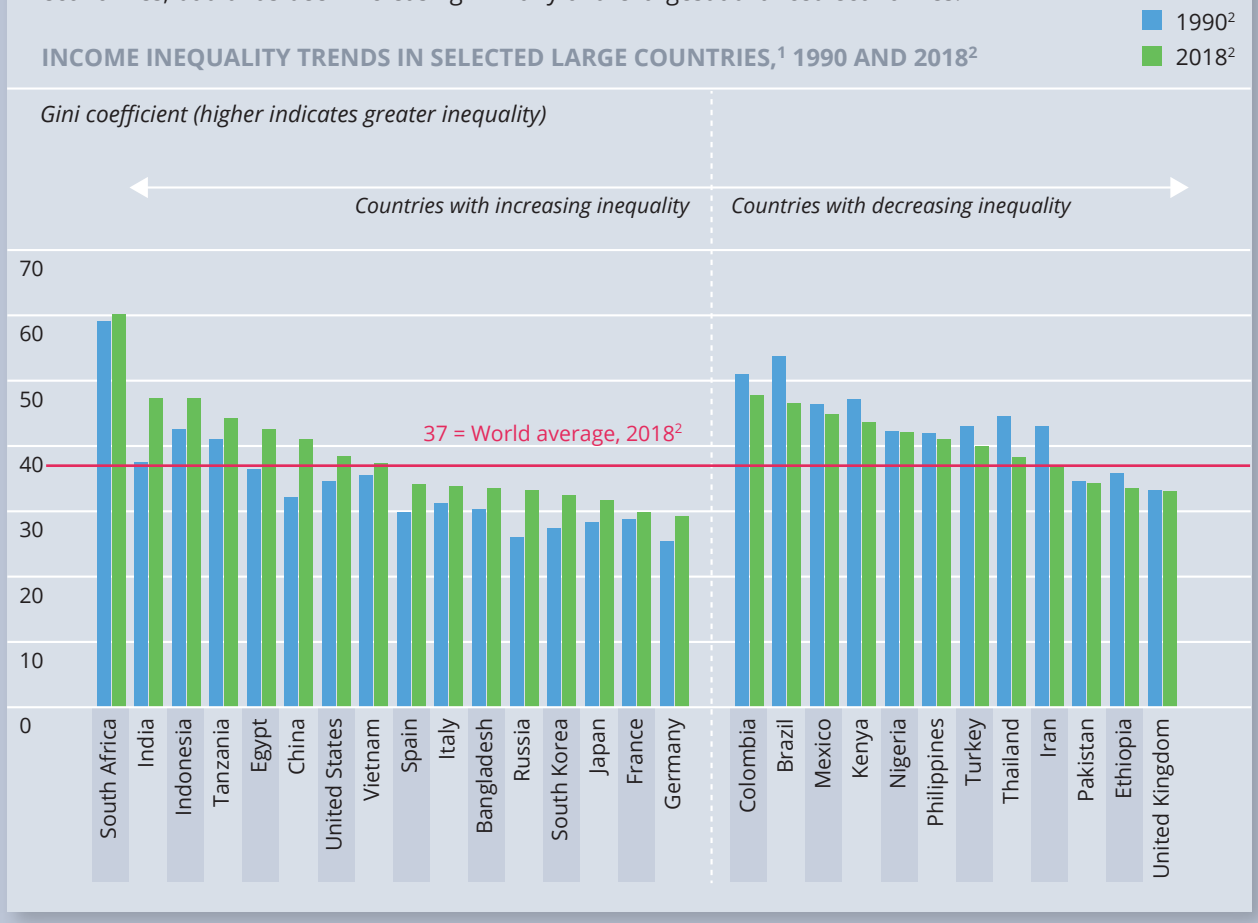
Many large developing economies have seen their middle classes expand rapidly during the past 20 years. However, households in most advanced and developing economies have taken on increasing levels of debt as they have been squeezed by a higher cost of living.

[1]Household debt data is not available.
Source: World Bank, IMF.

In advanced economies, the middle class is contracting with many rising to higher incomes and a smaller portion dropping below the poverty line. Moreover, the middle class in many countries is strained by rising costs for housing, healthcare, and education. The percent of the population falling below the national poverty line in advanced economies has increased in 19 of 32 countries between 2007 and 2016, including in France, Germany, Italy, and Spain, while the majority of those that left the middle class across all advanced economies rose to higher income levels. This reflects the trend towards income polarization, in which the number of workers in low-income jobs and the number in high-income expands

INCOME INEQUALITY BY COUNTRY

Income inequality is highest in developing economies, as measured by the Gini coefficient, but in many it has been stable or improving. Income inequality is relatively low overall in advanced economies, but it has been increasing in many of the largest advanced economies.



[1]Largest by size of population, 2020. Ranked by most recent estimate of income inequality.
[2]1990, 2018, or nearest available data.
Source: Standardized World Income Inequality Database.

Economic Inequality Here to Stay

The factors contributing to the slowing of progress on human development will also contribute to the persistence of within-country income inequality. Around half of all countries experienced a widening gap between the rich and the poor between 1990 and 2018, including the world's most powerful states—China, India, Russia, and the United States. Meanwhile, the large countries that experienced declines in inequality during these decades mostly remained above the global average for inequality. A number of structural causes combined to contribute to this growing inequality, including technological advancements that favored advanced educations and specialized skills while automating low-skill jobs; the outsourcing of many jobs and industries to developing economies; and an ideological shift toward market-driven solutions and away from redistributive, government policies.

at the same time. Most high-skill workers probably will continue to benefit from workplace technology, while middle-skill workers doing repetitive tasks that can be automated will face declining wages and job losses. Even some workers in high paid professions may see their earnings challenged by artificial intelligence (AI) and machine learning. Household debt has already soared across advanced economies in recent years because of these income strains and higher costs for healthcare, housing, and education.

MIGRATION: PEOPLE ON THE MOVE

Demographic trends and economic incentives will continue to drive large-scale migration during the next two decades. Although there is little certainty about the level of migration as government policies fluctuate, the push and pull factors for cross-border movements of people will endure globally—feeding debates in destination countries over migration and aggravating social divisions in some areas. The past 20 years saw a large increase in cross-border migration, not only in absolute numbers but also as a percent of the global population. More than 270 million persons in 2020 were living in a country to which they had migrated, 100 million more than in 2000, representing an increase of more than half a percent of the global population. Most migrants left their homes to pursue better economic prospects, but tens of millions were fleeing conflict, crime, religious and social repression, and natural disasters.

For the vast majority of migrants who are workers, migration flows clearly reflect wage differentials between countries—the flows are from smaller, middle-income economies to larger, high-income economies. Almost two-thirds of migrants in 2019 originated from middle-income economies, and more than half migrated to high income countries for higher pay and to send remittances home. The fastest growth in emigration begins at around $4,000 per capita GDP, the point at which people have reached lower-middle-income and can afford to travel, and then begins to slow when per capita GDP reaches $10,000-$12,000 where people are nearing the World Bank's definition of high income, making employment opportunities at home more attractive.

Looking forward, rapid population growth almost certainly will add to existing push factors in Sub-Saharan Africa, while many other developing countries are nearing the end of peak emigration. The population in the middle-income migration window of $4,000 to $10,000-$12,000 peaked around 2010 for several regions, including Latin America, Central Asia, and parts of Eastern Europe. East Asia, Southeast Asia, and South Asia are also nearing or past the strongest period for this income push factor, but the percent of the population in Sub-Saharan Africa in this income window will continue to rise during the next 20 years.

Greater need for workers in aging countries is a growing pull factor in European and Asian countries. European countries had the largest total number of cross-border immigrants at the end of 2019 at nearly 70 million, according to 2020 UN statistics. One-third came from Eastern Europe, which had a working-age population that was peaking just as advanced European economies were beginning to rapidly age. Aging European countries and Japan are expanding policies that provide visas for workers.

During the coming 20 years, people fleeing disasters and conflict will continue to contribute to migration flows. UN and NGO data show that domestic civil and political turmoil have pushed 80 million people out of their homes

as of yearend 2019, of which about a third have migrated to other countries.

BROADER IMPLICATIONS AND DISRUPTIONS

These demographic and human development trends will put pressure on governments to increase public investment and manage immigration, lead to instability in some countries, in some ways contribute to a rising Asia, and add to the agenda of already strained international development institutions.

Setbacks for Women, Children, and Minorities. The current pandemic exemplifies the fragility of progress against poverty in some regions and the potential for regression for women, minority groups, and others lower in economic, political, and social stature. Although so far mortality in low-income countries, outside Latin America, has been lower than in the advanced economies, the economic impacts have been severe. Beyond overwhelmed healthcare systems and the negative impact on income for millions of the near poor, broader disruptions include lack of or limited education and the diversion of medical resources from other priorities, including vaccinations and maternal health.

Growing Pressure For Public Investment. Growing populations, especially middle classes in developing countries, are putting increased pressure on governments for the provision of public goods, such as affordable housing, education, healthcare, and infrastructure. Poorly governed urban areas, especially those with access to infrastructure such as international ports or airports, are also ideal habitats for organized crime syndicates.

Double-Edged Sword For Political Stability. Older populations tend to be less violent and ideologically extreme, thus reducing the risk of internal armed conflict. East Asia and Latin America will have a median age above 30, suggesting a potential for greater social stability. Such populations also have strong preferences for democracy; where authoritarian regimes remain, instability from so-called color revolutions is likely to persist. In addition, in countries with fast growing and youthful populations, the growing gap between the expectations of growing urban cohorts and their governments' ability to provide for their education, healthcare, and job opportunities has the potential to increase political instability. In such countries, recruitment to radical extremist movements will be a major risk as well.

Increased Debate Over Migration. Immigrants can help developed economies mitigate the downsides of an aging population by improving economic productivity, providing services, and expanding the tax base. However, countervailing pressures such as strong cultural preferences for maintaining national identity and ethnic homogeneity could continue to fuel an antimigrant backlash in many developed countries and increasingly in some developing and middle-income countries with declining workforces, such as China. As a result, many are likely to choose technological innovation and automation and limit migration to highly skilled labor. Within and between countries, debates and division will continue over how much migration to allow and how to control flows.

Some Shifts Could Benefit A Rising East. Many developing countries in Asia will either gain potential advantages from demographic trends or are relatively well positioned to overcome demographic headwinds. As a result per capita incomes and human development levels probably will rise more in Asia than in any other region. Most Asian countries will con-

tinue to have large working-age populations, high secondary-level graduation rates, and, for many, substantial investments in health and infrastructure that bolster levels of well-being. The greatest variable is likely to be how China handles the demographic crunch it will see during the next two decades—the deep decline in fertility from its one-child policy has already halted the growth of its labor force and will saddle it with a doubling of its population over 65 during the next two decades to nearly 350 million, the largest by far of any country. Even if the Chinese workforce is able to rise closer to advanced-economy productivity levels through improved training and automation, China remains in danger of hitting a middle-income trap by the 2030s, which may challenge domestic stability.

Strained International Development Institutions. International institutions focused on human development will face a more complicated operating environment as demands for their coordination efforts grow. Any increase in humanitarian and refugee crises stemming from natural and human-created causes will divert international resources from efforts to make systemic improvements in poverty and disease. The likely failure of many countries to meet the UN's 2030 Sustainable Development Goals will have the largest impact on middle-income societies where populations that have recently emerged out of poverty are demanding progress toward next levels of education, medical care, and environmental quality. Traditional providers of development assistance might not be able to keep up with needs. Shortfalls in multilateral development assistance could facilitate plans by China and other countries to gain advantage from financing critical urban infrastructure in developing countries.

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STRUCTURAL FORCES

ENVIRONMENT

Key Takeaways

- During the next 20 years, the physical effects from climate change of higher temperatures, sea level rise, and extreme weather events will impact every country. The costs and challenges will disproportionately fall on the developing world, intersecting with environmental degradation to intensify risks to food, water, health, and energy security.
- There will be increased emphasis on mitigating greenhouse gas emissions to achieve net zero with new energy technologies and carbon dioxide removal techniques to meet the Paris Agreement goal of limiting warming to 1.5 degrees Celsius. However, as the world gets closer to exceeding 1.5°C—probably within the next 20 years—calls will increase for geoengineering research and possible deployment to cool the planet, despite possibly dire consequences.
- Debate will increase over how and how fast the world should reach net zero as countries face hard choices over how to implement drastic emissions cuts and adaptive measures. Neither the burdens nor the benefits will be evenly distributed within or between countries, heightening competition, contributing to instability, straining military readiness, and encouraging political discord.

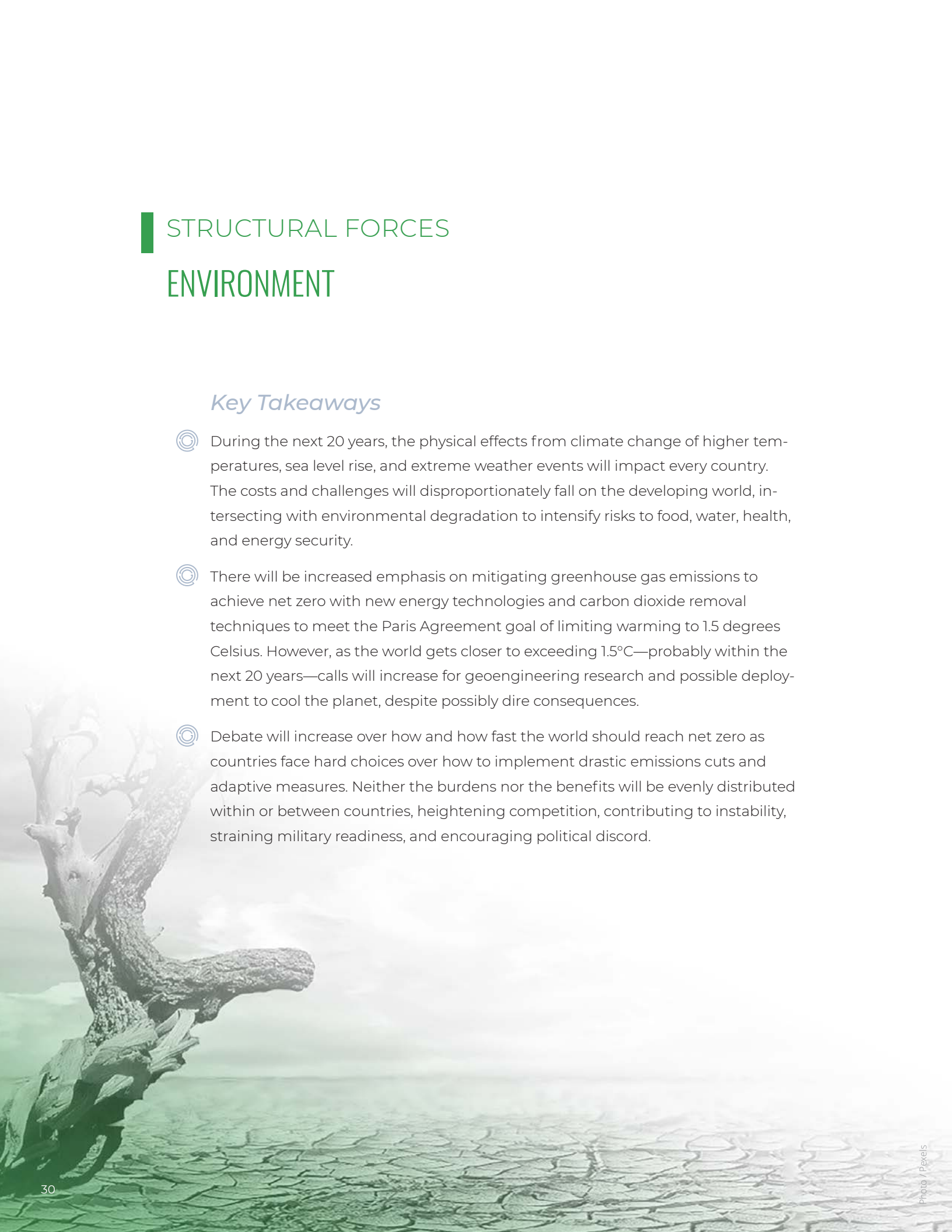
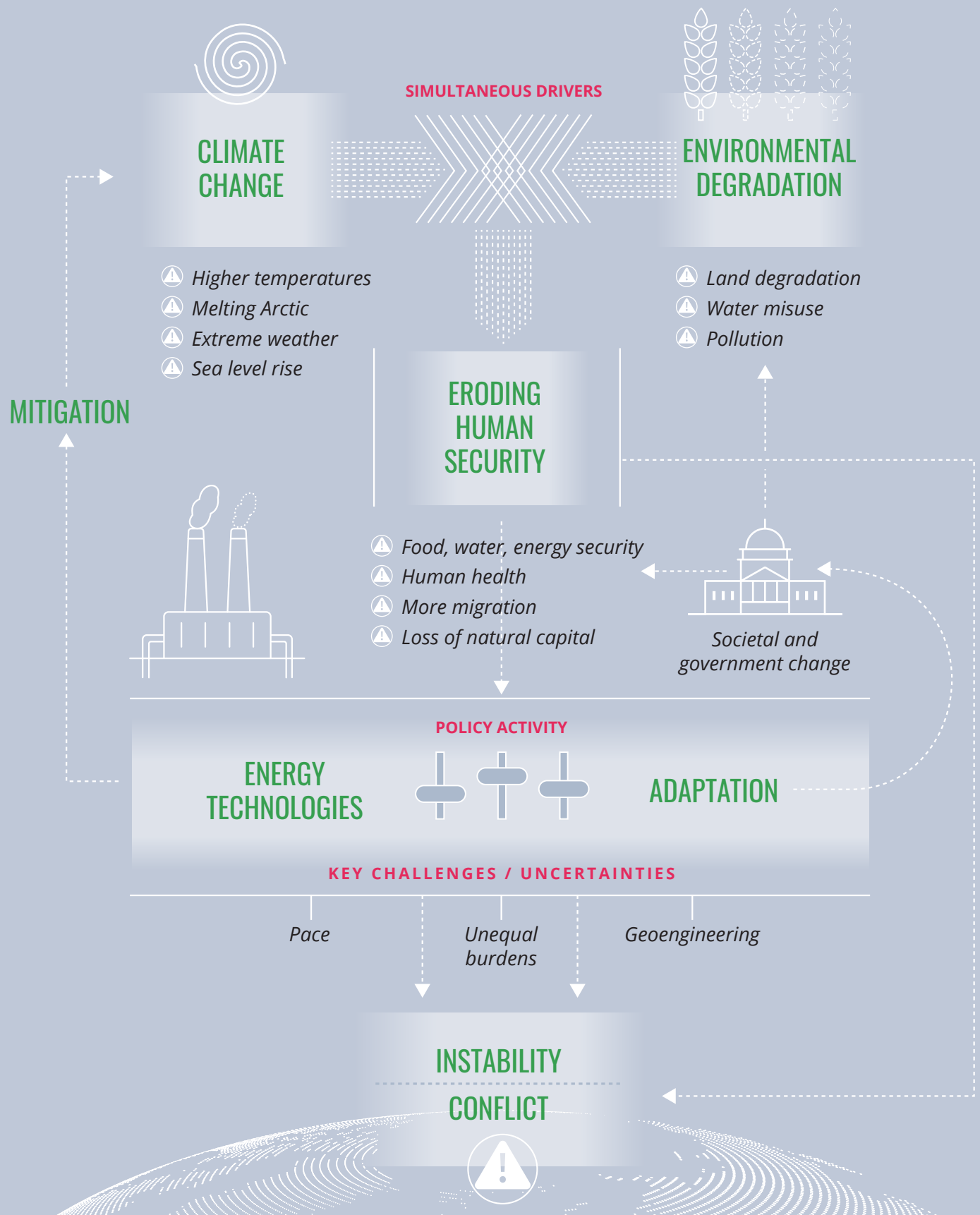
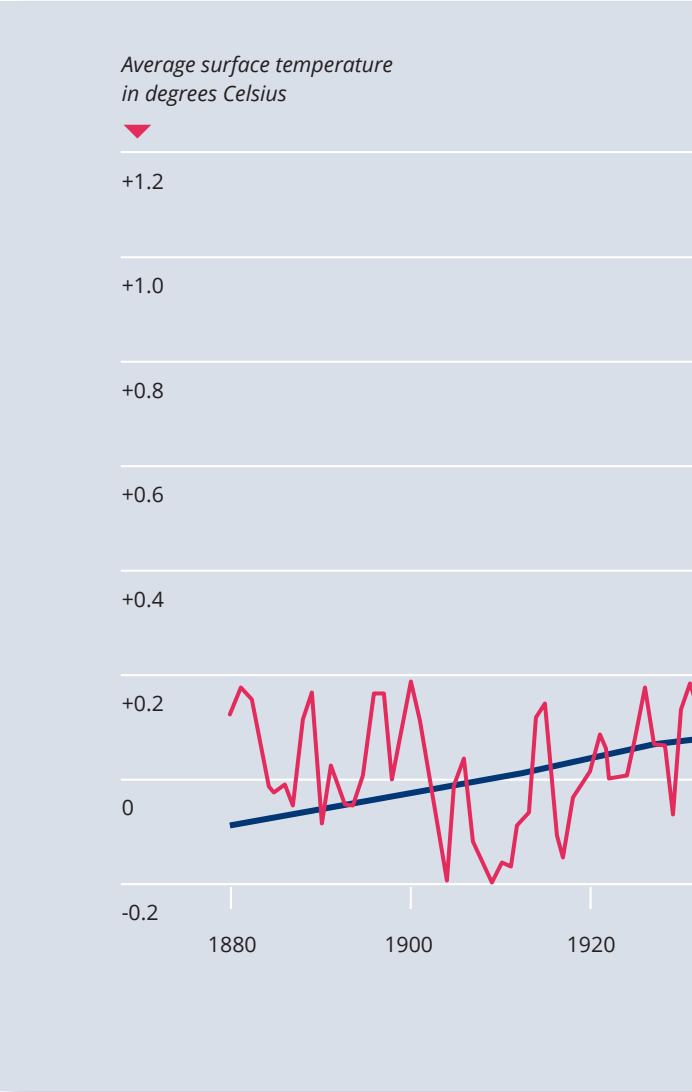


Photo / Pexels


SIMULTANEOUS DRIVERS
CLIMATE CHANGE
ENVIRONMENTAL DEGRADATION
Higher temperatures
Melting Arctic
Extreme weather
Sea level rise
Land degradation
Water misuse
Pollution
MITIGATION
ERODING HUMAN SECURITY
Food, water, energy security
Human health
More migration
Loss of natural capital
Societal and government change
POLICY ACTIVITY
ENERGY TECHNOLOGIES
ADAPTATION
KEY CHALLENGES / UNCERTAINTIES
Pace
Unequal burdens
Geoengineering
INSTABILITY
CONFLICT

The past ten years was the hottest on record, and every decade since the 1960s has been hotter than the previous one.

GLOBAL RISE IN CARBON DIOXIDE AND AVERAGE TEMPERATURE



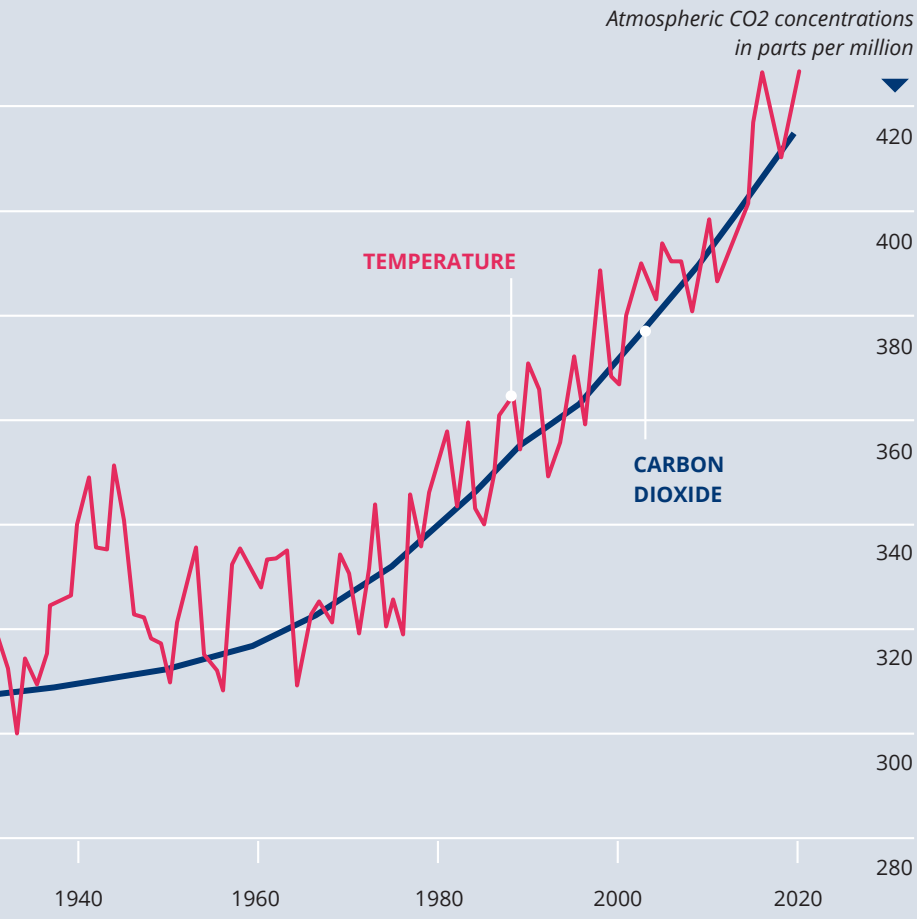
CLIMATE CHANGE HERE AND INTENSIFYING

We are living in a world already affected by climate change caused by growing human-induced concentrations of greenhouse gases in the atmosphere. The world has warmed on average 1.1 degrees Celsius since the late 19th century, causing diminished glaciers and ice caps, higher sea levels, more intense storms and heat waves, and a more acidic ocean, according to the Intergovernmental Panel on Climate Change. The past 10 years were the hottest on record, and every decade since the 1960s has been hotter than the previous one. On the current path, it is probable that within the next 20 years global warming will surpass 1.5°C while heading toward 2°C possibly by mid-century. Cumulative emissions already in the atmosphere will drive temperature increases in the next two decades even if emissions were to reach net zero immediately, according to the US National Climate Assessment.

Physical Effects

The physical effects of a changing climate are likely to gradually intensify during the next two decades compared to the catastrophic impacts modeled for the latter half of the century, should temperature rise continue unabated. No country or region will be immune from the physical effects of climate change and environmental degradation, but the impact will vary—some regions will even see some marginal benefits in the form of longer growing seasons. In general, developing countries will suffer more as they lack the capacity to adapt to climate change and on average are more highly exposed to its effects.

Melting Arctic and Sea Level Rise. Temperatures are warming at three times the global average in the Arctic largely as a result of feedback loops from melting ice and snow cover. This has caused mass loss from ice sheets and glaciers as well as reductions in sea ice extent



Source: NASA GISS, NOAA NCEI, ESRL. https://medialibrary.climatecentral.org/resources/national-and-global-emissions-sources-2020.

This graph illustrates the change in global carbon dioxide concentrations in atmospheric parts per million and in global surface temperature in degrees Celsius relative to pre-Industrial average temperatures. Nineteen of the 20 warmest years have occurred since 2001, and 2020 tied for the hottest year on record.

Willian Justen de Vasconcellos / Unsplash

NARROWING CLIMATE UNCERTAINTIES

Even though the Earth's climate is an extremely complex, interconnected system that is sensitive to small changes, increased data collection, computing power, and sophisticated modeling means that our understanding of climate change has become increasingly strong. Several areas of research are attempting to reduce uncertainty:

Attribution: Scientists are improving their ability to attribute specific events after the fact to climate change. This nascent field, known as extreme event attribution, could change how publics perceive the growing threat and provide a basis for developing countries or impacted communities to claim damages from high emitting countries or their government.

Feedback Loops: Scientists currently have a difficult time projecting when and to what extent positive feedback loops will drive further temperature increases and risk runaway warming. For example, the loss of reflective sea ice will reveal more of the ocean surface, which is dark and absorbs heat faster, in turn causing even more sea ice to melt. Another concerning feedback loop is methane, a powerful greenhouse gas that is released from wetlands, permafrost, and ocean hydrates in response to increased temperatures.

and thickness. Globally, the sea level has risen an average of 8 to 9 inches since the late 19th century; estimates of rise in the next 20 years range from another 3 to 14 inches, which would create additional problems for low lying coastal cities and islands. On land, thawing permafrost is likely to cause increasing damage to infrastructure, including transportation systems, pipelines, and power plants.

More Intense Heat Waves. Outside the Arctic, the fastest warming is projected to occur in central and eastern North America, central Europe, the Mediterranean region (including southern Europe, northern Africa and the Near East), western and central Asia, and southern Africa. The tropics especially are expected to experience widespread extreme heatwaves.

Extreme Weather and Weather Patterns. Warming temperatures are likely to create the atmospheric conditions for more intense and in some cases, more frequent natural disasters, including stronger hurricane-strength storms, coastal flooding, storm surges, and droughts. Traditional weather patterns are also changing—for example, dry areas are expected to become drier, wet areas will become wetter, and precipitation will be less frequent but more intense in some areas.

ADDING TO ENVIRONMENTAL DEGRADATION

During the next two decades, population growth, rapid urbanization, and poor land and resource management will increasingly intersect with and exacerbate climate change effects in many countries, particularly in the developing world. With coastal cities growing, more people than ever will be threatened by a combination of storm surges and sea level rise that worsen existing coastal erosion.

Land Degradation. The expansion and unsustainable management of agriculture and forestry practices degrade land, and both contribute to and intensify the effects of climate change. A 2019 study found that global deforestation and land degradation each contributed to about 10 percent of all human-induced greenhouse gas emissions by releasing carbon stored in the trees and the soil.

Water Misuse. Poor water governance within and between states will remain the primary

driver of water stress during the next two decades. As precipitation declines or becomes more erratic, population growth, economic development, and continued inefficient irrigation and agricultural practices will increase demand. In many river basins, upstream countries are building dams and altering water sources with little or no consultation with their downstream neighbors, such as the Grand Ethiopian Renaissance Dam, increasing the risk of conflict.

Pollution. Although air and water pollution have decreased in many high-income countries since a peak in the 20th century, they continue to grow globally as the number of middle-income countries has increased; for instance, 80 percent of industrial and municipal wastewaters are discharged untreated into waterways. Similar to other environmental factors, air pollution and climate change influence each other through complex interactions in the atmosphere. Climate change will lead to more stagnation events—stationary domes of hot air that can cause air pollutants to get trapped and persist in the lower atmosphere—and will worsen air quality by increasing the frequency of wild fires.

ERODING HUMAN SECURITY

The physical impacts of a warmer world, combined with environmental degradation, are likely to lead to an array of human security challenges, primarily but not exclusively in developing countries in the near term. According to a 2018 study, 36 percent of cities globally face acute environmental stress from droughts, floods, and cyclones; climate change will add to these. These challenges will compound one another in coming years; as extreme events become more intense and more frequent, societies may struggle to recover from one event before the next one hits.

Exacerbating Food and Water Insecurity. Changing precipitation patterns, rising temperatures, increased extreme weather events, and saltwater intrusion into soil and water systems from rising seas and storm surges are likely to exacerbate food and water insecurity in some countries during the next two decades. Regions that remain dependent on rain-fed agriculture will be particularly vulnerable, such as Sub-Saharan Africa, Central America, some areas of Argentina and Brazil, parts of the Andean region, South Asia, and Australia. By contrast, some higher latitude regions such as Canada, northern Europe, and Russia may benefit from global warming by lengthened growing seasons.

Fisheries are also under threat from severe overfishing that climate change will further stress through oxygen depletion, rapid warming, and ocean acidification. Fishermen have to go further to catch fewer and smaller fish, potentially venturing into the territorial waters of other countries. In addition, warming ocean temperatures threaten to kill many more coral reefs—already they have declined by 30 to 50 percent, and at 1.5°C warming, they could decline by 70 to 90 percent—further threatening fishing and tourism industries.

Threats to Human Health. Decreased water, air, and food quality, along with changes in disease vectors and water-borne pathogens, all threaten human life. Death rates from pollution vary significantly across the world—typically highest in middle-income countries in East and South Asia. In addition, extreme weather and disasters often kill people and disrupt health infrastructure and prevent access to care. Climate change is expected to change the geographic range and in some cases frequency of disease outbreaks affecting humans, animals, and plants, including those

that are vector-borne (West Nile, malaria, Dengue), waterborne (cholera), airborne (influenza, hantavirus), and food-borne (salmonella).

Loss of Biodiversity. The variability among all living organisms—known as biodiversity—is declining faster than at any point in human history, risking food and health security and undermining global resilience. Warming temperatures are likely to lead to the extinction of plants and animals that can no longer survive in their traditional habitats or shift quickly to new locations as well as encourage the spread of invasive species that choke out native organisms.

Increased Migration. Extreme weather events increase the risk of more environmentally-induced migration, which usually occurs within states as affected populations move to nearby communities, often temporarily. Climate change probably will exacerbate this as sea level rise or extreme heat makes certain locales permanently uninhabitable, although mainly after 2040, possibly causing permanent migration and movement to other states.

MITIGATION GAINING TRACTION

Efforts to set a path toward net zero greenhouse gas emissions will intensify during the coming decade and spark increased debate about how and how soon to achieve this goal. The 2015 Paris Agreement set a global goal of limiting warming to less than 2°C, preferably to 1.5°C, and resulted in countries volunteering modest targets to reduce or establish a peak for their emissions. Although developed country emissions have continued to decline largely because of increased energy efficiency and use of natural gas, and the COVID-19 pandemic also caused a brief drop in global emissions—overall emissions have continued to increase. This trend has led to a growing number of countries making more ambitious pledges to become carbon neutral—such as Chile, the European Union (EU), Japan, New Zealand, and South Korea by 2050, and China by 2060.

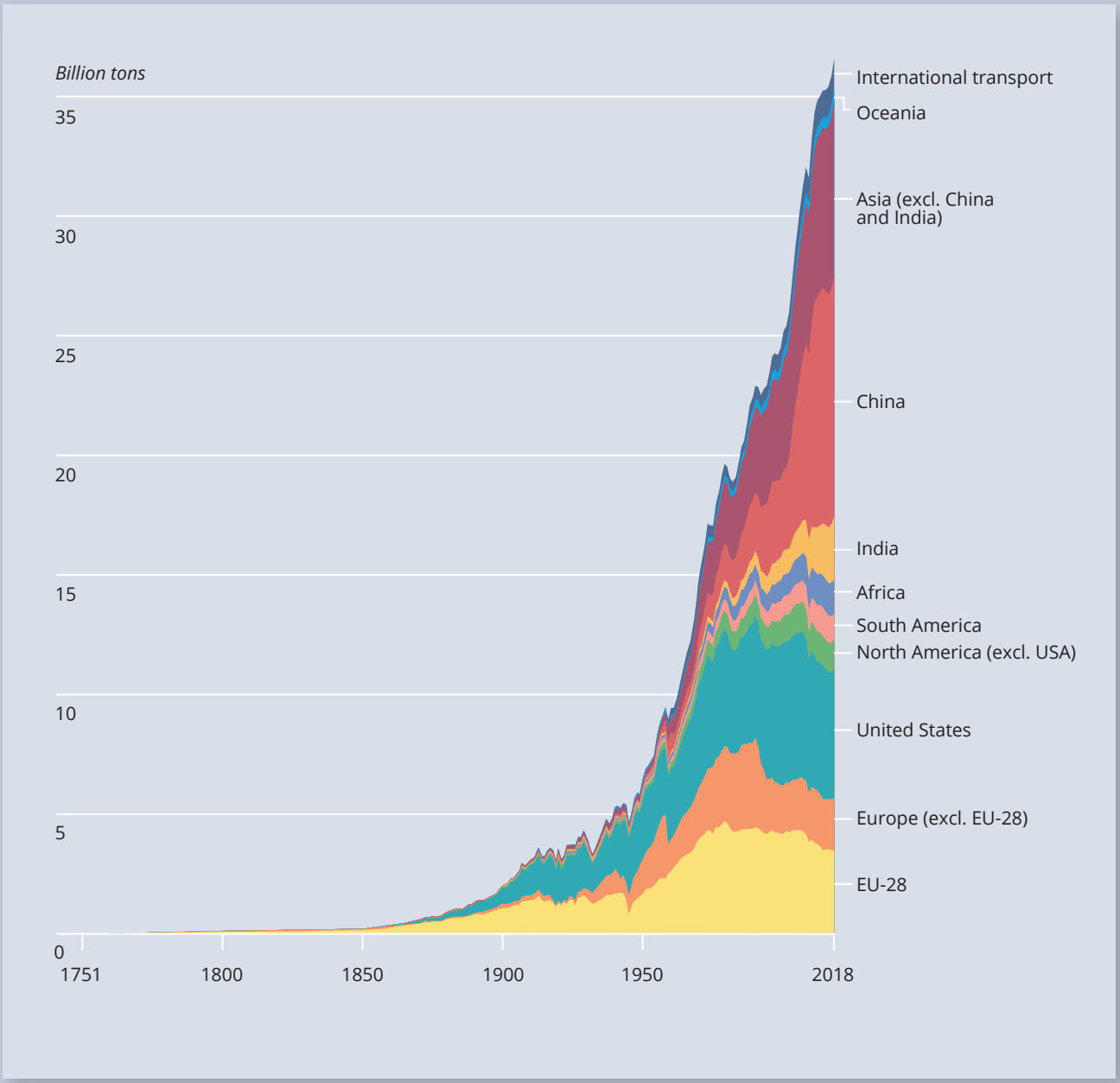
As climate modeling improves, divisions are likely to become more pronounced between those who advocate reaching net zero emissions over decades by transitioning to new technologies and those who argue that net zero must be achieved more quickly to prevent the worst outcomes. State pledges factor in advancements in technologies to mitigate emissions while boosting economic growth and assume that the worst effects of climate change can be avoided through a more gradual approach. Advocates of faster action argue that the window to avoid the cataclysmic effects is closing and that more dramatic, immediate behavioral changes are required. Limiting the global temperature increase to 1.5°C will require unprecedented changes in energy consumption and production to allow developing countries to grow their economies while not offsetting the carbon reductions from developed countries.

Energy Transition Underway

A critical aspect of the global debate and the ability to mitigate climate change is the speed of the transition from fossil fuels to renewable energy. Even though fossil fuels will continue to supply the majority of energy needs during the next 20 years, wind and solar are almost certain to grow faster than any other energy source because of technological advances and falling costs, and nuclear power production may grow, particularly if new, safer designs emerge. Increasing energy efficiencies probably will also reduce the rate of energy demand growth and the carbon intensity per unit of energy used. A range of current and future technological developments—as well as regulatory and investment choices by governments,

ANNUAL TOTAL CO_2 EMISSIONS, BY REGION

This chart shows CO_2 emissions from fossil fuels and cement production only—land use change is not included.



Source: Carbon Dioxide Information Analysis Center (CDIAC); Global Carbon Project (GCP).
Note: 'Statistical differences' included in the GCP dataset is not included here.
OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

KEY EMERGING ENERGY TECHNOLOGIES

The cost to build and operate new **solar photovoltaic and wind-powered plants** is broadly cheaper than equivalent fossil fuel–fired power plants. Even more efficient, lower cost renewable technologies, such as perovskite solar cells, are poised to transform and disrupt energy industries in the next two decades. Moreover, increasingly connected wind turbine technology is enabling massive and lower-cost offshore wind projects worldwide. China is the world's largest producer and exporter of solar panels and wind turbines.

Advanced energy storage will be needed to enable more renewables in grid systems and support broad deployment of electric vehicles. Lithium-ion batteries have seen large cost reduction and performance improvements in recent years, and investments are also increasing in potentially safer, cheaper, more powerful, and longer duration alternatives. In the future, it is likely that advanced energy storage would allow for the development of decentralized and autonomous electrical grids that integrate batteries, renewable power sources, and electric vehicles and that potentially have no need for backup from fossil fuels.

Green hydrogen—produced through electrolysis with no by-products—has the potential to play a greater role in storing excess solar and wind energy and helping to decarbonize heating, industry, and heavy transport. The industry is still in its infancy, but costs are expected to come down because countries with cheap renewable energy sources are particularly interested in it, such as Chile.

Several companies are developing **small modular nuclear reactors (SMRs)**, about one-third the size of traditional nuclear reactors, which could lead to broader acceptance from countries traditionally opposed to nuclear projects because SMRs are smaller and safer. SMRs have the potential to provide power generation to remote areas, such as in Africa, which could help developing countries electrify their populations without increasing emissions. In addition, SMRs—when combined with solar and wind power—could help solve the problem of intermittency.

businesses, and consumers—will influence energy use in buildings, transportation, and power, which together account for a majority of global emissions. Many of these technologies could also contribute to greater energy resilience and self-sufficiency for states.

Increased Efforts To Remove Carbon Dioxide

The success of efforts to remove carbon dioxide from the atmosphere will also be critical. The Intergovernmental Panel on Climate Change estimates that mitigating emissions alone almost certainly will not be enough to limit warming to 1.5°C, which increases the importance of technologies that remove carbon dioxide from the atmosphere to use it or store it underground. Most of the modeled pathways to limit warming to 1.5°C involve a substantial expansion of carbon dioxide removal (CDR) primarily through afforestation and bioenergy with carbon capture and storage (BECCS). Other technologies being researched include soil sequestration, ocean fertilization, and direct air capture. Research into and a push to deploy BECCS—still a nascent technology—almost certainly will increase because it is one of the few negative emissions technologies that exist because it uses carbon dioxide to grow biomass that is converted to usable energy while storing the carbon dioxide underground. Currently about 25 commercially operational CDR projects offset a negligible amount of yearly emissions, and efforts to scale up CDR will face policy, technological, and economic constraints absent market incentives. More countries may introduce a carbon tax, or a credit for removing carbon, in an effort to speed up CDR as well as broaden adoption of renewable energy technologies.

Complementary Actions on Emissions

Many more actors are likely to join international and governmental efforts to address climate

and environmental challenges. Action at the local level has already increased, and a growing number of companies have pledged to go carbon neutral. Some large asset managers have concluded that climate change threatens their long-term returns and are requiring carbon emissions disclosures from firms in their portfolios or declining to invest in some fossil fuel projects. In 2018, nearly 10,000 cities and municipalities in 128 countries took some form of climate action, as did 6,225 companies headquartered in 120 countries, representing $36.5 trillion in revenue, larger than the combined gross domestic product (GDP) of the United States and China. Public-private partnerships are becoming a preferred operating framework, partly a recognition that nonstate efforts are most effective when linked to state action.

GROWTH OF RESILIENCE AND ADAPTATION

In addition to efforts to reach net zero emissions, many countries and local communities will expand investment in adaptive infrastructure and resilience measures. Some measures are as inexpensive and simple as restoring mangrove forests or increasing rainwater storage; others are as complex as building massive sea walls and planning for the relocation of large populations. A key challenge for these efforts will be funding for vulnerable communities—particularly as governments face competing fiscal and political challenges and have to choose which communities to support.

Public-private partnerships are innovating new insurance approaches aimed at building resilience to climate risks, such as insuring natural assets like the Mesoamerican reef off Mexico or index-based weather insurance for local farmers in Kenya. These approaches rely on new data and machine learning technologies—suggesting that as these technologies advance during the next 20 years, resilience mechanisms may become more sophisticated.

Calls for Geoengineering

As warming gets closer to exceeding the Paris Agreement goals, it is increasingly likely that states and nonstate actors will more aggressively research, test, and possibly deploy geoengineering measures—deliberate large-scale interventions in the earth's natural systems—to try to counteract climate change. Current research is largely focused on solar radiation management (SRM), an effort to cool the planet by reflecting the suns energy back into space. Stratospheric aerosol injection (SAI), a form of SRM that sprays particles in the stratosphere to cause global dimming, has attracted funding by those who fear the worst of climate change. Proponents argue that the needed energy transformation will happen too slowly and that SAI can buy the planet time because it is technologically feasible and less expensive than mitigation.

Current research is almost entirely in computer models with academia, nongovernmental organizations, and private companies playing a leading role. However, there will be increased calls for countries to begin engaging in the dialogue and possibly take leadership to develop international agreements that could help set research standards, ensure transparency in live tests, determine the legal framework around if, how, and when to deploy SRM technologies, and monitor the effects. The possibly catastrophic unintended side effects are not well understood, and some scientists fear that SRM, while keeping temperatures down, would create unexpected and devastating changes in weather systems and rainfall patterns. Countries and nonstate actors deploying it alone will increase the risk of conflict and blowback, especially when others blame

them for a disaster they believe was caused by geoengineering.

BROADER IMPLICATIONS AND DISRUPTIONS

In addition to direct physical effects of climate change, states and societies are likely to be strained by hard choices and tradeoffs given the difficulty and costs of drastic emissions cuts and adaptive measures. The burden of these steps will not be evenly distributed within or between states, and the long-term payoff of mitigation policies runs counter to political incentives, making it difficult to sustain controversial commitments. The second- and third-order implications of climate change will affect human and national security in several ways.

Drive Societal Cleavages and Political Movements. Concerns about climate change have grown across the globe with hundreds of thousands of protesters—mostly young people—marching in the streets advocating for faster change. Policy responses to mitigate or adapt to climate change also contribute to political volatility—particularly when they are linked to broader socio-political interests—such as the French protests against fuel price hikes in 2018. In Europe, nationalist and populist parties have capitalized on public concerns about the economic hardships associated with climate mitigation policies, and they have framed their opposition in terms of equality and social justice for working class populations.

Increased Pressure for Global Action. As warming continues to rise, there will be more debate and tension among countries over transparency, cuts, and responsibility. Developing countries that want the room to grow their economies and increase emissions will more forcefully demand that developed countries provide them with advanced energy technologies to leapfrog their energy systems to a low carbon model. In addition, developing countries will increasingly demand that developed countries meet their commitments to provide financing to help vulnerable populations adapt. Greater demands will be made on international financing vehicles such as the Green Climate Fund, which has approved $4 billion worth of adaptation projects.

Heighten Competition. Climate change and environmental degradation will contribute to and reflect a more contested geopolitical environment. Countries and other actors are likely to compete over food, mineral, water, and energy sources made more accessible, more valuable, or scarcer. Receding Arctic sea ice is opening new sea routes and opportunities to access valuable resources there, including natural gas and oil deposits, rare earth metals, and fish stocks. Russia is building more icebreakers to patrol its northern coastline and project power as an Arctic leader, and even non-coastal states like China and India are seeking to take advantage of shorter trade routes and resources. In addition, China is trying to boost its international image by claiming to be a leader on climate diplomacy despite its growing emissions—already the highest in the world.

Contribute to Instability and Conflict Risk. Rarely is climate change the sole or even primary driver of instability and conflict; however, certain socio-political and economic contexts are more vulnerable to climate sparks that ignite conflict. Countries of particular concern are those with ethnic or religious polariza-

tion; livelihoods highly dependent on natural resources or agriculture; weak or illegitimate conflict resolution mechanisms; a history of violence; and low adaptive capacity. For example, an increase in drought or extreme weather may reduce the opportunity cost of joining armed groups for struggling farmers and herders, while sectarian elites may advance their polarizing political goals by exploiting local grievances exacerbated by climate change.

Strain Military Readiness. While militaries will continue to adapt and fight in the changing world, climate effects will strain readiness and compound fiscal pressures on many militaries. Storm surges and sea level rise will force changes to the design and protection of naval bases and aircraft runways, prolonged extreme heat will limit training days, and major storms and floods will force militaries to divert more resources to disaster relief at home and abroad.

Increase Pressure on Strained International Systems. Current international law and cooperative bodies are increasingly mismatched to global climate challenges. For example, international refugee law does not account for people displaced by climate change effects. Many existing organizations designed to help manage shared resources, such as the Arctic Council or the Nile Basin Initiative, may be overwhelmed or sidelined, given their voluntary nature and lack of enforcement mechanisms. Also, efforts to develop international standards or regulations for high-risk activities like SRM lag behind the technology, increasing the possibility that countries or individuals will pursue unilateral action that risk blowback.

ENERGY TRANSITION GEOPOLITICS AND ECONOMICS

The transition from fossil fuels has the potential to significantly reshape geopolitics and economics, depending on its speed and structure. Petro-states—currently accounting for 8 percent of world GDP and nearly 900 million citizens—would face major revenue losses in an aggressively decarbonizing scenario. Those that can more efficiently and cheaply extract oil or diversify their economies will better weather the transition.

In addition, the transition will diminish countries' ability to use energy as a tool of coercion or statecraft because energy systems will become more decentralized. Countries will have decreased leverage in energy markets because oil and renewables operate differently; the former is an extracted resource that is traded, whereas the latter is harnessed by building out domestic infrastructure. As a result, it will be more difficult for any one country to affect others' energy supply. For example, Chinese dominance of the clean energy equipment market does not allow Beijing to threaten global energy supplies in the way that control of the oil markets by the Organization of Petroleum Exporting Countries once did.

However, a shift to renewable energy will increase competition over certain minerals, particularly cobalt and lithium for batteries and rare earths for magnets in electric motors and generators. As actors race to develop new renewable energy technology during the next two decades, they will focus on countries that supply these minerals, such as the Democratic Republic of the Congo and Bolivia.

Photo / Bigstock

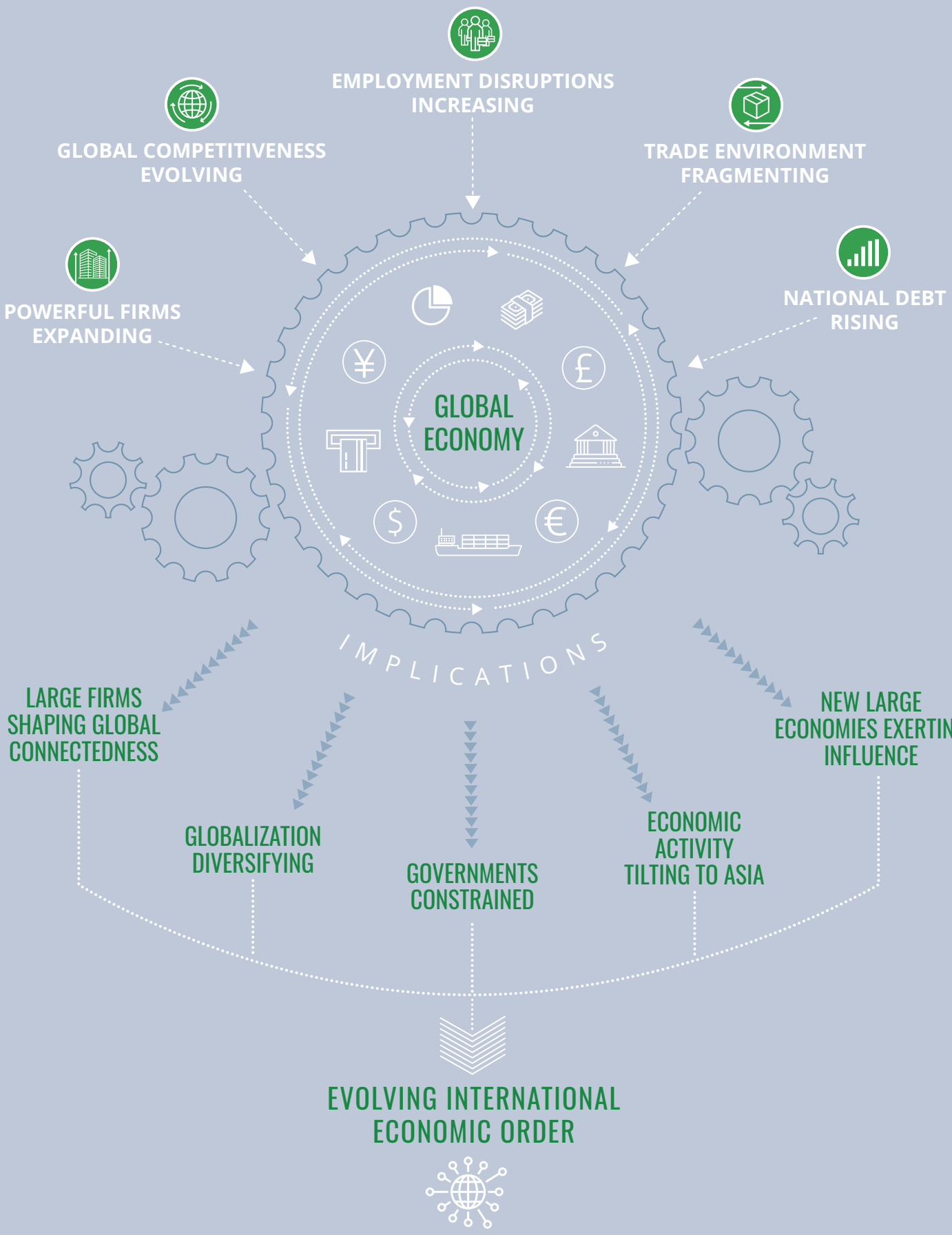
STRUCTURAL FORCES

ECONOMICS

Key Takeaways

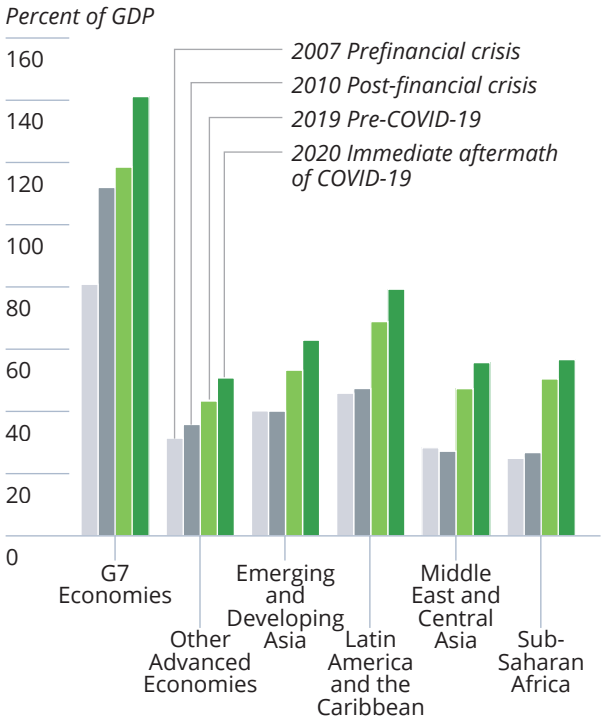
- During the next two decades, several global economic trends, including rising national debt, a more complex and fragmented trading environment, the global spread of trade in services, new employment disruptions, and the continued rise of powerful firms, are likely to shape conditions within and between states.
- Many governments may find they have reduced flexibility as they navigate greater debt burdens, diverse trading rules, and public pressure to deal with challenges that range from demographic shifts to climate change.
- Asian economies appear poised to continue decades of growth, although potentially at a slower pace. Productivity growth will be a key variable globally; increased growth rates in the Organization for Economic Cooperation and Development (OECD) countries would help governments deal with economic, demographic, and other challenges; and increased growth rate in Asia could help countries avoid the middle-income trap.

CHUUTERSNAP / Unsplash


EMPLOYMENT DISRUPTIONS INCREASING
GLOBAL COMPETITIVENESS EVOLVING
TRADE ENVIRONMENT FRAGMENTING
POWERFUL FIRMS EXPANDING
NATIONAL DEBT RISING
GLOBAL ECONOMY
IMPLICATIONS
LARGE FIRMS SHAPING GLOBAL CONNECTEDNESS
GLOBALIZATION DIVERSIFYING
GOVERNMENTS CONSTRAINED
ECONOMIC ACTIVITY TILTING TO ASIA
NEW LARGE ECONOMIES EXERTING INFLUENCE
EVOLVING INTERNATIONAL ECONOMIC ORDER

Over the next few decades, the economic costs of aging will strain public finances in all G20 economies, unless difficult decisions are made to either reduce benefits and/or raise taxes.

NATIONAL DEBT AS A PERCENTAGE OF GDP



Source: WEO 2020 Database.

Economic trends during the next two decades probably will vary more than trends in demography and climate. Economic forecasting is inherently uncertain and highly connected to other key trends, including technology, as well as government policies. In this section, we focus on several longer term economic trajectories that are creating both opportunities and challenges for states and nonstate actors.

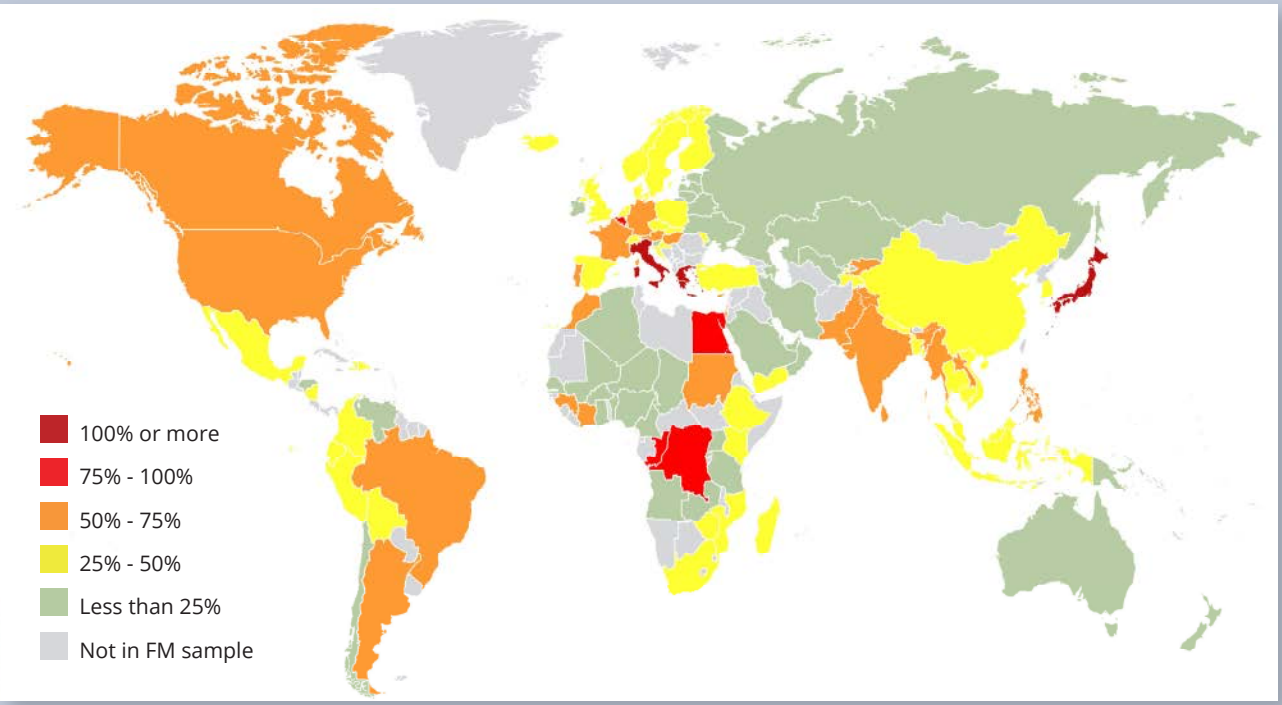
HIGH NATIONAL DEBT ENDURING, RISING

National debt levels have risen in almost every country since the 2007-08 global financial crisis and are likely to continue to face upward pressure through at least 2040. Strong borrowing in response to the COVID-19 pandemic, rising old-age dependency burdens in most of the largest economies, and increased demands on governments to spur economic growth as well as respond to other global challenges have all contributed to the debt levels. National debt to gross domestic product (GDP) ratios were higher in 2019 than in 2008 in almost 90 percent of advanced economies, including the United States and Japan, and leapt upward in 2020 because of the pandemic and government responses. Average debt ratios in emerging markets in 2019 were comparable to those that prevailed during the debt crisis wave of the mid-1980s and 1990s. In 2019, the International Monetary Fund (IMF) assessed that approximately two-fifths of low-income developing countries were at high risk of, or in, debt distress. During the next few decades, the economic costs of aging will strain public finances in all G20 economies, unless difficult decisions are made to reduce benefits or raise taxes.

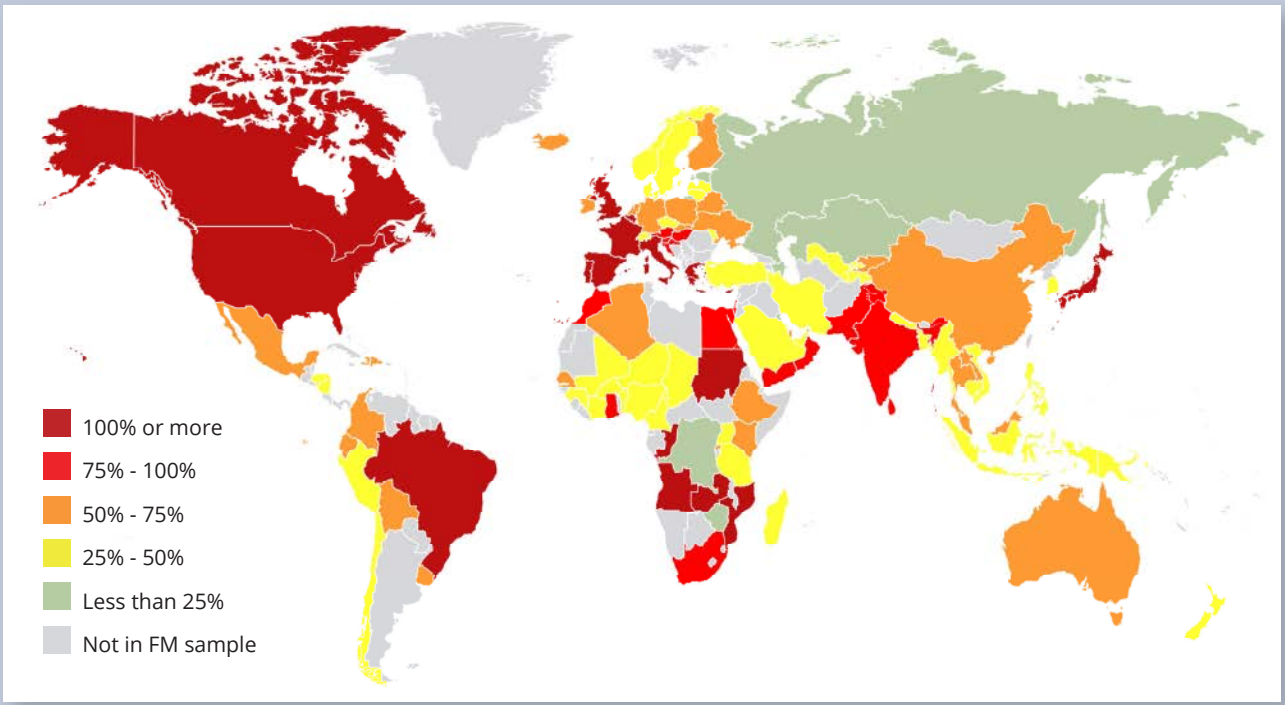
Reducing national debt ratios during the next 20 years is likely to be even more challenging than during the decade that followed the financial crisis. The cost of providing healthcare and pensions in most of the largest economies, as well as paying for other social programs, will remain a drag on discretionary spending without major productivity gains or a reduction in the cost of these services. Slow economic growth in some economies could reduce tax revenues and impair governments' ability to reduce spending because of the need to invest in economic recovery and infrastructure or respond to the effects of climate change.

NATIONAL DEBT AS A PERCENTAGE OF GDP

2007 | PRE-GLOBAL FINANCIAL CRISIS



2020 | COVID-19



Source: International Monetary Fund.

Sustainable for Some, But Others at Heightened Risk of Default. A prolonged period of low interest rates, similar to the post-financial crisis period, would increase the affordability of debt for some economies, including advanced economies in Asia, Europe, and North America, allowing them to sustain higher national debt ratios. The world's major central banks, including the European Central Bank, the Federal Reserve, and the Bank of Japan, have pursued an ultra-low interest rate policy for at least the past decade, and most economists expect these countries to be able to sustain high debt ratios because they have borrowed in their own currency. Departures from this policy could increase debt servicing costs and increase the risks associated with high debt ratios.

Emerging and developing economies that have financed at least some of their debt with external borrowing are at increased risk of debt distress and could face a debt crisis, even if global interest rates remain low, because local currency depreciation and increased risk premiums could increase servicing costs. Some governments are likely to face the choice of reining in public spending and risking public discontent, or maintaining public spending, which would further increase debt burdens and borrowing costs and risk local currency depreciation. Facing these choices, some governments are likely to prioritize spending on domestic issues rather than the global commons.

DISRUPTIONS IN EMPLOYMENT

The global employment landscape will continue to shift because of new technologies, notably automation, online collaboration tools, artificial intelligence (AI), and perhaps additive manufacturing. Tasks that once seemed uniquely suited to human abilities, such as driving a car or diagnosing a disease, are already automated or potentially amenable to automation in the next decade. Studies have estimated that automation could eliminate 9 percent of existing jobs and radically change approximately one-third in the next 15 to 20 years. Emerging technologies will also create jobs and will enable greater virtual labor mobility through Internet-based freelance platforms that match customers with self-employed service providers as well as speed-of-light commercial data and software transmission.

Demographics, specifically aging populations, will promote faster adoption of automation, even with increases in the retirement age. Most of today's largest economies will see their workforces shrink over the coming two decades as aging workers retire. South Korea is projected to lose 23 percent of its working-age population (age 15-64), Japan 19 percent, southern Europe 17 percent, Germany 13 percent, and China 11 percent during this period, if the retirement age remains unchanged. Automation—traditional industrial robots and AI-powered task automation—almost certainly will spread quickly as companies look for ways to replace and augment aging workforces in these economies. Automation is likely to spread more slowly in other countries, with the key being whether it offers cost advantages, including over low-skilled labor.

The number of jobs created by new technologies is likely to surpass those destroyed during the next 20 years, judging from past episodes. One study by the World Economic Forum estimates that by 2025, automation will have created 97 million new jobs and displaced 85 million existing jobs. Several factors, including skills, flexibility, demographic factors, underlying wages, the share of jobs susceptible to automation, and access to continuing education could influence how well individual countries

are able to adapt to automation. For example, countries with growing working-age cohorts are likely to experience more employment dislocations or downward pressure on wages than countries with older populations at comparable levels of automation.

Automation may affect a growing share of the workforce. During the past two decades, it has replaced mostly middle-skill job professions, such as machine operators, metal workers, and office clerks. Automation may increasingly affect more high-income professions, such as doctors, lawyers, engineers, and university faculty. Although new jobs will emerge, there is likely to be a skills mismatch between jobs lost and jobs created. This mismatch could lengthen the period of unemployment for many workers as they attempt to gain the skills required for newly created jobs, and it could further skew the distribution of gains. More youthful economies might be more agile if they are able to provide the education needed to properly train new entrants into the workforce.

COULD 2040 BE JOBLESS?

The breadth and speed at which AI could replace current jobs raises questions as to whether economies will have the capacity to generate sufficient new jobs and whether workers will have the requisite skills for the new jobs created.

During the next few decades, AI appears likely to follow the trend of previous waves of innovation, resulting in net job creation over time, but it may lead initially to an overall decline if jobs disappear faster than new ones are created.

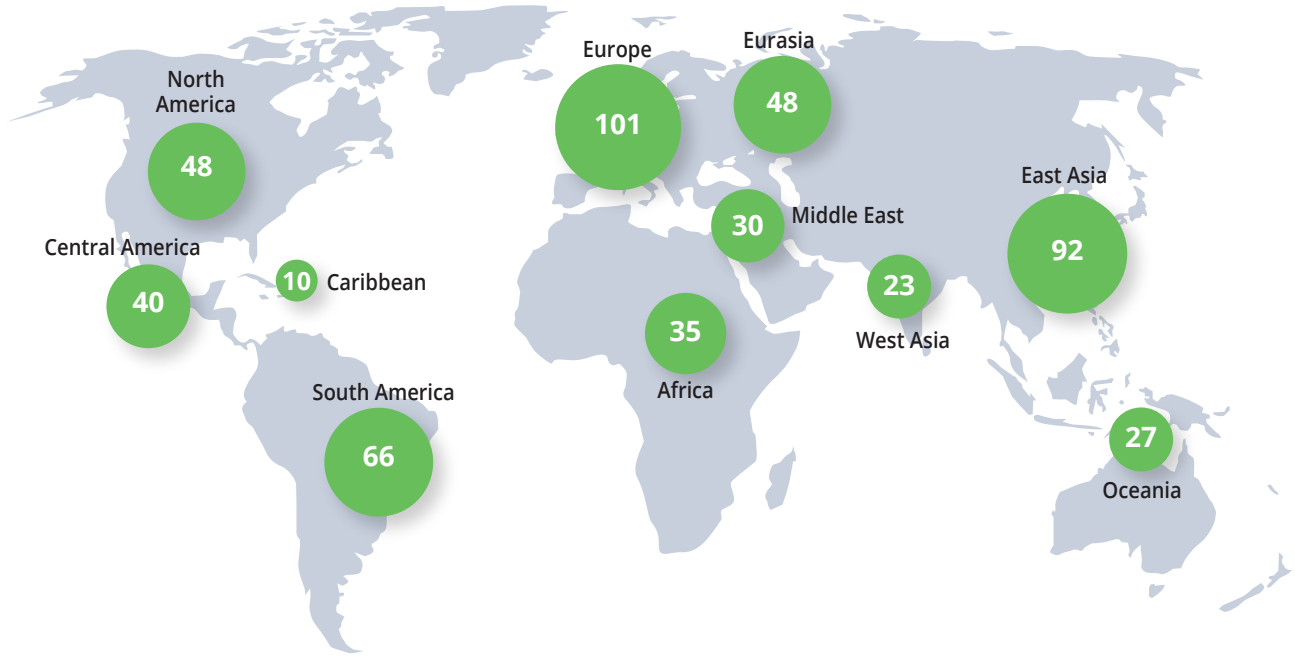
Alternatively, some economists question whether AI could lead to more continuous disruption to labor markets, as machines rapidly gain in sophistication, resulting in more persistent job losses.

MORE FRAGMENTED TRADING ENVIRONMENT

The global trading system is likely to become even more fragmented during the next two decades. Since the creation of the World Trade Organization (WTO) in 1995, little or no progress has been made toward additional global trade agreements. Regional and bilateral trade agreements have proliferated, further fragmenting the global trading environment. Only a single multilateral agreement, the Trade Facilitation Agreement, has been completed since the WTO's inception. Progress has been limited by fundamental differences over agricultural trade and related subsidies and protection of intellectual property rights among member countries as well as by a widening divide between developed and developing countries. Lacking updates, current trade rules are inadequate for new types of flows, including e-commerce and other services. However, barriers to trade in global services, such as data localization rules, and the continued desire to protect domestic agriculture are likely to make future agreements to update the WTO even more difficult.

As WTO rules become increasingly antiquated, future regional agreements are likely to establish new rules and standards, especially for new types of commercial transactions, resulting in further fragmentation of global trade rules. There has been a large increase in the number of bilateral and regional trade arrangements since the formation of the WTO, and more limited progress in sector-specific agreements. Some of these agreements not only cover tariffs and market access but also establish rules and standards in areas not covered by the WTO or other global multilateral agreements, such as the digital trade rules in

REGIONAL TRADE AGREEMENTS IN FORCE



Source: World Trade Organization. Information as of June 2020.

the United States–Mexico-Canada Agreement. Larger agreements, including the Asia-focused Regional Comprehensive Economic Partnership (2020), the Comprehensive and Progressive Agreement for Trans Pacific Partnership (2018), and the Africa Continental Free Trade Area (2020), are likely to boost regional trade and could attract more foreign direct investment to these regions.

Expanding unilateral, often non-tariff trade restrictions, are likely to further complicate international trade for governments and the private sector, limit trade-driven economic growth, and weaken overall growth. Although the US-China trade war has garnered headlines, many countries have increased their use of restrictive trade measures during the past 12 years. Between 2008 and 2018, the number of restrictive trade-related policy measures implemented globally increased by more than 200 percent compared to the previous decade, with Latin America and Asia accounting for 30 percent and 40 percent respectively. In the Asia Pacific region, for example, non-tariffs measures have increased even as applied tariffs have fallen. With a record number of new trade barriers in 2019, trade restrictions are becoming structurally ingrained in the European Union's (EU) trade relations.

A combination of the desire to protect jobs in the manufacturing sector, concerns about capturing gains from winner-take-all technological progress, and a focus on critical inputs, such as medical equipment and pharmaceutical feedstocks, is likely to further accelerate the use of protectionist trade policies. The anticipated increase in job losses in manufacturing during the next two decades is likely to place pressure on governments, particularly those in advanced and manufacturing-dependent emerging economies, to take protective actions. In addition, a recognition that technologies, such as AI, could lead to sustainable first mover advantages—in which being the first to market a new product provides a competitive advantage—might lead some governments to

intensify their use of trade restrictions as they jockey for global position. Finally, protecting critical inputs and strategic supplies, especially pharmaceuticals in the wake of the pandemic, could lead to greater trade restrictions for these industries.

China, the EU, Japan, and other economic powers will also use their leverage to advance national security goals, further distorting markets. Since 2008, they already have intensified their use of trade restrictions and domestic market regulations for strategic influence. Looking forward, concerns about privacy and control of data streams as well as trade in industrial goods and other technologies are likely to lead to even more activist trade policies for broader national security interests.

ECONOMIC CONNECTEDNESS EVOLVING, DIVERSIFYING

In addition to trade policies, demand for and the increased ability to deliver services across borders and the use of e-commerce platform technologies are likely to further transform economic connectedness, including the shape of global value chains, the location of foreign direct investment, and the composition and direction of trade. Despite the fragmentation of the global trading system, trade in a broad range of services, including financial, telecommunications, information, tourism, and others, is poised to increase during the next two decades. In OECD countries, services account for roughly 75 percent of GDP and 80 percent of employment, but the current value of services trade globally is only one-third of that of manufactured goods, suggesting that there is significant room for growth. The WTO's Global Trade Model estimates that global trade would grow by around 2 percentage points more than baseline growth through 2030 if countries adopted digital technologies, which would facilitate expansion of services trade and provide a further boost to continued growth in economic connectedness.

New Manufacturing Technologies Shifting Trade. The configuration of global supply chains in 2020 largely reflected the importance of economies of scale and labor as a source of value creation in the manufacturing sector, leading to the centralization of production in a few lower wage locations, especially China. A large increase in the use of digital technologies

UNCERTAIN FUTURE OF MONEY

The financial sector is not immune from the technological changes that are transforming other industries. Digital currencies are likely to gain wider acceptance during the next two decades as the number of central bank digital currencies increase. China's central bank launched its digital currency in 2020, and a consortium of central banks, working in conjunction with the Bank of International Settlements, is exploring foundational principles for sovereign digital currencies.

The introduction of privately issued digital currencies, such as Facebook's proposed Libra, would further drive acceptance of digital currencies. The extent to which privately issued digital currencies will provide a substitute for the use of national or regional fiat currencies, including the US dollar and the euro, to settle transactions will depend on the regulatory rules that are established.

The US dollar and the euro are also likely to face threats from other fiat currencies, the potency of which will depend on changes in the current international financial architecture and the global importance of international linkages. Privately issued digital currencies could add complexity to the conduct of monetary policy by reducing countries' control over their exchange rates and money supply.

and additive manufacturing might reduce the importance of economies of scale and labor as an input and encourage firms to move more production closer to markets. These new production technologies could diminish the attractiveness of locating production in China and accelerate the rate at which companies reorient their supply chains.

E-Commerce Platform Economy Firms Enabling Global Trade. Cloud computing, automation, big data analytics, AI, and other information technologies are enabling new distribution modes that expand access to international markets for all sellers but especially for small and medium-sized enterprises that have historically faced high foreign market entry costs. E-commerce platform firms, which in 2020 included the Chinese firm Alibaba and America's Amazon, are creating a marketplace that matches buyers and sellers independent of geographic location, providing a comparatively low-cost and low-risk way for firms to enter foreign markets, and increasing international trade flows.

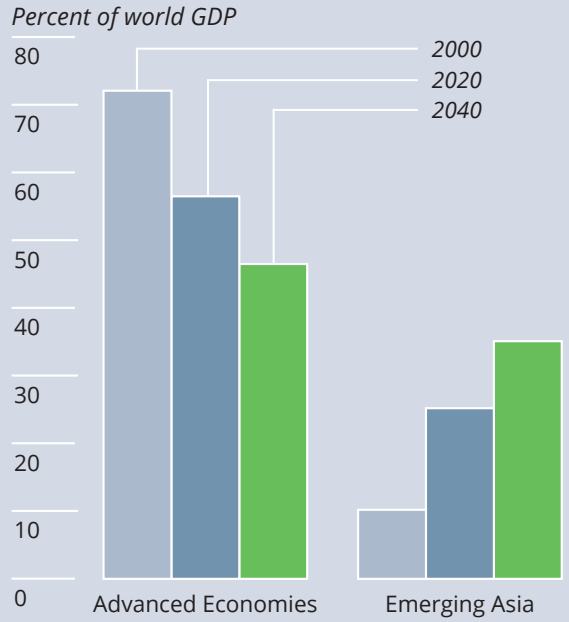
E-commerce sales in 2018 were equivalent to 30 percent of global GDP that year, according to data released in 2020. International e-commerce spanned business-to-business and business-to-consumer sales; approximately 25 percent of all online shoppers made cross-border purchases in 2018. Looking forward, increased access to the Internet, falling data costs, growth in smartphone ownership, and a shift to online purchases post-pandemic are likely to result in more e-commerce sales, with many of these sales taking place on large global e-commerce platforms.

Multinational "Superstar" Firms Perpetuate Economic Globalization. Technology and digitization are also transforming the structure of some industries, increasing the prevalence of oligopolies and near monopolies and resulting in global superstar or "winner-take-all" firms. Global superstar firms are the world's largest and most profitable across all industries, including pharmaceuticals, consumer goods, and information technology. These firms captured approximately 80 percent of economic profit among companies with annual revenues greater than $1 billion in 2017 and earned approximately 1.6 times more economic profit than they did in 1997. Superstar firms, while domiciled in a single country, have sales that are global, and growth in the size and reach of these firms is likely to translate into an increase in economic globalization. The economic factors that support the rise of global superstar firms, including high fixed costs, low marginal costs, network and platform effects, and machine learning, are likely to persist through the next two decades.

Further, as technology, including big data and machine learning, and intangibles, such as brand, become increasingly important drivers of value creation during the next two decades, the market dominance of superstar firms is likely to increase. Growth in superstar firms is also likely to affect the division of economic gains between and within countries, potentially leading to friction and uneven regulation as host economies try to capture some of the value created by these firms. The power of these firms beyond business—including control of data and information flows—will encourage government efforts to regulate them, essentially as public utilities, or possibly break them up.

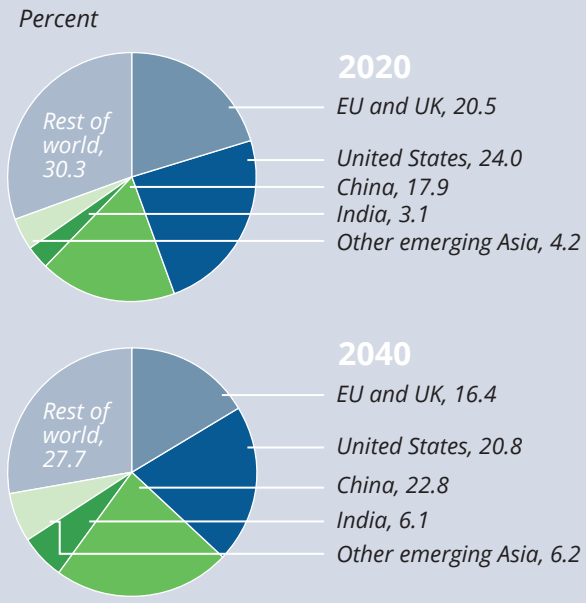
State Owned Multinationals Continue to Expand. State-owned multinationals (SOMNCs), most of which originated in China, India, Russia, Saudi Arabia, United Arab Emirates (UAE), and some EU member countries, almost certainly will continue to be active participants in international commerce. Some SOMNCs

ECONOMIC WEIGHT SHIFTING TO ASIA



Source: Oxford Economics.

FORECAST SHARE OF WORLD GDP



Source: Oxford Economics.

ECONOMIC ACTIVITY FORECAST TO TILT TO ASIA

2040 Population Rank		2020 GDP Rank	2040 GDP Rank
1	INDIA	6	↑ 3
2	CHINA	2	↑ 1
5	INDONESIA	16	↑ 8
6	PAKISTAN	39	↑ 23
8	BANGLADESH	44	↑ 28
14	PHILIPPINES	34	↑ 20
15	JAPAN	3	↓ 4
16	VIETNAM	40	↑ 24

Source: Oxford Economics.

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COULD AI BOOST PRODUCTIVITY?

Labor productivity growth has fallen in most economies during the past two decades even as there have been large advances in technology. The next wave of technological improvements, including AI could reverse this trend.

AI might have large effects on productivity during the next two decades, in line with the delayed nature of productivity gains from electricity and information technology. The pace of adoption could also affect productivity gains. According to one study, AI could boost global GDP by 1.2 percent per year if 70 percent of companies adopted some form of AI by 2030.

Although any gains are likely to be unequally distributed, both between and within countries, countries that are net gainers from an AI-induced productivity boost would have expanded economic opportunities that could allow them to deliver more services, reduce national debt levels, and finance some of the costs of an aging population.

may distort the global competitive landscape because of the state support that they receive. As the competition for technology leadership intensifies, SOMNCs, including those from China, could increase their reliance on state support to capture and lock-in first mover advantages, prompting private companies to lobby their governments to intervene on their behalf.

CONTINUED TILT TOWARD ASIA

Global economic activity has been tilting toward Asia during the past 40 years, reflecting its higher rate of economic growth in comparison with the rest of the world, large population, and reduction in grinding poverty—a trend that almost certainly will continue through at least 2030 and perhaps through 2040. Some of the most populous countries in Asia are positioned to be among the world's largest economies by 2040, even as their per capita income lag behind that of advanced economies.

Asia's record growth during the past 40 years has resulted in a convergence between Asian standards of living and those of middle- and even high-income economies. In 2020, China and other developing Asia countries contributed 18 percent and 7 percent respectively to global GDP. If these trends continue, by 2040 developing countries in Asia are projected to account for approximately 35 percent of global GDP, with India and China as the largest contributors at 29 percent of global GDP, according to Oxford Economics.

The faster economic growth in Asia could lead to some of the most populous countries being among the world's largest economies by 2040. For example, faster economic growth in India—on track to be the most populous country by 2027—could propel India into the ranks of the world's three largest economies. Similarly, faster growth in Indonesia, the world's fourth most populous country, could allow it to break into the ranks of the top 10 economies by 2040. However, their standards of living or per capita GDP are likely to remain well below those of advanced economies.

BROADER IMPLICATIONS AND DISRUPTIONS

The economic environment of the future, characterized by increasing national debt, a more complex trading environment, diversified global connections, and employment disruptions, will increase strains on governments. Taken together, these trends are likely

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to shift economic influence to a broader range of players, including private corporations and less open economies, led by China.

Straining Contributions to Global Challenges. High national debt, and associated debt servicing costs, could restrict the financial contribution that governments are able and willing to make toward global public goods and to address shared challenges, including global health and climate change. Wealthy countries might cut back on health assistance programs—or be unable to expand them to match population increases in poor countries. Less investment could delay emissions mitigation measures, and developed countries could backtrack on commitments to provide adaptation financing to the developing world. Slower growth and high debt could also limit the ability of some governments, including those in developing countries most at risk from the adverse effects of climate, from investing in adaptation measures to protect their infrastructure and communities from extreme weather.

Platformization Spurring Economic Growth. E-commerce platform firms will not only sustain globalization by matching customers and businesses across borders, but they can also facilitate growth in domestic business by offering a marketplace for domestic firms and customers to meet. The rise of e-commerce platform firms could help spur the growth of small and medium-sized enterprises, which have historically made a significant contribution to economic growth and job creation. These small and medium-sized firms often face funding constraints, but e-commerce platform firms offer lower customer acquisition costs and potentially greater market reach that could reduce costs, increase financing, and enable faster growth. In developing and emerging markets, these platform firms could lower the barriers to entry, help unlock financing, and provide an avenue to formalization of the underground economy. Greater regulation of platform firms—particularly by countries trying to impose trade barriers—might reduce gains.

Increasing Challenges to International Economic Governance. The number of large but still developing economies and their relative economic weight are likely to increase during the next 20 years. These economies, led by China, could increasingly demand more influence over the direction of economically focused international organizations, altering standards and norms to reflect their economic interests, some of which may be incompatible with the interest of advanced economies. Other frictions might emerge because these economies are large in aggregate but still considered developing based on per capita GDP, giving them access to concessions from the IMF, World Bank, and WTO. These tensions could shape the future orientation and undermine the effectiveness of these organizations, as well as result in the creation of more parallel organizations and increase the influence of developing economies on global economic rules.

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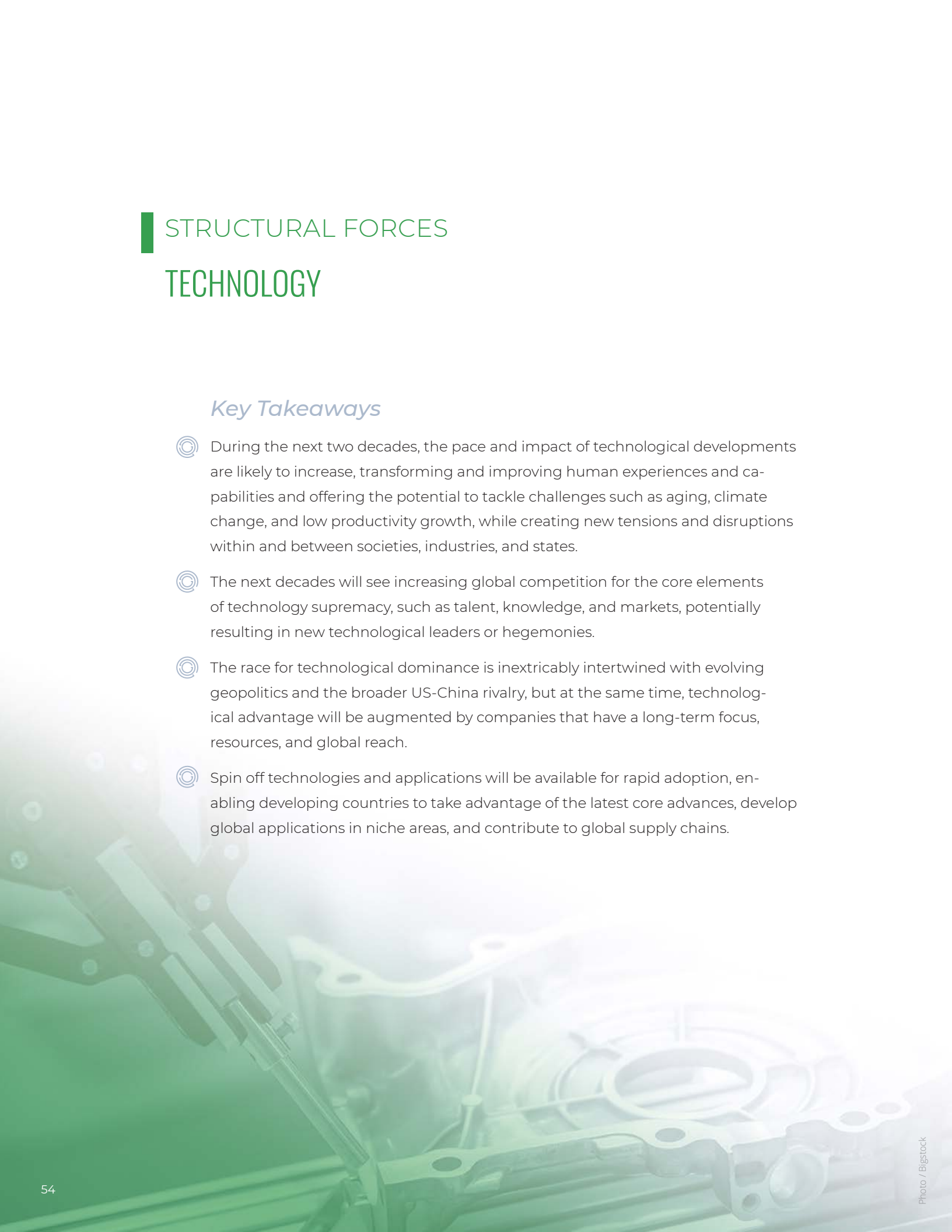
STRUCTURAL FORCES

TECHNOLOGY

Key Takeaways

- During the next two decades, the pace and impact of technological developments are likely to increase, transforming and improving human experiences and capabilities and offering the potential to tackle challenges such as aging, climate change, and low productivity growth, while creating new tensions and disruptions within and between societies, industries, and states.
- The next decades will see increasing global competition for the core elements of technology supremacy, such as talent, knowledge, and markets, potentially resulting in new technological leaders or hegemonies.
- The race for technological dominance is inextricably intertwined with evolving geopolitics and the broader US-China rivalry, but at the same time, technological advantage will be augmented by companies that have a long-term focus, resources, and global reach.
- Spin off technologies and applications will be available for rapid adoption, enabling developing countries to take advantage of the latest core advances, develop global applications in niche areas, and contribute to global supply chains.



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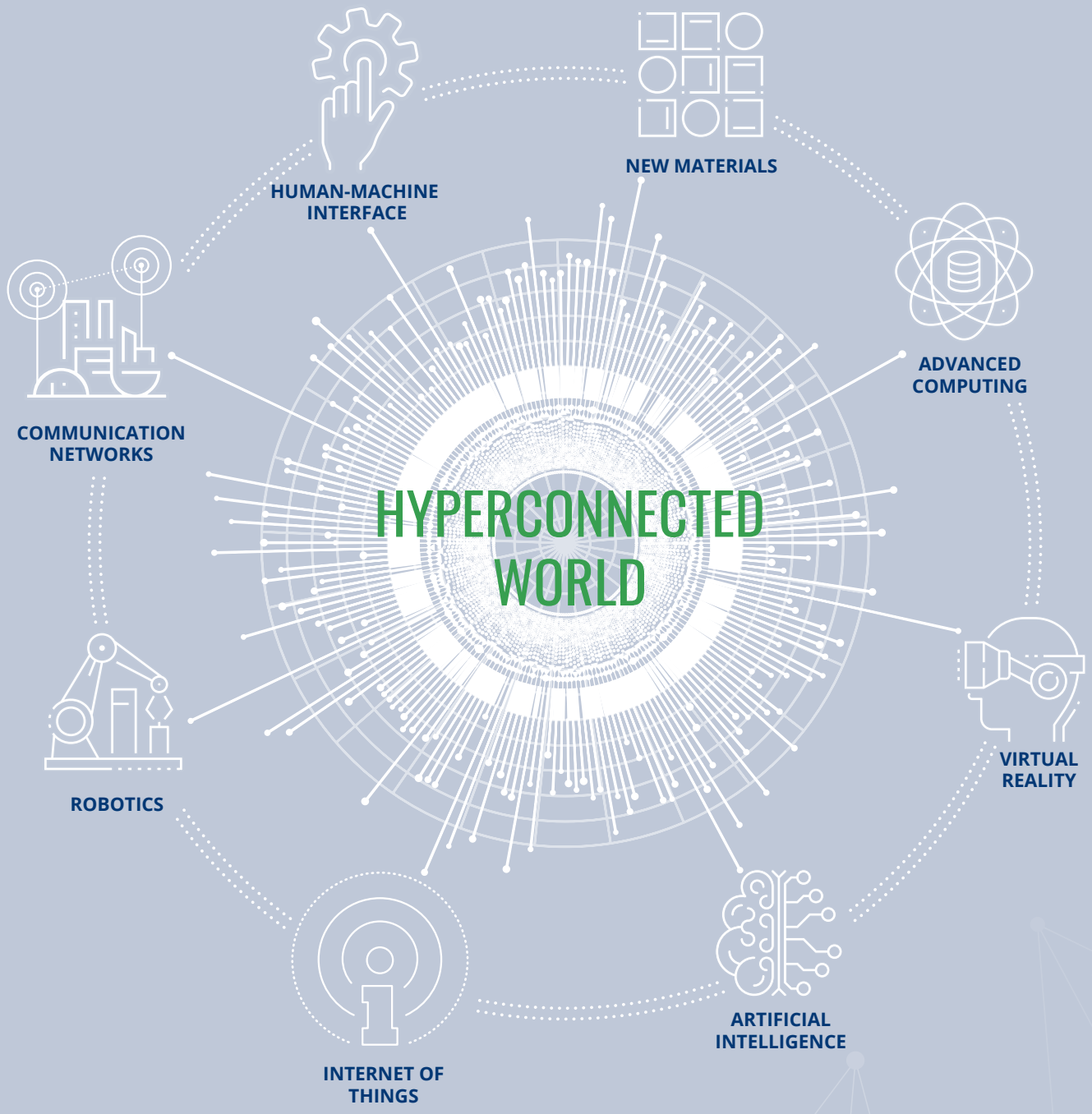
HUMAN-MACHINE INTERFACE
NEW MATERIALS
COMMUNICATION NETWORKS
ADVANCED COMPUTING
HYPERCONNECTED WORLD
ROBOTICS
VIRTUAL REALITY
INTERNET OF THINGS
ARTIFICIAL INTELLIGENCE

The increasing convergence of seemingly unrelated fields and the rise of global competition to generate and lock in advantage are accelerating the emergence of cutting-edge technologies.

Assessing technological trends and their broader implications is challenging because timelines remain uncertain, the path from foundational science to a transformational application can be difficult to discern, and the connections between a technology and its potential broader implications can be indirect and complex. Emerging technologies also raise myriad ethical, societal, and security questions—ranging, for example, from who we are as humans, to our impact on the environment, to the bounds of acceptable warfare.

TRENDS ACROSS EMERGING TECHNOLOGIES

Multiple trends are shaping the technology landscape of the next two decades, and while new technologies will not emerge uniformly or predictably, they are likely to share some common drivers and dynamics. The increasing convergence of seemingly unrelated fields and the rise of global competition to generate and lock-in advantage are accelerating the emergence of cutting-edge technologies. The diffusion of technological knowledge, the aggressive setting of standards to favor one technology solution over another, and ever shorter product development timelines will incentivize long-term strategy and rapid decisionmaking to avoid missteps and falling behind competitors.

Scientific Convergence Sparking Innovation. The convergence of seemingly unrelated areas of scientific research and technological applications is making the rapid development of novel applications possible, practical, and useful. For example, the smartphone was enabled by decades of basic research and development in electronics, antennas, materials, batteries, telecommunications networks, and user interfaces. By 2040, the increasing convergence of technologies, such as artificial intelligence (AI), high-speed telecommunications, and biotechnology, will be augmented by increased understanding of the social and behavioral sciences to enable rapid breakthroughs and user customized applications that are far more than the sum of their parts. Taken together, these technology platforms can then provide a foundation for rapid innovation while lowering the barriers to market entrance.

Growing Competition for Dominance. The race for technological dominance is inextricably intertwined with evolving geopolitics and is increasingly shaped by broader political, economic, and societal rivalries, particularly those associated with China's rise. Amassing the resources to sustain broad technology leadership, including the concentration of human talent, foundational knowledge, and supply chains, requires decades of long-term investment and visionary leadership. Those focusing their resources today are likely to be the technology leaders of 2040. In open economies, a mix of private efforts and partnerships between governments, private corporations, and research programs will compete with state-led economies, which may have an advantage in directing and concentrating

resources, including data access, but may lack the benefits of more open, creative, and competitive environments.

Technologies Diffusing Globally. Spin off technologies and applications are often available for rapid adoption in nearly every region of the world, enabling even developing countries to take advantage of the latest core advances, develop global applications in niche areas, or contribute to the supply chains of more advanced economies. Many states will seek to accelerate and harness this process, sponsoring focused efforts, such as regional alternatives to Silicon Valley or biotechnology incubators that will increase the risk of surprise from novel applications arising from unexpected locations.

Timelines Shrinking. The time to develop, deploy, mature, and then retire technologies is moving from decades to years and sometimes faster. Multiple actors, including corporations and states, at the forefront of emerging technology may deploy and exploit a new technology before others get off the starting blocks. Those trying to catch up, especially in developing countries, may be increasingly forced to choose technologies before the implications of those choices are fully understood, risking investment in technological dead ends or falling hopelessly behind. Planned economies may be able to react faster to emerging technology developments, potentially at the cost of reduced technological diversity and efficiency.

TECHNOLOGIES DRIVING TRANSFORMATION

Although technology advances in unpredictable ways, shaped by unexpected difficulties and unanticipated breakthroughs, some technological areas appear to offer the po-

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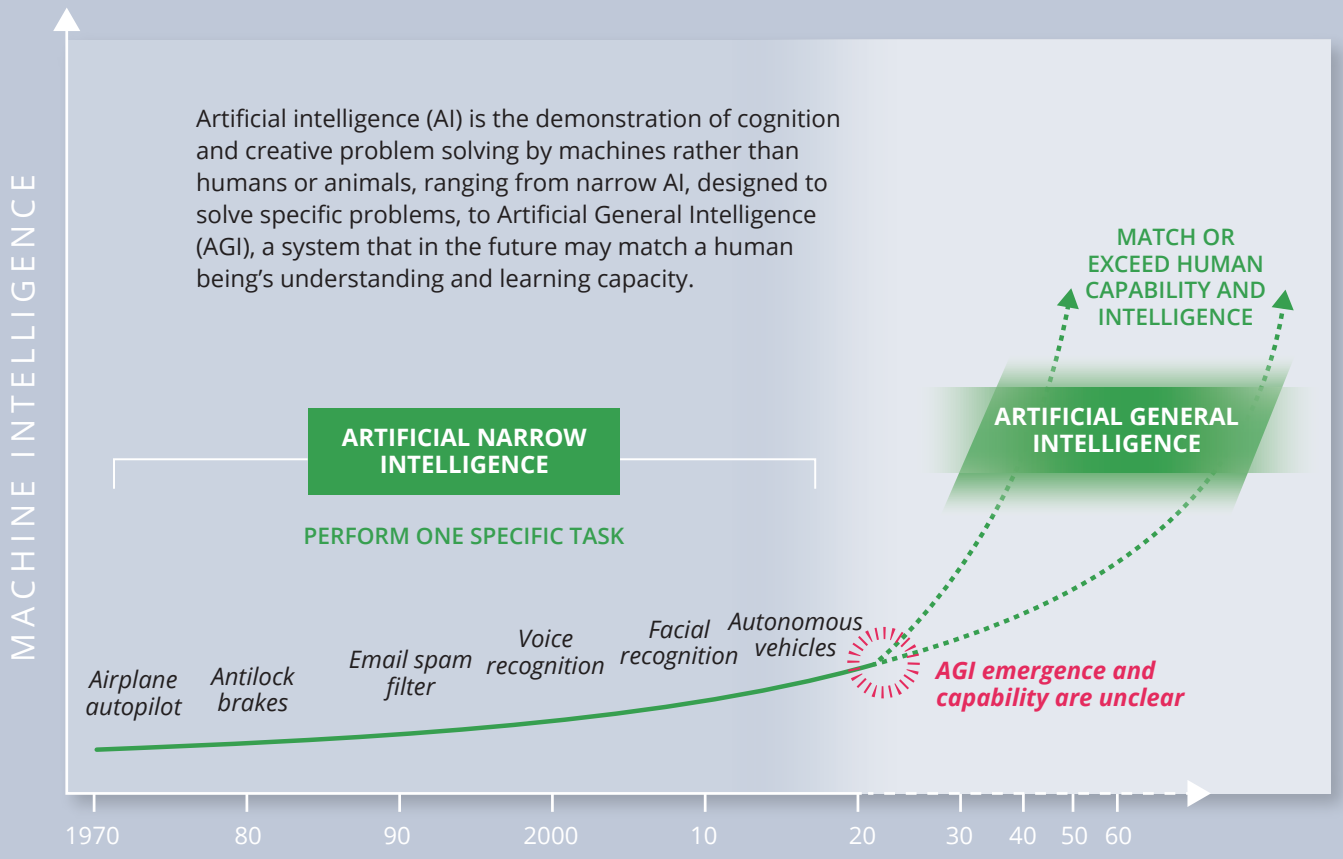
TRAJECTORY OF ARTIFICIAL INTELLIGENCE



tential for transformative change and provide examples of the potential consequences of new technologies in the coming decades. The following sections on AI, biotechnology, and materials and manufacturing—selected after consultation with technology leaders—highlight the potential benefits and risks of new technologies individually and collectively in creating a future hyperconnected world. Advances in these areas will combine with other technologies, such as energy storage, to shape societies, economies, and perhaps the nature of power.

Artificial Intelligence Becoming Mainstream

AI is the demonstration of cognition and creative problem solving by machines rather than humans or animals, ranging from narrow AI, designed to solve specific problems, to Artificial General Intelligence, a system that in the future may match or exceed a human being's understanding and learning capacity. By 2040, AI applications, in combination with other technologies, will benefit almost every aspect of life, including improved healthcare, safer and more efficient transportation, personalized education, improved software for everyday tasks, and increased agricultural crop yields. Political and business leaders worldwide are seeking global talent and are pouring resources into developing AI, hoping to be among the first to use it to reshape societies, economies, and even war. Enabled by concurrent increases in high-quality data, computing capability, and high-speed communication links, AI will challenge leaders to keep pace

and reap the benefits while mitigating harmful effects, such as threats to privacy and liberty.

Although many new AI developments will be available globally, there are disproportionate advantages for nations that can afford to support, develop, and adopt AI now. Widespread adoption of AI, particularly in warfare, also increases the risk of intentional misuse or unintended engagement or escalation.

Industry and Labor Transformed. AI will transform almost all industries and disrupt the global labor force, creating new job fields, eliminating others, and driving significant economic and social redistributions. Human-machine teaming will be common for many future jobs. To harness the advantages of AI while mitigating unemployment, countries and corporations will need to focus on education and retraining their workforce.

Data Will Be King. AI dependent industries and organizations of the future will require massive quantities of data to operate efficiently and competitively. Institutions, companies, and countries already investing in ways to acquire, classify, store, and monetize data will have advantages. The unprecedented amounts of data available in 2040 will provide valuable insights and capabilities but also open up access, privacy, ownership, and control of data as areas of increasing competition and conflict.

Security and Privacy Reimagined. Current notions of privacy will continue to evolve, with individuals needing to share more personal information for access to applications, and tracking becoming ubiquitous. Authoritarian governments are likely to exploit increased data to monitor and even control their populations. Moreover, many companies and organizations will also have powerful tools such as video manipulation, or deep fakes, to improve tailored marketing or advance a particular narrative. Emerging AI applications may also become potential targets for data manipulation to skew their output.

Ethics of Autonomy. AI's development and the level of human involvement in decision-making, if any, will continue to raise ethical concerns, and perspectives on ethical obligations are likely to be differ globally. In addition, the opaque nature of AI decisionmaking increases the possibility of unintentional bias, discrimination, unexpected outcomes, or intentional misdirection. Cooperation to advance trustworthy AI, with transparent and clear decisionmaking processes, may improve trust and confidence for all parties. Although many countries will develop strict rules on the use of personal data, there will be debate on whether these rules can coexist with the full realization of AI capabilities.

AI Enhanced Warfare. AI will confer strong advantages to countries that incorporate AI into their military systems. AI will enhance the performance of existing weapons, defenses, and security systems, both physical and cyber, while counter-AI techniques, designed to negate or confuse AI decision making, also are likely to emerge.

Smart Materials and Manufacturing Are Building a New World

By 2040, advances in novel materials, coupled with smart manufacturing, will reshape the production of everything from consumer goods to high-end military systems, reducing costs, extending capabilities, shifting supply chains, and enabling entirely new design options. The period of rapid change we are entering is often referred to as a Fourth

Industrial Revolution because of its potential to improve standards of living while possibly disrupting traditional industries, jobs, supply chains, and business models.

Materials and manufacturing are inextricably linked in a long-standing virtuous cycle, where advances in one drive advances in the other. Although this cycle alone could continue to drive progress for decades to come, it most likely will be accelerated by convergent advances in high performance computing, materials modeling, AI, and bio-materials. Increased connectivity will complement this growth by allowing advances to be distributed and accessible across the globe.

Increased Design Options. Additive manufacturing (AM), more commonly known as 3D printing, is being used to fabricate an increasing variety of materials, from titanium to explosives, in smaller facilities and with less expertise, bringing advanced manufacturing capabilities to small companies and individuals worldwide. Despite some technical hurdles and questions of reliability, AM is driving a revolution in modern manufacturing by enabling rapid prototyping, highly customized parts, on-site production, and the fabrication of shapes that would otherwise be impossible.

Adapting On The Fly. Advances in information systems, including computational modeling and machine learning, combined with advanced physical systems, such as a robust industrial Internet of Things and advanced robotics, are likely to enable fully integrated, collaborative manufacturing systems that respond in real time to meet changing conditions in the factory, in the supply network, and in demand.

Design What You Need. Materials today are undergoing a revolutionary transformation, shifting from off-the-shelf materials to optimized materials and processes designed for custom products. Combined with additive manufacturing, materials-by-design will enable great strides in making everything from airplanes to cell phones stronger, lighter, and more durable.

Assemble What You Need. The coming decades will see advances in the development of new materials with previously unobtainable properties, enabling previously unreachable levels of performance for many applications. Two-dimensional materials, metamaterials, and programmable matter will have unusual strength, flexibility, conductivity, or other properties that enable new applications.

Biotechnology Enabling Rapid Innovation

Improved capability to predictably manipulate biological systems, augmented by advances in automation, information, and materials sciences, is spurring unprecedented innovation in health, agriculture, manufacturing, and cognitive sciences. By 2040, biotechnology innovations most likely will enable societies to reduce disease, hunger, and petrochemical dependence and will transform how we interact with the environment and each other. Societies will be challenged to harness these beneficial advancements while addressing the market, regulatory, safety, and ethical concerns surrounding these technologies—for example, genetically modified crops and foods.

Biotechnology is likely to make significant contributions to economic growth during the next two decades, potentially affecting 20 percent of global economic activity by 2040, notably in agriculture and manufacturing, based on

BENEFITS AND RISKS OF ADVANCED BIOTECHNOLOGY APPLICATIONS

BENEFITS	APPLICATION	RISKS
Misdiagnoses plummet and healthcare outcomes improve.	**DIGITAL HEALTH / PERSONALIZED MEDICINE** *Tailored medical treatments using AI to combine data from genetic sequencing, diagnostics, and biomonitoring.*	*Access disparities due to costs or location. Personal health data misuse or manipulation.*
Rapid, more effective medical treatments.	**ON DEMAND MEDICINE PRODUCTION** *Cell-and gene-based therapies, combined with improvements in drug design and production, for faster disease response.*	*Disputes over R&D prioritization in developed vs. developing countries.*
Reduce delays and rejections of organ transplants and repairs.	**BIOPRINTING AND XENOTRANSPLANTATION** *Additive manufacturing to "print" biological parts for medical testing or tissue replacement, grow human-compatible organs in animals for transplantation.*	*Access disparities due to the high up-front costs.*
Major reduction in inherited genetic diseases.	**REPRODUCTIVE ENGINEERING** *Using genomic technologies to select and modify human embryos for broad range of traits and abilities.*	*Ethical and social divides over applications. Unequal access.*
Novel treatments for neurological disorders. Enhanced cognition and expanded perception.	**COMPUTER-HUMAN INTERFACES** *Machine augmentation of human cognitive processes.*	*Tensions between augmented and non-augmented individuals. New cyber/bio vulnerabilities.*
Improved speed and reliability in designing and making novel materials, medicines.	**BIO-MANUFACTURING** *Bio-design and production of enhanced or highly specified materials, medicines and foods.*	*Increased potential for misuse and workforce restructuring.*
Ready production of new and novel molecules, materials and treatments.	**SYNTHETIC ORGANISMS** *Genetically modified organisms and biological processes create new materials and medicines.*	*Potential for weapons applications or accidental misuse. Unknown environmental impacts.*
Make barren or depleted lands productive. Mitigate human-induced and natural threats to the environment.	**ENVIRONMENTAL RESTORATION** *Large-scale ecological intervention, through biotechnology, reforestation, or ocean engineering creates, manipulates, or rescues damaged environments.*	*Unintended, potentially global environmental or public health consequences.*
Practically unlimited capacity for long-term data storage.	**DNA-BASED DATA STORAGE** *DNA used to encode and store data.*	*Increased potential for long-term social monitoring.*
Increased variety of cheaper, more nutritious foods created with lower environmental impact.	**TRANSFORMED AGRICULTURE AND FOOD PRODUCTION** *Automated precision production processes and integrated crop-livestock systems use genetically altered organisms.*	*Reduced biodiversity, social tensions over genetic modification, workforce and supply chain disruptions.*

NEW TECHNOLOGIES FUELING SPACE COMMERCE AND SPARKING COMPETITION

The space landscape in 2040 will combine emerging technology with a maturation of today's capabilities to help drive commercialization and introduce new applications. Services, such as communications, navigation, and satellite imagery, will become ubiquitous offering improved capabilities, lower costs, and increasing efficiencies. The efforts of both government and commercial actors will establish new domains of space competition, particularly between the United States and China.

Space Exploration Expands

By 2040, an increasing number of countries will be participating in space exploration as part of international cooperative efforts. By doing so, these countries will acquire national prestige, opportunities for scientific and technical advancement, and potential economic benefits. Although governments will remain the primary source of funding to support large-scale space exploration activities, the role of commercial entities will expand dramatically in most aspects of space activities. Commercial efforts will coexist, and probably cooperate, with government-funded space programs, advancing space technologies.

China As A Space Power

By 2040, China will be the most significant rival to the United States in space, competing on commercial, civil, and military fronts. China will continue to pursue a path of space technology development independent of that involving the United States and Europe and will have its own set of foreign partners participating in Chinese-led space activities. Chinese space services, such as the Beidou satellite navigation system, will be in use around the world as an alternative to Western options.

Space Supporting Government and Military Needs

Enhanced space services and new technology will be available for military applications as well as civil government and commercial use. National space assets will be particularly coveted as governments remain concerned about the possibility that commercial or foreign government space services could be denied in conflict.

On-Orbit Activities Become Routine

By 2040, governments probably will conduct routine on-orbit servicing, assembly, and manufacturing activities, enabled by advanced autonomy and additive manufacturing, to support national space systems and international efforts. Commercial companies probably will offer on-orbit services, such as repair, remote survey, relocation, refueling, and debris removal. On-orbit services will be used to upgrade satellites, extend their functional lives, and allow for new types of space structures, such as extremely large or complex instruments, but they may need government support to establish the industry.

AI Goes to Space

AI will allow innovative use of space services by assisting with operation of large satellite constellations and space situational awareness capabilities. AI will also support the fusion and analysis of enormous volumes of high-quality, continuously collected data, driven partly by hyperconnected space and ground systems.

bioeconomy growth rates relative to gross domestic product (GDP). In 2019, the United States estimated its bioeconomy at nearly $1 trillion dollars annually, or approximately 5.1 percent of its total economy, while European Union and UN estimates from 2017-19, which apply a broader definition of bioeconomic activities, show biotech contributing as much as 10 percent to Europe's economy.

Hyperconnectivity Uniting and Separating Societies

By 2040, the world will have orders-of-magnitude more devices, data, and interactions, linking together all aspects of modern life and crossing political and societal boundaries. Increasing speed and global access will provide nations, corporations, and even individuals with services and resources once limited to prosperous countries. This hyperconnected world is a future already beginning to emerge; next generation networks, persistent sensors, and myriad technologies will fuse together in a global system with billions of connected devices. Today's ubiquitous public cameras, for example, will lead to tomorrow's smart cities, where optical and other sensors combine with AI to monitor people, vehicles, and infrastructure globally.

By some estimates, the current Internet of Things, a precursor to a hyperconnected future, will reach 64 billion objects by 2025, up from 10 billion in 2018—all monitored in real time. Looking forward, a hyperconnected world could support up to 1 million devices per square kilometer with next generation cell phone systems (5G), compared with the 60,000 devices currently possible with current cell networks, with even faster networks on the horizon. Networked sensors will become ubiquitous; more than 20 billion devices were operative in 2020, and with new terrestrial networks combined with an increase in space-based services, it is projected that hundreds of billions and eventually trillions of devices may be connected globally.

Accelerated Societal Change. Privacy and anonymity may effectively disappear by choice or government mandate, as all aspects of personal and professional lives are tracked by global networks. Real-time, manufactured or synthetic media could further distort truth and reality, destabilizing societies at a scale and speed that dwarfs current disinformation challenges. Many types of crimes, particularly those that can be monitored and attributed with digital surveillance, will become less common while new crimes, and potentially new forms of discrimination, could arise.

New Cybersecurity Paradigms. Greater connectivity almost certainly will increase the vulnerability of connected individuals, institutions and governments as the presence of hundreds of billions of connected devices vastly increases the cyber-physical attack surface. In addition, cyber security enforcement based on geographic borders is likely to become less relevant in an increasingly global web.

BROADER IMPLICATIONS OF TECHNOLOGY EVOLUTION

Emerging technologies are rapidly improving a broad range of human experiences and capabilities, but at least in the short term, these same technologies may disrupt longstanding systems and societal dynamics, forcing individuals, communities, and governments to adjust and find new ways of living, working, and managing. As with any disruption, some will thrive whereas others will struggle, potentially facing increasing inequalities and imbalances. Emerging technologies are not solely responsible for the following developments, but they are likely to aggravate and amplify them.

NASA / Unsplash

Solving Problems Fast. As the global COVID-19 vaccine development effort has showcased, technologies—often integrated in new and imaginative ways—can be quickly reapplied from their original use to solve crisis needs. The research that enabled the unprecedented and rapid development of effective COVID-19 vaccines built on decades of foundational investments in the health sciences. Similarly, challenges decades in the making, such as climate change, may be moderated by bringing together suites of technological solutions that each address one element of a much larger issue.

Technology as Geopolitical Power. Technology is a tool of national power that the United States has long led through investments in research, innovation, and development. The next decades will see increasing global competition for the core elements of technology supremacy, such as talent, knowledge, and markets, potentially resulting in new technological leaders or hegemonies in the 2030s. Complex international supply chains, the global diffusion of innovation, and investments by geopolitical rivals could further impede the unilateral use of technology by nations to achieve their goals. Conditions are ripe for both greater international cooperation as well as new types of multifaceted competition and conflict that could define the coming era.

Aggravating Social Tensions. The pace of technological change could increase societal tensions between those with the access, ability, and will to adapt and those who are unable or unwilling to change. With the rapid spread and adoption of technologies, some individuals, communities, and countries could make rapid advancements while others may be left behind with little hope of catching up, exacerbating inequalities within and between states.

Technological adoption also may outpace ethical maturity and regulation, creating persistent and potentially corrosive social anxiety and political divisions. These tensions could be further inflamed by the use of manufactured or AI targeted messaging such as deep fakes.

Complicating Government-Corporate Relationships. Public-private partnerships for investment, research, and development have been critical for attaining many technological breakthroughs and advantages, but core corporate and national interests do not naturally align. Large technology companies increasingly have resources, reach, and influence that rivals and even surpasses some states. National interests in maintaining technological control and advantage as well as protecting national security can be at odds with corporate interests in expanding global market share and increasing profits.

Disrupting Industries and Jobs. The pace of technological change, notably developments in advanced manufacturing, AI, and biotechnology, may hasten disruptions to manufacturing and global supply chains, eliminating some modes of production and jobs and bringing supply chains closer to markets. Shifting supply chains could disproportionately affect less advanced economies, while many new jobs will require workers with improved or retooled skills.

Enabling Governance, Threatening Freedom and Privacy. The technology-saturated and hyperconnected future will offer leaders and governments new tools to monitor their populations, enabling better service provision and security but also offering greater means of control. The same technologies that empower citizens to communicate, organize, and monitor their health are providing increasing amounts of data to governments and the private sector. Governments, especially authoritarian governments, will exercise unprecedented surveillance capabilities to enforce laws and provide security while tracking and de-anonymizing citizens and potentially targeting individuals.

Stimulating Debates Over Openness. The prospects of a hyperconnected world will stimulate debates and divisions within and between states about the benefits and risks of open, connected networks. As global networks become increasingly interconnected, it may be more difficult to maintain a segregated or closed system, and efforts to block the broader Internet potentially could irreparably cut off closed systems from the global economy.

Existential Risks. Technological advances may increase the number of existential threats; threats that could damage life on a global scale challenge our ability to imagine and comprehend their potential scope and scale, and they require the development of resilient strategies to survive. Technology plays a role in both generating these existential risks and in mitigating them. Anthropomorphic risks include runaway AI, engineered pandemics, nanotechnology weapons, or nuclear war. Such low-probability, high-impact events are difficult to forecast and expensive to prepare for but identifying potential risks and developing mitigation strategies in advance can provide some resilience to exogenous shocks.

EMERGING DYNAMICS

While these demographic, environmental, economic, and technological trends are setting the stage, the story of the next 20 years will be written primarily by the choices made at societal, state, and international levels. Emerging dynamics at all levels point to greater debate and contestation. Personal and policy choices will determine the cohesiveness of societies, the resilience of states in all regions, and the types of interactions between states.

In many countries, people are pessimistic about the future and growing more distrustful of leaders and institutions that they see as unable or unwilling to deal with disruptive economic, technological, and demographic trends. In response, people are gravitating to familiar and like-minded groups for community and security, including ethnic, religious, and cultural identities as well as groupings around interests and causes. Communities are more fragmented and in conflict; a cacophony of competing visions, goals, and beliefs are placing greater demands on governments.

At the same time, governments are struggling under mounting pressures and tighter resources, and they are finding it difficult to meet the challenges of a globally interconnected, technologically advanced, and diverse world. The result is a growing disequilibrium between public demands and governments' ability to deliver welfare and security, portending greater political volatility and increasing risks for democracy. Unmet needs and expectations are encouraging a flourishing marketplace of additional actors providing governance, security, and services, including nongovernmental organizations, churches, corporations, and even criminal organizations. States that adapt to the mounting governance challenges probably will be better positioned to rebuild trust and legitimacy.

During the next two decades, power in the international system will evolve to include a broader set of sources and features with expanding technological, network, and information power complementing more traditional military and economic power. The rivalry between the United States and China is likely to set the broad parameters for the geopolitical environment during the coming decades, forcing starker choices on other actors. States will leverage these diverse sources of power to jockey over global norms, rules, and institutions, with regional powers and nonstate actors exerting more influence within individual regions and leading on issues left unattended by the major powers. The increased competition over international rules and norms, together with untested technological military advancements, is likely to undermine global multilateralism, broaden the mismatch between transnational challenges and institutional arrangements to tackle them, and increase the risk of conflict.

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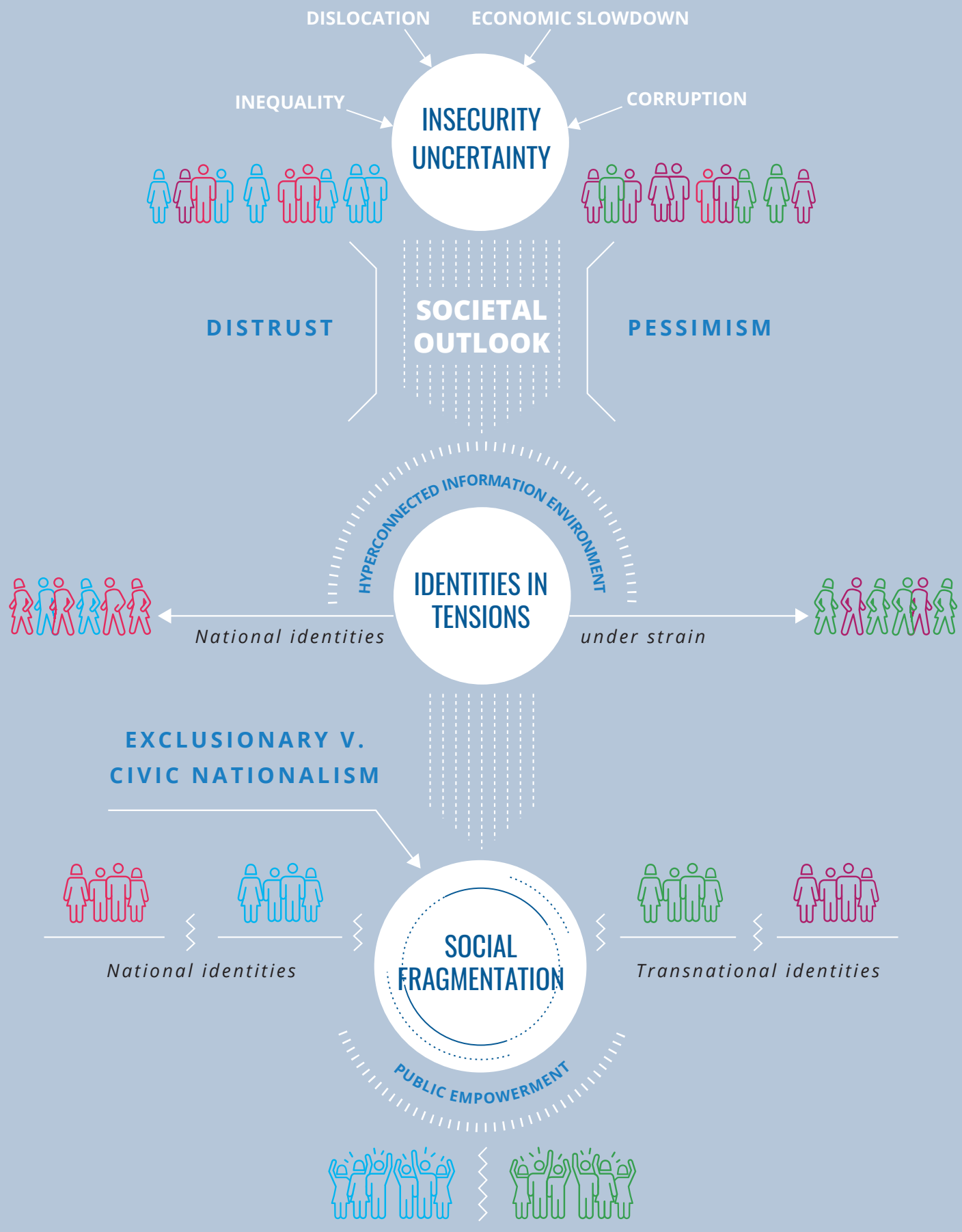
EMERGING DYNAMICS

SOCIETAL: DISILLUSIONED, INFORMED, AND DIVIDED

Key Takeaways

- Slowing economic growth and gains in human development, coupled with rapid societal changes, have left large segments of the global population feeling insecure, uncertain about the future, and distrustful of institutions and governments they view as corrupt or ineffective.
- Many people are gravitating toward familiar and like-minded groups for community and security, including ethnic, religious, and cultural identities as well as groupings around interests and causes. These groups are more prominent and in conflict, creating a cacophony of competing visions, goals, and beliefs.
- The combination of newly prominent transnational identities, the resurgence of established allegiances, and a siloed information environment is creating and exposing fault lines within states, undermining civic nationalism, and increasing volatility.
- Populations in every region are becoming better equipped with the tools, capacity, and incentive to agitate for social and political change and to demand resources, services, and recognition from their governments.

Mauro Mora / Unsplash


DISLOCATION
ECONOMIC SLOWDOWN
INEQUALITY
CORRUPTION
INSECURITY
UNCERTAINTY
DISTRUST
SOCIETAL
OUTLOOK
PESSIMISM
HYPERCONNECTED INFORMATION ENVIRONMENT
IDENTITIES IN
TENSIONS
National identities
under strain
EXCLUSIONARY V.
CIVIC NATIONALISM
SOCIAL
FRAGMENTATION
National identities
Transnational identities
PUBLIC EMPOWERMENT

Potentially slower economic growth in coming years and smaller gains in human development in many countries are likely to exacerbate distrust of institutions and formal sources of authority for some members of the public.

RISING PESSIMISM, WAVERING TRUST

Global and local challenges, including economic strains, demographic shifts, extreme weather events, and rapid technological change, are increasing perceptions of physical and social insecurity for much of the world's population. The COVID-19 pandemic is intensifying these economic and social challenges. Many people, particularly those who are benefiting less than others in their societies, are increasingly pessimistic about their own prospects, frustrated with government performance, and believe governments are favoring elites or pursuing the wrong policies. The economic growth and rapid improvements in health, education, and human development of the past few decades have begun to level off in some regions, and people are sensitive to the increasing gap between winners and losers in the globalized economy and are seeking redress from their governments. Approximately 1.5 billion people moved up into the middle class in the past few decades, but some are beginning to fall back, including in advanced economies.

Public opinion polls repeatedly have shown increasing pessimism about the future in countries of all types around the world, but especially in advanced and middle-income economies. According to the 2020 Edelman Trust Barometer, the majority of respondents in 15 of 28 countries polled are pessimistic that they and their families will be better off in five years, an average increase of 5 percent from the previous year. Less than a quarter of those polled in France, Germany, and Japan, for example, believe they will be better off in 2025. In coming years, this pessimism is likely to spread in developing countries with large youthful populations but with slowing progress in eradicating poverty and meeting human development needs, particularly Sub-Saharan Africa.

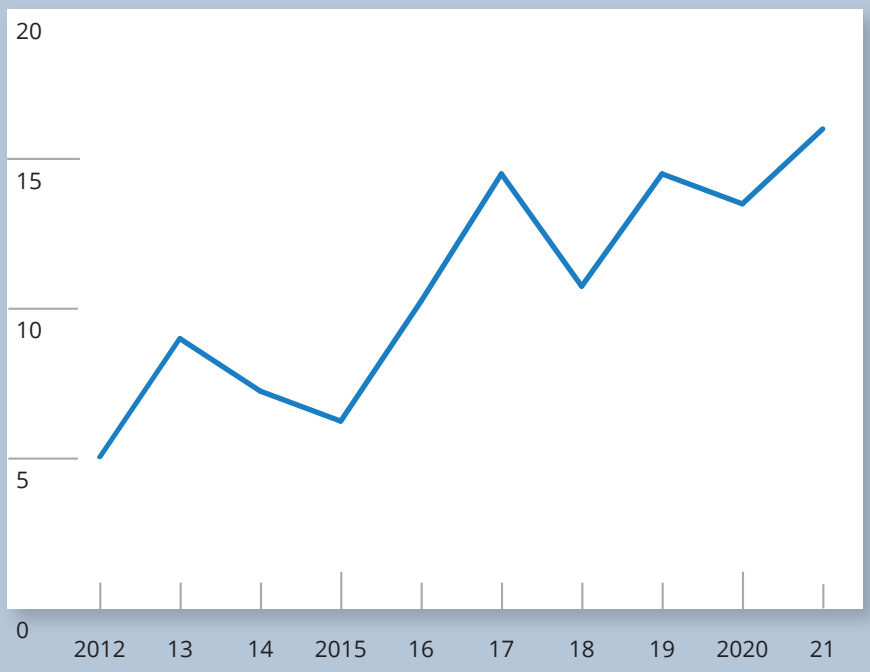
Potentially slower economic growth in coming years and smaller gains in human development in many countries are likely to exacerbate distrust of institutions and formal sources of authority for some members of the public. Trust in governments and institutions, which is highly dependent on perceptions of fairness and effectiveness, has been consistently low for the past decade, particularly in middle- to high-income countries. In a 2020 study of 16 developed countries by Edelman, the portion of the mass public trusting government since 2012 never exceeded 45 percent, and among Organization for Economic Cooperation and Development (OECD) economies, public trust in government fell in more than half of countries between 2006 and 2016, according to separate public opinion polling by Gallup. Of 11 geographically diverse countries analyzed by Edelman during the COVID-19 pandemic, pub-lic trust in government increased an average of 6 percentage points between January and May 2020, and then it declined an average of 5 percentage points between May 2020 and January 2021 as governments failed to contain the coronavirus.

Trust is not uniform across societies. Globally, trust in institutions among the informed public—defined as people who are college educated, are in the top 25 percent of household

TRUST GAP, 2012-21

Average trust gap between informed public and mass public in four key institutions: business, media, government, and non-governmental organizations.

Percent trust gap



***Informed Public**: College-educated 35-64 year-olds in the top 25 percent of household income and report significant media consumption and public engagement.*

***Mass Public**: All population not including informed public.*

Source: Richard Edelman, *Twenty Years of Trust*, 2020.

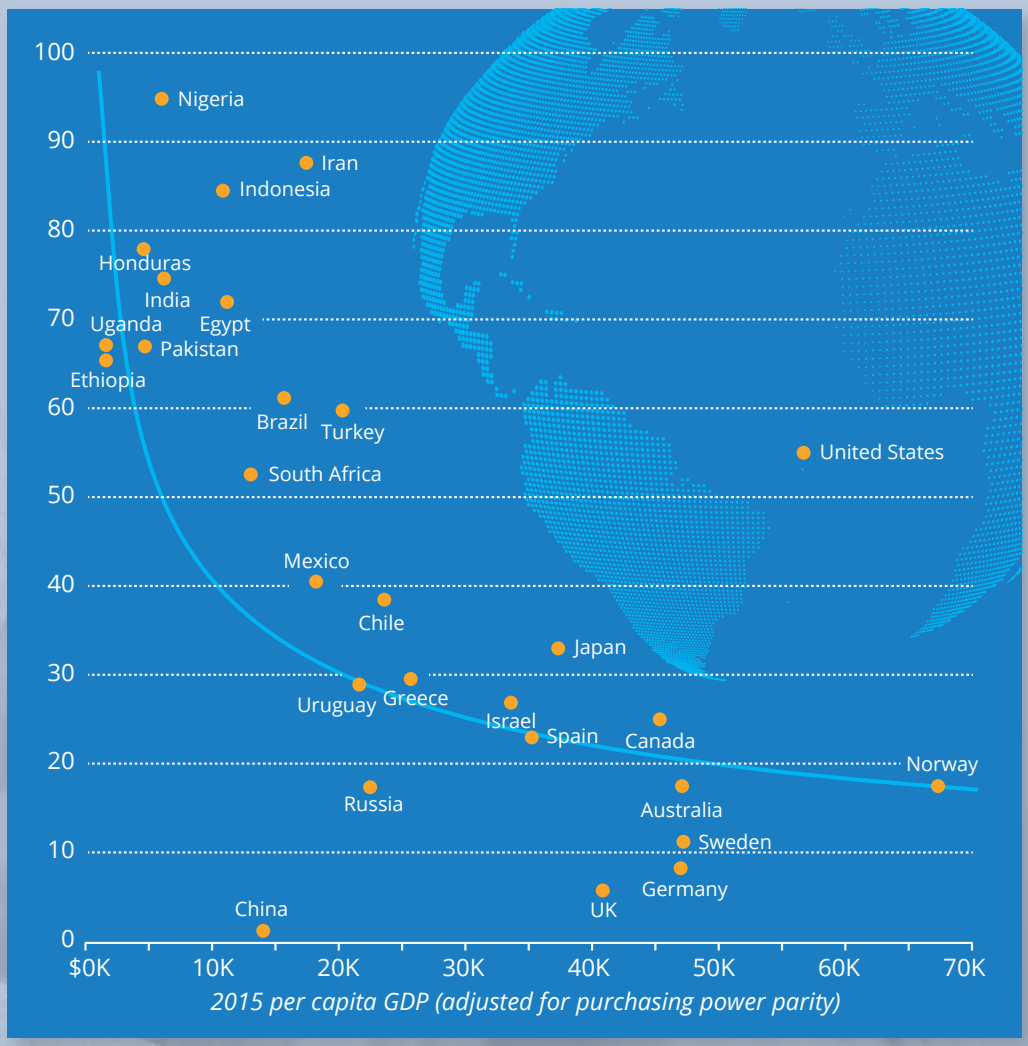
income in each market, and exhibit significant media consumption—has risen during the past 20 years whereas more than half of the mass public during the past decade repeatedly say the "system" is failing them. The gap in trust in institutions between the informed public and the mass public has increased during the past decade, according to the Edelman surveys, showing a gap of 5 percentage points in 2012 and 16 points in the 2021 report. Similarly, the gap in trust in business quadrupled during this period.

- Increasing actual or perceived inequality within countries, particularly in those in which overall economic growth is slowing, often coincides with declining trust and rising public dissatisfaction with the political system. In less-developed countries, corruption is undermining confidence in government, and people tend to trust informal institutions more than government where political power is concentrated among the wealthy elite. Corruption is now one of the most dominant factors driving demand for political change. According to 2019 polling by Transparency International, a majority of respondents across Latin America (53 percent), the Middle East and North Africa (65 percent), and Sub-Saharan Africa (55 percent) said that corruption is increasing in their region.
- In coming years, advancements in artificial intelligence (AI), machine learning, 5G, and other technologies that will expand access to the Internet could further diminish public trust as people struggle to determine what is real and

SELECTED WORLDWIDE RELIGIOUS COMMITMENT: PRAYER AND WEALTH

The data reveals an inverse correlation between religiosity, as measured by the percent of adults who say they pray daily, and per capita GDP.

Percent of adults who say they pray daily



Source: Pew Research Center surveys 2008-2017. The Age Gap in Religion Around the World.

what is rumor or manipulation. In addition, populations fear the increasingly pervasive surveillance and monitoring by governments and fear private corporations seeking control or profit from their personal information.

IDENTITIES MORE PROMINENT

As trust in governments, elites, and other established institutions erodes, societies are likely to fragment further based on identities and beliefs. People in every region are turning to familiar and like-minded groups for community and a sense of security, including cultural and other subnational identities as well as transnational groupings and interests. Identities and affiliations are simultaneously proliferating and becoming more pronounced. In turn, this is leading to more influential roles for identity groups in societal and political dynamics but also generating divisions and contention.

Many people are gravitating to more established identities, such as ethnicity and nationalism. In some countries, slowing population growth, increasing migration, and other demographic shifts are intensifying perceptions of vulnerability, including a sense of cultural loss. Many people who feel displaced by rapid social and economic changes resent violations of age-old traditions and perceive that others are benefiting from the system at their expense. These perceptions also fuel beliefs that economic and social change is damaging and that some leaders are pursuing misguided goals.

Consistent with the growing salience of established identities, religion continues to play important roles in people's lives, shaping what they believe, whom they trust, with whom they congregate, and how they engage publicly. In developing regions where populations are growing fastest, including Africa, South Asia, and parts of Latin America, publics report greater participation in religious practices, pointing to the sense of purpose religion provides. Perceptions of existential threats from conflict, disease, or other factors also contribute to higher levels of religiosity.

Buddhist monks advocating for democracy near Mandalay, Burma. Religion plays a key organizing role in some parts of the world, serving as an important source of legitimacy and authority.

Many people are emphasizing and organizing around different aspects of their identities, including race, gender, and sexual orientation, as well as around causes and issues, such as climate change and religious freedom. The forces of globalization, including greater mobility, urbanization, and connectivity, are increasing awareness and prominence of a wide array of constituencies that transcend national boundaries and are making it easier for people to organize around common interests and values. These identities are playing greater roles within and between countries as groups agitate for recognition and specific goals. For example, a broad global coalition has successfully lobbied for public acceptance of and legal protections for homosexuality worldwide, including organizing online campaigns and public events even in socially conservative countries, such as Iran. Between 2013 and 2019, the percentage of people indicating that homosexuality should be accepted in society increased in 21 of 27 geographically diverse countries, according to the Pew Research Center, and 30 countries have legalized same-sex marriage since 1989.

. . . And in Conflict

The expansion and increasing prominence of identity groups demanding recognition and rights are forcing an increase in debate about the social and economic foundations of societies. Intensifying and competing identity dynamics are likely to provoke increasing political debate and polarization, societal divisions, and in some cases, unrest and violence.

- Increasing numbers of immigrants, refugees, and guest workers in many countries, such as middle-income countries in Southeast and Central Europe, are prompting heated debates about national identity and citizenship and leading to the emergence of ethnic nationalist political parties, greater demands for assimilationist policies, and a decline in support for migrants globally.
- The growing recognition and support for LGBTQ rights are prompting responses from people in countries in every region, such as Brazil, Iran, Nigeria, and Poland, where some people perceive such movements as an affront to their deeply held beliefs and corrosive to their societies. Political and religious leaders in some countries are advocating laws restricting LGBTQ rights and criminalizing homosexuality.
- In most countries, progress toward gender equality has been substantial, including improving education, healthcare, job opportunities, and leadership roles, but even in longstanding democracies, resentment and pushback remain. The global #MeToo movement shed light on the breadth of sexual harassment and sexual assault that occurs across the world, but still several countries, such as Hungary and Russia, have reduced protections for women, including decriminalizing domestic and sexual violence.

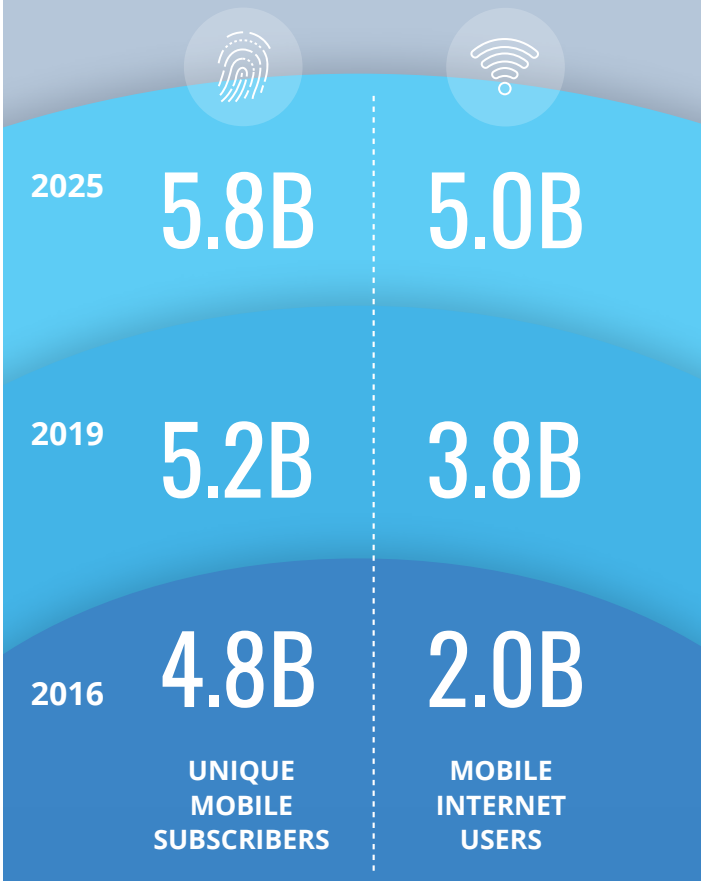
INFORMATION ENVIRONMENT CONNECTING, CONFUSING, AND DIVIDING

The exponential growth of the hyperconnected information environment is likely to strengthen and further complicate identity allegiance and societal dynamics. Social media, in particular, makes it easier for people to affiliate with others around the world who share common characteristics, views, and beliefs. Moreover, social media can create echo chambers of like-minded users who share information that confirms their existing worldviews and limits their understanding of alternative perspectives.

Over time, this dynamic is increasing awareness of and building new connections between previously isolated groups, while also polarizing people's perceptions of policies, public institutions, events, moral issues, and societal trends. Such polarization will lead to a proliferation of competing, entrenched perspectives, limiting opportunities for compromise and decreasing societal cohesion.

During the next 20 years, the algorithms and social media platforms that curate and distill massive amounts of data will produce content that could overtake expertise in shaping the political and social effects engendered by a hyperconnected information environment. Power increasingly will be wielded by the generators of content as well as the arbiters of who gets to see it. Social media platforms will reinforce identity groups, or foster new and unanticipated groupings, and accelerate and amplify natural tendencies to associate with people who share the same views, often engendering competing visions of the truth

GROWTH IN MOBILE DIGITAL COMMUNICATION



Source: Global System for Mobile Communications Association.

about an issue. The platforms will make it easier for competing opinion leaders—including from marginalized groups—to publish their views and debate among themselves, honing the cohesiveness and "market appeal" of their messages. This effect is magnified because people rely on their own identity communities for information and piggyback on the knowledge of others.

People will also use social identities such as culture, ethnicity, nationality, and religion as critical filters for managing information overload, potentially further fragmenting national identities and undermining trust in government. These identities provide a sense of belonging and reinforce norms about how group members should behave, rules about whom to trust, and beliefs about complex issues. Identity-based violence, including hate and political crimes, may increasingly be facilitated by social media. In India, social media and mobile messaging platforms have become a key force behind viral falsehoods, such as rumors that quickly spread among some Hindus regarding Muslims' alleged slaughter of cows or possession of beef, which led to the "cow vigilante" lynching of Muslims.

Publics increasingly will depend on their favorite gatekeepers—such as news media outlets, social media platforms, and trusted voices of authority—to sift truth from fiction. Efforts to arbitrate controversial content, such as flagging or removing demonstrably false claims, are unlikely to be effective in changing beliefs and values aligned with one's closely held identities, however. Identity-based beliefs tend to eclipse truth-seeking because of the overriding need to belong, obtain status, understand the social world, maintain dignity, and feel morally justified.

Nighttime traffic in Jakarta. Urbanization will create greater concentrations of people able to mobilize around shared grievances.

NATIONAL IDENTITIES UNDER STRAIN

In some countries, the contestation among identities is challenging conceptions of national identity, which historically have been a source of state cohesion and national purpose. Nationalism overall has gained strength, but in some cases, exclusionary forms of nationalism are gaining prominence and weakening ideals of civic nationalism. Societies that are ethnically and culturally diverse may be more susceptible to challenge. Exclusionary forms of nationalism have been ascendant in many regions, especially those experiencing demographic changes, with slow or stagnant economic growth and people who fear losing special status.

- Some leaders and regimes are fanning exclusionary nationalism to promote their rule and policies. In Burma, for example, the halting democratic transition during the past decade and countrywide poverty increased insecurities, which helped to intensify Buddhist nationalism and foster anti-Muslim sentiments and even violence. Likewise, Chinese leaders have tapped widespread, often xenophobic nationalism to build support for policies, such as an aggressive Chinese posture in territorial disputes.
- In other cases, cultural and economic insecurity stemming from globalization has fueled nationalist forces. For example, British supporters of Brexit cited a range of longstanding British complaints about the European Union, but most polling indicated that concern with migration was a key factor driving the Brexit vote. The migrant crisis in 2015 also prompted a surge in nationalist forces in several other European countries, including France, Germany, and the Netherlands, where majority populations fear cultural change and economic competition.
- Some government regimes seek to use religious and ethnic themes in other countries to mobilize foreign popular support for their foreign policy objectives. India's attempts to export Hindu nationalism, Turkey's effort to mobilize the Turkish diaspora in Europe to amplify Turkey's influence, and Russia's support of Russian Orthodox minorities outside Russia demonstrate ways in which leaders exploit identities to achieve foreign policy goals.

PUBLICS MORE EMPOWERED, MORE DEMANDING

During the past few decades, steady economic improvements and access to technology have equipped populations in every region with the resources, time, and tools to channel their needs and interests into action and to engage officials and other elites with greater intensity, frequency, and effectiveness. Populations in advanced economies already are well positioned, and those in developing countries are becoming better equipped to agitate for change. For example, China's middle class, defined as those earning between $10 and $110 per day, has grown rapidly from 3.1 percent

Markus Spiske / Unsplash

of the population in 2000 to 52.1 percent in 2018—equivalent to approximately 686 million people who are better positioned to make demands on their government.

- Publics in most of the world have grown more prosperous and educated during the past several decades, and the corresponding reduction in people's preoccupation with immediate needs has facilitated a wider scope of awareness and ambition. With greater prosperity, people will have more free time, higher expectations, and better access to the tools for participation, as well as increasing concerns about losing what they have achieved, which is likely to increase the intensity of political participation during the next two decades.
- Additionally, the growth in urban populations in the coming decades will be most pronounced in parts of the developing world that also struggle with the capacity to deliver services and are host to high percentages of young people, including Africa and South Asia. Urbanization is creating concentrated populations with shared interests and grievances—the raw ingredients fueling social movements that can quickly spiral into protests.
- The proliferation of communication technologies is raising real-time awareness of international trends and events on the ground and offering people the tools to organize and spread their messages. Between 2014 and 2020, the number of people worldwide using the Internet grew from 3 billion to 4.54 billion. Mobile Internet penetration is projected to increase from 49 percent in 2019 to 60.5 percent globally by 2025. An estimated 800 million more people will begin using social media platforms during the next five years, up from 3.6 billion people in 2020.

As people become better equipped and connected, the intensity of their demands on governments is likely to grow in every region. With higher expectations but more vulnerable conditions, people's demands on governments for solutions to growing challenges could become more varied, contradictory, and difficult to address. These demands are likely to range across economic, political, and social issues, with various groups pressing for conflicting policies—such as protecting key industries versus reducing greenhouse gas emissions. Even in countries with strong democracies, people are likely to turn to mass protests, boycotts, civil disobedience, and even violence with increasing frequency, judging from the rise in public protests during the past decade. Along with social media, these also will be the preferred ways to make voices heard in authoritarian countries. During the next two decades, these multiple paths for channeling discontent are likely to present an increasingly potent force with a mix of implications for social cohesion.

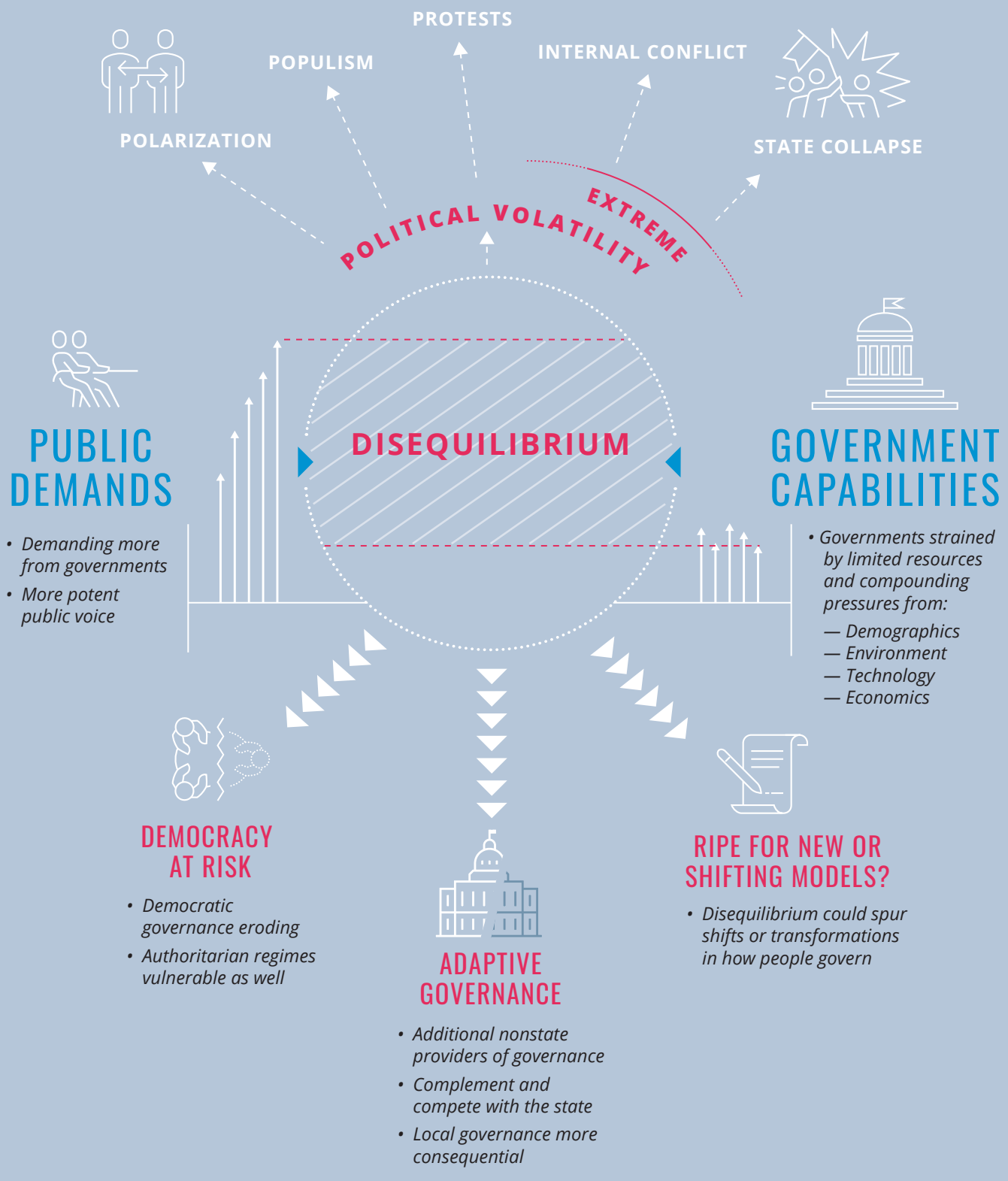
EMERGING DYNAMICS

STATE: TENSIONS, TURBULENCE, AND TRANSFORMATION

Key Takeaways

- Governments in all regions will face mounting pressures from economic constraints and a mix of demographic, environmental, and other challenges. Meanwhile, populations will demand more, and they are empowered to push for their conflicting goals and priorities.
- The relationships between societies and their governments are likely to face persistent tensions because of a growing mismatch between what publics expect and what governments deliver. This widening gap portends more political volatility, risks for democracy, and expanding roles for alternative sources of governance.
- Growing public discontent, if accompanied by a catalyzing crisis and inspired leadership, could spur significant shifts or transformations in how people govern.

Photo / Bigstock


PROTESTS
POPULISM
INTERNAL CONFLICT
POLARIZATION
STATE COLLAPSE
EXTREME
POLITICAL VOLATILITY
DISEQUILIBRIUM
PUBLIC DEMANDS
• Demanding more from governments
• More potent public voice
GOVERNMENT CAPABILITIES
• Governments strained by limited resources and compounding pressures from:
— Demographics
— Environment
— Technology
— Economics
DEMOCRACY AT RISK
• Democratic governance eroding
• Authoritarian regimes vulnerable as well
ADAPTIVE GOVERNANCE
• Additional nonstate providers of governance
• Complement and compete with the state
• Local governance more consequential
RIPE FOR NEW OR SHIFTING MODELS?
• Disequilibrium could spur shifts or transformations in how people govern

While populations are exercising more potent public voices, governments will experience mounting pressure from economic constraints and a mix of demographic, environmental, and other challenges.

GROWING MISMATCH BETWEEN PUBLIC DEMANDS AND GOVERNMENT CAPABILITIES

Over the next two decades, the relationships between states and their societies in every region are likely to face persistent tensions because of a growing mismatch between what publics need or expect and what governments can or are willing to deliver. In many countries, populations with expectations heightened by previous prosperity are likely to face greater strains and disruptions from slowing economic growth, uncertain job opportunities, and changing demographics. These populations also will be better equipped to advocate for their interests after decades of steady improvements in education and access to communication technologies as well as the greater coherence of like-minded groups. Although trust in government institutions is low among the mass public, people are likely to continue to view the state as ultimately responsible for addressing their challenges, and to demand more from their governments to deliver solutions.

While populations are exercising more potent public voices, governments will experience mounting pressure from economic constraints and a mix of demographic, environmental, and other challenges. Individually and collectively, these pressures will test states' capacity and resilience, deplete budgets, and add to the complexity of governing.

Demographics and Human Development. Many countries will struggle to build on or even sustain the human development successes achieved in the past several decades because of setbacks from the ongoing global pandemic, slower global economic growth, the effects of conflict and climate, and more difficult steps required to meet higher development goals. Meanwhile, countries with aging populations and those with youthful and growing populations will each face unique sets of challenges associated with those demographics. Migration is likely to increase the salience of identity issues that divide societies in receiving countries and may fuel ethnic conflicts. Rapid urbanization—occurring mostly in Africa and Asia—will stress governments' ability to provide adequate infrastructure, security, and resources for these growing cities.

Responding to **Climate Change and Environmental Degradation** will strain governments in every region. The impact will be particularly acute in Africa, Asia, and the Middle East, where governments are already weak, stressed, or fragile. Wealthy countries will also increasingly face environmental costs and even disasters that challenge governments' responsiveness and resources, potentially undermining public trust.

Economic Constraints. The expected trend of slowing economic growth is likely to strain the resources and capacity of governments to provide services. Governments are already saddled with debt on an unprecedented scale. In addition, rising or persistent inequality within many states, coupled with corruption, will threaten people's faith in government and trust in one another.

Technological Change. Governments will be hard pressed to keep up with the pace of technological change and implement policies that harness the benefits and mitigate the risks and disruptions. Technological advances will also empower individuals and nonstate actors to challenge the role of the state in new ways.

In the face of these challenges, existing systems and models of governance are proving inadequate to meet the expectations of populations. The result is a growing disequilibrium between public demands and governments' ability to deliver economic opportunity and security. This public pessimism cuts across rightwing, leftwing, and centrist governments, democratic and authoritarian states, and populist and technocratic administrations. For instance, in Latin America and the Caribbean, public opinion surveys in 18 countries showed a significant decline in satisfaction with how democracy is performing in their countries from an average of 59 percent of respondents in 2010 to 40 percent in 2018. As publics grow skeptical of existing government systems, governments and societies are likely to struggle to agree on how to adapt or transform to address key goals, including advancing economic opportunities, addressing inequalities, and reducing crime and corruption.

The nature of these challenges and the government responses will vary across regions and countries. In South Asia, for instance, some countries will face a combination of slow economic growth that is likely to be insufficient to employ their expanding workforces, the effects of severe environmental degradation and climate change, and rising polarization. Meanwhile European countries are likely to contend with mounting debt, low productivity growth, aging and shrinking workforces, rural-urban divides, and possibly increasing inequality as well as fractured politics and debates over economic and fiscal policies at the national level and in the EU. In China, the central tension is whether the Chinese Communist Party can maintain control by delivering a growing economy, public health, and safety, while repressing dissent. The massive middle class in China is largely quiescent now; an economic slowdown could change this.

Informal settlements in Mumbai, India. Inequality in many countries will be a key challenge for governments and a source of discontent among populations.

Alfarnas Solkar / Unsplash

Many states are likely to remain stuck in an uneasy disequilibrium in which populations are unsatisfied with the existing system but unable to reach consensus on a path forward. A decade ago, the Arab Spring exposed serious shortcomings in the prevailing political orders, but in most countries in the region, a new social contract between state and society has yet to emerge. Similar to the Middle East, other regions could be headed toward a protracted and tumultuous process in part because citizens have lost faith in the ability of government institutions to solve problems.

Photo / Bigstock

Protests—seen here in Algeria—have surged worldwide in the past decade, reflecting public dissatisfaction on a range of topics including inequalities, political repression, corruption, and climate change.

Amine M'Siouri / Pexels

Even if states improve security and welfare in the aggregate, these gains and opportunities may be unevenly distributed, fueling discontent in seemingly more prosperous societies. For instance, from 2000-2018, Organization for Economic Cooperation and Development (OECD) countries experienced overall growth in employment, but jobs were divided between high and low wages with little in the middle, many jobs became increasingly tenuous, and job growth varied significantly across regions and demographic groups.

POLITICAL VOLATILITY RISING

In coming years, this mismatch between governments' abilities and publics' expectations is likely to expand and lead to more political volatility, including growing polarization and populism within political systems, waves of activism and protest movements, and, in the most extreme cases, violence, internal conflict, or even state collapse. Variations in state capacity, ideology, and prior histories with mobilization will shape how and when public discontent translates into political volatility in each country.

Polarization and Populism. Polarization along ethnic, religious, and ideological lines is likely to remain strong, as political leaders and well-organized groups push a wide variety of broad goals and approaches that cut across economic, governance, social, identity, and international issues. In some countries, such polarization is likely to increase and reinforce political dysfunction and gridlock and heighten risks of political instability. Once established, severe polarization is difficult to reverse. Public dissatisfaction with mainstream politics for failing to address economic or social grievances has also led to the global rise in populism during the past several decades—measured in both the number of populist leaders in power and populist party vote shares worldwide. Although some populists will falter in office, the populist appeal is likely to endure as long as dissatisfaction, polarization, and fractured information landscapes persist. In addition, populism tends to surge after economic crises or changes in the ethnic or religious composition of a society from migration.

Protests. Anti-government protests have increased globally since 2010, affecting every regime and government type. Although protests are a signal of political turbulence, they can also be a sign of democratic health and a force for democratization by pressing for accountability and political change. The protest phenomenon is likely to persist in cycles and waves because of the enduring nature of the underlying drivers, including ongoing public dissatisfaction and desire for systemic change,

insufficient government responses, and pervasive technology to organize protests rapidly.

Political Violence, Internal Conflict, and State Collapse. During the next two decades, increased volatility is likely to lead to the breakdown of political order and outbreak of political violence in numerous countries, particularly in the developing world. As of 2020, 1.8 billion people—or 23 percent of the world's population—lived in fragile contexts with weak governance, security, social, environmental, and economic conditions, according to an OECD estimate. This number is projected to grow to 2.2 billion—or 26 percent of the world's population—by 2030. These states are mostly concentrated in Sub-Saharan Africa, followed by the Middle East and North Africa, Asia, and Latin America. These areas will also face an increasing combination of conditions, including climate change, food insecurity, youthful and growing populations (in Africa), and rapid urbanization, that will exacerbate state fragility. Outbreaks of political violence or internal conflict are not limited to these fragile states, however, and are likely to appear even in historically more stable countries when political volatility grows severe.

DEMOCRACY UNDER PRESSURE AND AUTHORITARIAN REGIMES ALSO VULNERABLE

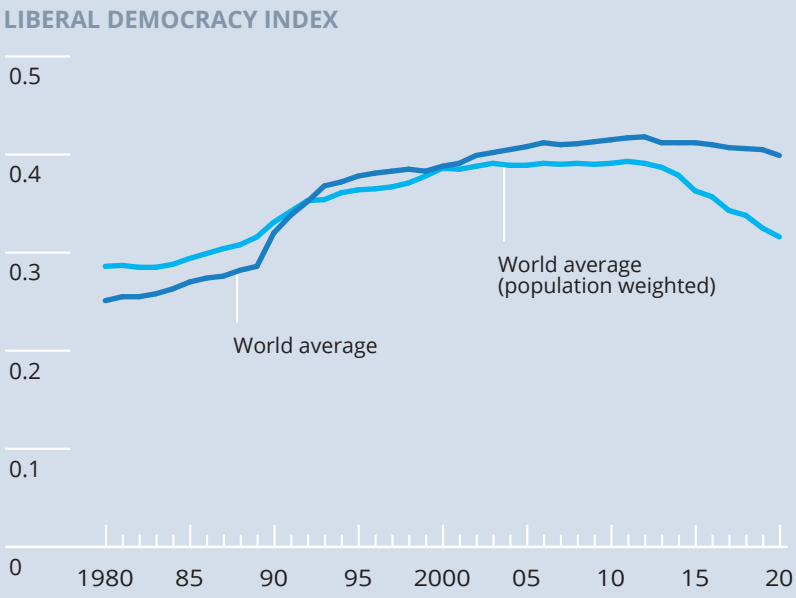
This volatile political climate creates vulnerabilities for all types of governments, from established liberal democracies to closed authoritarian systems. Adaptability and performance are likely to be key factors in the relative rise and fall of democratic and authoritarian governance during the next 20 years. Governments that harness new opportunities, adapt to rising pressures, manage growing social fragmentation, and deliver security and economic prosperity for their populations will preserve or strengthen their legitimacy, whereas those that fail will inspire competitors or demands for alternative models. Democracies will also have the advantage of drawing legitimacy from the fairness and inclusivity of their political systems—attributes harder to achieve in authoritarian systems.

Democracy Eroding

The challenges governments face suggest there is a high risk that an ongoing trend in erosion of democratic governance will continue during at least the next decade and perhaps longer. This trend has been widespread—seen in established, wealthy, liberal democracies as well as less mature partial democracies. Key democratic traits, including freedom of expression and the press, judicial independence, and protections for minorities, are deteriorating globally with countries sliding in the direction of greater authoritarianism. The democracy promotion non-governmental organization (NGO) Freedom House reported that 2020 was the 15th consecutive year of decline in political rights and civil liberties. Another respected measure of democracy worldwide, Varieties of Democracy, indicates that as of 2020, 34 percent of the world's population were living in countries where democratic governance was declining, compared with 4 percent who were living in countries that were becoming more democratic.

Several internal and external forces are driving this democratic erosion. In some Western democracies, public distrust of the capabilities and policies of established parties and elites, as well as anxieties about economic dislocations, status reversals, and immigration, have fueled the rise of illiberal leaders who are undermining democratic norms and institutions and civil liberties. In newer democracies—mostly in the developing world—that transitioned from authoritarian rule in the

DEMOCRATIC GOVERNANCE DECLINING GLOBALLY



The wave of democratization that surged around the world after the end of the Cold War has crested, and aggregate global levels of democracy have begun to decline in recent years.

Source: Varieties of Democracy's Liberal Democracy Index measures electoral freedoms, civil liberties, rule of law, and constraints on the executive branch.

1980s and 1990s, a mix of factors has led to democratic stagnation or backsliding, including weak state capacity, tenuous rule of law, fragile traditions of tolerance for opposition, high inequality, corruption, and militaries with a strong role in politics. Externally, China, Russia and other actors, in varying ways, are undermining democracies and supporting illiberal regimes. This support includes sharing technology and expertise for digital repression. In particular, some foreign actors are attempting to undermine public trust in elections, threatening the viability of democratic systems. Both internal and external actors are increasingly manipulating digital information and spreading disinformation to shape public views and achieve political objectives.

Looking forward, many democracies are likely to be vulnerable to further erosion and even collapse. An academic study of 75 democracies that experienced substantial democratic decline since 1994 found that 60 of them (or 80 percent) eventually became autocracies. However, the decline is not inexorable, and it may ultimately reflect a bad patch in a long cycle that has seen democracy advance and retreat, with an overarching trend to more democracy during the past century. The long-term legitimacy of democratic systems hinges on two general conditions: maintaining a fair, inclusive, and equitable political process and delivering positive outcomes for populations. Addressing public concerns about corruption, elite capture, and inequality can help restore public trust and strengthen institutional legiti-

Ugandan officials operating a facial recognition surveillance system provided by a Chinese company.

(@KagutaMuseveni / Twitter)

macy. In addition, providing effective services, economic stability, and personal security—historically advantages for democracies—increases public satisfaction. Beyond these basic governance benchmarks, demonstrating resilience to emerging global challenges will help restore and maintain public confidence.

Over the long term, the advance or retreat of democracy will depend in part on the relative power balance among major powers. Geopolitical competition, including efforts to influence or support political outcomes in other countries, relative success in delivering economic growth and public goods, and the extent of ideological contest between the Western democratic model and China's techno-authoritarian system, will shape democratic trends around the world.

Authoritarian Regimes Will Face Vulnerabilities

Authoritarian regimes will face many of the same risks as democracies and many may be less adaptable, making a sudden, violent change of government after a period of apparent stability more likely. Although authoritarian regimes in countries from China to the Middle East have demonstrated staying power, they have significant structural weaknesses, including widespread corruption, overreliance on commodities, and highly personalist leadership. Public protests are posing increasing threats to authoritarian regimes, toppling 10 regimes between 2010 and 2017; another 19 regimes were removed in elections, often held in response to mass protests. Corruption was a primary motivation behind many protests, and authoritarian regimes tend to be more corrupt than democracies. Authoritarian regimes that rely on raw commodities to finance their patronage networks and fuel their economies will be vulnerable to fluctuations in commodity prices, especially if energy transitions depress oil prices. Personalist authoritarian regimes—in which power is consolidated in one person or a small group—tend to be the most corrupt and erratic in decisionmaking, the least likely to plan for succession, and the most likely to start wars and escalate conflicts. Today the most common form of authoritarian regime is personalist—rising from 23 percent of dictatorships in 1988 to 40 percent in 2016—and other regimes, including in China and Saudi Arabia, are moving in that direction.

To try to quell, withstand, or address public discontent, authoritarian regimes are using new and traditional forms of coercion, cooptation, and legitimation. Technology has helped make authoritarian regimes more durable in recent years, in part because digitization and communication technologies make surveillance more pervasive and less costly. The flip side of these technological trends is that they

have given populations the tools to circumvent digital repression and mobilize dissent. In addition to repression, regimes will rely on cooptation to convince critical allies to stay loyal, but this dynamic depends on more tenuous flows of resources. Many authoritarian governments will seek to build popular legitimacy through effective government performance and compelling ideologies. With their centralized power, some authoritarian regimes have demonstrated faster and more flexible responses to emerging challenges, but historically authoritarian governments have suffered from lack of innovation caused by misallocation of resources. Authoritarian regimes that deliver economic opportunities and maintain security may convince their publics that their system is better suited to dealing with the complexity and speed of tomorrow's world.

ADAPTIVE APPROACHES TO GOVERNANCE: MORE ACTORS PROVIDING A WIDER RANGE OF SERVICES

As public needs and expectations mount, there is likely to be a growing shift toward adaptive approaches to governance that involve a broader set of actors outside state institutions delivering welfare and security. Nonstate actors, including private sector companies, NGOs, civil society groups, religious organizations, and insurgent and criminal networks, have long provided governance in all types of states. These roles are likely to expand to a wider range of actors and functions because of a combination of factors including: the failure of states to provide adequate governance; the increasing resources and reach of the private sector, NGOs, and individuals because of technology; and the growing complexity and number of public policy challenges that require multiple stakeholders to address. This shift is likely to produce some tensions and growing pains within states, as exemplified by illiberal regimes cracking down on civil society organizations or democracies seeking to regulate social media and operations of some nonstate actors.

Depending on the context and activity, nonstate actors will complement, compete with, and in some cases replace the state. The provision of governance outside state institutions does not necessarily pose a threat to central governments, nor does it diminish the overall quality of governance for the population. The roles and relationships between state and nonstate actors will depend on their relative capacity, penetration, and alignment with population expectations. From the Middle East to Africa and Latin America, insurgent groups and criminal organizations are filling in the governance gap and at times exploiting weak governments to expand their influence by providing employment and social services, ranging from healthcare and education to security and trash collection. In other cases particularly in Africa, international NGOs, some religiously based, augment the role of the state by providing health and education services. During the COVID-19 pandemic, numerous examples of adaptive governance have appeared. Corporations, philanthropies, technology companies, and research and academic institutions have worked in concert with governments to produce breakthroughs at record speeds. Elsewhere, civil society organizations all over the world have filled gaps in government responses, providing humanitarian relief and welfare services. This role of nonstate actors in governance extends beyond providing services; for example, technology companies wield significant power in their control over information flows and networks with the ability to shape political discourse.

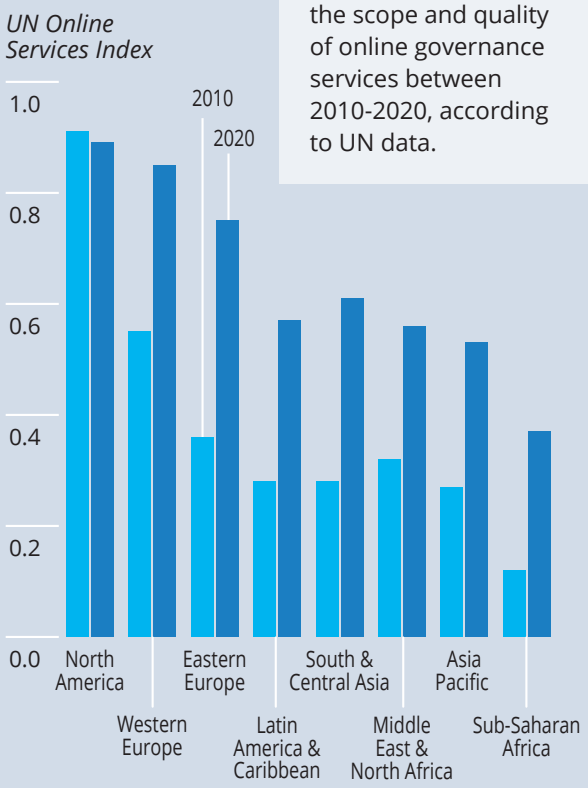
INNOVATION IN GOVERNANCE

States and nonstate actors will look for ways to adapt to mounting governance challenges, experimenting with novel tools and techniques for providing security and welfare that could in turn be adopted around the world. Although trends in governance innovation are difficult to discern or forecast, one clear area of innovation will be in the development and application of technologies to improve the speed, efficiency, and precision of governance.

- Governments worldwide have increased their use of technology for service provision and citizen engagement during the past two decades. While the most proficient countries for digital governance are largely high-income countries, the general trend in digital governance extends across all countries and regions.
- The increasing availability of data about all aspects of people's lives—coupled with the artificial intelligence (AI) technology to analyze it—is making governments more agile in directing services and providing security. This is a double-edged sword: the same AI-enabled surveillance technology that allows governments to diminish crime also enables them to monitor and repress their populations.
- Given the roles of public and private sectors in technology development and application, key innovations are likely to involve both state and nonstate actors. For instance, the advent of mobile payments and banking systems in Africa has allowed governments to implement cash transfers and pay employees more efficiently and reliably.
- Once established, innovative governance approaches are likely to spread around the world. For example, AI-enabled surveillance technology has proliferated around the globe—adopted by at least 74 countries as of 2018—and is provided by both Chinese and Western companies. Likewise, successful models gain adherents quickly: at least 40 countries have implemented conditional cash transfer programs as a development tool, inspired in part by the success of Brazil's Bolsa Familia program in the 2000's in reducing poverty.

GOVERNMENT USE OF DIGITAL TECHNOLOGY

Governments in almost every region increased the scope and quality of online governance services between 2010-2020, according to UN data.



Frederic Köberl / Unsplash

Local Governance More Consequential

Local governments are also likely to become increasingly important sources of governance innovation because of their ability to solve problems for their populations. Local governments generally have the advantage of proximity to the problems of their constituents, legitimacy, accountability, and the flexibility to customize responses; they also have less partisanship. Cities and subnational governments have greater ability than national governments to create and lead multisectoral networks involving various levels of government, private sector, and civil society; these partnerships have helped to revitalize some former industrial cities in the West. Local and city governments—increasingly organized into networks—will take action on international issues such as climate change and migration, getting ahead of national governments in some cases. As urban areas grow in population and as hubs for economic activity, technology, and innovation, these local governments are likely to gain increasing clout vis-a-vis national governments. Even in authoritarian regimes, local governance is likely to be a locus for problem solving, but with different constraints.

Bangkok, Thailand accounts for almost half of the country's economic output.

allPhoto Bangkok / Pexels

Like national governments, local governments are likely to face budgetary constraints, particularly after the COVID-19 crisis. Cities in the developing world are likely to face significant financing gaps for infrastructure development and climate change adaptation. In addition, urbanization is likely to exacerbate urban-rural societal divides, while the expanding role for local and city governance may undermine policy coherence when local and national strategies for problem solving diverge.

Image / Bigstock

RIPE FOR NEW OR SHIFTING MODELS?

The combination of widespread public discontent and major crises or shocks could create conditions that are ripe for significant shifts or transformations in the models, ideologies, or ways of governing. Historically, ideological shifts across regions have taken place at moments of catastrophic crisis, such as in the wake of a major war or economic collapse, because people are more willing to embrace bold systemic changes to address overarching problems. However, the emergence of a new unifying ideology or system—on the scale of communism or economic liberalism—is rare. Other stresses, such as another pandemic or a major environmental catastrophe, that expose governance shortcomings might create conditions ripe for new or alternative models to gain traction if widespread dysfunction is sustained.

Pervasive discontent and major crises probably are necessary forcing functions for transformations but not sufficient. Transforming discontent into something new also requires the combination of inspiring and unifying leadership with compelling ideas or ideology to build political coalitions and garner societal consensus. Short of a new ideology, new approaches—or even more combinations or blends of systems—could occur along several axes, from centralized to localized governance, from a strong state role to a strong nonstate role, from democratic to authoritarian, from secular to religious, or from nationalist to internationalist. These shifts or transformations would spur inevitable contestation between the constituencies holding onto the old orders and those embracing the new ones.

The precise nature of these shifts, transformations, or new models is uncertain and difficult to foresee. Some potential outcomes include: cities or subnational regions emerging as the focal point for governance if populations see local governments as more trustworthy and capable of solving problems than national governments; the private sector and other nonstate actors overtaking and displacing governments as the primary providers of welfare and security; democracy experiencing a revival if it proves more adaptive to the coming global challenges; or the world succumbing to an authoritarian wave partially inspired by China's model of technology-driven authoritarian capitalism. Moreover, compelling new governance models or ideologies that have not yet been envisioned or identified could emerge and take hold.

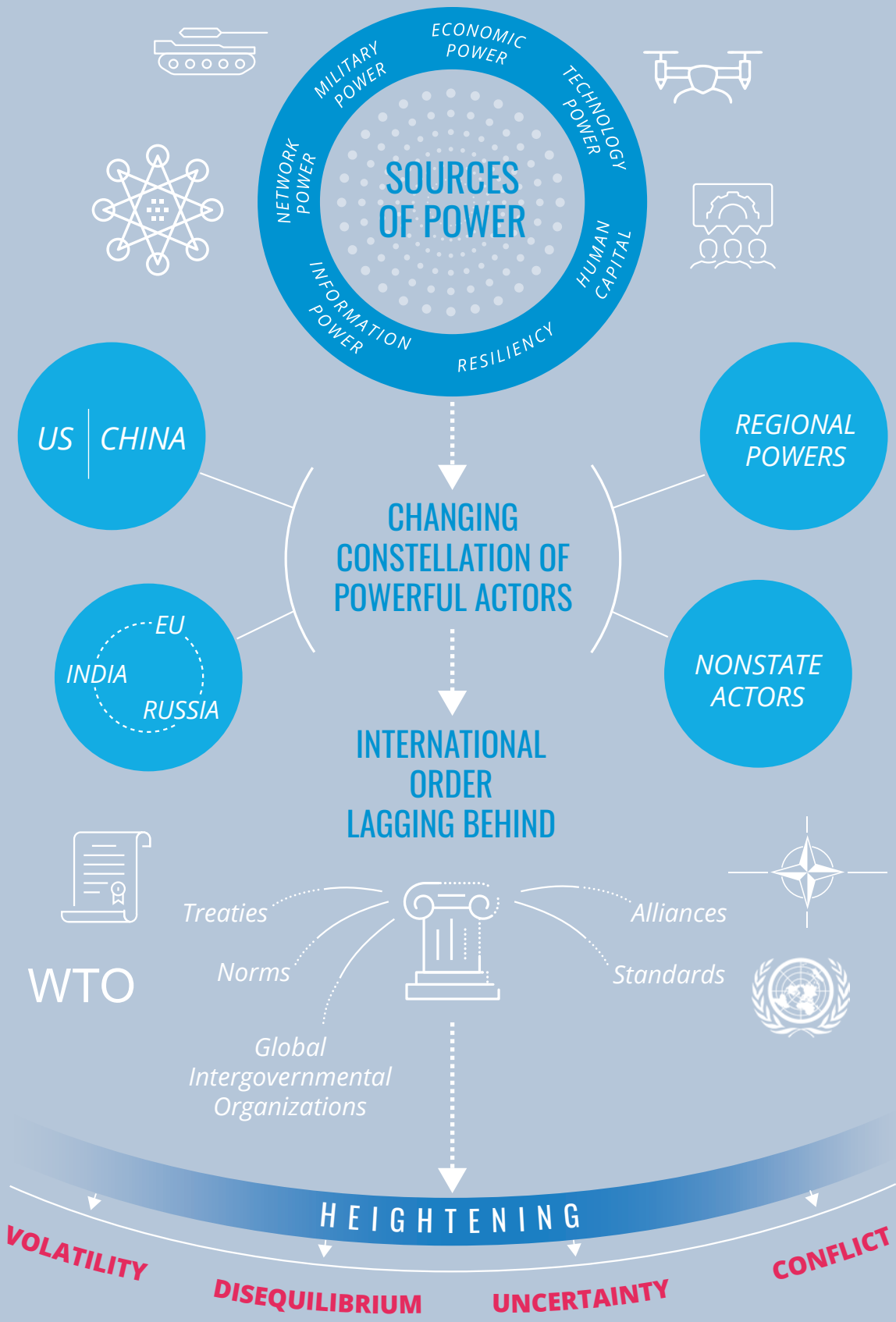
EMERGING DYNAMICS

INTERNATIONAL: MORE CONTESTED, UNCERTAIN, AND CONFLICT-PRONE

Key Takeaways

- During the next two decades, power in the international system will evolve to include a broader set of sources and features with expanding technological, network, and information power complementing more traditional military, economic, and cultural soft power. No single state is likely to be positioned to dominate across all regions or domains, opening the door for a broader range of actors to advance their interests.
- The United States and China will have the greatest influence on global dynamics, supporting competing visions of the international system and governance that reflect their core interests and ideologies. This rivalry will affect most domains, straining and in some cases reshaping existing alliances, international organizations, and the norms and rules that have underpinned the international order.
- In this more competitive global environment, the risk of interstate conflict is likely to rise because of advances in technology and an expanding range of targets, new frontiers for conflict and a greater variety of actors, more difficult deterrence, and a weakening or a lack of treaties and norms on acceptable use.

Photo / Bigstock


SOURCES OF POWER
ECONOMIC POWER
TECHNOLOGY POWER
HUMAN CAPITAL
RESILIENCY
INFORMATION POWER
NETWORK POWER
MILITARY POWER
US | CHINA
REGIONAL POWERS
EU
INDIA
RUSSIA
NONSTATE ACTORS
CHANGING CONSTELLATION OF POWERFUL ACTORS
INTERNATIONAL ORDER LAGGING BEHIND
WTO
Treaties
Norms
Global Intergovernmental Organizations
Alliances
Standards
HEIGHTENING
VOLATILITY
DISEQUILIBRIUM
UNCERTAINTY
CONFLICT

These power dynamics are likely to produce a more volatile and confrontational geopolitical environment, reshape multilateralism, and widen the gap between transnational challenges and cooperative arrangements to address them.

During the next two decades, the intensity of competition for global influence is likely to reach its highest level since the Cold War. No single state is likely to be positioned to dominate across all regions or domains, and a broader range of actors will compete to advance their ideologies, goals, and interests. Expanding technological, network, and information power will complement more traditional military, economic, and soft power aspects in the international system. These power elements, which will be more accessible to a broader range of actors, are likely to be concentrated among leaders that develop these technologies.

These power dynamics are likely to produce a more volatile and confrontational geopolitical environment, reshape multilateralism, and widen the gap between transnational challenges and cooperative arrangements to address them. Rival powers will jockey to shape global norms, rules, and institutions. The United States, along with its longstanding allies, and China will have the greatest influence on global dynamics, supporting competing visions of the international system and governance that reflect their core interests and ideologies. Their rivalry will affect most domains, straining and in some cases reshaping existing alliances and international organizations that have underpinned the international order for decades.

Accelerating power shifts—as well as hardening ideological differences and divisions over governance models—are likely to further ratchet up competition. The rivalry is unlikely to resemble the US-Soviet rivalry of the Cold War, however, because of the greater variety of actors in the international system that can shape outcomes, interdependence in various domains, and fewer exclusive ideological dividing lines. The lack of a preponderant power or global consensus on some key areas will offer opportunities for other actors to lead or pursue their own interests, especially within their regions. The European Union (EU), India, Japan, Russia, and the United Kingdom most likely will also be consequential in shaping geopolitical and economic outcomes.

This more competitive environment with rapidly emerging technologies is likely to be more volatile with a heightened risk of conflict, at least until states establish new rules, norms, and boundaries for the more disruptive areas of competition. States will face a combination of highly destructive and precise conventional and strategic weapons, cyber activity targeting civilian and military infrastructure, and a confusing disinformation environment. Regional actors, including spoilers such as Iran and North Korea, will jockey to advance their goals and interests, bringing more volatility and uncertainty to the system. At the same time, states may struggle to establish stable deterrence with these new systems, particularly if the rules and treaties governing them continue to erode or lag.

CHANGING SOURCES AND COMPOSITION OF POWER

During the next 20 years, sources of power in the international system are likely to expand

and redistribute. Material power, measured by the size of a nation's economy, military, and population, and its technological development level, will provide the necessary foundation for exercising power, but will be insufficient for securing and maintaining favorable outcomes. In an even more hyperconnected world, power will include applying technology, human capital, information, and network position to modify and shape the behavior of other actors, including states, corporations, and populations. The attractiveness of a country's entertainment, sports, tourism, and educational institutions will also remain important drivers of its influence. As global challenges such as extreme weather events and humanitarian crises intensify, building domestic resiliency to shocks and systemic changes will become a more important element of national power, as will a state's ability and willingness to help other countries. In coming years, the countries and nonstate actors that are best able to harness and integrate material capabilities with relationships, network centrality, and resiliency will have the most meaningful and sustainable influence globally.

Material Power. Military capabilities and economic size will remain the foundation of state capacity and power projection, compelling other countries to take a state's interests and policies into account. These two areas of power allow states to maintain their security and to amass resources that enable other elements of power.

Technology Power. Technology, particularly military technologies, will continue to be central to a country's security and global influence, but going forward, cutting edge artificial intelligence (AI), biotechnology, and data-driven decisionmaking will provide states with a range of advantages for economic growth, manufacturing, healthcare, and societal resiliency. With these technologies, there will be a first mover advantage, enabling states and nonstate actors to shape the views and decisionmaking of populations, to gain information advantages over competitors, and to better prepare for future shocks.

Human Capital. Favorable demographics, including a strong working-age population, universal basic education, and a concentration of science, engineering, math, and critical thinking skills, will provide large advantages for innovation, technological advancement, economic growth, and resiliency. Regions with large working-age populations, including in Latin America and South Asia, will have new sources of potential economic strength if they can improve education, skillsets, and infrastructure; aging and contracting societies in Europe and Asia will need to find ways to augment their workforce to avoid seeing this element of power weakened.

Networks and Nodes. Control of key sites of exchange, including telecommunications, finance, data flows, and manufacturing supply chains, will give countries and corporations the ability to gain valuable information, deny access to rivals, and even coerce behavior. Many of these networks, which are disproportionately concentrated in the United States, Europe, and China, have become entrenched

Photo / Bigstock

over decades and probably will be difficult to reconfigure. If China's technology companies become co-dominant with US or European counterparts in some regions or dominate global 5G telecommunications networks, for example, Beijing could exploit its privileged position to access communications or control data flows. Exercising this form of power coercively, however, risks triggering a backlash from other countries, and could diminish the effectiveness over time.

Information and Influence. Compelling ideas and narratives can shape the attitudes and priorities of other actors in the international system, and they can legitimize the exercise of other types of power. The soft power attractiveness of a society, including its culture, entertainment exports, sports, lifestyles, and technology innovations, can also capture the imagination of other populations. Tourism and education abroad—particularly higher education—can increase the attractiveness. From public diplomacy and media to more covert influence operations, information technologies will give governments and other actors unprecedented abilities to reach directly to foreign publics and elites to influence opinions and policies. China and Russia probably will try to continue targeting domestic audiences in the United States and Europe, promoting narratives about Western decline and overreach. They also are likely to expand in other regions, for example Africa, where both have already been active.

Resiliency. As the world has become more deeply interconnected, systemic shocks are becoming more common and more intense, spawning many second-order effects. Governments that are able to withstand, manage, and recover from shocks and that have domestic legitimacy will have better capacity to project power and influence abroad. Building resiliency, however, depends on a reservoir of trust within societies and between populations and leaders, and is likely to be more difficult to muster as societies become more fractured.

MORE ACTORS ASSERTING AGENCY

As sources of power expand and shift globally, the actors and the roles they play in shaping global dynamics will also change. No single actor will be positioned to dominate across all regions and in all domains, offering opportunities for a broader array of actors and increasing competition across all issues. The growing contest between China and the United States and its close allies is likely to have the broadest and deepest impact on global dynamics, including global trade and information flows, the pace and direction of technological change, the likelihood and outcome of interstate conflicts, and environmental sustainability. Even under the most modest estimates, Beijing is poised to continue to make military, economic, and technological advancements that shift the geopolitical balance, particularly in Asia.

China Reclaiming Global Power Role

In the next two decades, China almost certainly will look to assert dominance in Asia and greater influence globally, while trying to avoid what it views as excessive liabilities in strategically marginal regions. In Asia, China expects deference from neighbors on trade, resource exploitation, and territorial disputes. China is likely to field military capabilities that put US and allied forces in the region at heightened risk and to press US allies and partners to restrict US basing access. Beijing probably will tout the benefits of engagement while warning of severe consequences of defiance. China's leaders almost certainly expect Taiwan to move closer to reunification by 2040, possibly through sustained and intensive coercion.

Photos / Bigstock

China will work to solidify its own physical infrastructure networks, software platforms, and trade rules, sharpening the global lines of techno-economic competition and potentially creating more balkanized systems in some regions. China is likely to use its infrastructure and technology-led development programs to tie countries closer and ensure elites align with its interests. China probably will continue to seek to strengthen economic integration with partners in the Middle East and Indian Ocean region, expand its economic penetration in Central Asia and the Arctic, and work to prevent countervailing coalitions from emerging. China is looking to expand exports of sophisticated domestic surveillance technologies to shore up friendly governments and create commercial and data-generating opportunities as well as leverage with client regimes. China is likely to use its technological advancements to field a formidable military in East Asia and other regions but prefers tailored deployments—mostly in the form of naval bases—rather than large troop deployments. At the same time, Beijing probably will seek to retain some important linkages to US and Western-led networks, especially in areas of greater interdependence such as finance and manufacturing.

China is likely to play a greater role in leading responses to confronting global challenges commensurate with its increasing power and influence, but Beijing will also expect to have a greater say in prioritizing and shaping those responses in line with its interests. China probably will look to other countries to offset the costs of tackling transnational challenges in part because Beijing faces growing domestic problems that will compete for attention and resources. Potential financial crises, a rapidly aging workforce, slowing productivity growth, environmental pressures, and rising labor costs could challenge the Chinese Communist Party and undercut its ability to achieve its goals. China's aggressive diplomacy and human rights violations, including suppression of Muslim and Christian communities, could limit its influence, particularly its soft power.

Other Major Powers

Other major powers, including Russia, the EU, Japan, the United Kingdom, and potentially India, could have more maneuvering room to exercise influence during the next two decades, and they are likely to be consequential in shaping geopolitical and economic outcomes as well as evolving norms and rules.

Russia is likely to remain a disruptive power for much or all of the next two decades even as its material capabilities decline relative to other major players. Russia's advantages, including a sizeable conventional military, weapons of mass destruction, energy and mineral resources, an expansive geography, and a willingness to use force overseas, will enable it to continue playing the role of spoiler and power broker in the post-Soviet space, and at times farther afield. Moscow most likely will continue trying to amplify divisions in the West and to build relationships in Africa, across the Middle East, and elsewhere. Russia probably will look for economic opportunity and to establish a dominant military position in the Arctic as more countries step up their presence in the region. However, with a poor investment climate, high reliance on commodities with potentially volatile prices, and a small economy—projected to be approximately 2 percent of global gross domestic product (GDP) for the next two decades—Russia may struggle to project and maintain influence globally. President Vladimir Putin's departure from power, either at the end of his current term in 2024

or later, could more quickly erode Russia's geopolitical position, especially if internal instability ensues. Similarly, a decrease in Europe's energy dependence on Russia, either through renewables or diversifying to other gas suppliers, would undercut the Kremlin's revenue generation and overall capacity, especially if those decreases could not be offset with exports to customers in Asia.

The EU's large market and longstanding leadership on international norms will enable it to retain significant influence in coming decades, especially if it can prevent additional members from departing and can reach consensus on a common strategy for navigating global competition and transnational challenges. The economic weight of the EU's single market almost certainly will continue to give it global geopolitical clout on trade, sanctions, technology regulations, and environmental and investment policies. Countries outside the EU often model their standards and regulations on EU policies. European military strength is likely to fall short of some members' ambitions because of competing priorities and long-term underinvestment in key capabilities. European defense expenditures will compete with other post–COVID-19 fiscal priorities, and its security initiatives are unlikely to produce a military capability separate from the North Atlantic Treaty Organization that can defend against Russia.

The **United Kingdom** is likely to continue to punch above its weight internationally given its strong military and financial sector and its global focus. The United Kingdom's nuclear capabilities and permanent UN Security Council membership add to its global influence. Managing the economic and political challenges posed by its departure from the EU will be the country's key challenge; failure could lead to a splintering of the United Kingdom and leave it struggling to maintain its global power.

Japan's highly educated population, technologically innovative economy, and integral position in trade and supply chain networks position it to remain a strong power in Asia and beyond. Japan is likely to remain highly economically dependent on its largest trading partner and main regional rival China and a close ally of the United States while working to further diversify security and economic relationships, particularly with Australia, India, Taiwan, and Vietnam. Japan will also face mounting demographic and macroeconomic challenges, including a shrinking labor force—the oldest of any developed country—with inflexible immigration policies, low demand and economic growth, deflation, declining savings rates, and increased government debt.

India's population size—projected to become the largest in the world by 2027—geography, strategic arsenal, and economic and technological potential position it as a potential global power, but it remains to be seen whether New Delhi will achieve domestic development goals to allow it to project influence beyond South Asia. As China and the United States compete, India is likely to try to carve out a more independent role. However, India may struggle to balance its long-term commitment to strategic autonomy from Western powers with the need to embed itself more deeply into multilateral security architectures to counter a rising China. India faces serious governance, societal, environmental, and defense challenges that constrain how much it can invest in the military and diplomatic capabilities needed for a more assertive global foreign policy.

Regional Powers Seeking Greater Influence

In this competitive environment, regional powers, such as Australia, Brazil, Indonesia, Iran, Nigeria, Saudi Arabia, Turkey, and the United Arab Emirates (UAE), probably will seek to take advantage of new opportunities and to take on roles previously filled by a major power to shore up regional stability or gain influence. This mix of regional powers seeking greater roles and influence is likely to change during the next two decades, reflecting opportunities as well as the changing capabilities and leadership goals of various states. Regional powers probably will try to play major powers off each other to maximize rewards while attempting to avoid being drawn into unwanted conflicts. They may seek to build their own coalitions or strengthen regional blocs to project influence and in some cases, collaborate on global challenges, but in other cases they may act more aggressively in conflicts in their region. Overcoming domestic governance challenges, recovering quickly from the COVID-19 pandemic and other shocks, and managing relationships with neighbors will be crucial for converting their key strengths into increased influence. Some probably will play crucial roles in tackling challenges at the regional level including nonstate actor security threats, terrorism, mass migration, and digital privacy.

Nonstate Actors Powerful, Influential

Nonstate actors, such as NGOs, religious groups, and technology superstar firms, will have the resources and global reach to build and promote alternative networks that complement, compete with, or possibly bypass states. In the past several decades, nonstate actors and transnational movements have used growing international connections for collective action or to influence populations around the world. In some cases, these actors can shape or constrain state actions through lobbying leaders and mobilizing citizens. The influence of nonstate actors will vary and be subject to government intervention. China, the EU, and others are already moving to regulate or break up superstar firms, while Beijing is trying to control or suppress NGOs and religious organizations. Many nonstate actors are likely to try to push back on state efforts to consolidate sovereignty in newer frontiers, including cyberspace and space.

GEOPOLITICAL COMPETITION INTENSIFYING AI-POWERED PROPAGANDA

The growth in global digital connectivity, immersive information technology, and widely accessible digital marketing techniques opens the potential for greater information influence activities against almost all societies.

Both states and nonstate actors almost certainly will be able to use these tools to influence populations, including by ratcheting up cognitive manipulation and societal polarization to shape how people receive, interpret, and act on information. Countries, including China and Russia, are likely to apply technological innovations to make their information campaigns more agile, difficult to detect, and harder to combat, as they work to gain greater control over media content and means of dissemination.

Governments and nonstate actors are increasingly able to exploit consumer behavior data and marketing techniques to microtarget messages to small audience segments. Propagandists could leverage AI, the Internet of Things, and other tools to tailor communications to large audiences, anticipate their reactions, and adapt messaging in near real time.

Behavioral big data, which captures statistical patterns in human psychology and action, may also enable significant predictive power and capacity for personalized influence. If meaningful regulation does not exist, public relations firms and political consultants can offer disinformation as a regular service, increasing public distrust in political institutions.

CONTESTED AND TRANSFORMING INTERNATIONAL ORDER

As global power continues to shift, many of the relationships, institutions, and norms that have largely governed and guided behavior across issues since the end of the Cold War are likely to face increasing challenges. Competition in these areas has been on the rise for years with China, Russia, and other countries demanding a greater say. Disagreements are likely to intensify over the mission and conduct of these institutions and alliances, raising uncertainty about how well-equipped they will be to respond to traditional and emerging issues. Over time, states may even abandon some aspects of this international order.

Rising and revisionist powers, led by China and Russia, are seeking to reshape the international order to be more reflective of their interests and tolerant of their governing systems. China and Russia continue to advocate for an order devoid of Western-origin norms that allows them to act with impunity at home and in their perceived spheres of influence. They are advocating for alternative visions of the role of the state and human rights and are seeking to roll back Western influence, but their alternative models differ significantly from each other. Russia is promoting traditional values and desires a Russian-dominated protectorate covering much of Eurasia. China seeks growing global acceptance of its current social system—namely the Chinese Communist Party's monopoly on power and control over society—socialist market economy, and preferential trading system.

Increasing Ideological Competition

The multidimensional rivalry with its contrasting governing systems has the potential to add ideological dimensions to the power struggle. Although the evolving geopolitical competition is unlikely to exhibit the same ideological intensity as the Cold War, China's leadership already perceives it is engaged in a long-term ideological struggle with the United States. Ideological contests most often play out in international organizations, standard-setting forums, regional development initiatives, and public diplomacy narratives.

Western democratic governments probably will contend with more assertive challenges to the Western-led political order from China and Russia. Neither has felt secure in an international order designed for and dominated by democratic powers, and they have promoted a sovereignty-based international order that protects their absolute authority within their borders and geographic areas of influence. China and Russia view the ideas and ideology space as opportunities to shape the competition without the need to use military force. Russia aims to engender cynicism among foreign audiences, diminish trust in institutions, promote conspiracy theories, and drive wedges in societies. As countries and nonstate actors jockey for ideological and narrative supremacy, control over digital communications platforms and other vehicles for dissemination of information will become more critical.

Relationships Facing More Tradeoffs

In this more competitive geopolitical environment, many countries would prefer to maintain diverse relationships, particularly economic ties, but over time, actions by China, Russia, and others may present starker choices over political, economic, and security priorities and relationships. Some countries may gravitate toward looser, more ad hoc arrangements and partnerships that provide greater flexibility to balance security concerns with trade and

economic interests. Longstanding security alliances in Europe and Asia are facing growing strains from a confluence of domestic perceptions of security threats, concerns about partner reliability, and economic coercion. That said, if China and Russia continue to ratchet up pressure, their actions may re-solidify or spawn new security relationships among democratic and like-minded allies, enabling them to put aside differences.

China and Russia probably will continue to shun formal alliances with each other and most other countries in favor of transactional relationships that allow them to exert influence and selectively employ economic and military coercion while avoiding mutual security entanglements. China and Russia are likely to remain strongly aligned as long as Xi and Putin remain in power, but disagreements over the Arctic and parts of Central Asia may increase friction as power disparities widen in coming years.

Contestation Weakening Institutions

Many of the global intergovernmental organizations that have underpinned the Western-led international order for decades, including the UN, World Bank, and World Trade Organization (WTO), are bogged down by political deadlock, decreasing capacity relative to worsening transnational challenges, and increasing country preferences for ad hoc coalitions and regional organizations. Most of these organizations are likely to remain diplomatic battlegrounds and to become hollowed out or sidelined by rival powers.

Looking forward, these global institutions are likely to continue to lack the capacity, member buy-in, and resources to help effectively manage transnational challenges, including climate change, migration, and economic crises. In many cases, these challenges exceed the institutions' original mandates. Members' rising fiscal challenges could translate into diminished contributions, and sclerotic decisionmaking structures and entrenched interests will limit the ability to reform and adapt institutions. These institutions probably will work with and in some cases in parallel with regional initiatives and other governance arrangements, such as the epidemic response in Sub-Saharan Africa, infrastructure financing in Asia, and artificial intelligence (AI) and biotechnology governance. The future focus and effectiveness of established international organizations depend on the political will of members to reform and resource the institutions and on the extent to which established powers accommodate rising powers, particularly China and India. The WTO probably will face considerable uncertainty about its future role and capacity to foster greater cooperation and open trade as states become more protectionist and rival blocs square off against each other. In contrast, the unique role of the International Monetary Fund (IMF) and high demand for IMF conditionality and assistance in debt restructuring most likely will make it central to the international system, although the growth of sovereign debt outside IMF purview will be a challenge. Similarly, multistakeholder agreements and organizations that regulate the global financial, insurance, or technical systems such as the Basel Accords and Internet Engineering Task Force are likely to remain in high demand.

Western leadership of the intergovernmental organizations may further decline as China and Russia obstruct Western-led initiatives and press their own goals. China is working to

re-mold existing international institutions to reflect its development and digital governance goals and mitigate criticism on human rights and infrastructure lending while simultaneously building its own alternative arrangements to push development, infrastructure finance, and regional integration, including the Belt and Road Initiative, New Development Bank, the Shanghai Cooperation Organization, and the Regional Comprehensive Economic Partnership. In the past five years, Moscow has tried to undermine international efforts to strengthen safeguards and monitor for chemical weapons and has used the International Criminal Police Organization (INTERPOL) to pursue opponents.

Continued underperformance of many of the global multilateral institutions is likely to shift some focus to alternative informal, multi-actor arrangements, such as the G5 Sahel Joint Force to counter extremists in the Sahel, the global vaccine alliance, and the global initiative to bring greater transparency to extractive industries. Some of these show promise in filling crucial capacity gaps, but their long-term impact will depend on marshalling the resources, political buy-in, and leadership from major and regional powers. Some regions, particularly Sub-Saharan Africa, Europe, and Southeast Asia, are likely to continue moves to strengthen regional organizations and integration, whereas other regions are likely to struggle to cooperate because of lingering inter-state divisions.

Standards as a Battlespace

International standards agreements support the emergence of new technologies by reducing market uncertainty and establishing norms. Membership on standard-setting bodies is increasingly competitive, largely because of the influence these bodies have on how and which technologies enter the market, and thereby, which technology producers gain advantage. Long dominated by the United States and its allies, China is now moving aggressively to play a bigger role in establishing standards on technologies that are likely to define the next decade and beyond. For example, international standard-setting bodies will play critical roles in determining future ethical standards in biotechnology research and applications, the interface standards for global communication, and the standards for intellectual property control.

Competition Over Global Norms

A broad set of actors will increasingly compete to promote and shape widely shared global norms ranging from respect for human rights and democratic institutions to conduct in warfare. Some democracies that experienced populist backlashes have backed away from their longstanding roles as champions of norms protecting civil liberties and individual rights. At the same time, authoritarian powers, led by China and Russia, have gained traction as they continue to emphasize their values and push back on norms they view as Western-centric—particularly those that gained currency after the end of the Cold War, such as exceptions that allow for interfering in the internal affairs of member states to defend human rights.

During the next 20 years, this competition probably will make it harder to maintain commitment to many established norms and to develop new ones to govern behavior in new domains, including cyber, space, sea beds, and the Arctic. Existing institutions and norms are not well designed for evolving areas such as biotechnology, cyber, and environmental response and for the growing number of new actors operating in space. Many norm-setting efforts may shift from consensus-based, uni-

OUTLOOK FOR INTERNATIONAL NORMS

Norms least likely to be contested	Norms likely to experience the most regional variation	Norms at highest risk of weakening globally in the next decade	Norms in early development
Description: Broadly accepted by states; violations widely condemned	***Description:*** Disparate acceptance across different regions	***Description:*** Contravened by at least one major power; stalled or curtailed implementation	***Description:*** Not formally codified or widely agreed; future agreement unclear
• National sovereignty • Territorial integrity • International criminal accountability for mass atrocities • Prohibition of military coups • Prohibition of genocide • Prohibition of torture • Right of self-defense • Child soldiers	• Freedom of navigation • Intellectual property rights • Digital privacy • Responsibility to Protect • LGBTQ protections • Space traffic management and satellite deorbiting • Environmental protections • Conduct in armed conflict • Child marriage	• Arms control and nonproliferation • Civil and political human rights • Refugee non-refoulment and resettlement • Women's rights and reproductive rights • Open commerce • Rule of law • Democratic institutions	• Biotechnology • Artificial Intelligence • Cyber security and conflict • Arctic access and resource extraction

versal membership institutions to non-global formats, including smaller and regionally-led initiatives. Alternatively, new norms might gain momentum if states collectively perceive growing risks of unilateral action or if increasingly powerful nonstate actors throw their weight behind new guidelines, particularly regarding the use of emerging technologies.

INCREASING RISK OF INTERSTATE CONFLICT

In this more competitive global environment, the risk of interstate conflict is likely to rise because of advances in technology and an expanding range of targets, a greater variety of actors, more difficult dynamics of deterrence, and weakening or gaps in treaties and norms on acceptable use. Major power militaries are likely to seek to avoid high-intensity conflict and particularly full-scale war because of the prohibitive cost in resources and lives, but the risk of such conflicts breaking out through miscalculation or unwillingness to compromise on core issues is likely to increase.

Changing Character of Conflict

Rapidly advancing technologies, including hypersonics and AI, are creating new or enhanced types of weapons systems while offering a wider array of potential targets, across military and civilian capabilities and including domestic infrastructure, financial systems, cyber, and computer networks. These technologies will give states a broader spectrum of coercive tools that fall below the level of kinetic attacks, which many states may be likely to favor as a means of achieving strategic effects while avoiding the political, economic, and human costs of direct violence and declaring hostilities. The result may be further muddied distinctions between sharpened competition and conflict, increasing the motivations for states to establish supremacy at each level of the escalation ladder.

Better sensors, automation, AI, hypersonic capabilities, and other advanced technologies will produce weapons with greater accuracy, speed, range, and destructive power, changing the character of conflict during the next 20 years. Although advanced militaries will have greater access to these advanced capabilities, some weapons are likely to come within reach of smaller states and nonstate actors. The proliferation and diffusion of these systems over time are likely to make more civilian and military systems vulnerable, heighten the risk of escalation, potentially weaken deterrence, and make combat potentially more deadly, although not necessarily more decisive. In a prolonged, large-scale conflict between major powers, some advanced military technologies may begin to have a diminishing impact on the battlefield as expensive and difficult to quickly replace high-end systems are damaged or destroyed or, in the case of munitions, expended in combat. Advanced sensors and weapons will aid in counterinsurgency efforts to identify and target insurgent forces, but these systems may not be sufficient to achieve decisive results given the already asymmetric nature of such conflicts.

Dominance in major power competition and more specifically on the battlefield may increasingly depend on harnessing and protecting information and connecting military forces. Belligerents are increasingly likely to target their adversaries' computer networks, critical infrastructure, electromagnetic spectrum, financial systems, and assets in space, threatening communications and undermining warning functions. The number and quality of sensors for observation will increase, as will

MAJOR POWER COMPETITION INCREASING THE LIKELIHOOD OF KINETIC CONFLICT

Geopolitical trends and technology changes are increasing the risk of major power kinetic conflict through 2040. Non-kinetic actions could escalate—possibly unintentionally—to active shooting wars among major powers because of weaker rules, greater speed of engagement, murkier information environment, and new technologies.

FACTORS THAT INCREASE THE LIKELIHOOD OF MAJOR POWER CONFLICT

- **Unclear rules and norms**
  - Eroding arms control frameworks
  - Weakening institutions
- **Declining deterrence**
- **Heightened geopolitical competition**
  - Declining hegemonic security and economic interdependence
  - Growing nationalism
- **Centralized decisionmaking**
  - Decline in democratic governance and increased authoritarian and personalist rule
- **Long-range weapons advancements**
  - Technological change and accelerated pace of warfare
  - AI decisionmaking
- **Murkier information environment**
  - Misinformation and disinformation overtakes or distorts objective truth

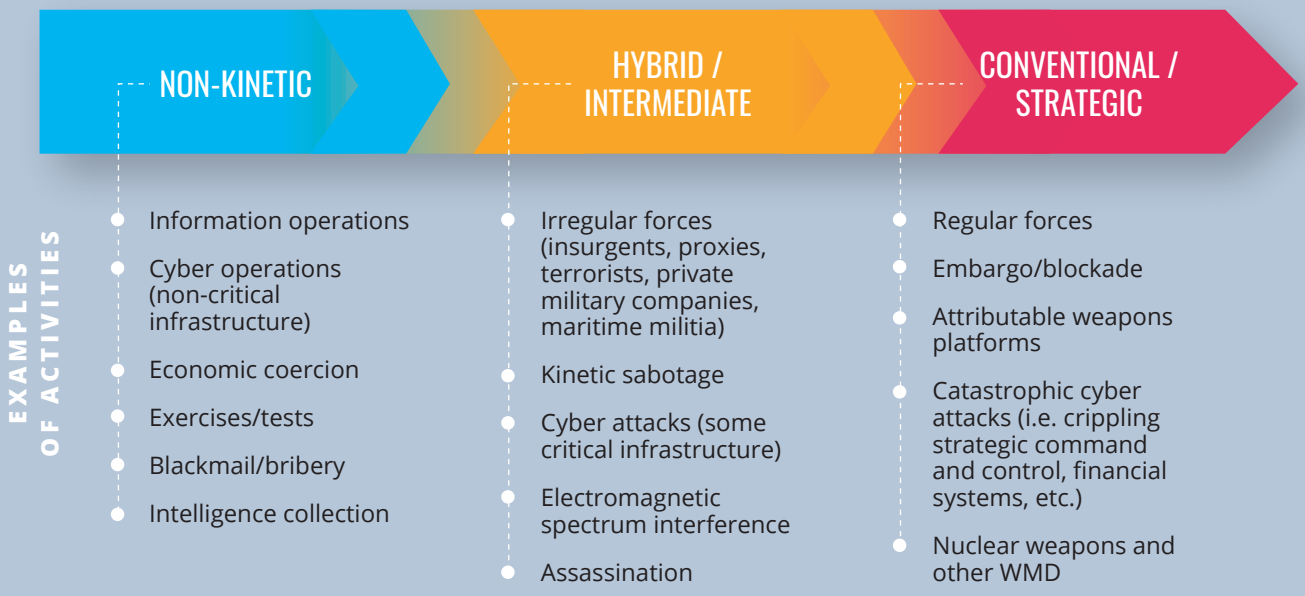
FACTORS THAT COULD REDUCE THE LIKELIHOOD OF CONFLICT

Some countervailing factors may restrain full-scale conflict in this period.

- **Alternative non-kinetic options**
  - Cyber attacks, information operations, economic coercion, and precision use of force can produce strategic effects while avoiding costs of traditional armed conflict
- **Leaders' fears**
  - Leaders fear prohibitive economic, humanitarian, and political damage or disruption
  - Leaders fear uncontrollable escalation dynamics and lack confidence they can deter retaliation
- **Survivable 2nd strike capability**
  - Absent major technological change, potent nuclear arsenals will leave deterrence intact; nuclear war will remain unwinnable and prohibitively costly

SPECTRUM OF CONFLICT

This graphic displays increasing levels of conflict from non-violent to strategic weapons.



the challenges for making sense of and using information. Some governments will be able to manipulate information against their rivals with more precision at scale.

Increasing sensors and connectivity will also make militaries and governments more vulnerable to cyber and electromagnetic attacks. The development of cyber weapons, doctrine, and procedures in conjunction with other weapons is likely to mature significantly during the next 20 years, increasing the consequences of cyber conflict. Countries that can disperse their networks and important warfighting assets, shorten decisionmaking processes, and build in redundancy at every level are likely to be better positioned for future conflicts.

Interstate kinetic conflicts—defined as direct engagement between the military forces of two or more adversaries in which at least one participant suffers substantial casualties or damage—are likely to escalate faster and with less warning than before, compressing response times and increasing pressure to delegate or even automate certain decision-making. Inexpensive sensors and data analytics could revolutionize real-time detection and processing by 2040, but many militaries most likely will still struggle to distill meanings and compile options for policymakers without AI and other algorithmic decisionmaking aids. This increased speed is likely to heighten the risk of miscalculation or inadvertent escalation to full-scale war.

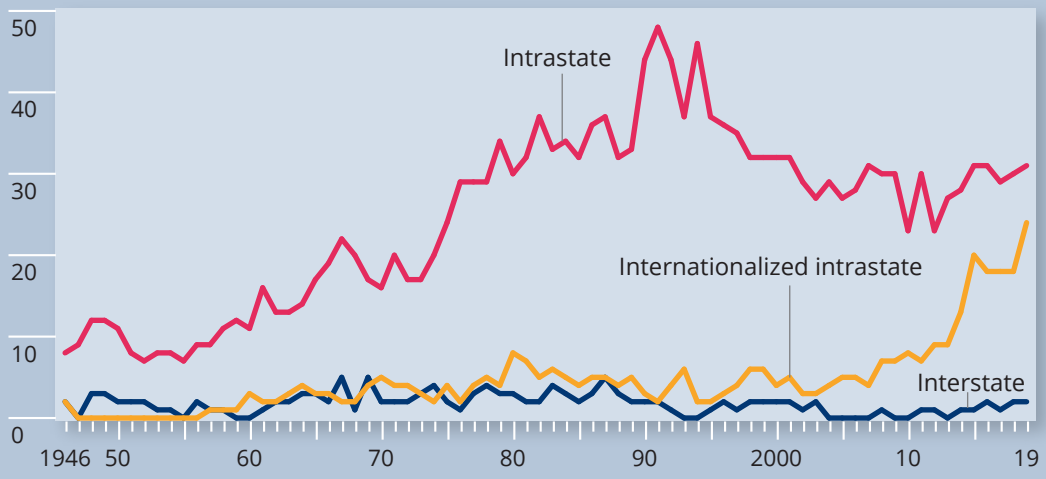
Additional Players

Some state-to-state conflicts and international interventions in local conflicts are likely to involve more armed proxies, private military companies, hackers, and terrorist organizations as governments seek to reduce risks and

INTRASTATE VERSUS INTERSTATE CONFLICT TRENDS

After several decades of low frequency of interstate conflict, internal conflicts and civil wars increasingly are taking on international dimensions, as regional and international powers back different sides and directly contribute troops and materiel. These conflicts could begin to spill over into more direct, major power conflict, especially as combatants employ new technologies or techniques. This graphic separates intrastate conflicts, in which there is no interference from other countries, from internationalized intrastate conflicts—in which at least one side receives direct support from other governments that actively participate in the conflict.

NUMBER OF CONFLICTS, 1946-2019



Source: Uppsala Conflict Data Program, 2020.

costs for conducting attacks. Proxies and private companies can reduce the cost of training, equipping, and retaining specialized units and provide manpower for countries with declining populations. Some groups can more quickly achieve objectives with smaller footprints and asymmetric techniques. Russia and Turkey have used private and proxy groups in conflicts in Libya and Syria, and private firms have provided a wide range of logistical and other services for coalition forces in Afghanistan, Iraq, and other countries.

More Difficult Deterrence

The introduction of non-kinetic and non-traditional weapons, new frontiers, and more players is likely to complicate deterrence paradigms and blur escalation red lines. Deterrence strategies rely on the prospect of harm to persuade an opponent to not engage in a specified behavior. These strategies have always been difficult to sustain outside of nuclear warfare, and new forms of attack—cyber and information operations, for example—will add to the challenge. Compounding the challenge, many countries lack clear doctrines for new military capabilities—including conventional, weapons of mass destruction, and asymmetric—to guide their use and develop shared understandings for deterrence. Advancements in conventional and hypersonic weapons; ballistic missile defense; robotics and automated systems; intelligence, surveillance, and reconnaissance networks; and long-range antiship missiles almost certainly will further complicate deterrence calculations and could lead to asymmetric retaliation. Leaders might calculate that they need to strike first in a crisis to avoid losing advanced weapons to a surprise attack.

GROWING CHANCE OF NUCLEAR PROLIFERATION OR EVEN NUCLEAR USE

Nuclear proliferation and potentially nuclear use are more likely in this competitive geopolitical environment. Advances in technology and diversification of delivery systems, arms control uncertainties, and spread of knowledge and skills related to nuclear technology add to the higher risk.

Countries that have declared their nuclear weapons are adding to or upgrading their arsenals; China and Russia are investing in new delivery vehicles including missiles, submarines, bombers, and hypersonic weapons. These states are likely to continue to field increasingly accurate, lower yield nuclear weapons on platforms intended for battlefield use, which could encourage states to consider nuclear use in more instances with doctrines that differentiate between large-scale nuclear exchanges and "limited use" scenarios.

Perceived external security threats are increasing in many regions, particularly the Middle East and Asia, which is a key factor in states' decision to develop nuclear weapons, according to academic research. Growing questions about security guarantees, extended deterrence, and heightened regional pressures could lead some advanced economies to acquire or build their own programs.

Arms Control and Treaties on the Brink

Existing norms and treaties governing the use of arms and conduct of war are increasingly contested, and new understandings are lagging behind technological innovations. Repeated and unpunished violations of rules and norms on nonviolability of borders, assassination, and use of certain prohibited weapons, like chemical weapons, are shifting actors' cost-benefit analysis in favor of their use. Renewed competition, accusations of cheating, and the suspension or non-renewal of several major agreements are likely to weaken strategic arms control structures and undermine nonproliferation.

Reaching agreement on new treaties and norms for certain weapons most likely will be more difficult for these reasons and because of the increasing number of actors possessing these weapons. Weapons considered to have strategic impact probably will no longer be confined to nuclear weapons as conventional weapon capabilities improve and new capabilities, such as long-range precision strike that could put at risk national leadership, offer powerful effects. Countries may struggle to reach agreement on limiting the disruptive or security aspects of AI and other technology because of definitional differences, dual-use commercial applications, and reliance on commercial and often international entities to develop new systems. Incentives for such rules and enforcement mechanisms could emerge over time, especially if crises unfold that showcase the big risks and costs of unrestrained arms development.

THE FUTURE OF TERRORISM: DIVERSE ACTORS, FRAYING INTERNATIONAL EFFORTS

Terrorist groups will continue to exploit societal fragmentation and weak governance to push their ideologies and gain power through violence. During the next 20 years, regional and intrastate conflicts, demographic pressures, environmental degradation, and democratic retrenchment are likely to exacerbate the political, economic, and social grievances terrorists have long exploited to gain supporters as well as safe havens to organize, train, and plot. These accelerants, the intensity and effects of which are likely to be uneven across different regions and countries, probably will also foster rural to urban international migration, further straining state resources and diminishing global and local counterterrorism efforts.

- Global jihadist groups are likely to be the largest, most persistent transnational threat as well as a threat in their home regions. They benefit from a coherent ideology that promises to deliver a millenarian future, from strong organizational structures, and from the ability to exploit large areas of ungoverned or poorly governed territory, notably in Africa, the Middle East, and South Asia.
- Extreme "rightwing" and "leftwing" terrorists promoting a range of issues—racism, environmentalism, and anti-government extremism, for example—may revive in Europe, Latin America, North America, and perhaps other regions.
- Insurgent groups and sectarian conflicts—increasingly around ethno-nationalist and communal causes—will also continue to foster terrorism. The specific groups will wax and wane as some are defeated and others gain power. Although some groups will aspire to conduct transnational attacks and maintain cross border connections, most attacks will continue to be perpetrated by local actors against local targets aimed at achieving local objectives.
- Iran's and Lebanese Hizballah's efforts to solidify a Shia "axis of resistance" also might increase the threat of asymmetric attacks on US, Israeli, Saudi, and others' interests in the Middle East.

Technology Evolving Tactics for Terrorists and Counterterrorism Forces

Most terrorist attacks during the next 20 years probably will continue to use weapons similar to those currently available—such as small arms and improvised explosives—because these are generally sufficient, accessible, and reliable. However, technological advances, including AI, biotechnology, and the Internet of Things, may offer opportunities for terrorists to conduct high-profile attacks by developing new, more remote attack methods and to collaborate across borders. Terrorists will also seek weapons of mass destruction and other weapons and approaches that will allow them to conduct spectacular mass casualty attacks. For example, Islamic State of Iraq and Syria (ISIS) has already launched mustard gas attacks and uses unmanned aerial vehicles extensively—as do Iranian-supported Shia militants. Autonomous delivery vehicles guided with the help of AI systems could enable a single terrorist to strike dozens of targets in the same incident. Augmented reality environments could also enable virtual terrorist training camps, connecting experienced plotters protected by distant sanctuaries with potential operatives.

Technological innovations that expand surveillance capacity may help governments to combat terrorists despite challenges posed by poor governance. Governments are likely to continue dramatically expanding the amount and types of information they collect as well as the tools to sort and organize that data. Advances in biometric identification, data mining, full-motion video analysis, and metadata analysis will provide governments with improved capabilities to identify terrorists and plotting. Development of precision long-range strike capabilities might undermine terrorist safe havens that are inaccessible to police or infantry forces.

Geopolitics Reshaping Counterterrorism Landscape

Shifting international power dynamics—in particular, the rise of China and major power competition—are likely to challenge US-led counterterrorism efforts and may make it increasingly difficult to forge bilateral partnerships or multilateral cooperation on traveler data collection and information-sharing efforts that are key to preventing terrorists from crossing borders and entering new conflict zones. Poor countries probably will struggle with homegrown threats, particularly if international counterterrorism assistance is more limited. Some countries facing existential threats, such as insurgencies in which terrorists are active, may choose to forge non-aggression pacts that leave terrorists free to organize within their borders and others compelled to submit to terrorist rule over significant parts of their territory.

Photo / Bigstock

SCENARIOS FOR 2040

CHARTING THE FUTURE AMID UNCERTAINTY

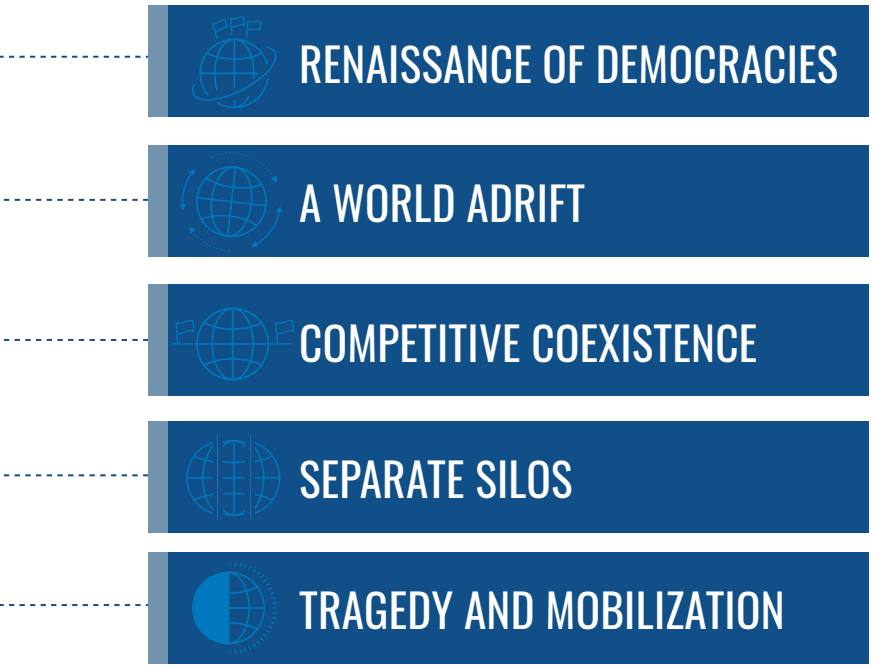
The previous chapters of Global Trends 2040 described how key structural forces are laying the foundations for our future world, including demographics, environment, economics, and technology, and then explored the dynamics emerging within societies, states, and the international system as communities and leaders respond to and engage with these forces. These sections point to a world that is increasingly out of balance and contested at every level, but this trajectory is not set in stone.

To better understand how these conditions might play out differently during the next 20 years, we developed scenarios describing a range of possible global futures. Three key questions or uncertainties helped to shape these scenarios.

- **How severe are the looming global challenges?**
- **How do states and nonstate actors engage in the world, including focus and type of engagement?**
- **Finally, what do states prioritize for the future?**

Image / Bigstock

Using these questions, we have identified five plausible, distinctive, and illustrative stories of the future. Each reflects the key themes of shared global challenges, fragmentation, disequilibrium, adaptation, and greater contestation.



Three of the scenarios portray futures in which international challenges become incrementally more severe, and interactions are largely defined by the US-China rivalry. In **Renaissance of Democracies**, the United States leads a resurgence of democracies. In **A World Adrift**, China is the leading but not globally dominant state, and in **Competitive Coexistence**, the United States and China prosper and compete for leadership in a bifurcated world.

Two other scenarios depict more radical change. Both arise from particularly severe global discontinuities, and both defy assumptions about the global system. The US-China rivalry is less central in these scenarios because both states are forced to contend with larger, more severe global challenges and find that current structures are not matched to these challenges. **Separate Silos** portrays a world in which globalization has broken down, and economic and security blocs emerge to protect states from mounting threats. **Tragedy and Mobilization** is a story of bottom-up, revolutionary change on the heels of devastating global environmental crises.

SCENARIO 1

RENAISSANCE OF DEMOCRACIES

In 2040, the world is in the midst of a resurgence of open democracies led by the United States and its allies. Rapid technological advancements fostered by public-private partnerships in the United States and other democratic societies are transforming the global economy, raising incomes, and improving the quality of life for millions around the globe. The rising tide of economic growth and technological achievement enables responses to global challenges, eases societal divisions, and renews public trust in democratic institutions. In contrast, years of increasing societal controls and monitoring in China and Russia have stifled innovation as leading scientists and entrepreneurs have sought asylum in the United States and Europe.

HOW WE GOT THERE

The successful development and worldwide distribution of the COVID-19 vaccine in 2020-21 focused global attention on the importance of scientific research, innovation, and technological development to address emerging global challenges. Networks of research institutes, governmental agencies, nongovernmental organizations, and private corporations operating in Organization for Economic Cooperation and Development countries ramped up information-sharing and developed coordinated approaches for research and development focused on artificial intelligence, biotech, and other technologies critical to revitalizing economies and addressing societal needs. During the succeeding 10 years, these efforts produced a series of groundbreaking advances, enhancing productivity and leading to an economic boom. Technological advances and economic growth combined to improve government capacity, enabling democratic governments to deliver services and provide security more effectively.

With greater resources and improving services, these democracies launched initiatives to crack down on corruption, increase transparency, and improve accountability worldwide, boosting public trust. These efforts helped to reverse years of social fragmentation and to restore a sense of civic nationalism. The combination of rapid innovation, a stronger economy, and greater societal cohesion enabled steady progress on climate and other challenges. Democratic societies became more resilient to disinformation because of greater public awareness and educa-

Photo / Bigstock

tion initiatives and new technologies that quickly identify and debunk erroneous information. This environment restored a culture of vigorous but civil debate over values, goals, and policies.

In contrast to the culture of collaboration prevailing in open societies, Russia and China failed to cultivate the high-tech talent, investment, and environment necessary to sustain continuous innovation. For China, the complete crackdown on Hong Kong in 2022 launched a decade of even greater digital repression, limiting any semblance of free expression. While they remained strategic military powers, both China and Russia were bogged down by domestic strains. China's aging population, high public and private debt, and inefficient state-directed economic model blocked the country's transition to a consumer economy, and by 2029 China was stuck in the middle-income trap and had alienated populations in developing countries. Russia declined because of a stagnating workforce, overreliance on energy exports, and post-Putin elite infighting.

By the mid-2030s, the United States and its allies in Europe and Asia were the established global leaders in several technologies, including AI, robotics, the Internet of Things, biotech, energy storage, and additive manufacturing. Democracies joined forces to set international standards to limit the negative consequences of technologies, including disinformation that had previously been so divisive in open societies. Multilateral cooperation spilled over into other areas, including cyber security, climate change mitigation, and rules for managing the seabed, the Arctic, and space.

Technological success fostered a widely perceived view among emerging and developing countries that democracies were more adaptable and resilient and better able to cope with growing global challenges. Years of unfulfilled Chinese promises also pushed some of the most populous countries, including Brazil, Indonesia, India, and Nigeria, to fully embrace transparent democracy. The rapid diffusion of advanced technologies to developing economies enabled faster than expected improvements in education and job skills, building on remote learning platforms developed during the pandemic. With China's rise no longer seen as inevitable, leading states and investors turned to more rapidly growing economies with robust private sectors and innovation systems.

Autocratic regimes tried but failed to push back against the growing strength of democratic allies. Russia threatened to intervene on behalf of ethnic Russian minorities in several of the non-North Atlantic Treaty Organization (NATO) post-Soviet states, a move widely seen as a desperate last attempt by Moscow to divert attention from its domestic problems. China took threatening steps in the South China Sea. Both invested in asymmetric weapons systems and disinformation technologies to counter US advantages while avoiding the costs of direct violence.

KEY TAKEAWAYS

- Open, democratic systems proved better able to foster scientific research and technological innovation, catalyzing an economic boom. Strong economic growth, in turn, enabled democracies to meet many domestic needs, address global challenges, and counter rivals.
- The combination of better service provision and anticorruption efforts helped restore public trust in institutions and eventually mended many fractured societies. Strong differences in public preferences and beliefs remained but these were worked out democratically.
- US leadership proved central to multilateral coordination and focus on global challenges, building on established alliances and international institutions. A revival in the EU and United Kingdom, spurred on by technological innovation and economic growth, was key to broader success.
- Over time, the combination of severe repression, stalled economic growth, and mounting demographic pressures undermined established authoritarian regimes in China and Russia, making them less predictable and more aggressive in their neighborhoods.

SCENARIO 2

A WORLD ADRIFT

In 2040, the international system is directionless, chaotic, and volatile as international rules and institutions are largely ignored by major powers such as China, regional players, and nonstate actors. Organization for Economic Cooperation and Development (OECD) countries are plagued by slower economic growth, widening societal divisions, and political paralysis. China is taking advantage of the West's troubles to expand its international influence, especially in Asia, but lacks the will and military might to take on global leadership, leaving many global challenges, such as climate change and instability in developing countries, largely unaddressed.

HOW WE GOT THERE

Many of the world's advanced and emerging market economies never fully recovered from the COVID-19 pandemic, which was prolonged by a slow and inefficient vaccine rollout. By the late-2020s, high national debt, the costs of caring for aging populations, and repeated climate events strained government budgets and crowded out other spending priorities, like education, infrastructure, and scientific research and development. Environmental, health, and economic crises had emerged gradually and sporadically over the decade, limiting political support and resources for governments to take action beyond emergency relief and short-term economic stimulus. Economic hardships widened societal divisions and made it harder to reach political compromise on domestic and national security priorities.

Public frustrations and protests grew in many countries, but fragmented and competing opposition movements were unable to agree on clear demands and goals. Polarized societies, shaped by social media, led to more political deadlock and wild policy swings. These factionalized communities, primarily in democratic countries, were unable to take effective action on the economy, the environment, migration, and foreign policy. Uncertainty surrounding crises and erratic government responses suppressed investment and job creation, plunging North America and Europe into a period of sluggish growth that many likened to Japan's "lost decade" in the 1990s. Developing countries stagnated, with some turning to China and several suffering state failure, particu-

larly in Africa and the Middle East. International challenges festered, ranging from terrorism to declining human development. Waves of migrants fled conflict, environmental disaster, and economic decline and sought entry to wealthier countries in Europe, Asia, and North America.

During this period, China experienced many of the same environmental and societal problems but was better able to adapt because of stronger social cohesion and trust; agile direction from centralized authority; a proven ability to deliver jobs, goods, and services; and a political system that repressed competing voices. Although to a lesser degree than the growth in the boom years of the 1990s and 2000s, domestic demand generated gross domestic product (GDP) growth sufficient to allow China to surpass the United States to become the world's largest economy by 2030. Huge infrastructure projects aimed at managing the effects of climate change, like the great Shanghai sea wall, became the envy of the world. Similar infrastructure development programs and steady foreign investment and assistance helped China gain influence in the developing world.

Despite these gains, China continued to focus on countering perceived security threats around its periphery and at home. Beijing remained wary of international entanglements and leadership roles outside its immediate region. Rather than attempting to fashion a new global order, China concentrated on promoting industries and setting technology standards that advanced its development goals.

Many governments were content to profit from China's large market and to pocket other benefits, like Chinese assistance with domestic surveillance and security systems, but few wanted to live under a China-led international order. The United States attempted to preserve ties to remaining allies in the region, but Japan and South Korea pursued increasingly independent military modernization programs and even their own nuclear weapons programs, in part out of concern about the reliability of the US security umbrella against China and North Korea.

By 2035, China's position in Asia became unassailable, especially after it successfully compelled the Government of Taiwan to come to the table for talks on unification. The triumph of China's economic and military coercive power was a turning point for the region, signaling Beijing's ability to intimidate a close US partner and forcing China's neighbors to worry that the Chinese People's Liberation Army would turn its focus to settling other regional scores. No other states put themselves in a position to challenge China's rise in the region. Russia generally aligned with China but became a lesser partner with each passing year. Although India benefited from growth in Asia, it could take years for it to be able to take on, much less contain, its more powerful neighbor.

KEY TAKEAWAYS

- This is a directionless world in which international rules of behavior are no longer followed, global cooperation is limited, and technology fails to provide solutions.
- China's increasingly aggressive moves in Asia elevates the risk of armed conflict with other regional powers, especially over critical resources. In contrast, developing countries with large unemployed youthful populations feel compelled to appease Chinese demands in hopes of securing much needed investment and aid.
- Regional powers and nonstate actors, including corporations, have more influence over domains like cyber, space, and other technologies, but they lack the power to dominate the system.
- Weakened rules and lack of multilateral cooperation leave the world more vulnerable to individual hackers, terrorists, and criminal groups. Belligerents feel emboldened to pursue their goals with force, particularly in the Middle East and Africa.
- Large global problems, particularly climate change and health challenges, fester as states lack incentives to pursue collective actions and instead apply a patchwork of mismatched approaches. Nonetheless, some states, companies, and private organizations use the freedom to discover novel ways to enhance human health and worker productivity and to experiment with new approaches to economic development and governance.

SCENARIO 3

COMPETITIVE COEXISTENCE

In 2040, the United States and China have prioritized economic growth and restored a robust trading relationship, but this economic interdependence exists alongside competition over political influence, governance models, technological dominance, and strategic advantage. The risk of major war is low, and international cooperation and technological innovation make global problems manageable over the near term for advanced economies, but longer term climate challenges remain.

HOW WE GOT THERE

After a slow recovery from the COVID-19 crisis and an extended US-China trade war, by the late 2020s, pent-up demand and widespread popular frustration with underperforming economies led to a revival in the Organization for Economic Cooperation and Development (OECD) countries of market-driven economic policies to stimulate growth. Meeting in Canada in 2031, the G7 endorsed plans for economic stimulus payments, liberalized trade and investment, streamlined taxes, and decreased regulations. Memories of an overbearing European Union (EU) having faded, Europeans agreed to a new round of trade liberalization, somewhat paradoxically under strengthened EU institutions. Weakened by years of depressed oil prices, post-Putin Russia supported the new G7 economic consensus, and emerging economies, including Brazil and India, joined with important economic reforms.

China rejected the OECD model and adhered to its closed state-directed system but prioritized economic growth and trade. Beijing and Washington took steps to stabilize economic relations, despite their mutual suspicion and contrasting political-economic models. The relationship has been fraught with disagreements on core security issues and values, but seeking relief from the tight trade and investment restrictions of the 2020s led each side to conclude that they need each oth-

James Kenny / Unsplash | Macau Photo Agency / Unsplash

er to prosper; the two sides agreed in the 2030s to protect their most vital common economic interests.

China and the United States formed rival "communities of common values" that compete for markets and resources under opposing domestic systems, one based on state direction, autocratic control, and public surveillance technologies and the other on private enterprise, democracy, personal freedom, and open information flows. The competition somewhat dampened fragmentation within countries as populations rallied to support their countries and leaders. Much of the work of managing the flow of trade and information was done by large corporations doing business globally. The United States, China, and like-minded states belonging to their respective camps intervened to prevent small conflicts from escalating to the point that they would threaten global economic progress and stability. Nevertheless, geopolitical competition, such as in the South China Sea, remained a persistent threat to economic relations, and many internal conflicts in poor countries festered with little international effort to intervene.

Rising commodity prices and demand for foreign workers stimulated an economic recovery that improved prospects for growing middle classes in some developing countries. Several advanced economies with aging populations set up guest worker programs, filling important service jobs while reducing uncontrolled migration using biometric tracking programs. Rising wages in China led to outsourcing and income gains in India, Southeast Asia, and parts of Africa. Nonetheless, large youthful populations in the developing world, especially in Africa, did not benefit from the reviving global economy.

Advances in renewable energy generation and storage and in carbon capture technologies dampened the growth of emissions, but not fast enough to prevent some catastrophic impacts. Wealthy countries were able to invest in adaptation measures at home to protect at risk populations, but developing countries lagged behind and suffered the most from increased disasters, presenting second-order security challenges.

KEY TAKEAWAYS

- The US-China rivalry and other state-to-state relations are channeled into competition for markets, resources, and brand reputation within mutually accepted rules in these areas. Publics rally around their governments in the competition, tempering societal fragmentation.
- Strengthened economic interdependence lowers the risk of the major powers pursuing armed conflict; most of them engage in influence operations, corporate espionage, and cyber attacks that allow them to achieve goals without risking destructive wars.
- The central security challenge is how to keep the geopolitical competition between the United States and China from undermining the economic cooperation upon which their prosperity and the global economy depends.
- Long-term stability remains at risk from growing climate challenges that were ignored in favor of near-term economic gains; technological innovations and economic prosperity have lulled leaders into believing that they can put off making hard choices on climate change.

SCENARIO 4

SEPARATE SILOS

In 2040, the world is fragmented into several economic and security blocs of varying size and strength, centered on the United States, China, the European Union (EU), Russia, and a few regional powers, and focused on self-sufficiency, resiliency, and defense. Information flows within separate cyber-sovereign enclaves, supply chains are reoriented, and international trade is disrupted. Vulnerable developing countries are caught in the middle with some on the verge of becoming failed states. Global problems, notably climate change, are spottily addressed, if at all.

HOW WE GOT THERE

By the early 2030s, cascading global challenges from decades of job losses in some countries in part because of globalization, heated trade disputes, and health and terrorist threats crossing borders prompted states to raise barriers and impose trade restrictions to conserve resources, protect citizens, and preserve domestic industries. Many economists thought that economic decoupling or separation could not really happen because of the extensive interdependence of supply chains, economies, and technology, but security concerns and governance disputes helped drive countries to do the unthinkable, despite the extraordinary costs.

Countries with large domestic markets or sizeable neighbors successfully redirected their economies, but many developing economies with limited resources and market access were hit hard as both import and export markets dried up. Economic stagnation fostered widespread insecurity across Africa, the Middle East, and South Asia, fueling a retreat to subnational ethnic and religious identities, strained societies, fragmented states, and spreading instability. New waves of migrants headed to the developed world hoping to escape poverty, poor governance, and increasingly harsh environmental conditions. Their hopes were dashed when political pushback prompted destination countries to block most migration.

As physical barriers went up, dependence on digital commerce and communications soared, but a combination of information management challenges and repeated data security breaches led those states with strong cyber controls, like China and Iran, to reinforce their cyber barricades. Then states that once advocated for an open Internet set up new closed, protected networks to limit threats and screen out unwanted ideas. By 2040, only the United States and a few of its closest allies maintained the semblance of an open Internet while most of the world operated behind strong firewalls.

With the trade and financial connections that defined the prior era of globalization disrupted, economic and security blocs formed around the United States, China, the EU, Russia, and India. Smaller powers and other states joined these blocs for protection, to pool resources, and to maintain at least some economic efficiencies. Advances in AI, energy technologies, and additive manufacturing helped some states adapt and make the blocs economically viable, but prices for consumer goods rose dramatically. States unable to join a bloc were left behind and cut off.

Security links did not disappear completely. States threatened by powerful neighbors sought out security links with other powers for their own protection or accelerated their own programs to develop nuclear weapons, as the ultimate guarantor of their security. Small conflicts occurred at the edges of these new blocs, particularly over scarce resources or emerging opportunities, like the Arctic and space. Poorer countries became increasingly unstable, and with no interest by major powers or the United Nations in intervening to help restore order, conflicts became endemic, exacerbating other problems. Lacking coordinated, multilateral efforts to mitigate emissions and address climate changes, little was done to slow greenhouse gas emissions, and some states experimented with geoengineering with disastrous consequences.

KEY TAKEAWAYS

- Separating economies has dire consequences, including massive financial losses for countries and corporations, as supply chains fracture, markets are lost, and once lucrative sectors, like travel and tourism, decline. The resulting economies are less vulnerable to future supply chain disruptions but also less efficient.
- Larger countries with abundant resources, few nearby enemies, and defensible borders, such as the United States and Canada, are better able to adapt than most others. The focus on self-sufficiency makes some states more resilient even as others founder.
- To maintain domestic stability in this world, states adopt mixed political models combining elements of democracy and authoritarianism, increasing surveillance and potentially repression. Many states turn to exclusionary forms of nationalism to unify majority populations against perceived foreign enemies.
- Unable to attract talent globally or sustain international collaboration, technological innovation atrophies. Wealthy countries begin to compensate by shifting resources to domestic education.
- International organizations and collective action to tackle climate change, healthcare disparities, and poverty falter. Countries independently adapt to the catastrophic impacts, significantly increasing the incentive for risky solutions.
- Focused on internal security, the world's larger militaries avoid direct armed conflict. Rival blocs compete for control over scarce resources, leading to smaller wars or other means of diverting attention from domestic problems and rallying public support against foreign enemies. Nuclear weapons proliferate.

SCENARIO 5

TRAGEDY AND MOBILIZATION

In 2040, a global coalition, led by the European Union (EU) and China working with nongovernmental organizations (NGOs) and revitalized multilateral institutions, is implementing far-reaching changes designed to address climate change, resource depletion, and poverty following a global food catastrophe caused by climate events and environmental degradation. Richer countries shift to help poorer ones manage the crisis and then transition to low carbon economies through broad aid programs and transfers of advanced energy technologies, recognizing how rapidly these global challenges spread across borders.

HOW WE GOT THERE

In the early 2030s, the world was in the midst of a global catastrophe. Rising ocean temperatures and acidity devastated major fisheries already stressed by years of overfishing. At the same time, changes in precipitation patterns depressed harvests in key grain producing areas around the world, driving up food prices, triggering widespread hoarding, and disrupting the distribution of food supplies, leading to global famine. A wave of unrest spread across the globe, protesting governments' inability to meet basic human needs and bringing down leaders and regimes. In one of many incidents in the Western world, thousands of people were killed in three days of violence in Philadelphia triggered by social media rumors about bread shortages.

The ongoing famines catalyzed a global movement that advocated bold systemic change to address environmental problems. Across the world, younger generations, shaped by the COVID-19 pandemic and traumatized by the threat of running out of food, joined together across borders to overcome resistance to reform, blaming older generations for destroying their planet. They threw their support behind NGOs and civil society organizations that were involved in relief efforts and developed a larger global following than those governments that were perceived to have failed their populations. As the movement grew, it took on other issues including global health and poverty.

Image / Bigstock

After Green parties swept democratic elections in several European countries between 2034 and 2036, the EU launched a campaign within the United Nations (UN) to greatly expand international aid programs and to set a new target date for meeting the UN's Sustainable Development Goals by 2050. Hurt badly by the famine and hoping to quell unrest in its major cities, China announced its support for the EU effort, which the Chinese Communist Party portrayed as a new national patriotic mission and the kind of global restructuring it had long advocated. Others, including Australia, Canada, and the United States, slowly joined the movement as environmentally focused parties gained political strength, winning several elections, despite strong continued resistance from some domestic groups arguing that their countries were better positioned to adapt to a changing climate and should prioritize domestic industries and constituencies.

The EU initiative resulted in the creation of a new international organization, the Human Security Council, in cooperation with developing countries, which focused on 21st Century transnational security challenges. Open to both states and nonstate actors, membership required a commitment to verifiable actions to improve food, health, and environmental security, even if these were perceived as painful for wealthier states and groups. Members could easily be expelled for noncompliance, and face grassroots, popular backlashes and boycotts, similar to the Anti-Apartheid Movement of the last century. By 2038, global attitudes about the environment and human security were being transformed by growing recognition of the unsustainability of past practices.

States and large corporations concentrated investments to advance technological solutions to food, climate, and health challenges and to provide essential aid to the hardest hit populations. Corporate goals expanded to embrace serving a wider range of stakeholders, including customers, employees, suppliers, and communities.

Not everyone has come on board. Russia and some states in the Organization of Petroleum Exporting Countries resisted change, and some communities found the new global ethos threatening to traditional values and patronage systems. Extremists resorted to cyber attacks and terrorism to draw attention to their causes. States with powerful energy interests, such as Iran, Russia, and some Gulf Arab states, faced disruptive political movements that threaten to lead to a prolonged period of political and social conflict.

KEY TAKEAWAYS

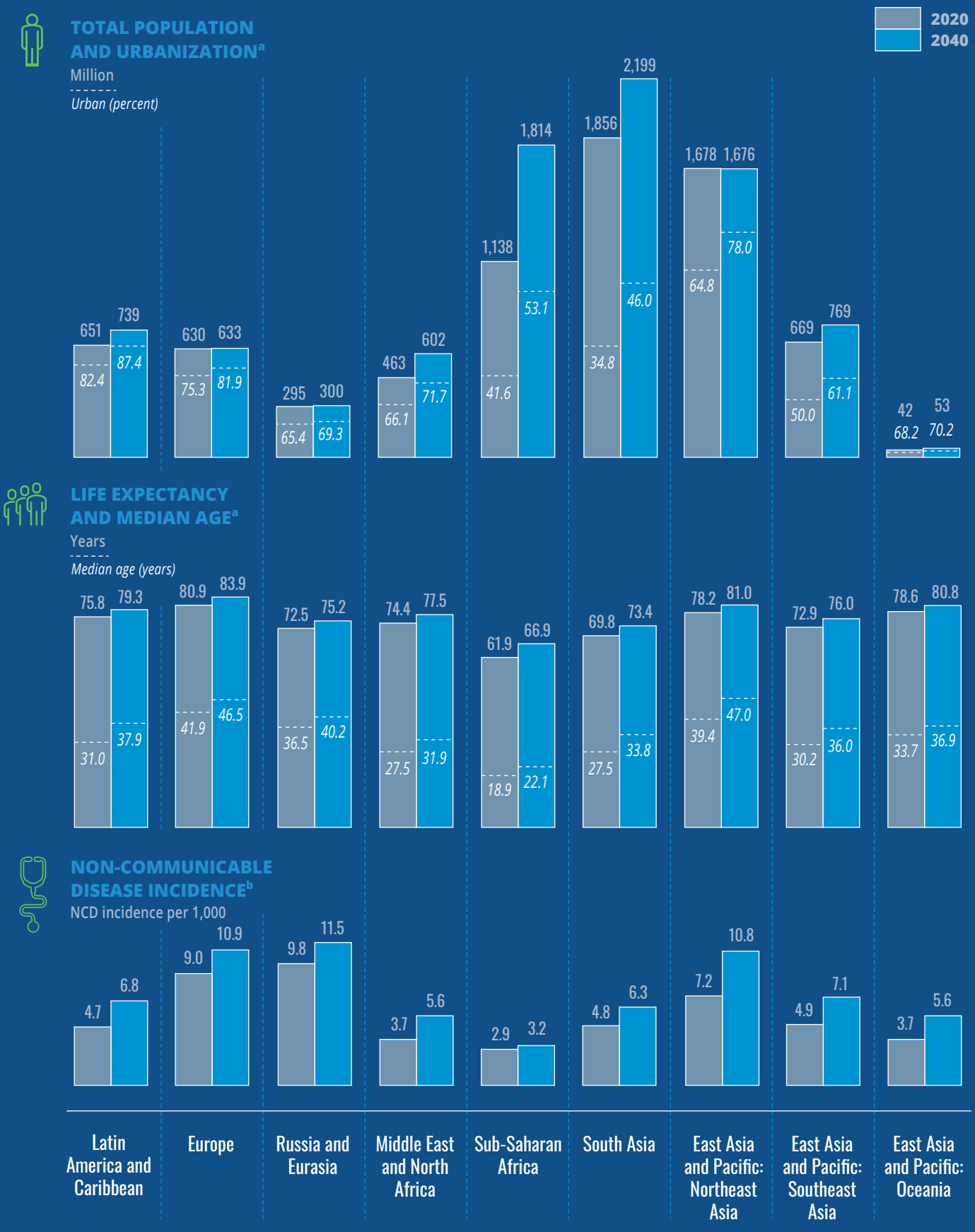
- An existential threat catalyzes a bottom-up social movement that transforms multilateral cooperation, disrupts economic incentives, and offers nonstate actors greater influence.
- Major power competition among individual states is rechanneled to address more pressing global challenges; the geopolitical hierarchy is reshuffled, creating once unlikely partnerships between progressive European political parties and the Chinese Communist Party. Europe takes the lead in promoting sustainable development, while China adopts and promotes new energy technologies.
- Countries beholden to fossil fuel industries are the slowest to get on board with the global revolution, creating a global backlash to their leadership, products, and brands. The second- and third-order implications of the new political movements create long-term challenges for their economies.
- With broad popular support, NGOs, multilateral organizations, and activist groups have unprecedented ability to influence standards, marshal resources, hold violators accountable, and prod states to act. In some cases, global priorities take precedence over national interests.

REGIONAL FORECASTS

This section of the Global Trends report provides 20-year projections of key demographic trends in nine regions: Latin America and Caribbean; Europe; Russia and Eurasia; Middle East and North Africa; Sub-Saharan Africa; South Asia; Northeast Asia; Southeast Asia; and Oceania. The 20-year projections include such demographic trends as population growth, rates of urbanization, median age, gross domestic product (GDP) per capita, non-communicable disease incidence, and religious affiliation. The graphics also highlight the state of democracy in each region, its readiness for the digital economy, and the potential physical effects of climate change over the next 20 years. We have moderate confidence in our 20-year outlooks for population growth, age structure, and median age because these measures are extrapolated directly from existing fertility and mortality rates, as well as decades of observed population trends. We have a lower degree of confidence in the outlooks for urbanization, GDP per capita, climate change, digital readiness, and the rise of noncommunicable disease, which can vary depending on human choices, introducing a greater potential for error.

Image | Chuttersnap / Unsplash

COMPARING SELECTED REGIONAL DEMOGRAPHICS



[a] United Nations Population Division. | [b] IHME and Pardee Center University of Denver.

LATIN A

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	MEXICO CITY, MEXICO	25.4
2	SAO PAULO, BRAZIL	24.5
3	BUENOS AIRES, ARGENTINA	17.1
4	RIO DE JANIERO, BRAZIL	14.8
5	LIMA, PERU	13.0

GDP PER CAPITA[b]

US$ at purchasing power parity

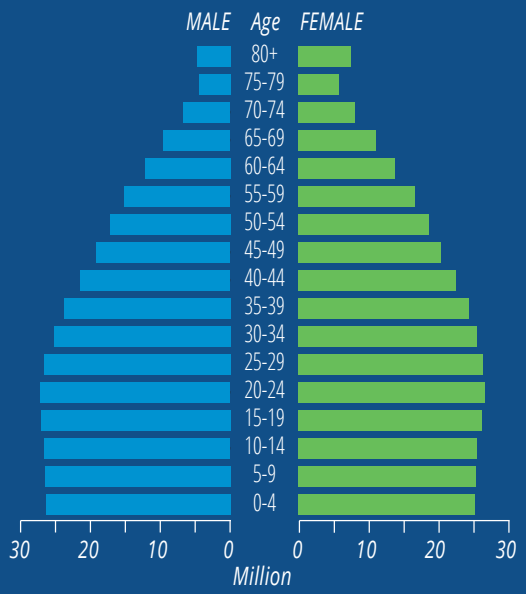
2020	2040
$13.4K	$18.9K

RELIGION[c]

2020	92.1%	4.1%	3.8%
2040	90.9%	5.3%	3.7%
	Catholic	Agnostic/ Atheist	Other

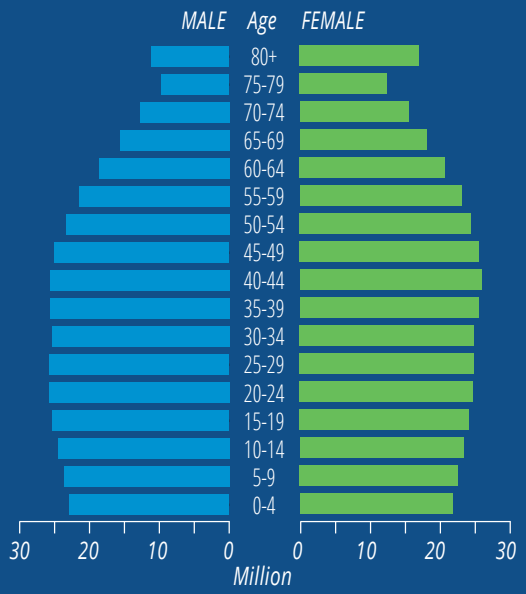
2020 AGE STRUCTURE[a]

Under 15	15-64	65+
23.9%	67.2%	8.9%



2040 AGE STRUCTURE[a]

Under 15	15-64	65+
18.8%	65.9%	15.2%



 [a] United Nations Population Division. | [b] Oxford Economics. | [c] World Religion Database.

MERICA AND CARIBBEAN

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 3

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 16

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 5

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 1

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 55.2% — 100

Digital skills of workforce rating[d]

1 = not at all — 3.4 — to a great extent = 7

Information globalization rating[e]

1 = low — 83.7 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

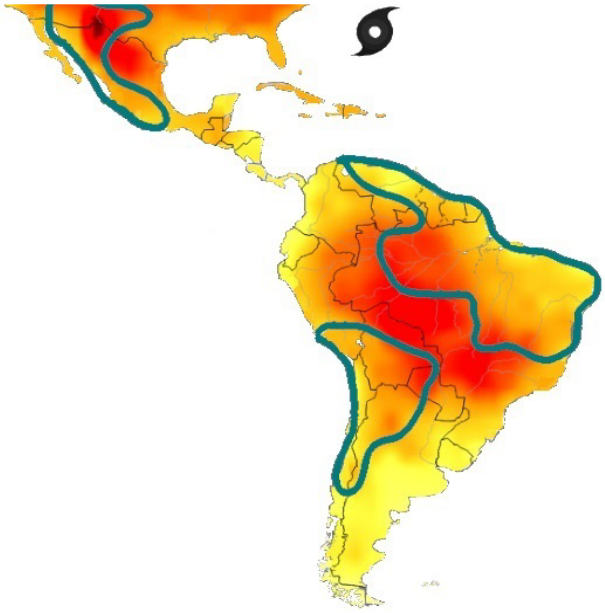
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

EUR

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	ISTANBUL, TURKEY	18.0
2	PARIS, FRANCE	12.1
3	LONDON, UNITED KINGDOM	10.6
4	MADRID, SPAIN	7.0
5	ANKARA, TURKEY	6.2

GDP PER CAPITA[b]

US$ at purchasing power parity

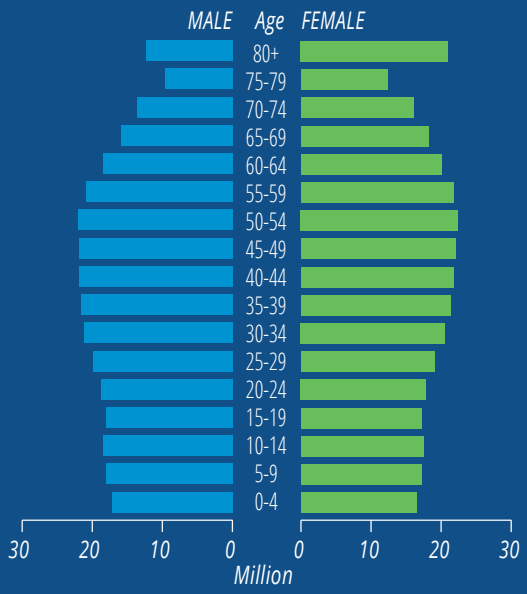
2020	2040
$37.2K	$51.0K

RELIGION[c]

2020	63.7%	18.8%	16.5%
2040	58.5% Christian	21.6% Muslim	18.7% Agnostic/ Atheist

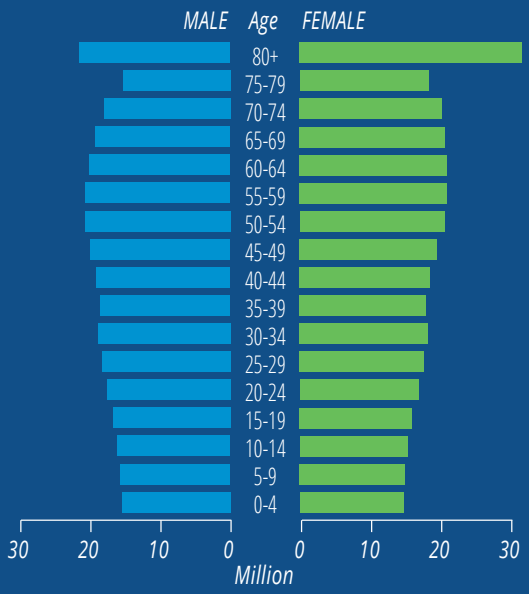
2020 AGE STRUCTURE[a]

Under 15	15-64	65+
16.6%	64.6%	18.8%



2040 AGE STRUCTURE[a]

Under 15	15-64	65+
14.5%	59.5%	26.0%



 [a] United Nations Population Division. | [b] Oxford Economics. | [c] World Religion Database.

OPE

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 19

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 13

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 3

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 0

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 78.0 % — 100

Digital skills of workforce rating[d]

1 = not at all — 4.5 — to a great extent = 7

Information globalization rating[e]

1 = low — 83.1 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

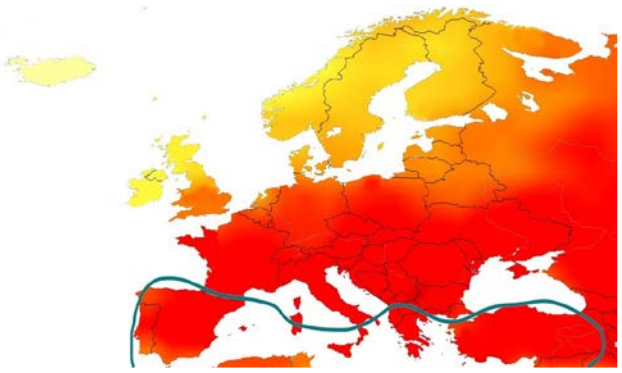
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

RUSSIA AN

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	MOSCOW, RUSSIA	12.8
2	SAINT PETERSBURG, RUSSIA	5.6
3	TASHKENT, UZBEKISTAN	3.0
4	KYIV, UKRAINE	3.0
5	BAKU, AZERBAIJAN	2.8

GDP PER CAPITA[b]

US$ at purchasing power parity

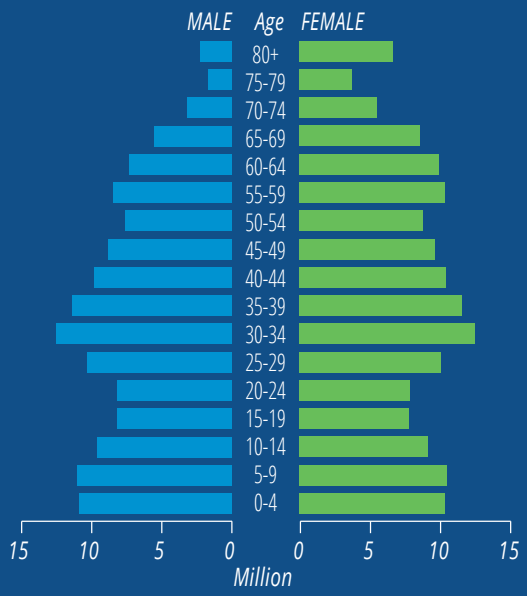
2020	2040
$18.4K	$30.4K

RELIGION[c]

2020	61.3%	32.5%	5.5%
2040	57.6%	38.1%	3.6%
	Christian	*Muslim*	*Agnostic/ Atheist*

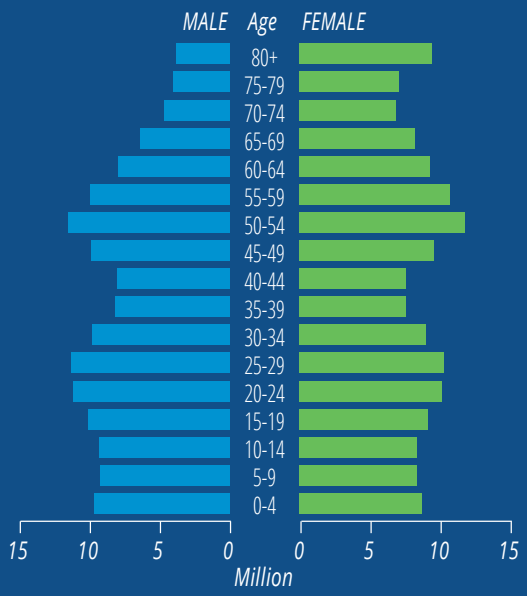
2020 AGE STRUCTURE[a]

Under 15	*15-64*	*65+*
21.2%	66.0%	12.8%



2040 AGE STRUCTURE[a]

Under 15	*15-64*	*65+*
18.0%	64.9%	17.1%



 [a] *United Nations Population Division.* | [b] *Oxford Economics.* | [c] *World Religion Database.*

D EURASIA

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 0

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 3

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 8

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 1

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 54.7 % — 100

Digital skills of workforce rating[d]

1 = not at all — 3.9 — to a great extent = 7

Information globalization rating[e]

1 = low — 79.2 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

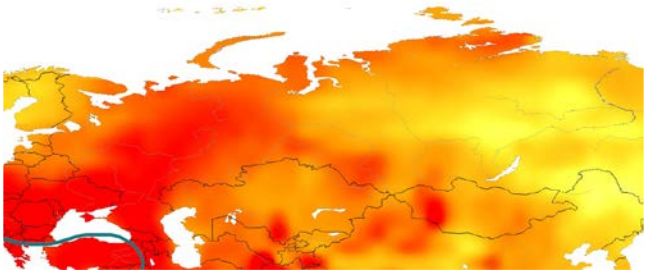
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

MIDDLE EAST &

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	CAIRO, EGYPT	28.5
2	BAGHDAD, IRAQ	10.8
3	TEHRAN, IRAN	10.7
4	RIYADH, SAUDI ARABIA	9.1
5	ALEXANDRIA, EGYPT	7.2

GDP PER CAPITA[b]

US$ at purchasing power parity

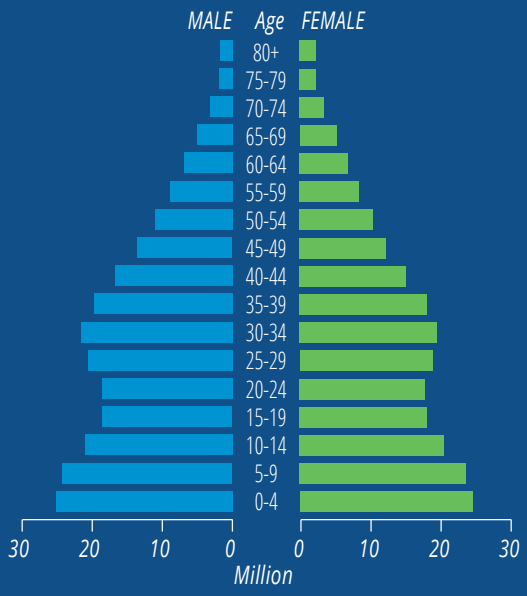
2020	2040
$15.3K	$19.9K

RELIGION[c]

2020	92.9%	3.9%	1.5%
2040	93.2%	3.6%	1.5%
	Muslim	*Christian*	*Jewish*

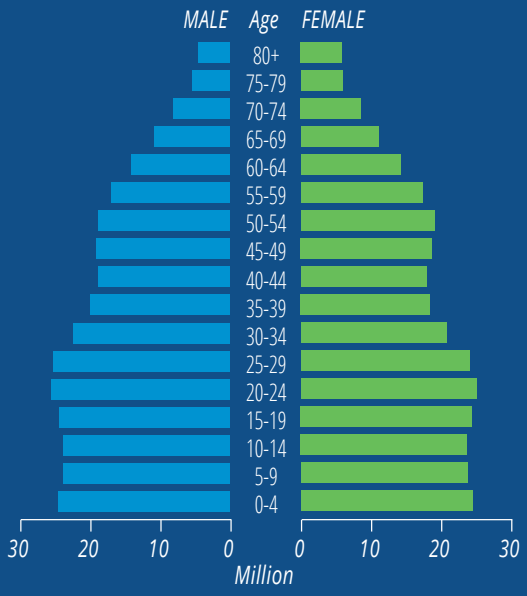
2020 AGE STRUCTURE[a]

Under 15	15-64	65+
29.8%	64.8%	5.4%



2040 AGE STRUCTURE[a]

Under 15	15-64	65+
23.6%	66.5%	9.9%



 [a] *United Nations Population Division.* | [b] *Oxford Economics.* | [c] *World Religion Database.*

NORTH AFRICA

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 2

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 0

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 5

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 12

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 42.9% — 100

Digital skills of workforce rating[d]

1 = not at all — 3.6 — to a great extent = 7

Information globalization rating[e]

1 = low — 69.8 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

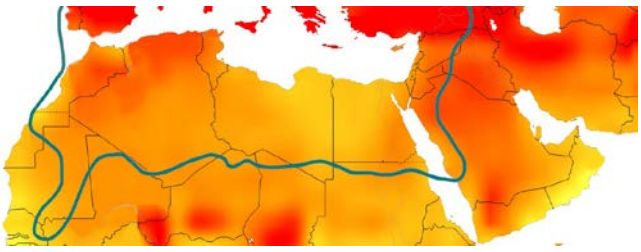
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

SUB-SAHAR

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	KINSHASA, DRC	26.7
2	LAGOS, NIGERIA	24.4
3	LUANDA, ANGOLA	14.5
4	DAR ES SALAAM, TANZANIA	13.4
5	KHARTOUM, SUDAN	9.6

GDP PER CAPITA[b]

US$ at purchasing power parity

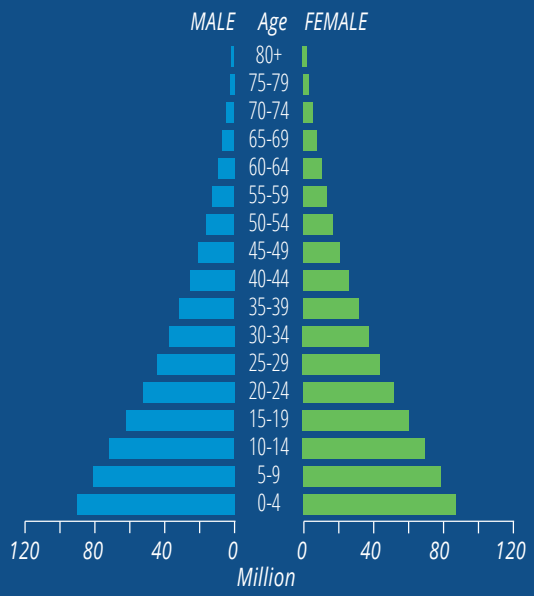
2020	2040
$3.6K	$4.7K

RELIGION[c]

2020	57.2%	32.2%	9.3%
2040	58.1%	33.7%	7.1%
	Christian	*Muslim*	*Ethnic Religion*

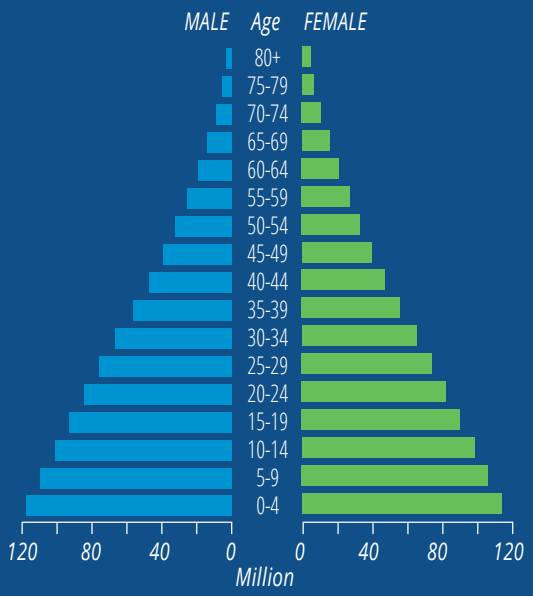
2020 AGE STRUCTURE[a]

Under 15	15-64	65+
42.0%	55.0%	3.0%



2040 AGE STRUCTURE[a]

Under 15	15-64	65+
36.0%	60.0%	3.9%



 [a] United Nations Population Division. | [b] Oxford Economics. | [c] World Religion Database.

AN AFRICA

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 1

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 17

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 27

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 5

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 17.6% — 100

Digital skills of workforce rating[d]

1 = not at all — 2.7 — to a great extent = 7

Information globalization rating[e]

1 = low — 61.0 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

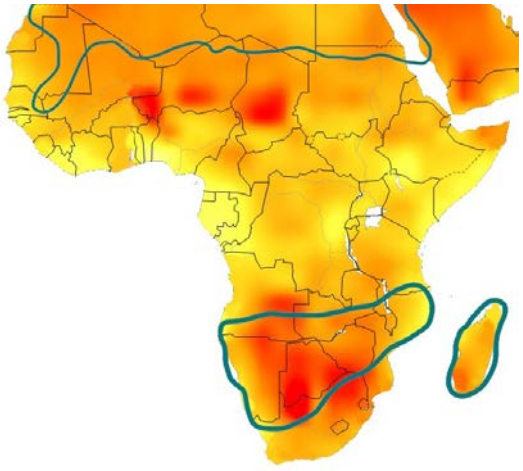
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

SOUTH

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	NEW DELHI, INDIA	43.3
2	DHAKA, BANGLADESH	31.2
3	MUMBAI, INDIA	27.3
4	KARACHI, PAKISTAN	23.1
5	CALCUTTA, INDIA	19.6

GDP PER CAPITA[b]

US$ at purchasing power parity

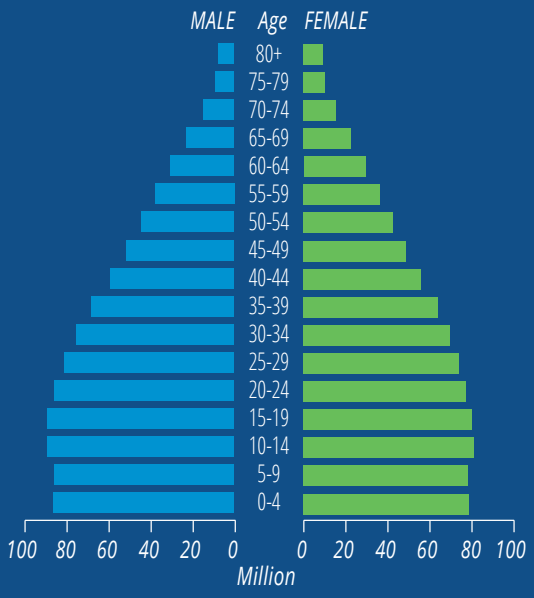
2020	2040
$5.9K	$15.7K

RELIGION[c]

	Hindu	Muslim	Christian	Ethnic Religion
2020	56.4%	32.1%	4.1%	3.0%
2040	53.9%	34.3%	4.8%	2.4%

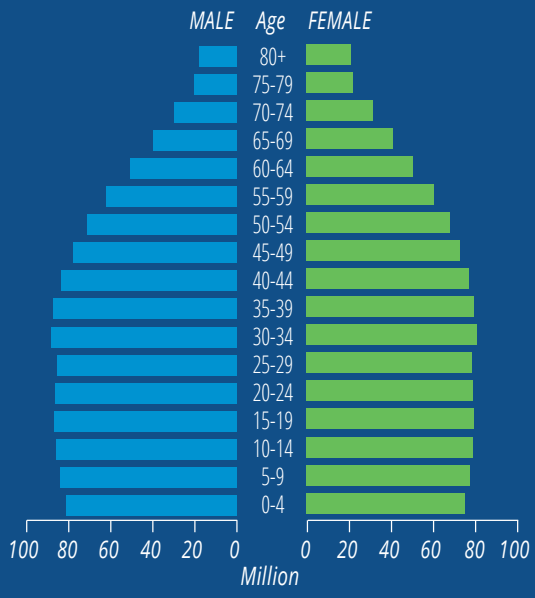
2020 AGE STRUCTURE[a]

Under 15	15-64	65+
27.6%	66.3%	6.1%



2040 AGE STRUCTURE[a]

Under 15	15-64	65+
21.8%	68.1%	10.1%



 [a] United Nations Population Division. | [b] Oxford Economics. | [c] World Religion Database.

ASIA

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 0

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 4

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 4

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 0

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 25.8% — 100

Digital skills of workforce rating[d]

1 = not at all — 4.2 — to a great extent = 7

Information globalization rating[e]

1 = low — 72.2 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

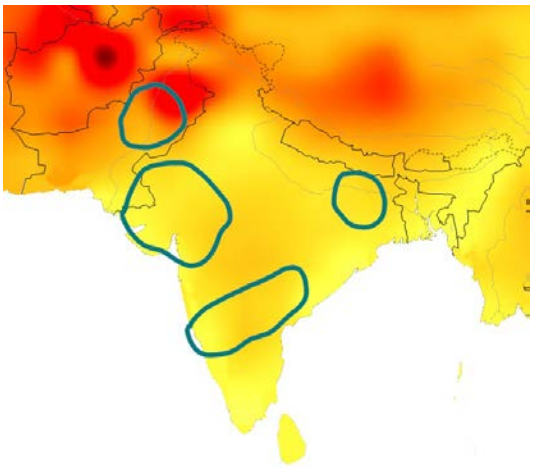
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

EAST ASIA AND PACIFIC NORTHE

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	TOKYO, JAPAN	36.0
2	SHANGHAI, CHINA	34.3
3	BEIJING, CHINA	25.4
4	CHONGQING, CHINA	20.5
5	OSAKA METROPOLITAN AREA	18.3

GDP PER CAPITA[b]

US$ at purchasing power parity

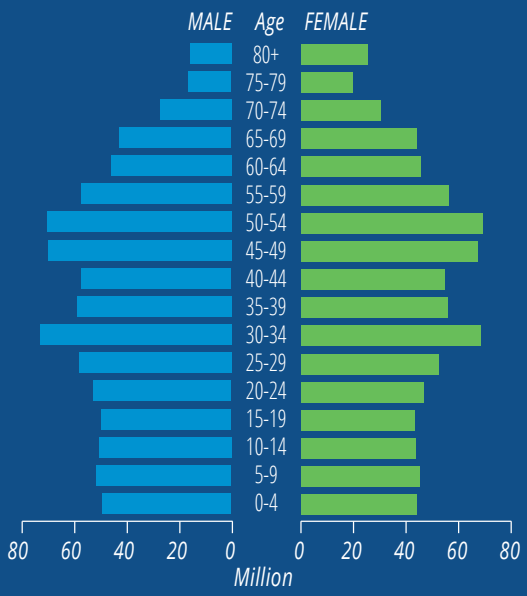
2020	2040
$19.4K	$36.7K

RELIGION[c]

2020	35.4%	27.2%	19.9%	7.7%
2040	31.1%	25.9%	21.4%	11.6%
	Agnostic/ Atheist	*Chinese Folk Religion*	*Buddhist*	*Christian*

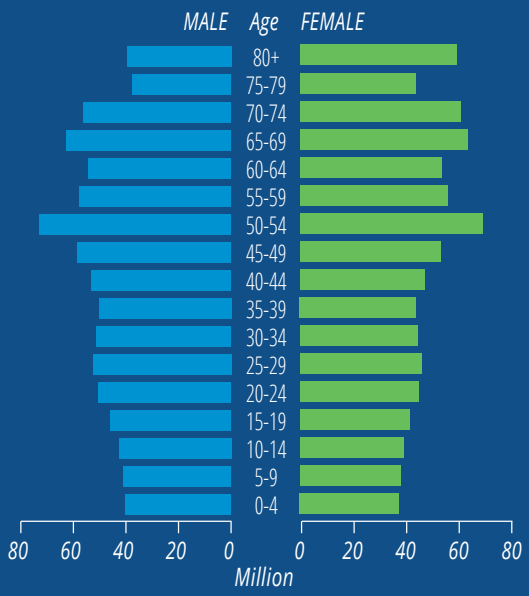
2020 AGE STRUCTURE[a]

Under 15	15-64	65+
17.1%	69.5%	13.4%



2040 AGE STRUCTURE[a]

Under 15	15-64	65+
14.0%	61.3%	24.8%



[a] *United Nations Population Division.* | [b] *Oxford Economics.* | [c] *World Religion Database.*

AST ASIA

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 3

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 1

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 0

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 2

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 55.5% — 100

Digital skills of workforce rating[d]

1 = not at all — 4.6 — to a great extent = 7

Information globalization rating[e]

1 = low — 86.3 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

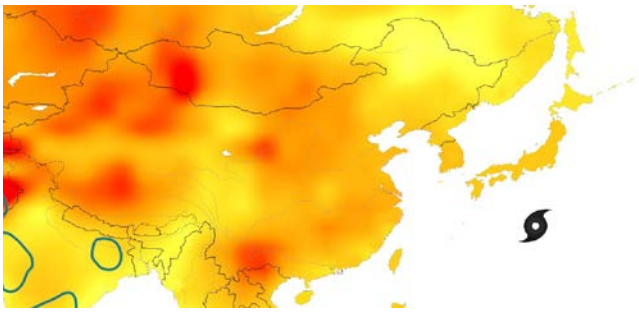
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

EAST ASIA AND PACIFIC SOUTHE

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	MANILA, PHILIPPINES	18.6
2	JAKARTA, INDONESIA	13.7
3	BANGKOK, THAILAND	12.7
4	HO CHI MINH CITY, VIETNAM	12.2
5	KUALA LUMPUR, MALAYSIA	10.5

GDP PER CAPITA[b]

US$ at purchasing power parity

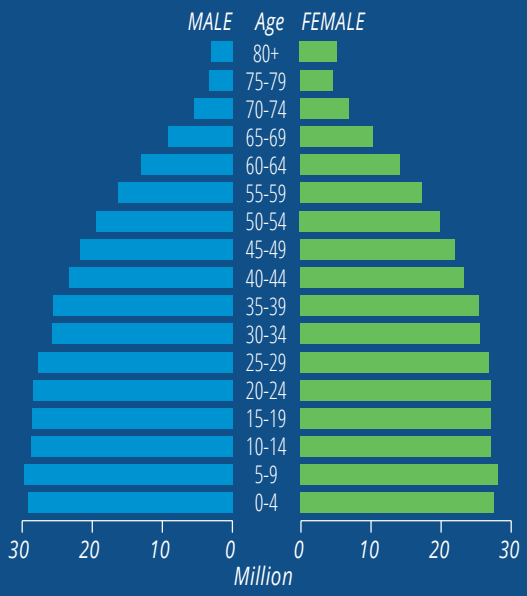
2020	2040
$11.8K	$24.5K

RELIGION[c]

	Muslim	Buddhist	Christian	Ethnic Religion
2020	37.2%	26.1%	22.9%	4.4%
2040	37.0%	25.0%	24.8%	3.8%

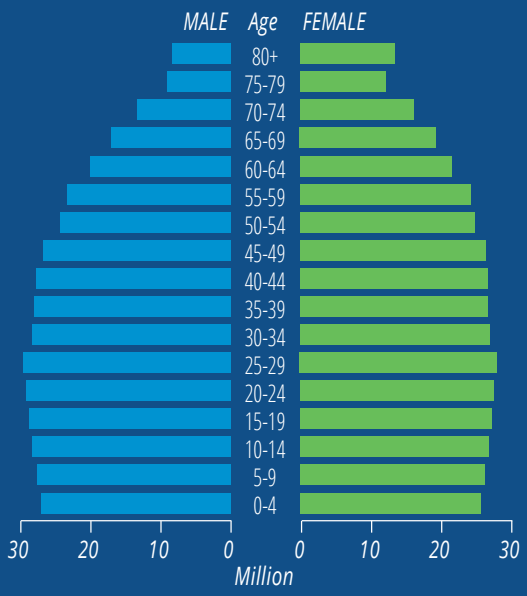
2020 AGE STRUCTURE[a]

Under 15	15-64	65+
25.2%	67.7%	7.1%



2040 AGE STRUCTURE[a]

Under 15	15-64	65+
20.3%	66.0%	13.7%



[a] United Nations Population Division. | [b] Oxford Economics. | [c] World Religion Database.

AST ASIA

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 0

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 2

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 5

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 3

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 36.9% — 100

Digital skills of workforce rating[d]

1 = not at all — 4.1 — to a great extent = 7

Information globalization rating[e]

1 = low — 82.9 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

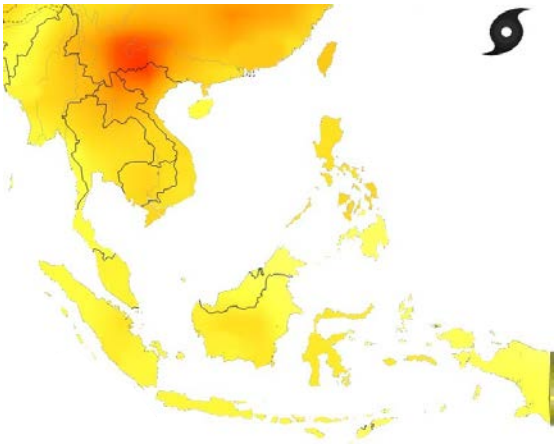
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

EAST ASIA AND PACIFIC

OCEA

FIVE LARGEST CITIES[a]

By population in 2035 (million)

1	MELBOURNE, AUSTRALIA	6.1
2	SYDNEY, AUSTRALIA	5.9
3	BRISBANE, AUSTRALIA	2.9
4	PERTH, AUSTRALIA	2.4
5	AUCKLAND, NEW ZEALAND	1.9

GDP PER CAPITA[b]

US$ at purchasing power parity

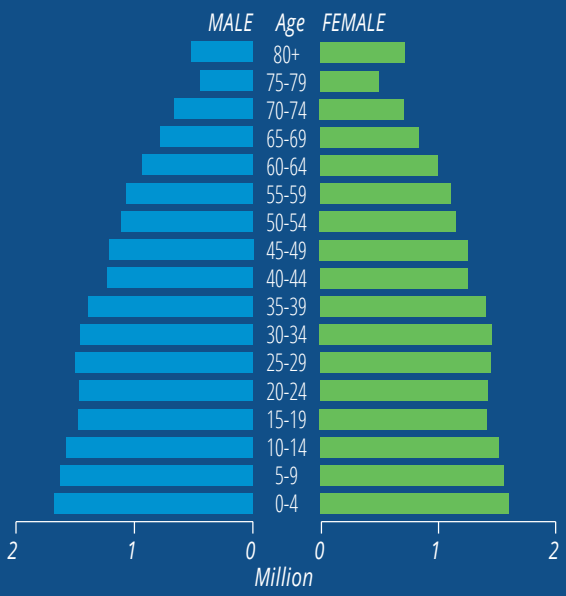
2020	2040
$34.0K	$43.3K

RELIGION[c]

2020	65.1%	25.3%	2.4%	2.2%
2040	62.1%	27.8%	2.5%	2.4%
	Christian	*Agnostic/ Atheist*	*Buddhist*	*Muslim*

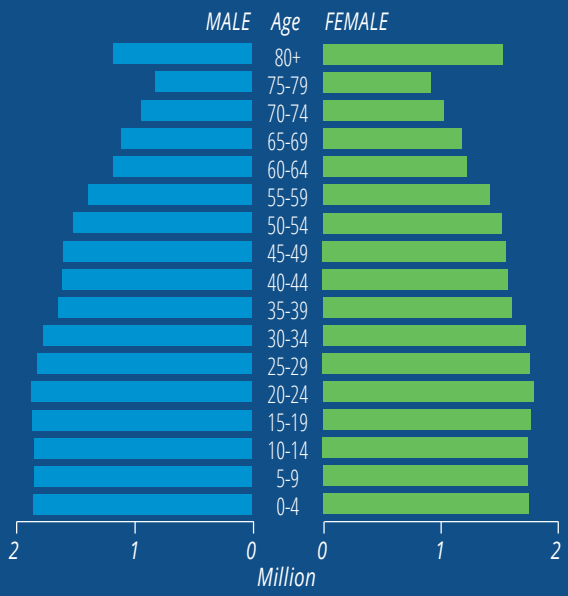
2020 AGE STRUCTURE[a]

Under 15	*15-64*	*65+*
23.6%	63.6%	12.8%



2040 AGE STRUCTURE[a]

Under 15	*15-64*	*65+*
20.9%	62.3%	16.8%



 [a] *United Nations Population Division.* | [b] *Oxford Economics.* | [c] *World Religion Database.*

NIA

2020

TYPES OF GOVERNMENTS[a]

Number of countries

Liberal Democracies 2

Hold free and fair multiparty elections and guarantee freedom of speech and expression. Liberal democracies also uphold the rule of law and have constraints on the executive.

Electoral Democracies 2

Hold free and fair multiparty elections and guarantee freedom of speech and expression, but do not uphold the rule of law and/or do not have constraints on the executive.

Electoral Autocracies 2

Hold elections but they are not free, fair, and multiparty, and/or the government does not guarantee freedom of speech and expression.

Closed Autocracies 0

Do not even hold multiparty elections for the chief executive.

[a] *Varieties of Democracy, 2020. The number of countries included in this study may not equal the number listed separately under "Selected Regions and Countries.*

2019[b]

READINESS FOR DIGITAL ECONOMY

Internet Users (of population)[c]

0 — 60.2% — 100

Digital skills of workforce rating[d]

1 = not at all — 3.4 — to a great extent = 7

Information globalization rating[e]

1 = low — 87.5 — high = 100

[b] *2019 or latest available data.*
[c] *International Telecommunication Union.*
[d] *World Economic Forum.*
[e] *KOF Globalization Index.*

2040

TEMPERATURE, DROUGHT, AND HURRICANE ACTIVITY

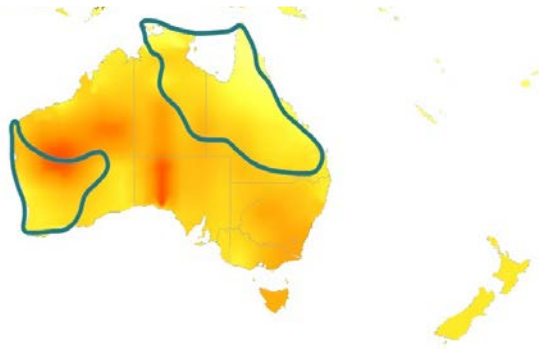
0 — 2.5

Increase in the hottest day temperature, Celsius

Increase in the longest annual drought by 2.5 days or more

Increase in major hurricane activity

This map[f] illustrates likely changes in maximum temperature, drought, and hurricane/cyclone activity in 2040—compared to the 1980-2005 baseline—given conditions specified by the United Nations' Intergovernmental Panel on Climate Change (IPCC) under Representative Concentration Pathway (RCP) 4.5. While several different temperature measures could have been used, maximum temperature on the hottest day of the year was chosen given the severe human, agricultural, and economic costs associated with heat waves. When combined with longer droughts, these effects are multiplied.



[f] *Data: Clemens Schwingshackl, Jana Sillman, and the Centre for International Climate and Environmental Research. Graphic: Pardee Center University of Denver.*

SELECTED REGIONS AND COUNTRIES

Latin America and Caribbean

Antigua and Barbuda
Argentina
Bahamas, the
Barbados
Belize
Bolivia
Brazil
Chile
Colombia
Costa Rica
Cuba
Dominica
Dominican Republic
Ecuador
El Salvador
Grenada
Guatemala
Guyana
Haiti
Honduras
Jamaica
Mexico
Nicaragua
Panama
Paraguay
Peru
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Suriname
Trinidad and Tobago
Uruguay
Venezuela

Europe

Albania
Austria
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Italy
Kosovo
Latvia
Lithuania
Luxembourg
North Macedonia
Malta
Montenegro
Netherlands
Norway
Poland
Portugal
Romania
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey
United Kingdom

Russia and Eurasia

Armenia
Azerbaijan
Belarus
Georgia
Kazakhstan
Kyrgyzstan
Moldova
Russia
Tajikistan
Turkmenistan
Ukraine
Uzbekistan

Middle East and North Africa

Algeria
Bahrain
Egypt
Iran
Iraq
Israel
Jordan
Kuwait
Lebanon
Libya
Morocco
Oman
Palestinian territories
Qatar
Saudi Arabia
Syria
Tunisia
United Arab Emirates
Yemen

Sub-Saharan Africa

Angola
Benin
Botswana
Burkina Faso
Burundi
Cabo Verde
Cameroon
Central African Republic
Chad
Comoros
Cote d'Ivoire
Congo, Democratic Republic of the
Congo, Republic of the
Djibouti
Equatorial Guinea
Eritrea
Eswatini
Ethiopia
Gabon
Gambia, the
Ghana
Guinea
Guinea-Bissau
Kenya
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Mozambique
Namibia
Niger
Nigeria
Rwanda
Sao Tome and Principe
Senegal
Seychelles
Sierra Leone
Somalia
South Africa
South Sudan
Sudan
Tanzania
Togo
Uganda
Zambia
Zimbabwe

South Asia

Afghanistan
Bangladesh
Bhutan
India
Maldives
Nepal
Pakistan
Sri Lanka

East Asia and Pacific

Northeast Asia

China
Japan
Mongolia
North Korea
Republic of Korea
Taiwan

Southeast Asia

Brunei
Burma
Cambodia
Indonesia
Laos
Malaysia
Philippines
Singapore
Thailand
Timor-Leste
Vietnam

Oceania

Australia
Cook Islands
Fiji
Kiribati
Marshall Islands
Micronesia, Federated States of
Nauru
New Zealand
Niue
Palau
Papua New Guinea
Samoa
Solomon Islands
Tonga
Tuvalu
Vanuatu

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