Megatrend 4
Economics & Business

The Roland Berger Trend Compendium 2050 focuses on stable long term developments …

> The **Roland Berger Trend Compendium 2050** is a global trend study compiled by **Roland Berger Institute (RBI)**, the think tank of Roland Berger. Our Trend Compendium 2050 describes the **most important megatrends** shaping the world between **now and 2050**

> Our **trend views are based on expert sources and assessments**. Estimates reflect the normal case, i.e. a stable development of the global economy

> To incorporate today's uncertainties into strategic planning, we recommend **combining the megatrends of the Roland Berger Trend Compendium 2050** with the **Roland Berger scenario planning approach**

Is it worth dealing with megatrends when there are such drastic global events as the Corona pandemic taking place?

Clearly yes! The Corona pandemic has far-reaching consequences and affects us deeply, all within a very short time – but in itself the pandemic does not set aside the megatrends here analyzed. Such is the inherent nature of megatrends: Climate change, the aging of society or the ongoing evolution of technology do not lose their overriding direction or importance. To cope with such challenges – and to master resulting opportunities – our awareness and understanding of these megatrends is paramount in order to develop sustainable answers

… and covers six megatrends that shape the future development of our world until 2050

1 People & Society

- Population
- Migration
- Values
- Education

2 Health & Care

- Pandemics & Other Wildcards
- Diseases & Treatments
- Caregiving

3 Environment & Resources

- Climate Change & Pollution
- Resources & Raw Materials
- Ecosystems at Risk

4 Economics & Business

- **Globalization Revisited**
- **Power Shifts**
- **Sectoral Transformation**
- **Debt Challenge**

5 Technology & Innovation

- Value of Innovations
- Frontier Technologies
- Humans & Machines

6 Politics & Governance

- Future of Democracy
- Governance & Geopolitics
- Global Risks

Global value chains are under revision, a new power bloc is emerging, sectoral transformation is key, pandemic accelerates global debt burden

Subtrends of megatrend "Economics & Business"

1

Globalization Revisited

2

Power Shifts

3

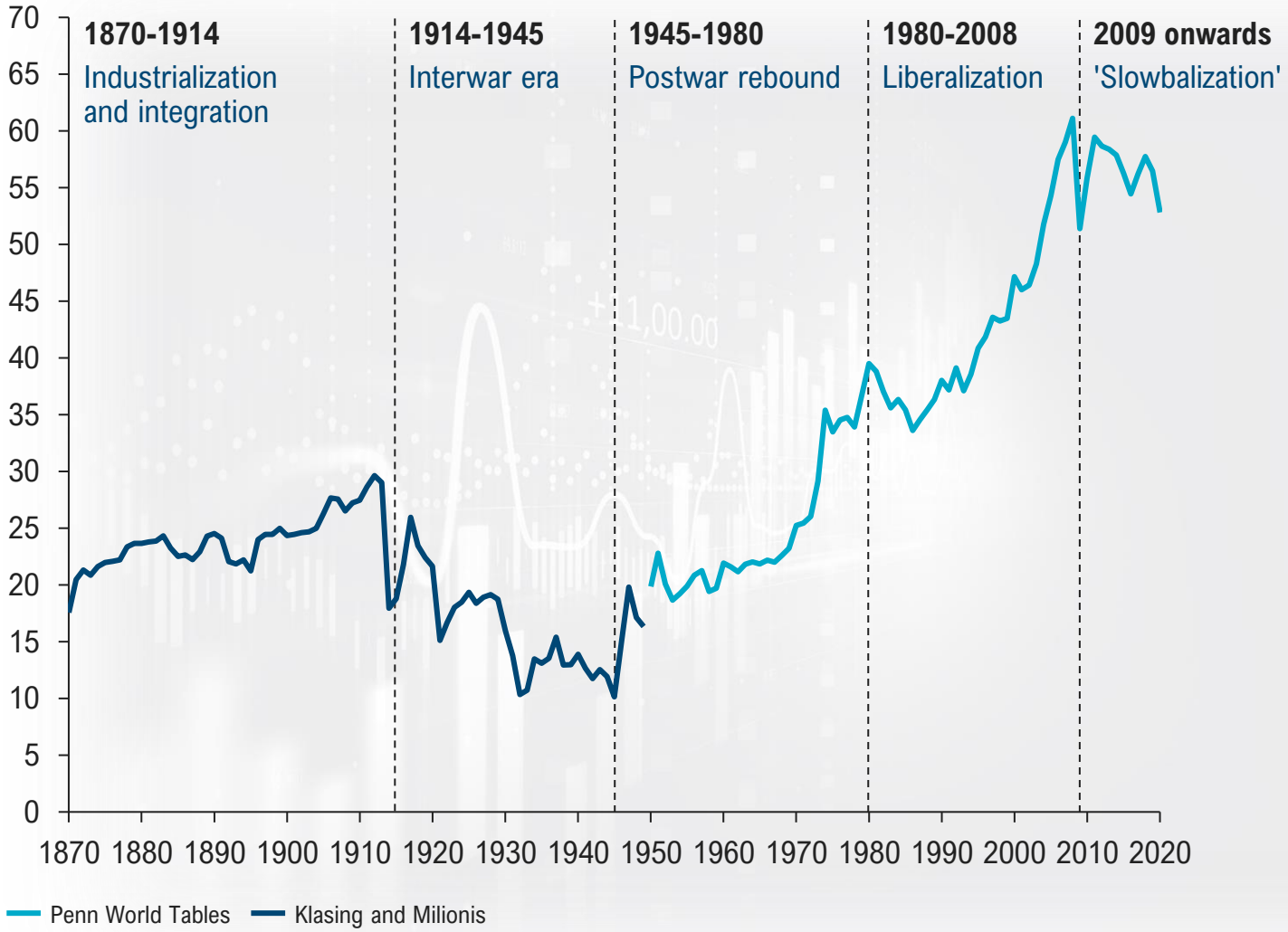
Sectoral Transformation

4

Debt Challenge

Since the global financial crisis, globalization appears restraint along an uneven plateau – Its future direction is dividing expectations

Global trade openness, 1870-2020 [%]

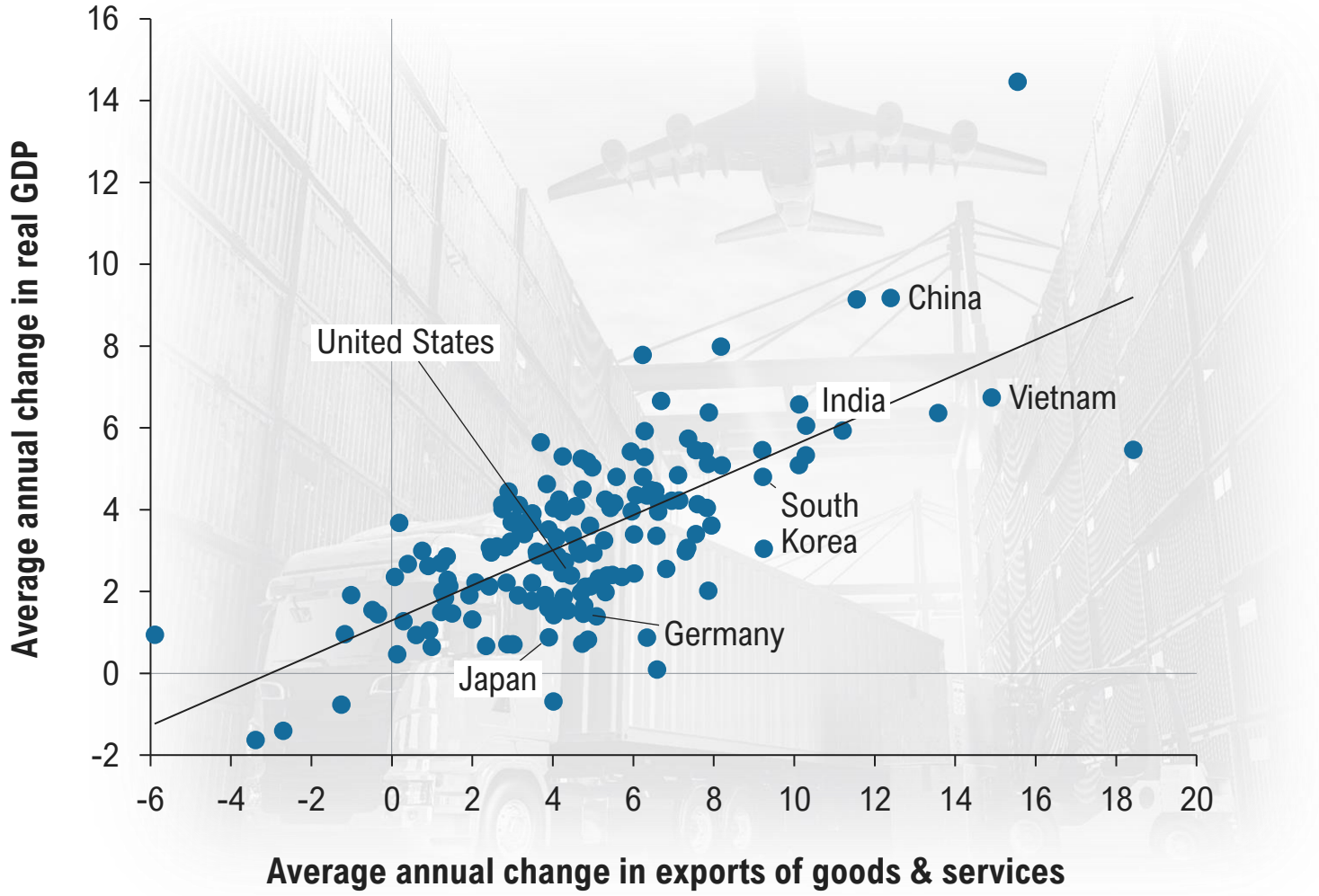


- The term **globalization** describes the **increasing interconnectedness** of the world's **economies, populations and cultures** caused by cross-border **trade** in goods and services, **technology** and **flows of investment**, **people** and **information**
- The **status** of globalization is often **measured** by **Global Trade Openness**, an indicator composed of the sum of global exports and imports as a percentage of global GDP
- Over the past 150 years, **globalization** has gone through **mostly burgeoning phases** – except for the interwar era, when globalization was in decline for several decades
- The **global financial crisis** of 2007-2009 marks a turning point for flourishing phases of **postwar rebound** followed by trade **liberalization;** since then, a period termed **slowbalization** can be observed. **Expectations** on its **future** path are **divided**: Globalization **growth** is expected to be comparatively **subdued** – some even see a phase of renewed **decline** in globalization ahead

Sources: Our World In Data; University of Groningen; World Bank; Roland Berger

Economic growth and trade display a clear correlation: Countries with high rates of export growth tend to have higher GDP growth rates

Compound annual growth rate of real GDP and trade, 1990-2019 [%]

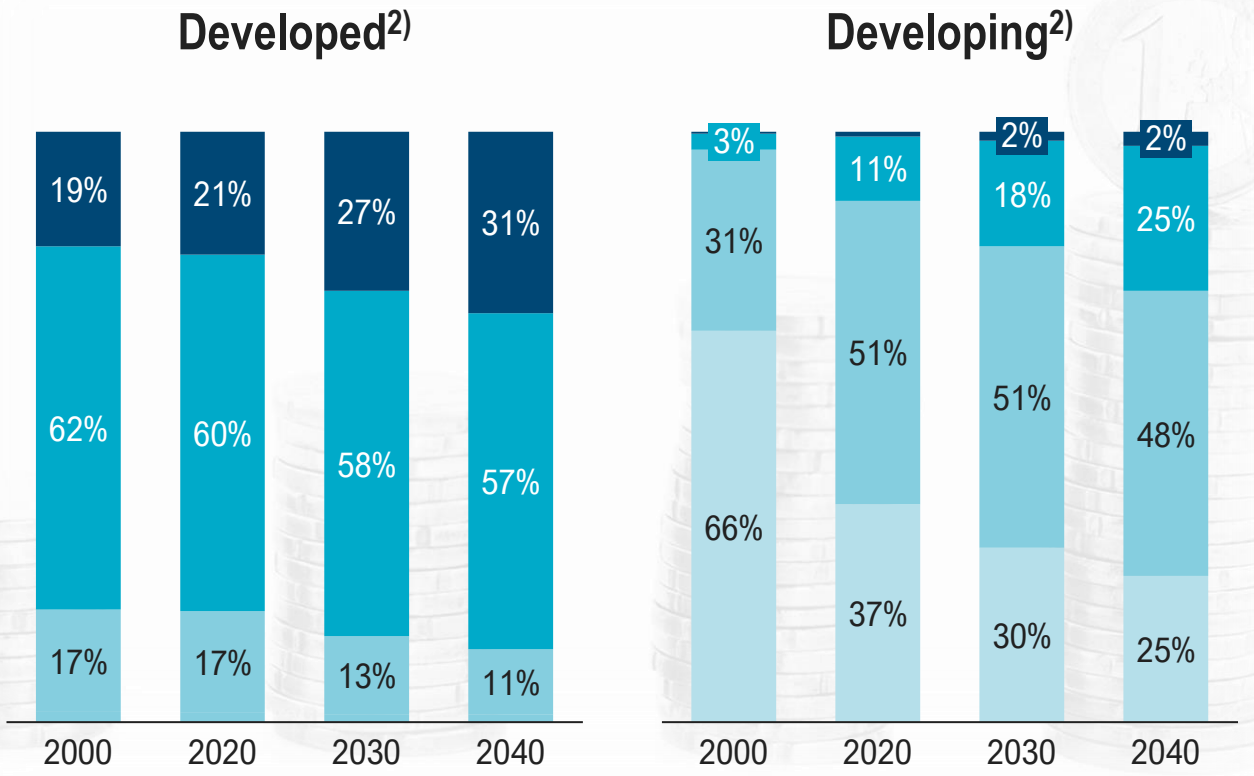


- Looking at country-level data from the last 30 years, there is a **notable correlation between economic growth and trade**: Countries with higher rates of export growth also tend to have higher rates of GDP growth – this **trade-growth relationship** can be observed (where data is available) for at least two centuries
- Although correlations shown here do not establish causality, current economic opinion indicates that **trade has a positive impact on GDP growth**
- Research has shown that **countries open to international trade** tend to **grow** at a **faster** rate, are **more innovative**, **improve productivity** more readily, fostering income and opportunities gains for their citizens
- A variety of reasons for trade as a growth-enhancing factor under **greater global economic integration** include increased competition on global markets, economies of scale as well as gains in learning and innovation

Sources: Oxford Economics; Roland Berger

Greater international trade integration has enabled households – notably in developing economies – to benefit from globalization

Globalization and income – Development of household income groups[1] [%]



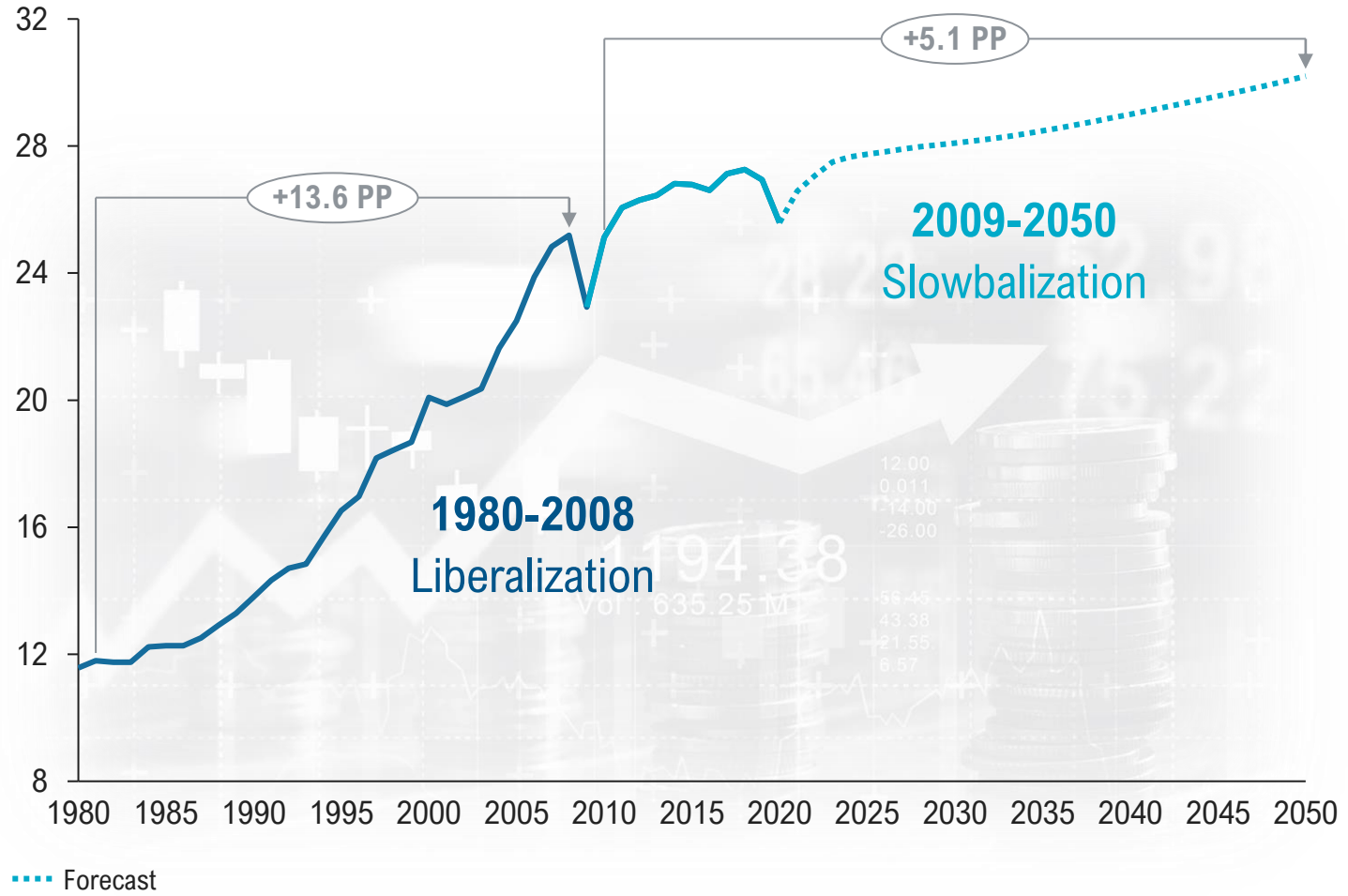
- **Developing economies** are expected to **increase their household income** due to closer global economic integration, resulting in an **upward shift of income groups**
- Comparative income inequalities are reduced as **income increases** for **developing countries** are **stronger** than for developed countries
- The share of households in developing countries with **incomes below USD 5,000** will **decline** from more than 60% in 2000 to **just 25%** by 2040
- However, in **2040**, **88%** of all households in developed economies will have an **annual income above 25,000 USD** compared to **only 27% in the developing countries**
- In **developed economies**, the **top household income group** (USD ≥100,000 p.a.) **will increase** its share by 2040 to nearly one third of all households
- Nevertheless, **enthusiasm for globalization has waned** over the last few years in many wealthy nations, for example in the United States and Europe, in part because their citizens **do not benefit as much** from the observed **income growth** compared to developing countries

1) Household income groups are based on country-specific household income distribution
2) Throughout this document, use of the terms developed and developing economies follow IMF definitions

Sources: Euromonitor, Roland Berger

International trade in goods and services gained notable traction from the mid-1980s – Since the global financial crisis, momentum has slowed

Global export of goods and services as a share of global GDP[1] [in %]



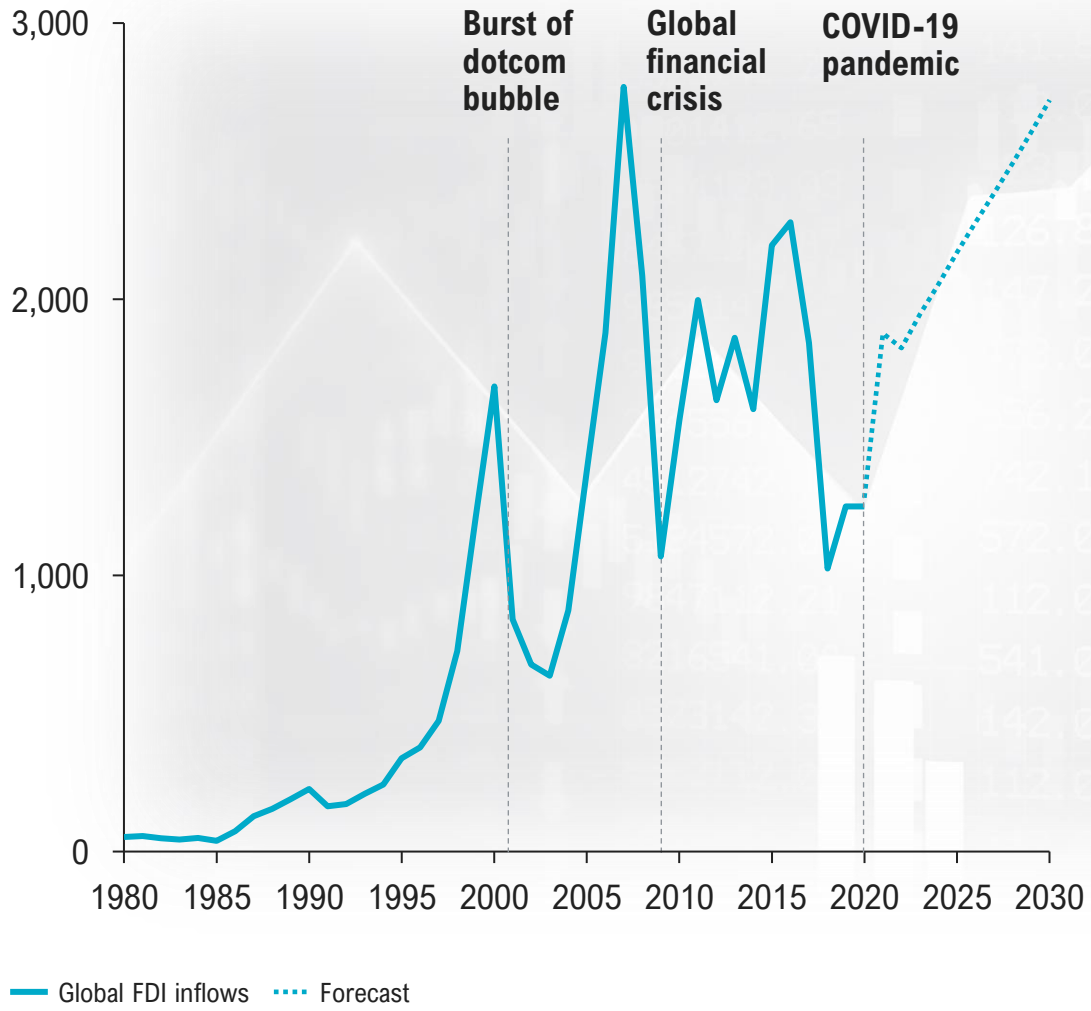
- While the **share of exports** in global GDP managed to **increase by 13.6 percentage points** (PP) during the phase of liberalization (1980-2008), export expectation trends are still positive and set to keep on **increasing in the future** – albeit at a much **slower pace** (2010-2050: **+ 5.1 percentage points**)
- A key reason for this slowdown in pace – with the **pre-pandemic share already being at a very high level at around 27%** – lies in a **natural process of saturation** that is starting manifest itself
- An additional factor is that **signs of rising protectionism** have been observed in recent years across several countries

1) Global exports measured in constant prices and exchange rate, USD, base year = 2015; global GDP measured in constant prices and PPP exchange rates, USD, base year = 2015; due to the extraordinary effect of the global financial crisis, 2009 data have been omitted for growth calculations

Sources: Oxford Economics; Roland Berger

While global trade is slowing down, foreign direct investment is rising – A trend towards more regional value chains is emerging

Global foreign direct investment, inward[1] [USD bn]

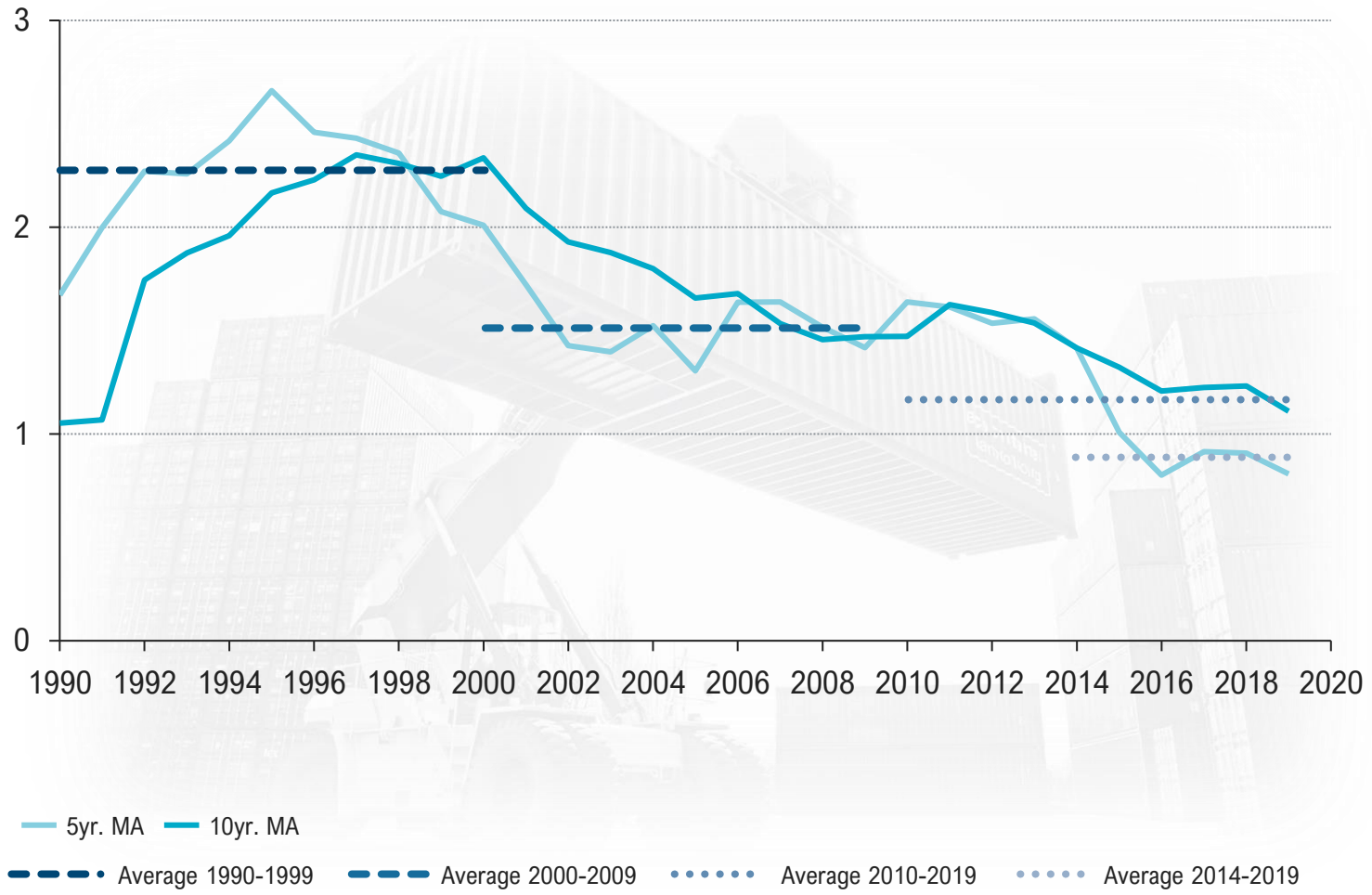


1) Due to different calculation methods, FDI data from different sources differ, sometimes considerably
Sources: Oxford Economics; Roland Berger

- One facet of rising globalization is an **increase in foreign direct investments**. FDIs are **investments** by **foreign entities abroad,** made either by establishing new operations or the (partial) acquisition of an existing business. As such, FDIs are **long-term investments** and involve **elements of business control**
- During the **liberalization** period, global **FDI flows increased tremendously**. After the **dotcom bubble** and the **global financial crisis, sharp declines followed** in both cases. Especially after the latter, FDI flows were much more volatile, settling at a lower level compared to the pre-crisis peak
- Underlying causes for the **economic downturn** due to the **COVID-19 pandemic** are markedly **different** to those in the two prior crises. In these crises, effects associated with **cyclical build-ups** of **excesses** in the economy and financial system were major causes resulting in a **pull-back in cross-border investment** due to **risk aversion**
- In **contrast**, while **risk aversion increased** in some parts of the global economy and markets **during the pandemic**, the overall **pull back was less severe** and mostly **limited to Q2 2020**. Companies were **buoyed by unprecedented levels** of government support, which also **boosted M&A activity** since the pandemic
- **Estimates** suggest that FDI flows will **continue to rise** in the future – but at a **much slower pace** of growth
- Caveat: Growth will **presumably be more volatile** than illustrated here

While global exports of goods grew on average twice as fast as GDP during the 1990s, this trend reversed at the turn of the millennium

Global trade elasticity[1], 5- and 10-year moving average [%]



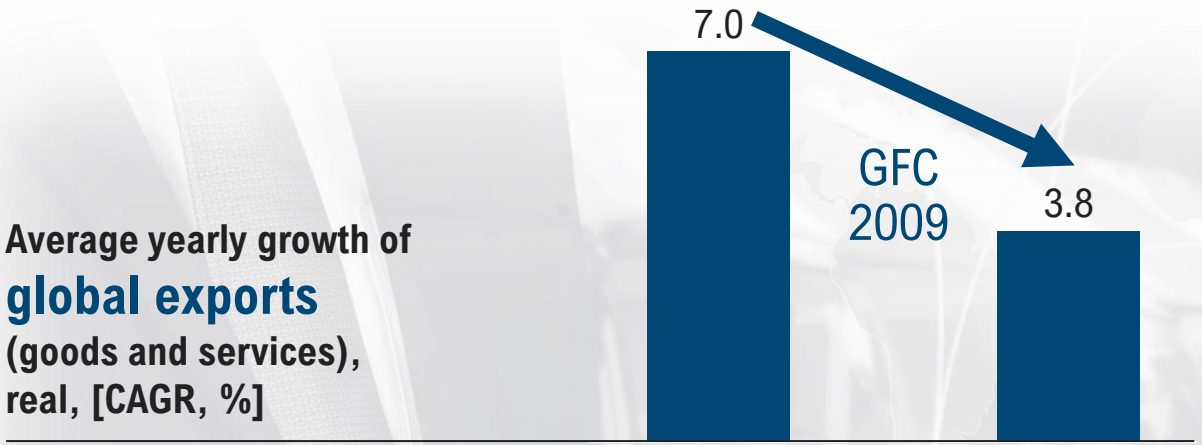
1) Trade elasticity is calculated as the ratio of growth in global exports of goods and global GDP growth
Sources: IMF; Roland Berger

- Valid arguments for an observable phase of slowbalization are **not based** on the result of a **short-term economic shock or exogenous political events**, **but** rather on a **long-term structural change** that was already indicated before the global financial crisis
- This diagnosis can be confirmed, for example, by looking at **trade elasticity,** where a **value above 1** means that the global **growth in exports** of goods was **greater** than the **growth in GDP**
- While export growth from 1990 to the turn of the millennium was **almost twice as high as GDP growth**, **trade elasticity has been falling continuously** since 2000 – dropping **below the value of 1 for the first time in decades in 2016** measured as five-year average, indicating that exports grew more slowly than GDP

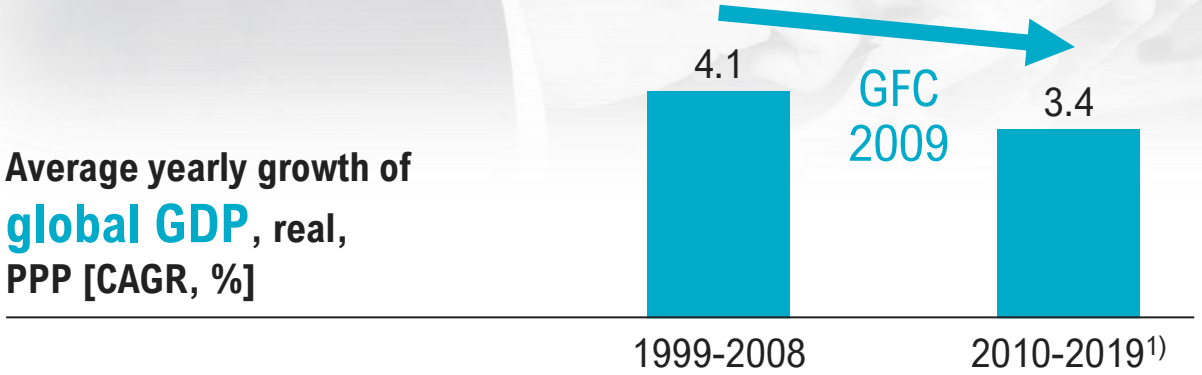
Since the global financial crisis, rates of trade growth have nearly halved, heralding a premature point of departure for the liberalization phase

Global trade has cooled off after 2009

Average yearly growth of global exports (goods and services), real, [CAGR, %]



Average yearly growth of global GDP, real, PPP [CAGR, %]

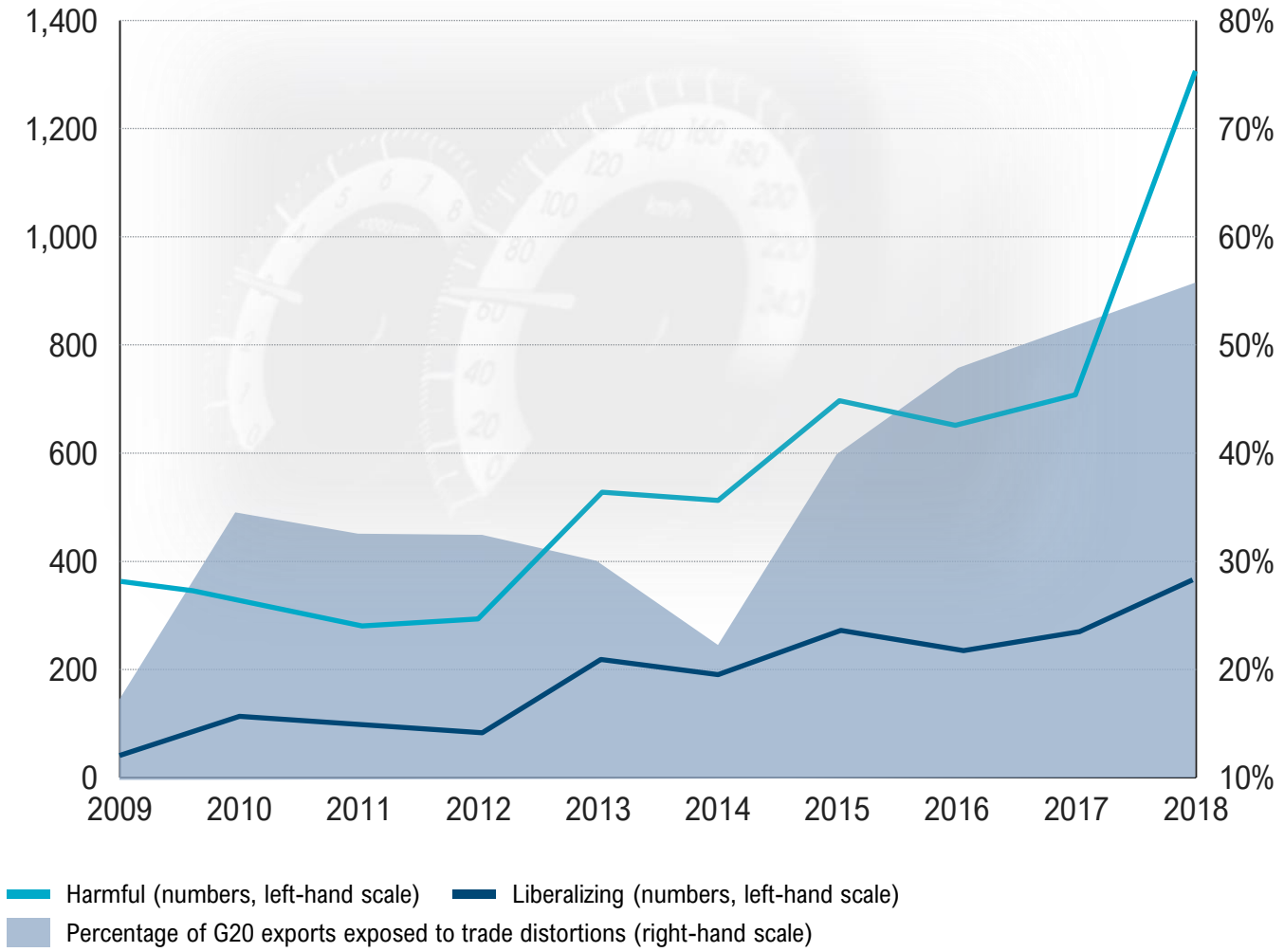


- The decade following the financial crisis was marked by a **slowdown in global interconnectedness**
- As a result, both the average annual **growth rates of exports and economic growth slowed down significantly**, with exports losing much more of their momentum
- After years of global outsourcing and offshoring, supply chains began to contract and the dynamic period of 'hyperglobalization' became stifled, resulting in a new **phase entitled 'slowbalization'**
- In terms of international cooperation and multilateralism, the **pace of global economic integration weakened**
- The change in **outlook on economic integration** as well as the subsequent **trade wars** between the US/EU and China were important drivers of **new trade barriers**
- In addition, the **COVID-19 crisis** has created huge uncertainty and **added additional barriers to trade flows**

1) Due to the distortions caused by the global financial crisis and the Covid-19 pandemic, the years 2009 and 2020 are both omitted from consideration
Sources: Oxford Economics; Roland Berger

The slowdown in globalization is predominantly due to the resurgence of protectionism – Trade interventions appear contagious

Announcements of new trade measures – Harmful vs liberalizing

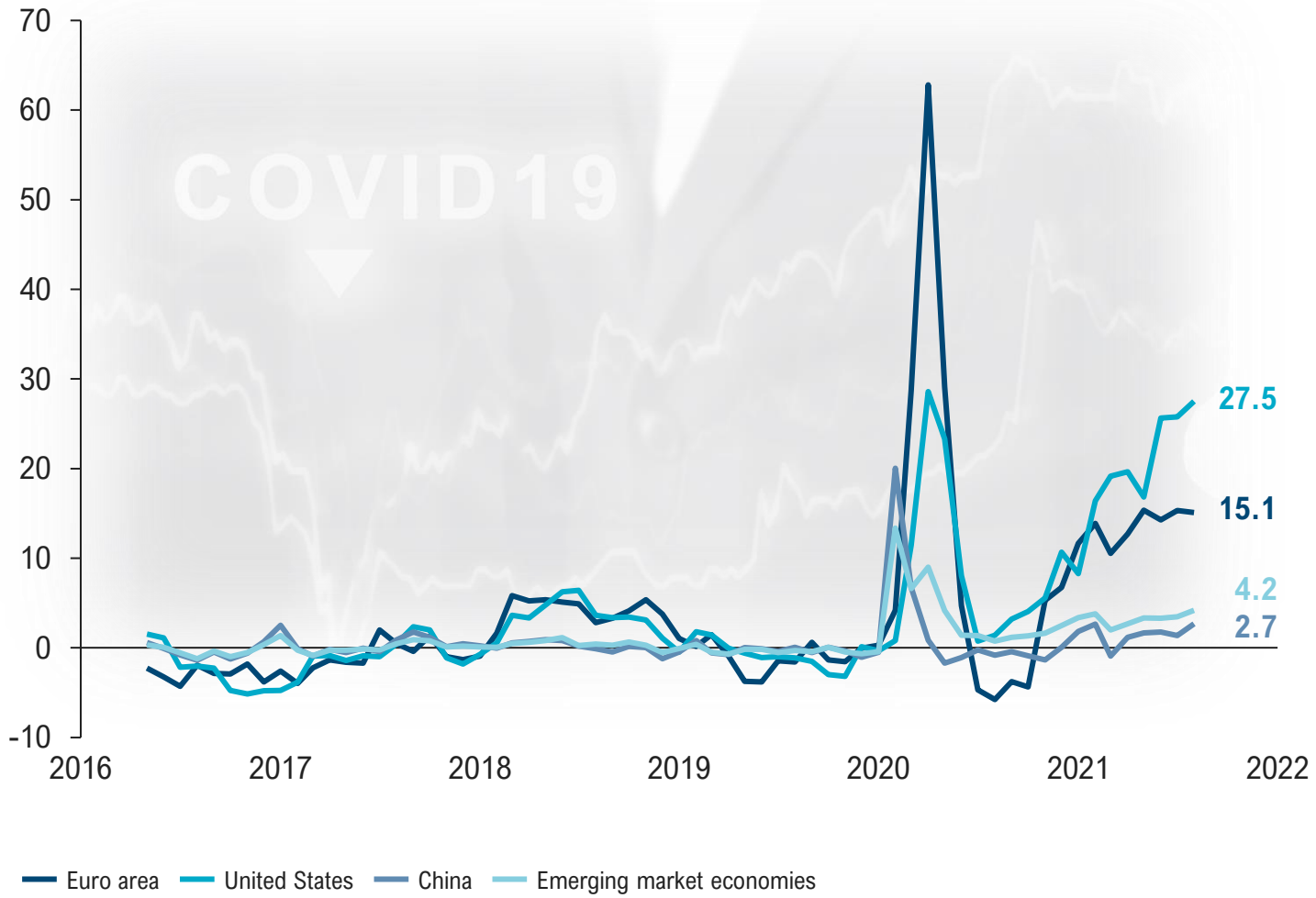


- Since 2009, the **number of harmful trade interventions** has **increased notably**, causing massive damage to the pursuit of free trade. The number of **liberalizing trade interventions increased** as well – but to a **much smaller extent**. As a result, **more than half of G20 exports** were subject to **trade distortions in 2018**
- Free trade in goods has **not just been stagnating since the conflict-laden Trump era**: Probably the **most prominent failed trade agreement,** the **US-European TTIP agreement**, encountered damaging **European resistance** during the Obama administration. Additionally, the **European trade agreement** with South American countries from the **MERCOSUR** common market **also stalled** for some time due to European concerns
- Now, under the Biden administration, **trade relationships are improving**: The trade war with Europe is gradually being resolved and some tariffs are being lifted again. However, doubts remain about Sino-American relations
- It remains to be seen whether the **trend towards more protectionism** will **continue in the future**

Sources: EC; Global Trade Alert; Roland Berger

Supply chain disruptions and trade uncertainty are major global lessons from the pandemic and other crises especially for advanced economies

Supply chain disruptions[1] [index]



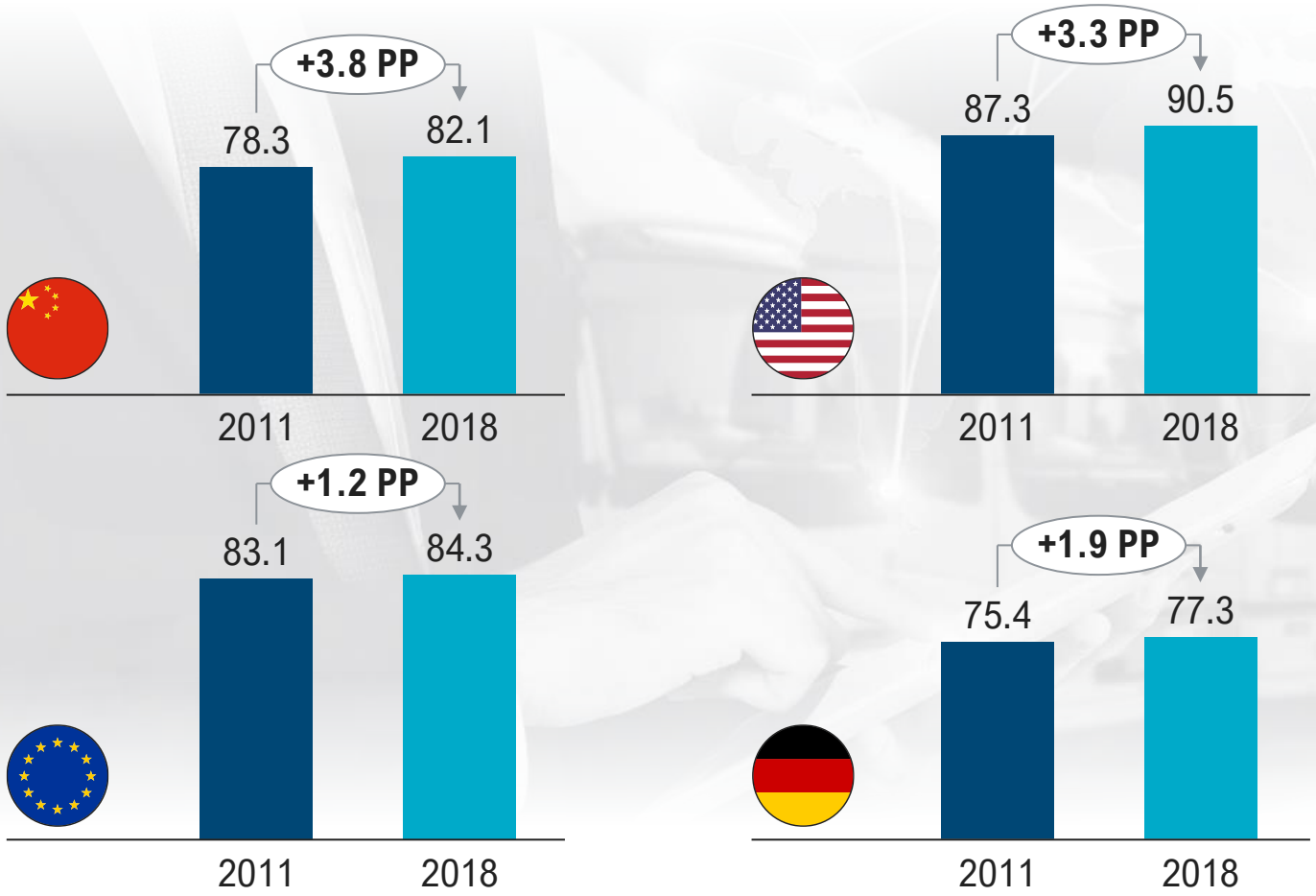
1) Supply chain disruptions are calculated as the difference between the supply delivery times subindex in the purchasing managers' index (PMI) and a counterfactual, cyclical measure of supply delivery times based on the manufacturing output subindex in the PMI

Sources: IMF; Roland Berger

- Nearly two years after the initial coronavirus outbreak forced China to halt its production facilities thus shutting down the world's biggest exporter, the global **flow of goods remains chaotic**
- Given the **unfamiliar nature and underlying factors** of the **present upswing**, the question has arisen as to **how long it will take for supply** to **keep pace with increasing demand**
- Although having effects globally, overall, supply chain problems **are concentrated in the advanced economies:** Empty shelves, material shortages, long delivery times and production stoppages in the USA or Germany, and British service stations running out of petrol – these are unprecedented problems highlighting **the importance of functioning trade**
- **Lessons learned** from the pandemic will lead many companies to **work on their robustness**, where "just-in-time" ideas concerned with maximum efficiency **give way to a new resilience credo**, in which, for example, companies return to stockpiling key input factors

Mirroring global trade developments, global supply chains also weakened while domestic production gained prominence

Domestic share of value added as a proportion of a country's/region's total exports 2011 and 2018 [%]



- The **COVID-19 crisis has exposed** key **weaknesses** within the principles of **international division of labor**: A massive supply and demand shock at the beginning of 2020 brought many economies to a standstill
- However, the **decline** of the importance **of global value chains** had already set in **a decade earlier**
- **China's economy moved up the value chain** and replaced imports of intermediate products with domestic production
- In the **US, the EU and Germany,** this kind of **substitutional shift** is also **evident – although less pronounced**
- The trend toward **regionalization** – or even reshoring – of production is due to **different causes** such as a **reduction of wage differentials,** a higher importance of **transport cost**, the pursuit of domestic production for **essential goods,** or the aim of a more **sustainable production** with shorter transport routes

Sources: OECD; Roland Berger

In terms of future FDI inflows, India is expected to show the strongest growth over the next decade, followed by other Asian countries

Relative development of inward FDI flows, 5 best/worst performers among G20 countries

	Ø 2010-2019 FDI inflow[1] [Mio. USD]	Ø 2020-2029 FDI inflow[1] [Mio. USD]	Δ FDI inflow [%]
India	54,773	155,600	184%
Japan	16,778	34,122	103%
Indonesia	19,419	36,948	90%
US	320,130	601,655	88%
Russia	34,880	55,547	59%
World	2,149,257	2,361,191	10%
Germany	79,840	73,894	-7%
Australia	51,478	46,283	-10%
Brazil	79,557	62,802	-21%
France	39,960	29,458	-26%
Argentina	9,730	5,380	-45%

> During the liberalization period, **global FDI inflows** witnessed a **period of rapid growth**, peaking just before the global financial crisis, stagnating with high volatility thereafter

> The decade to **2030** is likely to be one of **transformation for global value chains**, reshaping the global trade and investment landscape

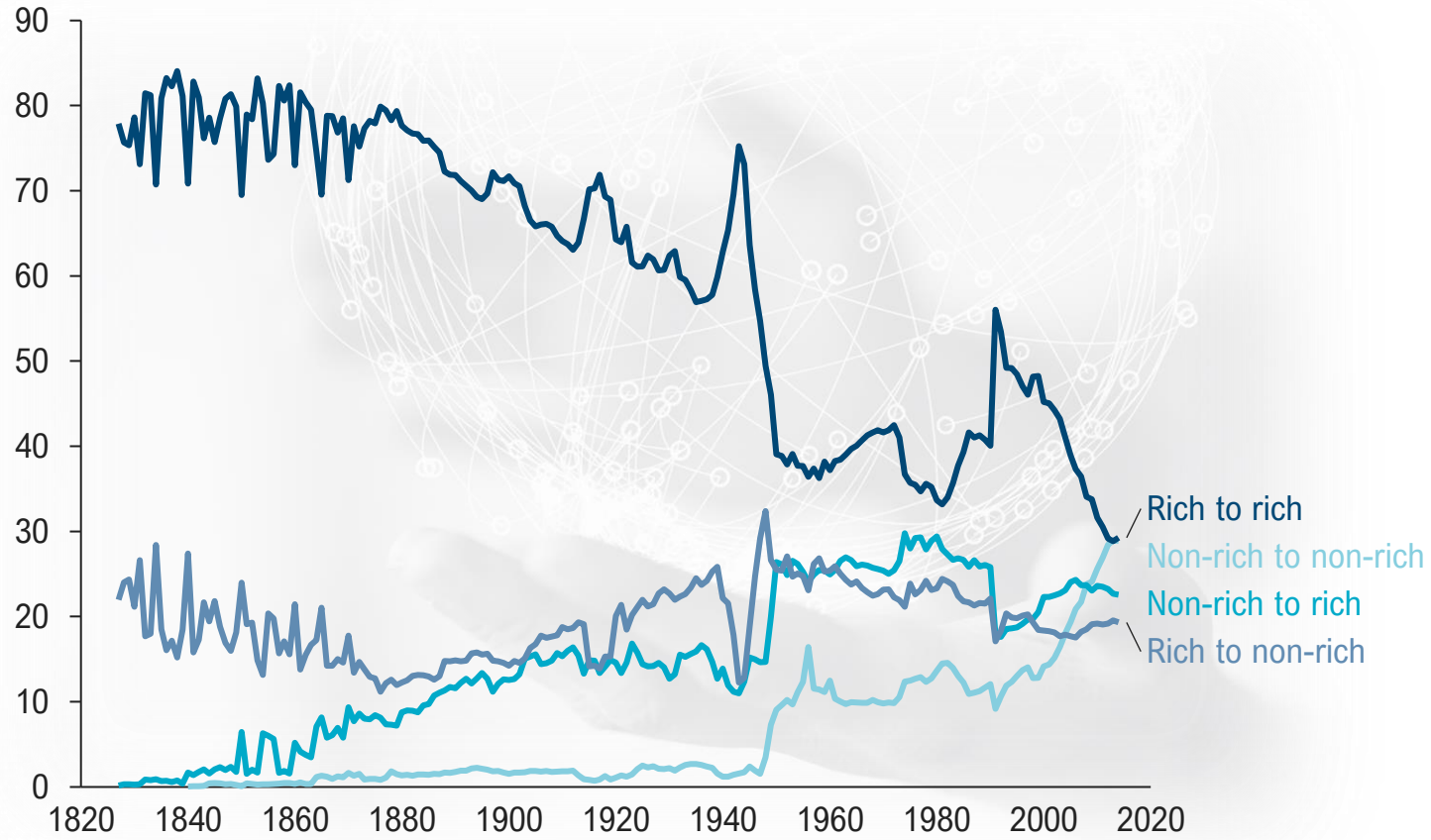
> The Covid-19 pandemic is **accelerating several trends** that were already emergent well before the pandemic, **magnifying some challenges** but also **presenting new investment and development opportunities**

> Driving forces that will reshape the global trade and investing landscape include **realignment** of **economic governance,** partly driven by **rises in protectionist measures**, **robotics driven industrial developments**, **corporate accountability** to fight corruption, tax evasion and anti-competitive practices, **resilience-oriented restructuring,** and an overall **sustainability imperative**

1) 10-year averages are calculated to smooth out highly volatile annual FDI fluctuations
Sources: Oxford Economics; Roland Berger

Today's rich countries have been trading with each other for a long time, whereas poorer countries' trading relationships started much later

Share of global exports by income level of trade partners[1], 1827-2014 [%]



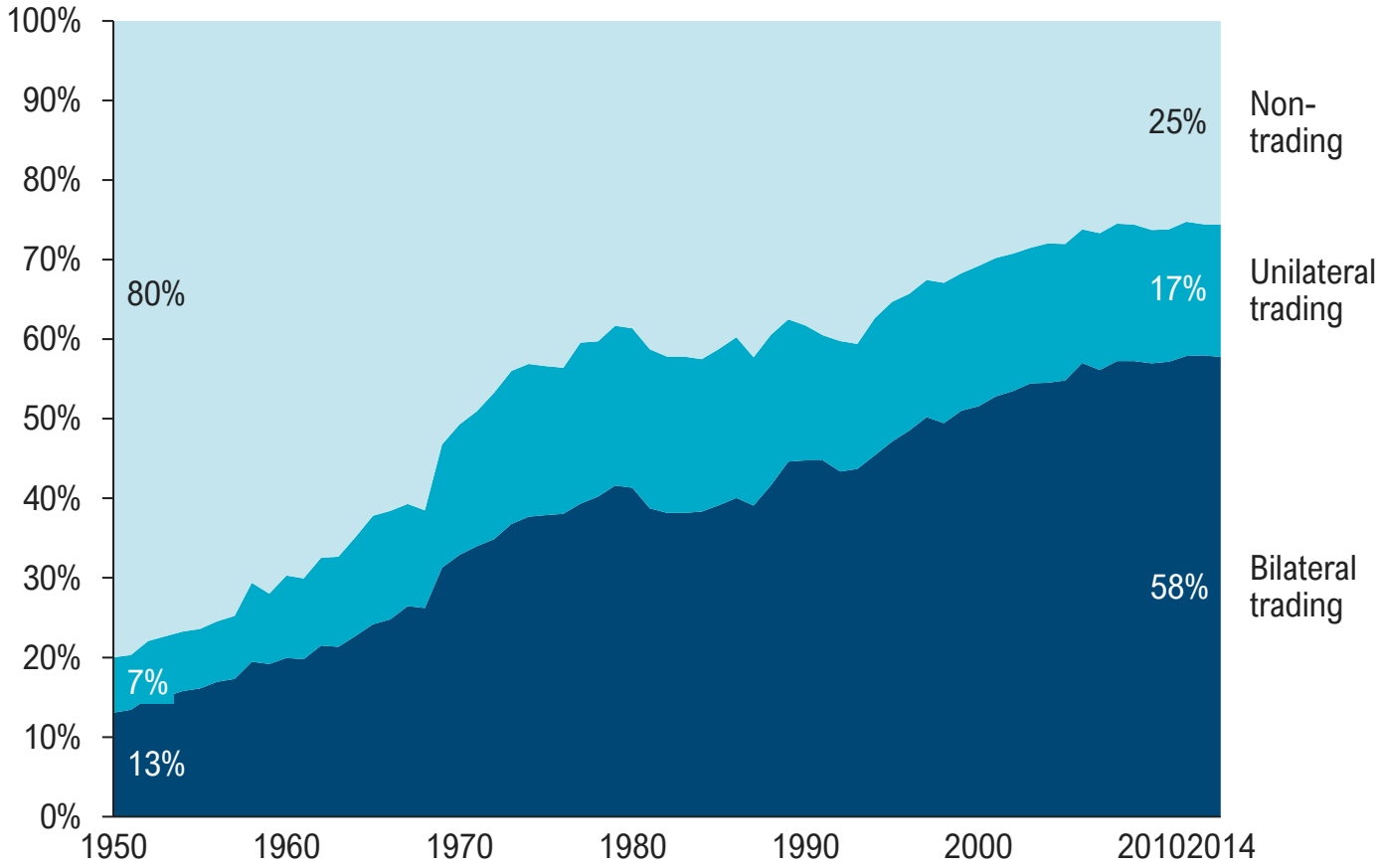
1) According to the source, 'rich countries' include Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States. 'Non-rich countries' are all the other countries in the world for which data is available

Sources: CEPII; Roland Berger

- World trade has historically displayed uneven relationships amongst trading partners: The graph shows the share of global **merchandise trade between different groups of countries**, classified according to their **income level**
- During the period of **industrialization**, **poorer countries were almost cut off** from **global trade** and were, at best, supplied by richer countries
- Just **after the interwar era, non-rich countries began to trade with one another** and the proportion of trade between non-rich countries has **now risen** to the **same level as trade between rich countries**
- Although, at first glance, it appears that the share of trade between rich countries has decreased, this **represents only a share** and that **trade has increased in absolute terms,** thus the absolute trade between rich countries is not falling, however, **trade in the non-rich countries is growing much faster**, driven particularly by the **rise of China**

While bilateral trade is becoming increasingly common, the fact remains that many countries still do not trade with each other at all

Share of bilateral and unilateral trade partnerships around the world, 1950-2014 [%]



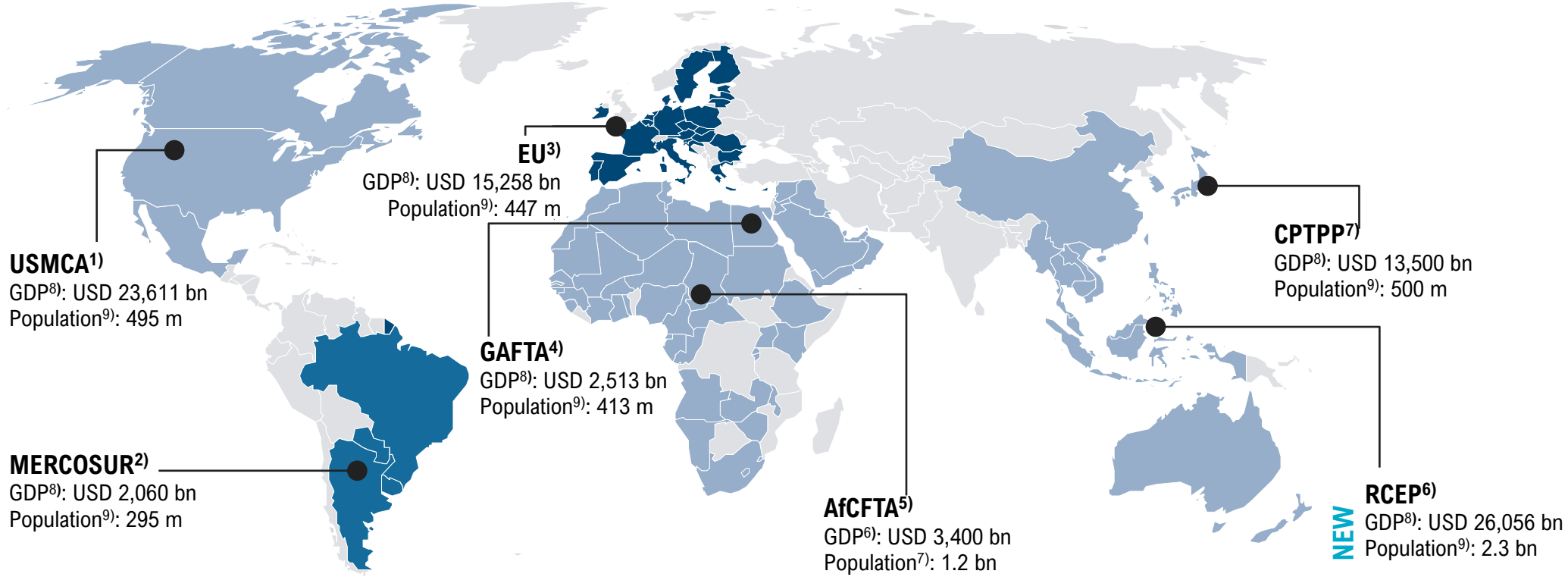
1) The starting point to construct this chart is a dataset with dyadic trade estimates. For each year, all country pairs with data were taken and classified as follows: "Non-trading" (pairs in which countries do not trade with one-another); "Bilateral" (pairs in which both countries export to one-another); and "Unilateral" (pairs in which only one country exports to the other)

Sources: CEPII; Roland Berger

- When **considering all pairs of countries** that engage in trade around the world, it can be found that in the majority of cases, there is a **bilateral relationship** today: **Most countries that export goods to a country, also import goods from the same country**
- As can be seen, **bilateral trade is becoming increasingly common,** accounting for **nearly 60%** of all country pairs trading with each other
- But it also remains true that **many countries still do not trade with each other at all.** In 2014 **about 25%** of all country-pairs recorded no trade with another countries
- However, the fact that 25% of pairs are classified as non-trading does not mean that there are countries that do not trade at all. Rather, it means that not every country trades with all other countries, but rather that **countries have specialized and trade with those countries where both countries can benefit from trading**

Free trade agreements are essential for effective and smooth exchanges of goods and services – New RCEP agreement forms the world's largest bloc

Most important free trade areas worldwide

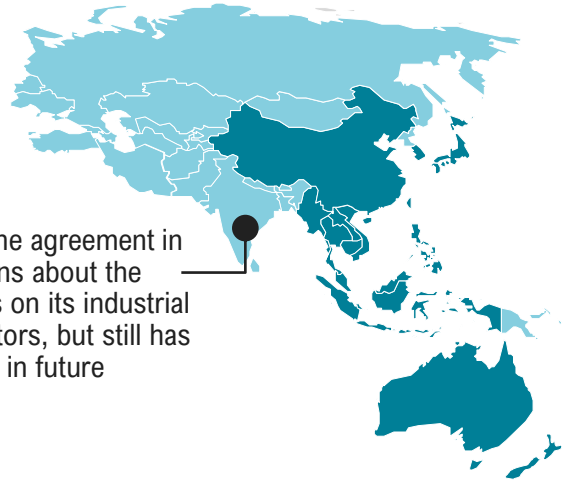


1) **United States-Mexico-Canada Agreement (former NAFTA):** Canada, Mexico, United States; 2) **Mercado Común del Sur:** Argentina, Brazil, Paraguay, Uruguay; 3) **European Union:** Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Swede; 4) **Greater Arab Free Trade Area:** Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen; 5) **African Continental Free Trae Area:** Algeria, Angola, Burkina Faso, Cameroon, Chad, Republic of Congo, Côte d'Ivoire, Djibouti, Egypt, eSwatini, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Mali, Mauritania, Mauritius, Namibia, Niger, Rwanda, Saharawi Republic, Sao Tome & Principe, Senegal, Sierra Leone, South Africa, The Gambia, Togo, Uganda and Zimbabwe; 6) **Regional Comprehensive Economic Partnership:** Brunei, Indonesia, Cambodia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam, China, Japan, South Korea, Australia, New Zealand; 7) **Comprehensive and Progressive Agreement for Trans-Pacific Partnership:** Mexico, Japan, Singapore, Australia, Canada, New Zealand, Vietnam, Peru; 8) GDP = Nominal GDP 2020; 9) Population = Population 2020

Sources: Oxford Economics; Roland Berger

On January 1st, 2022, the Regional Comprehensive Economic Partnership (RCEP) is coming into force, creating the biggest trade bloc in history

Summary of the RCEP trade agreement



India pulled out of the agreement in 2019 due to concerns about the trade bloc's impacts on its industrial and agricultural sectors, but still has the option to re-join in future

What is RCEP?

- RCEP is a free trade agreement between **15 Asia-Pacific nations**
- After 8+ years of negotiations, the agreement has **now been ratified** by ten countries including Australia, New Zealand, Brunei, Cambodia, Laos, Singapore, Thailand, Vietnam, China, and Japan, taking effect as of **January 1st, 2022**
- Members will benefit from **lower or complete removal of tariffs** within the next 20 years
- RCEP will **surpass existing Asia-Pacific trade agreements**

Implications

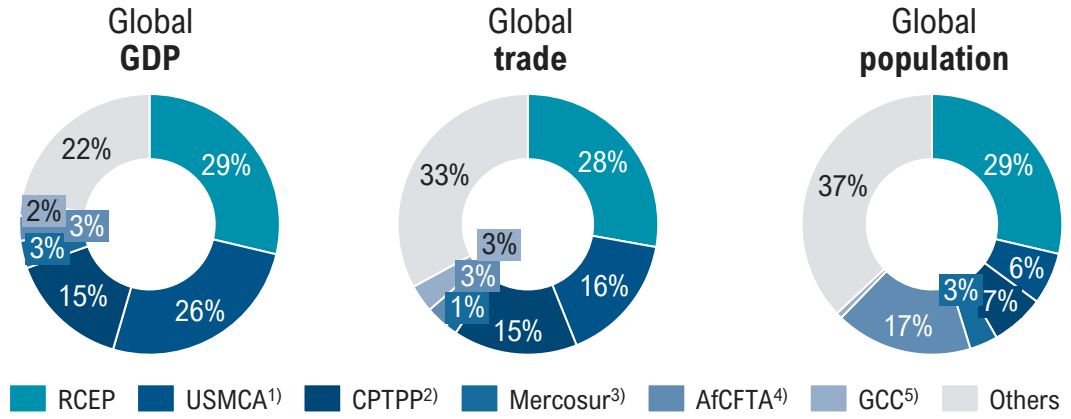
RCEP will establish common rules in areas of:

- Investment
- Tele-communication
- Competition
- e-Commerce
- Intellectual property

RCEP won't include:

- Labor union provisions
- Government subsidies
- Environmental protection

Comparison with other regional trade agreements



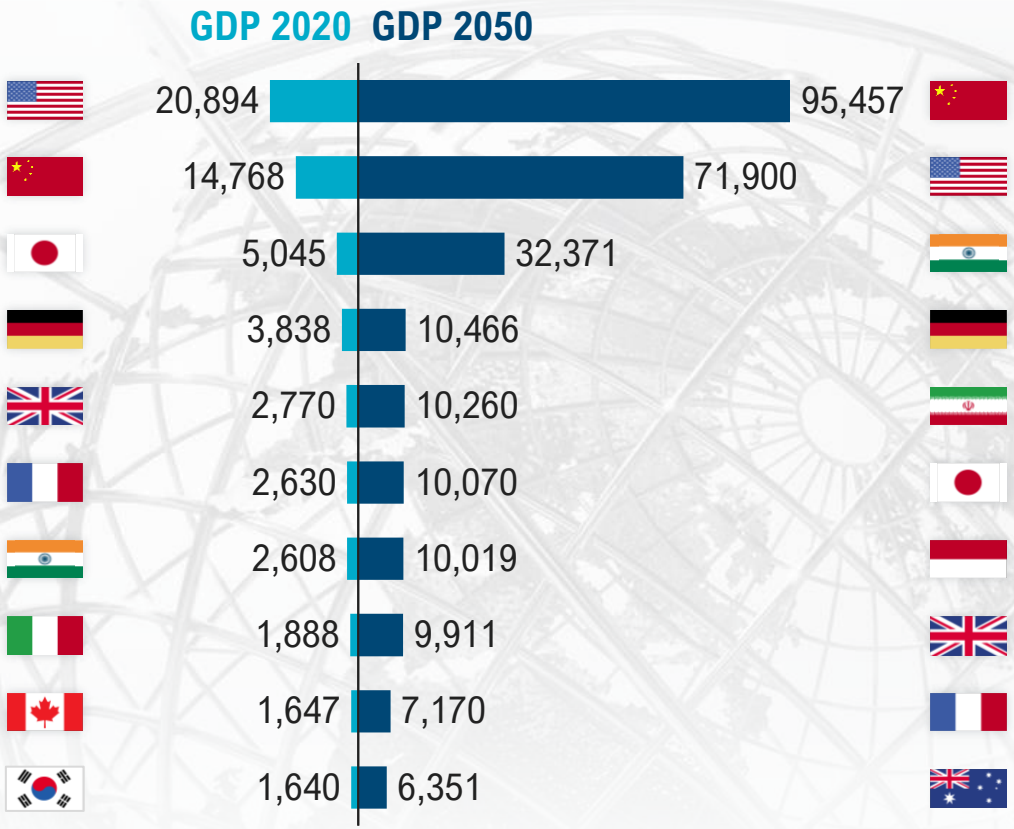
1) United States-Mexico-Canada Agreement (former NAFTA) 2) Comprehensive and Progressive Agreement for Trans-Pacific Partnership
3) Mercado Común del Sur or Southern Common Market 4) African Continental Free Trade Area 5) Gulf Cooperation Council

Sources: Visual Capitalist; European Parliament; Roland Berger

Economic power is shifting further toward emerging countries – With RCEP, Asia-Pacific countries set the course for a global economic power center

In 2050, 3 of the top 5 global economic players will stem from emerging markets

Top 10 countries in terms of nominal GDP in 2020 and 2050 [USD bn]



Geographically, Asia reaffirms its position at the center of global economic power

> By **2050, China** will have overtaken the US in terms of nominal GDP by a sizeable margin – having already become the **world's largest economy** from 2017 in terms of USD PPP onwards

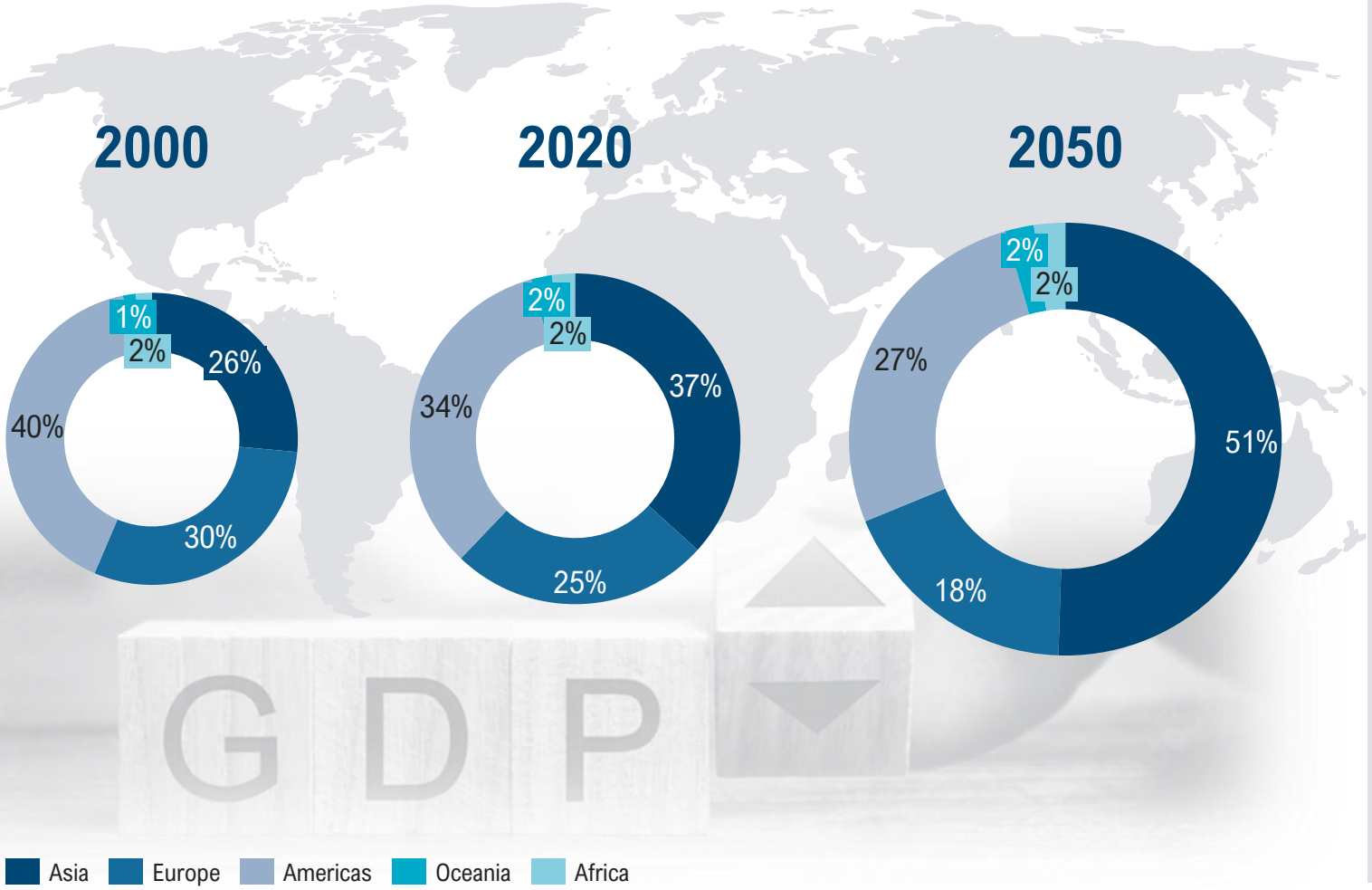
> Overall, the **Asian countries** will gain **significant importance by 2050: India** will claim the position of the world's third-largest economy by then while **Indonesia** and **Iran** will join the **global top 10**, meaning that five out of the ten largest economies will come from Asia

> **RCEP**, the **new Asian free trade agreement** will play its part, significantly **boosting** both **global trade** and **economic output by 2050.** In addition, **other countries and trade blocs will benefit**, too, by no longer having to enter trade negotiations with each of the RCEP countries individually; instead, they will be able to enter a **single agreement with the entire zone**

Sources: Oxford Economics; Roland Berger

By 2050, Asia is expected to comprise half of global GDP while Europe and the Americas will lose economic importance

Share of global GDP by region [nominal, %]

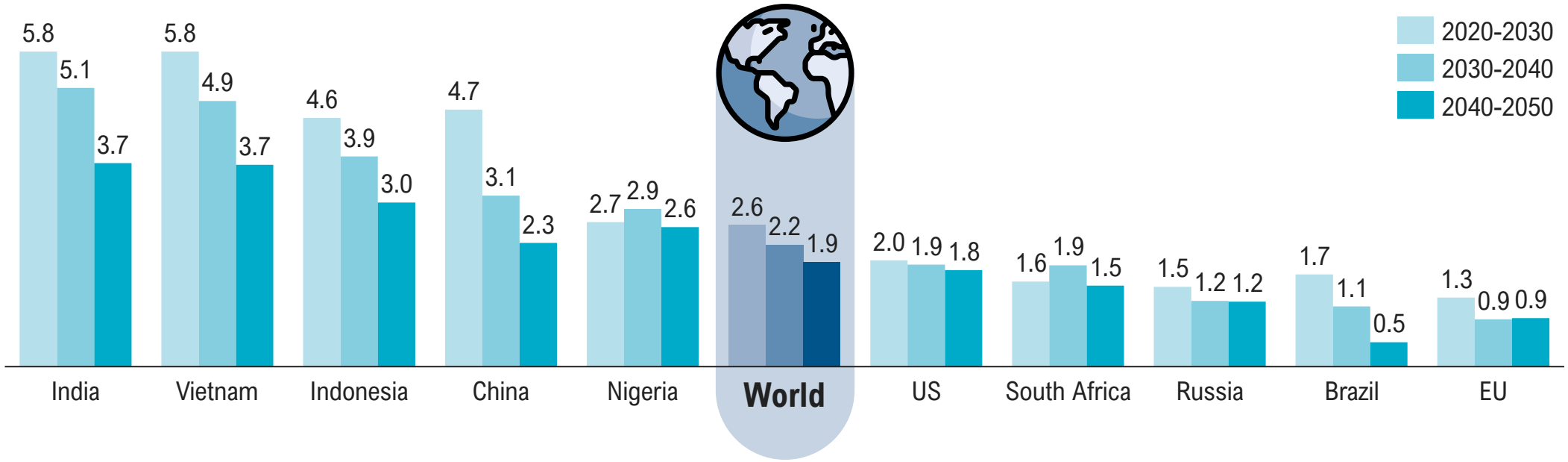


- By 2050, the **importance of the Asian** continent – in terms of global economic output – **will increase significantly**: While it still had a modest share of less than one quarter of global GDP two decades ago, **Asia** will **account for half of the global economy by 2050**
- Asia's rise is **by no means straightforward** or **predetermined**. Indeed, **success will require different patterns of growth as well as resolutions** regarding **a broad range of politically difficult issues** to endure over such a long period
- In addition to **intensifying trade relations** – as is already evident in the new RCEP – there are **other challenges** ahead. For example, Asian countries need to **avoid the middle-income trap**, which is limiting competitiveness as they grow. Rather, it is essential to **adapt to the shifting global economic and technological environment** by continually **reasserting Asia's comparative competitive advantages**

Sources: Oxford Economics; Roland Berger

Projected average GDP growth rates are set to decline in all major countries by 2050 – EU trails behind other large economies

GDP growth projections for selected major economies [average real GDP growth rate p.a., %]



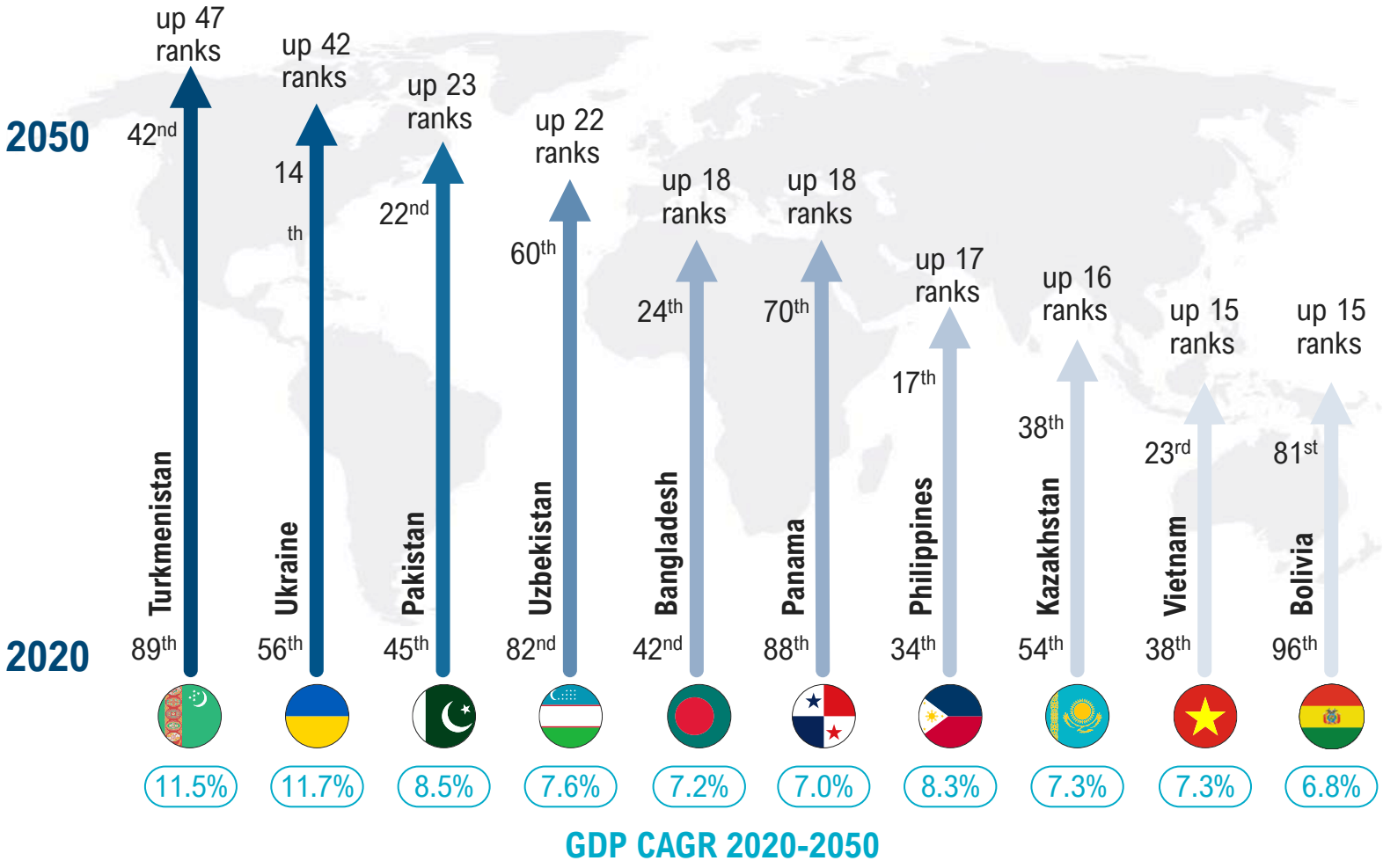
> **India** is already one of the countries with the **strongest growth rates** and is set to **remain so in the future**, partly because its economic rise started from a comparatively lower level, with a relatively poorer population still having to **catch up**. Moreover, India's population pyramid displays a **favorable demographic distribution:** Its working age population is still growing at an above average pace resulting in India's '**demographic dividend**'

> Many **other growth countries** display **similar characteristics and potential**: A growing working age cohort and comparatively low levels of income. By contrast, many **Western as well as some Asian countries are ageing** quite **rapidly** while having low population growth overall, leading to a shrinking working age cohort. Alongside the US, the EU is the leading region by Western standards, but the latter will only see very low GDP growth to 2050 due to a waning or (near) absent demographic dividend

Sources: Oxford Economics; Roland Berger

Not only China and India but also many other countries will continue to gain in economic importance – There will be a 'rise of the rest'

Country ranking by nominal GDP, most improved among top 100

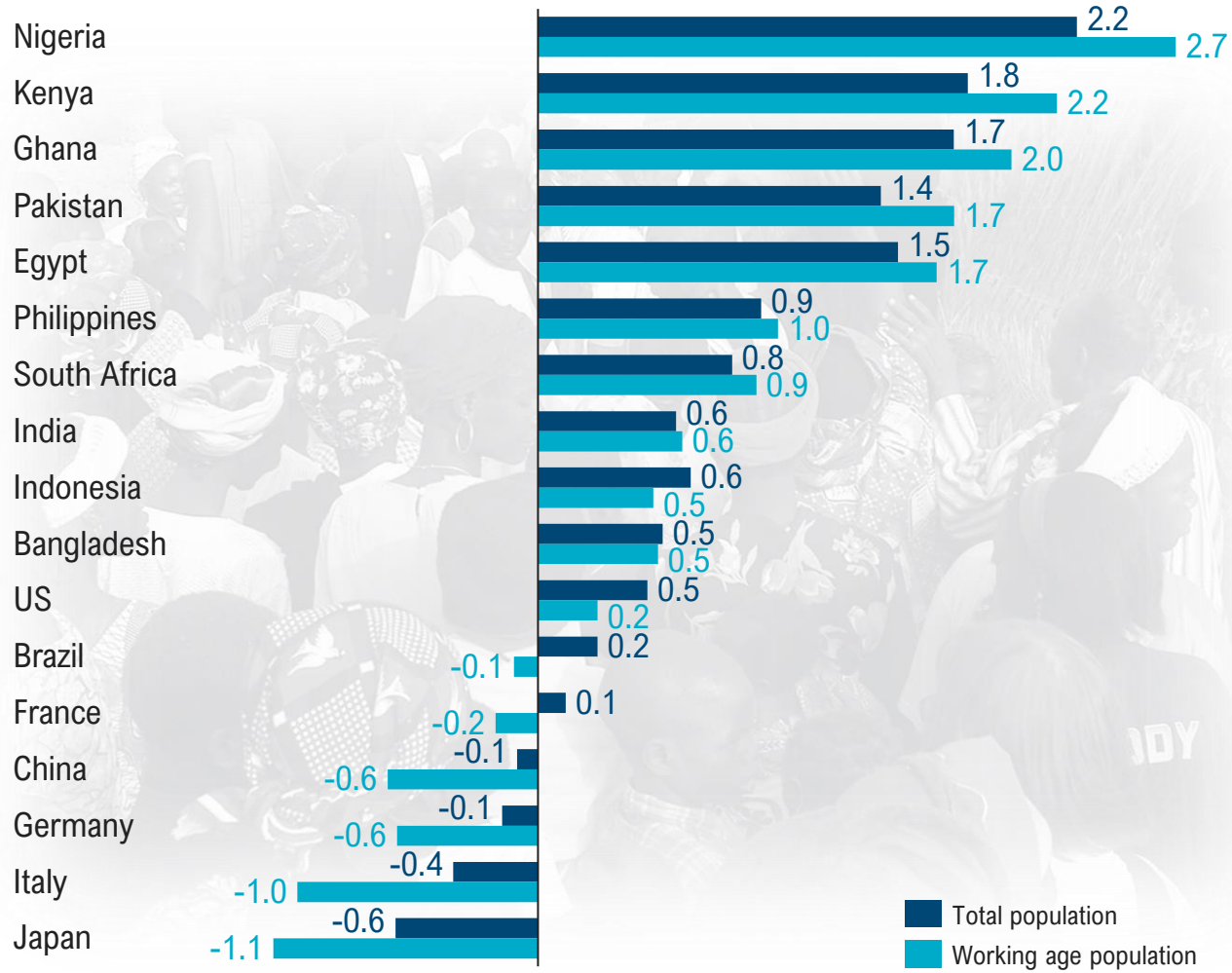


- While **China and India** are seen as the **main winners** of the **upcoming power shift**, there are also **other countries** with the ability to **significantly increase** their **economic importance** in the next 30 years
- It is notable that many central Asian **countries, some formerly part of the Soviet Union, will rise through the ranks**; Pakistan and the Philippines also show considerable growth potential
- A common trait of many of these top climbers is that their **populations** are **growing**, including their **working age cohort**
- With rising GDP comes a rise in personal wealth: Expectations are that a **new middle class** is growing in today's developing countries

Sources: Oxford Economics; Roland Berger

Beneficial labor input factor dynamics help explain the rise of younger emergent economies – Advanced economies display opposite trends

Average annual population and working age population growth for selected countries, 2020-2050 [%]

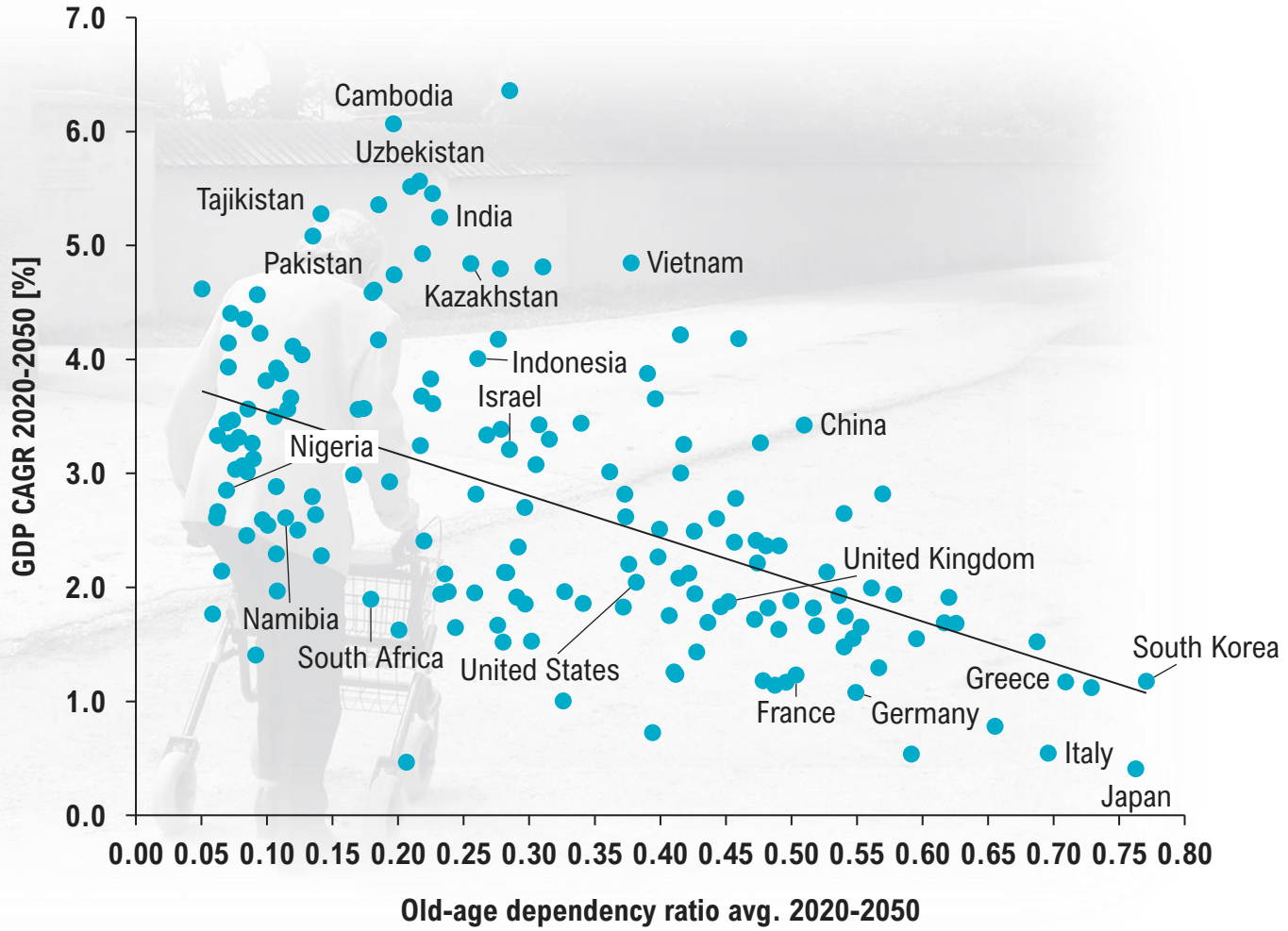


- Population growth plays a major role for today's emergent economies where **labor is still a dominant factor of production**, particularly when the use of automation and robotics in manufacturing trails behind due to **low levels of investment in technology**
- With **labor force increases** – due to population growth – total output is expected to increase, causing a rise in GDP. In principle, **cost of production decreases** due to the relative **abundance of labor** and its **downward effect on wages**; as a result, international competitiveness is enhanced
- Many of these emergent countries displaying strong population growth also **extended to their working age cohorts**, boosting **labor productivity**
- Vice versa, **todays advanced economies share the tendency of a decreasing and ageing population.** Today's oldest country – in terms of highest share of citizens aged 65 and older – is Japan with this share of the population numbering 28%, followed by **Italy with 23%. In addition, the working age population** in these mature economies is **shrinking faster than the overall population**

Sources: UN; Roland Berger

Labor is an essential input factor for economic growth – An aging population lowers a country's growth potential

Correlation between old-age dependency ratio and real economic growth, 2020-2050 [%]



> Countries that are growing much faster than the Western countries share a **lower old-age dependency ratio**

> The old-age dependency ratio **describes** the **proportion** of persons **aged 65+** compared to the number of people **aged 16-64** providing an indication of required level of economic support necessary from the **economically active to the economically inactive**

> As human capital is **essential for economic output,** the **correlation** between old age dependency and real economic growth is **negative**

> Empirically, an **ageing population** leads to a **reduced rate of growth in the labor force** and **capital stock** (due to a reduced savings rate). These developments are accompanied by a **downward pressure** on **real returns of physical capital**, and **upward pressure** on **real wage rates**

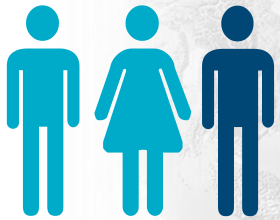
> As a result, the ageing population leads to a rise in the **tax and pension burden**, **decreases net economic welfare**, and **negatively** impacts the **economic rate of growth**

Sources: UN; Oxford Economics; Roland Berger

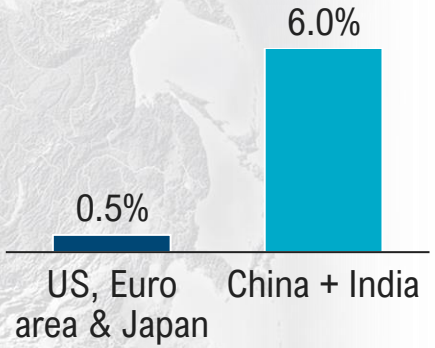
A new middle class is rising in Asia – 88% of entrants into the global middle class by 2030 will stem from Asia, totaling almost 1 bn people

Facts on the new global middle class[1)]

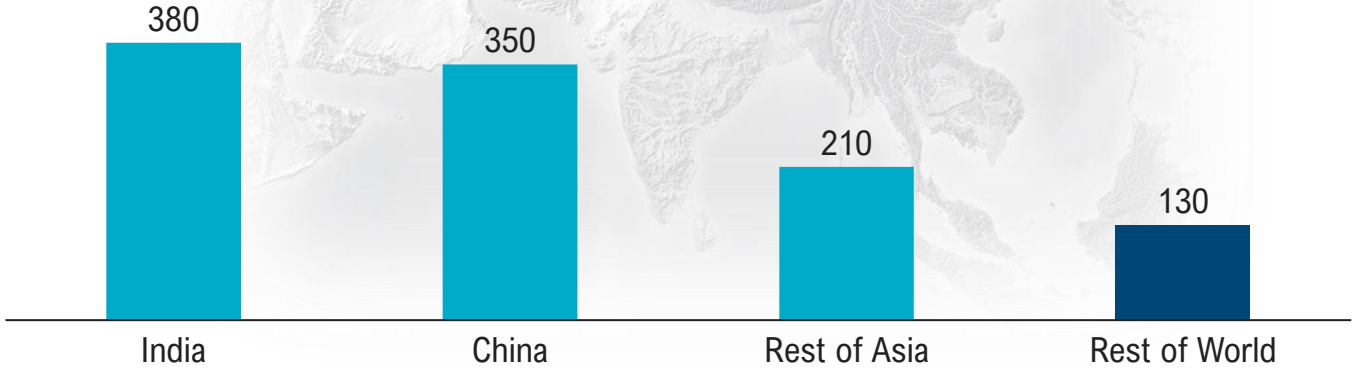
By 2030, Asia could represent 2/3 of the global middle-class population



Annual growth of the middle-class market in selected countries/regions [2017-2030]



Entrants to the global middle class by 2030 and region [m]

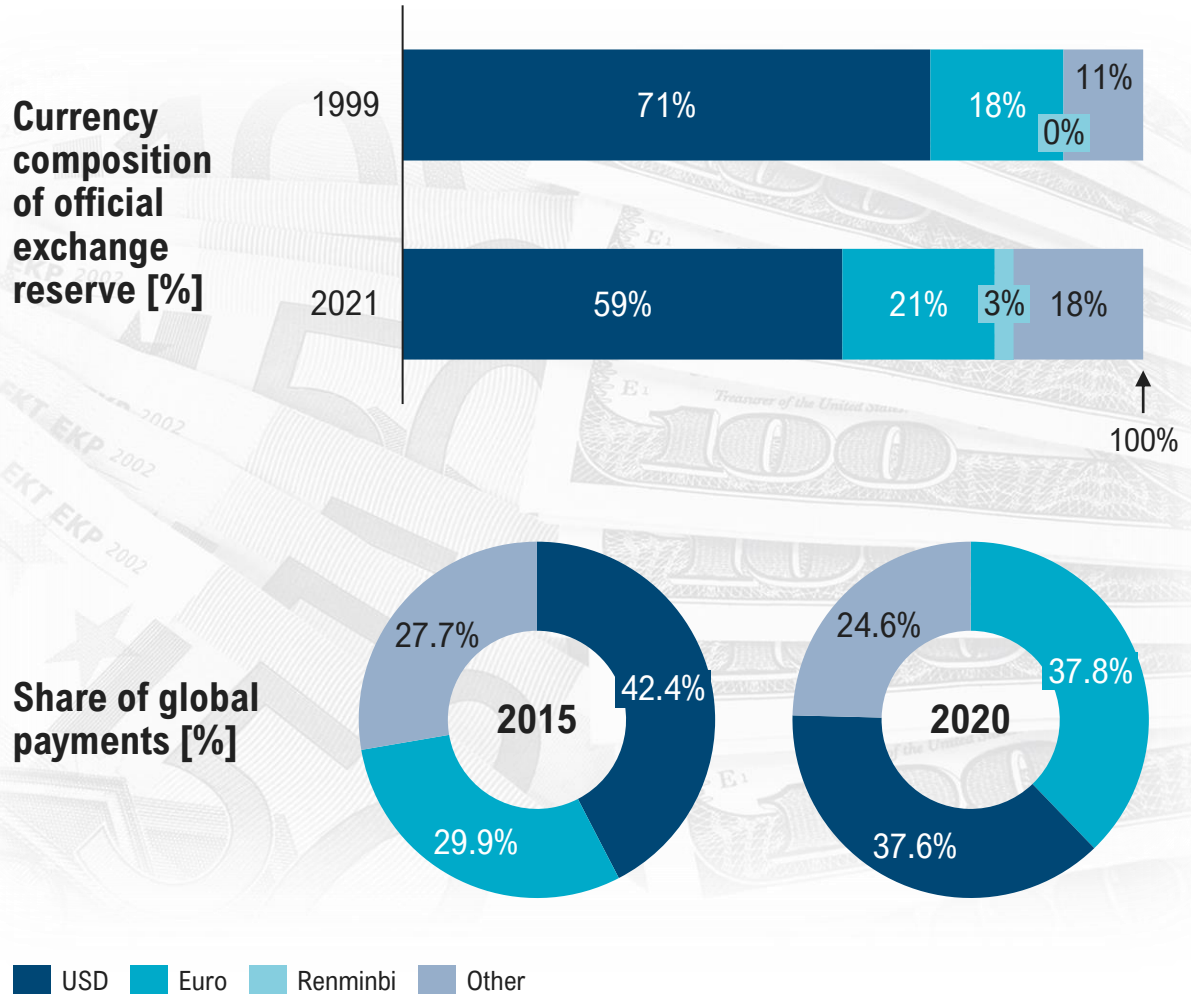


- The decade from 2020 to 2030 is estimated to witness the **most rapid expansion of the global middle class** observed so far
- While global figures are undoubtedly driven by developments in some of the world's largest economies, particularly **China** and **India**, overall, this **middle-class expansion** is heavily **concentrated** in **Asia,** with the most dynamic segment of the global middle-class market to be found among new entrants with comparatively low per capita spending
- The middle class is already spending USD 35 trillion (in 2011 PPP) annually globally; estimates foresee an **additional USD 29 trillion of spending by 2030**, accounting for about **one-third of projected GDP growth** (in PPP terms) – this is partially explained by the rise of today's emerging markets

1) The global middle class is defined as a four-person household earning between USD PPP 14,600 - 146,000 p.a.
Sources: Brookings Institute; Roland Berger

Predominance of the US dollar appears more fragile since the pandemic – Euro exceeds USD in share of global payments

Greenbacks hegemony under threat



- Presently, the US dollar continues to **reign supreme** in global markets. But the **greenback's dominance** is slowly **waning**, raising the question of **whether** the dollar's **hegemony is fragile**
- For a long time, American **policymakers** and many **economists** assumed that the **world's appetite** for **dollar debt** was virtually **insatiable**. But a **modernization** of **China's exchange rate regime** could be **detrimental** to the dollar's status
- The **share of the USD** in official **exchange reserves** has already been **declining** steadily for years; furthermore, the **euro surpassed** the US dollar in 2020 as the **currency most global payments** were settled in for the first time in years
- **Chinese renminbi** has also **entered** the **international playing field**, as China has gradually **allowed foreign** institutional investors to buy renminbi bonds. In 2016, the **IMF added the renminbi** to the **basket of major currencies** that determine the value of the IMF special drawing rights[1)]
- Expected **future changes in China's exchange-rate regime** are likely to **trigger a significant shift** in the international monetary order, leading to a **future characterized by a multi-reserve system** – rather than a single currency dominating global currency reserves

1) The SDR is an international reserve asset created by the IMF to supplement the official reserves of its member countries
Sources: IMF; Bloomberg; Roland Berger

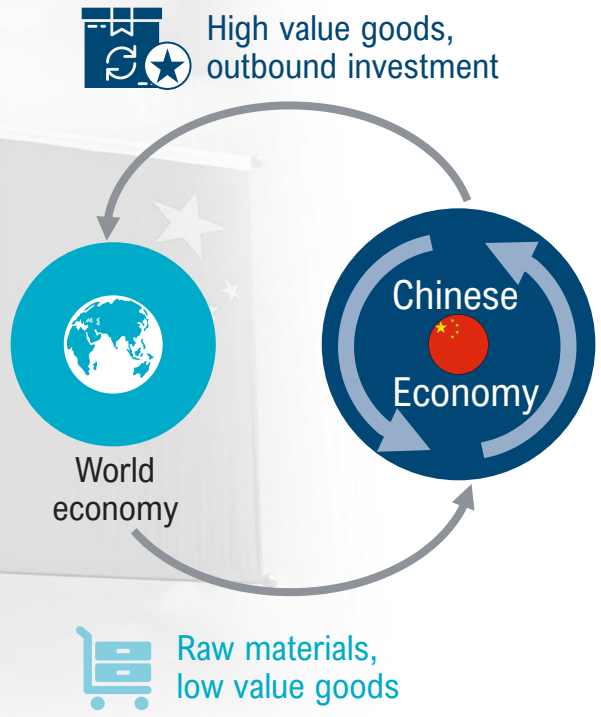
China's strategy to become a self-sufficient superpower is now two-pronged – Focus on boosting domestic consumption

Comparison of the great international circulation and the dual circulation strategy

Great international circulation strategy
Chinas growth model from 1990-2020

Key feature of the Chinese economy: Labor advantage, investment and export led growth

Dual circulation strategy
Chinas aspiration (2020 onwards)



Key feature of the Chinese economy: Domestic consumption and innovation-led growth

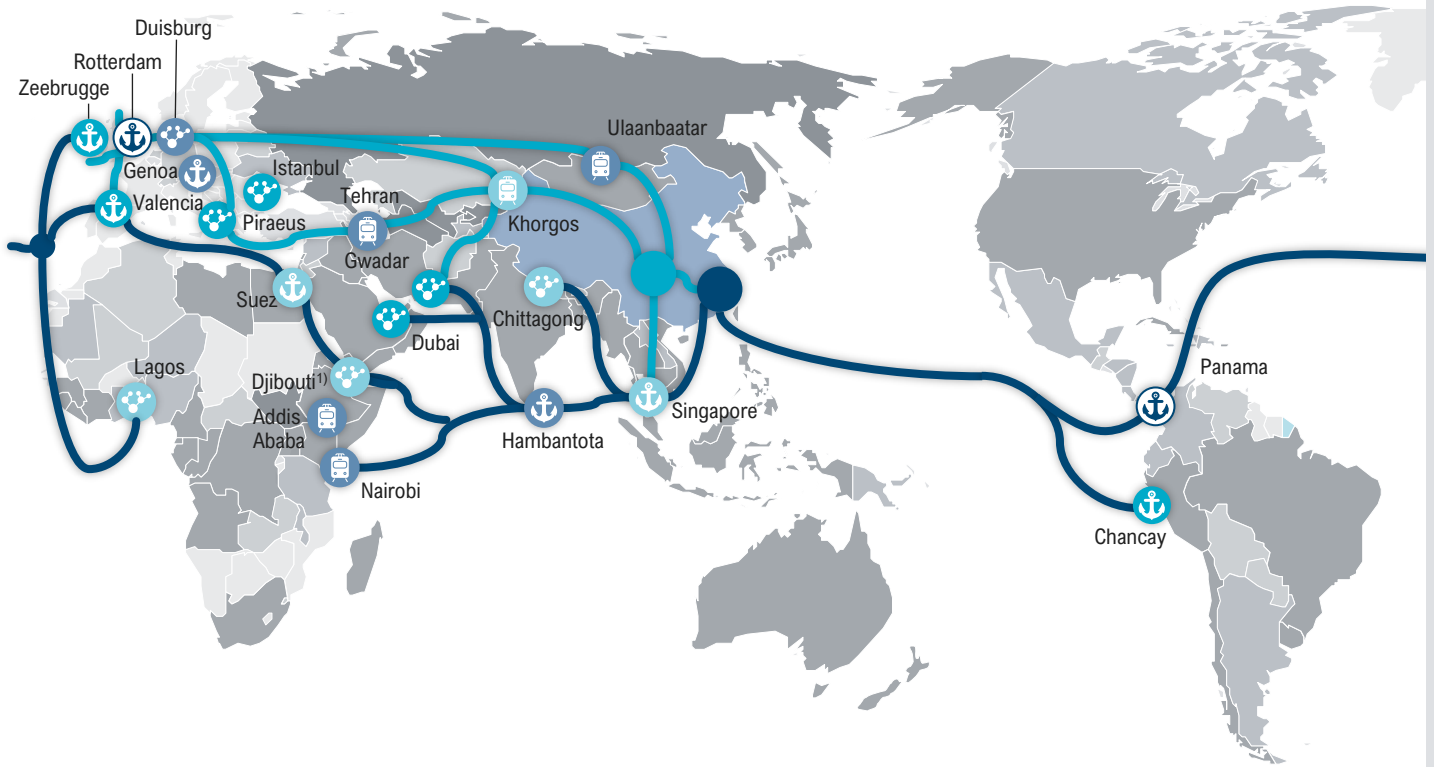
External circulation → Internal circulation ● ● Relative importance to China's economy

Sources: Merics; China Leadership Monitor; Roland Berger

- After the unveiling of China's industrial policy master plan entitled "Made in China 2025", an aspirational **dual circulation strategy for 2020 and beyond now defines China's long-standing ambition to become a self-sufficient superpower**; this follows a period of intense export growth starting in the 1990s, characterized by low labor costs and mass production of finished goods for Western markets
- **Sino-American trade wars have fed into China's parallel strategy** aimed at maintaining its growth momentum: Fostering the domestic markets by removing national bottlenecks regarding natural resources and technology, in order to vertically integrate production, thus **achieving self-sufficiency via its vast domestic market**
- Going forward, **China's future ambitions are founded on strong, more mature levels of domestic consumption**, also led by **innovation**, and **demand for higher value goods abroad** as well as **outbound investment in strategic foreign markets** and industries
- However, overseas trading partners are entering a new reality: As China will no longer be forced to import high-value manufacturing inputs, **major technology exporting countries** such as Germany, Japan, and the US **will feel this impact first**, while the second aspect – boosting demand abroad – will increase the **importance of the Belt and Road Initiative** (BRI)

One belt, more trade: China is reengineering historic Silk Road trade traditions to benefit a new global growth engine – on land and by sea

The Belt and Road Initiative will connect Asia, Africa and Europe



1) This is China's sole military base outside of China
2) Based on IMF Direction of Trade Statistics 2018: Exports (FOB) + Imports (CIF) with China per country
Source: University of Leiden; Roland Berger

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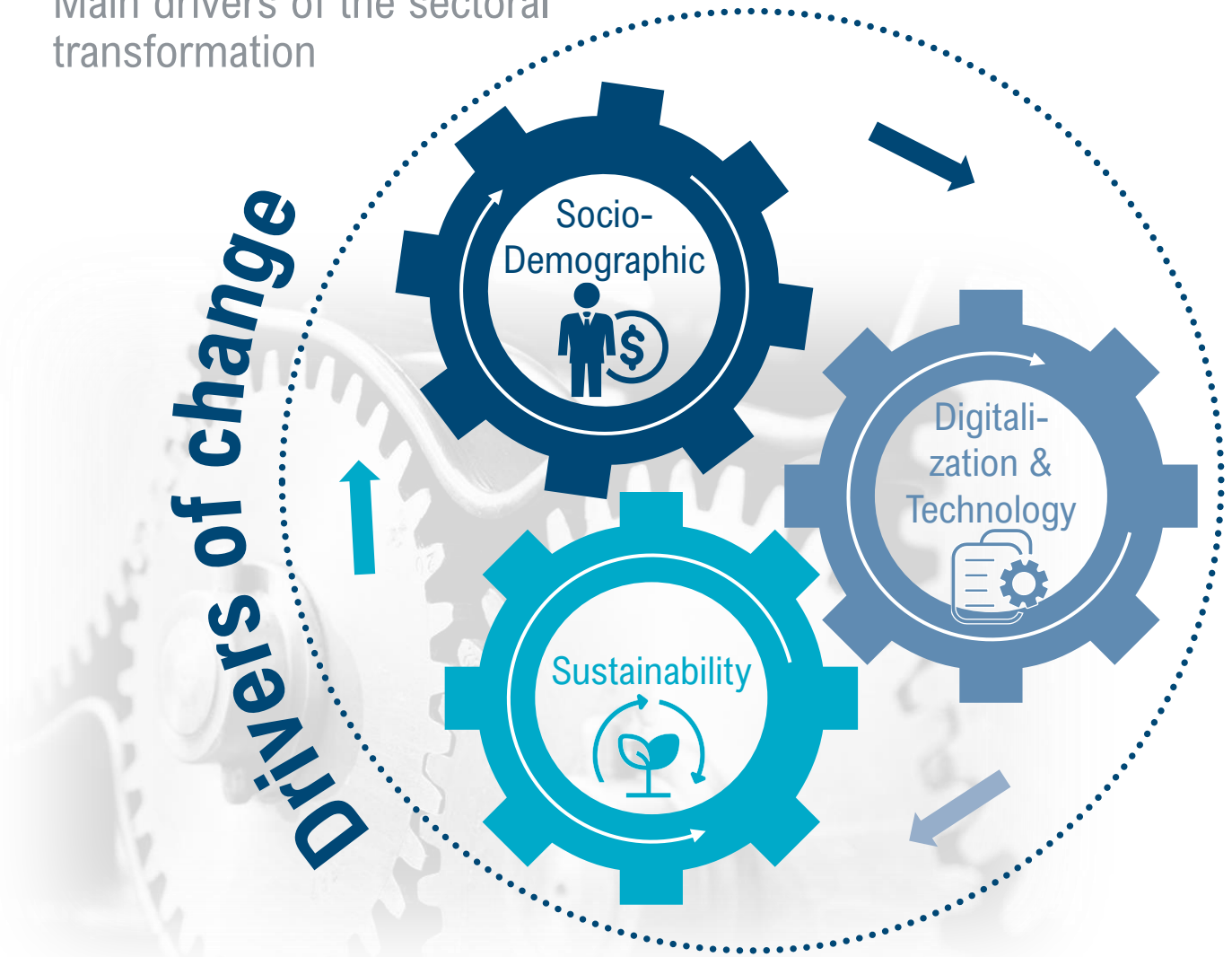
The future promises major sectoral transformations mainly driven by socio-demographic factors, sustainability and digitalization

Main drivers of the sectoral transformation



> Groundbreaking advances in science and technology are under way to transform major industries worldwide. Three overarching drivers have been identified that are fueling and accompanying this change: **Technological progress and digitization**, an increasing **focus on sustainability**, **and socio-demographic change**

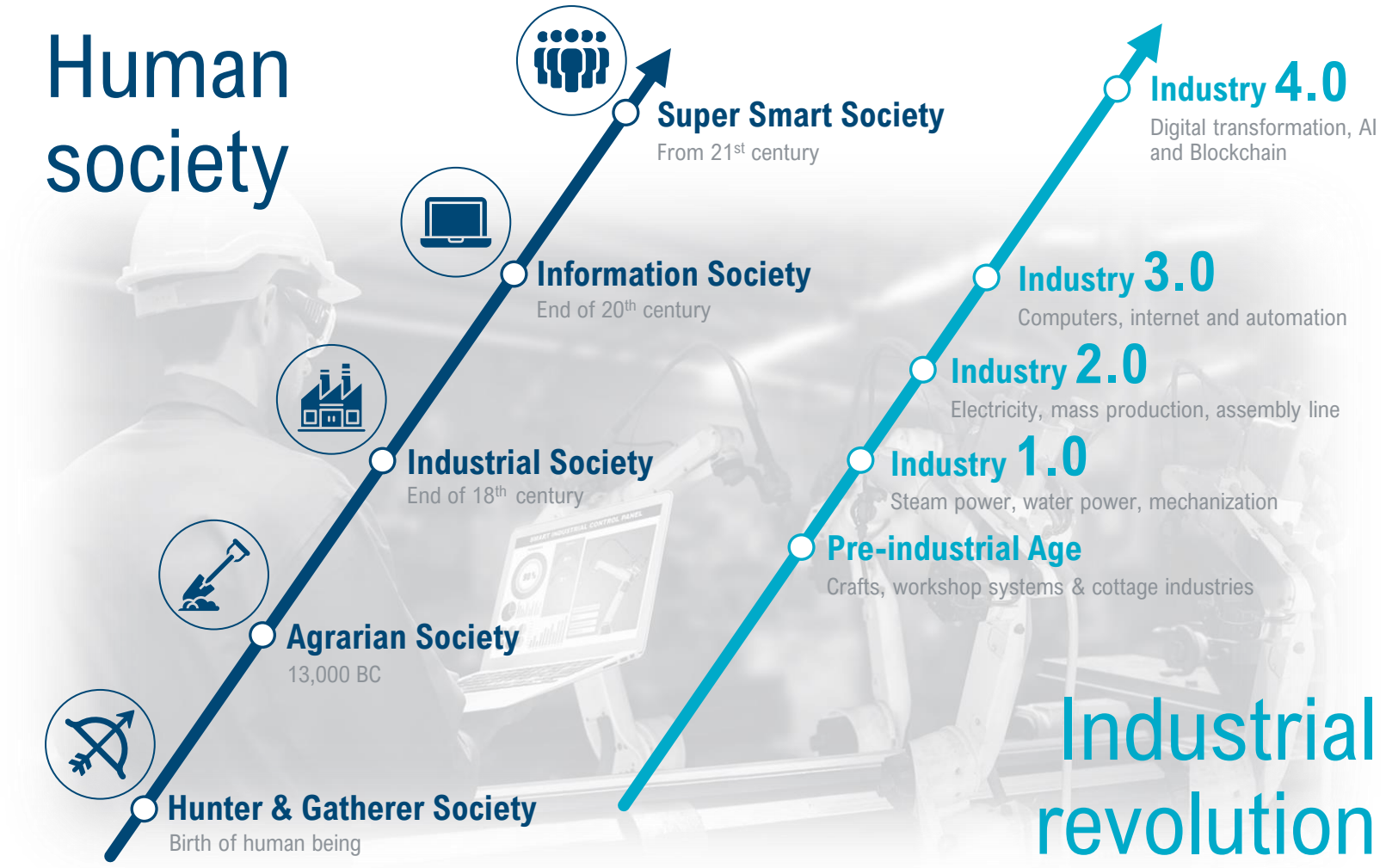
> **All three drivers** are **mutually interdependent.** For example, consumer preferences have evolved to favor more sustainable products, nudging companies towards being as sustainable as possible across a smarter value chain, while conforming to latest environmental policies

> These developments, often grouped under the umbrella term "**Fourth Industrial Revolution**" or **Industry 4.0** for short, and having previously occurred less closely intertwined, comprising areas such as nanotechnology, 3D printing, AI, machine learning, robotics, genetics and biotechnology, are now becoming **increasingly interlinked** and mutually beneficial. **Smart systems** – factories, homes, power grids, farms or entire cities – will **help overcome challenges** ranging from supply chain management to climate change

Sources: WEF; Roland Berger

Society and technology are in a permanent state of flux – A creative society can solve today's problems and generate (future) value

Timeline of the development of human society and industrial revolutions



- **Society and technology are forever changing**: With new technological possibilities, societal needs and behaviors are undergoing change and require considerable adaption
- In a constant and accelerating stream of unknown, uncertain and unpredictable situations, society is also faced with **new demands** regarding higher levels of **creative problem solving** and innovative **value creation abilities**
- To **think and act creatively** in this new, evolving technological landscape of digital transformation is a key capability that allows major present and future challenges, such as climate change or resource constraints, to be addressed while creating value for **future generations**

Sources: SphinxIT; Roland Berger

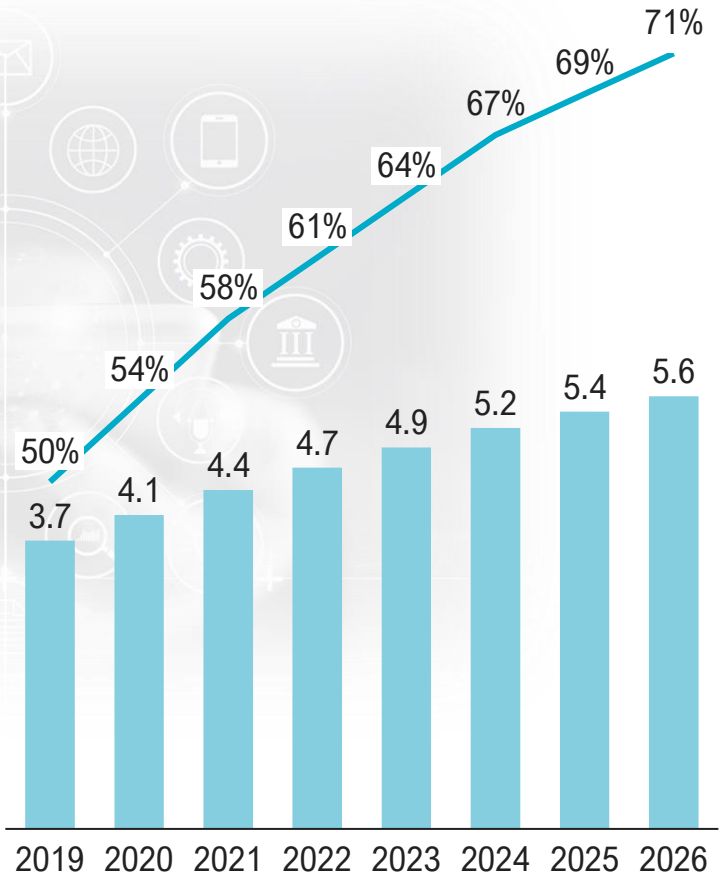
The digital revolution continues to change the corporate landscape as well as societies – Social life is shifting increasingly online

Most valuable companies by market capitalization [USD bn]

	2006[1]		2021[2]	
1	Exxon Mobile	447	Apple	2,285
2	General Electric	383	Microsoft	2,043
3	Microsoft	294	Saudi Aramco	1,870
4	Citigroup	274	Amazon	1,735
5	Gazprom	272	Alphabet	1,657

Digital company

Worldwide social media users [bn] and penetration rate [%]



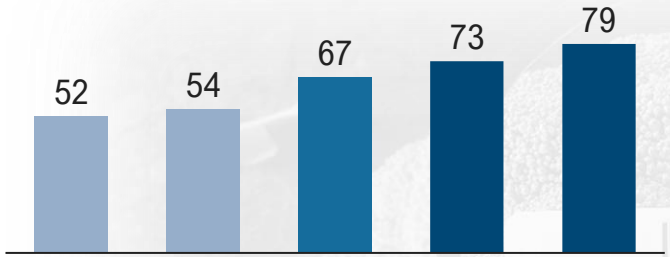
- The intense period of digital transformation during the fourth industrial revolution continues to transform many sectors in the shortest period of time: Fifteen years ago, the top 5 most valuable companies in the world stemmed from a broad variety of sectors, with the tech giant Microsoft casting a lonely figure – **now digital companies occupy almost all the top ranks.** In 2021, Saudi Aramco is the only company from a legacy industry amongst these top players
- In addition to the sectoral disruptions that digitization triggered, **digitization is also changing people's behavior**: For example, it is expected that almost three quarters of the world's population will be social media users as early as 2026. On average, Internet users spend more than two hours on social media platforms every day. Even **everyday activities** like shopping or socializing **are increasingly done online** – a trend that the COVID-19 pandemic has accelerated even further

1) Valuation based on data from December 31, 2006; 2) Valuation based on data from June 30, 2021
Sources: Bloomberg; DataReportal; Roland Berger

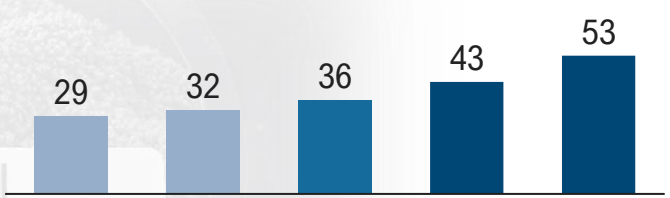
Consumer expectations reflecting the importance of sustainability continue to rise – Majority is willing to pay more for green credentials

Shift of consumer expectations in terms of sustainability

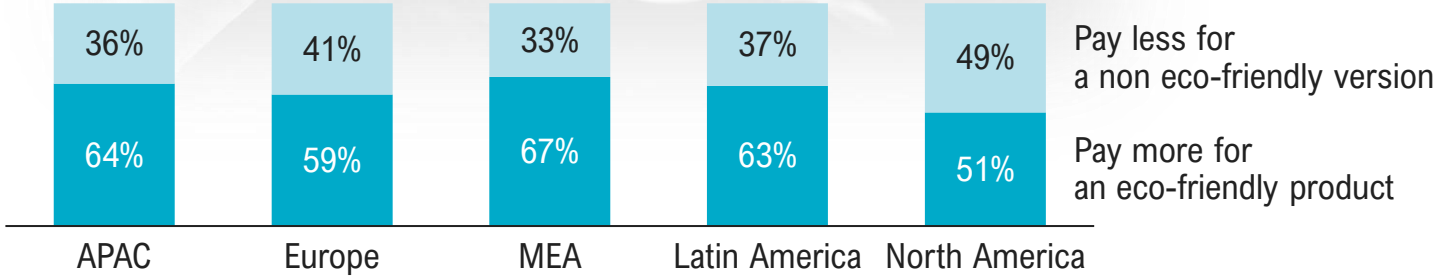
Global Google searches for 'sustainable'
[index value, yearly average]



Global Google searches for 'biodiversity loss'
[index value, yearly average]



Majority of consumers would pay more for eco-friendly products[1)]
[% of internet users who said would rather do the following]

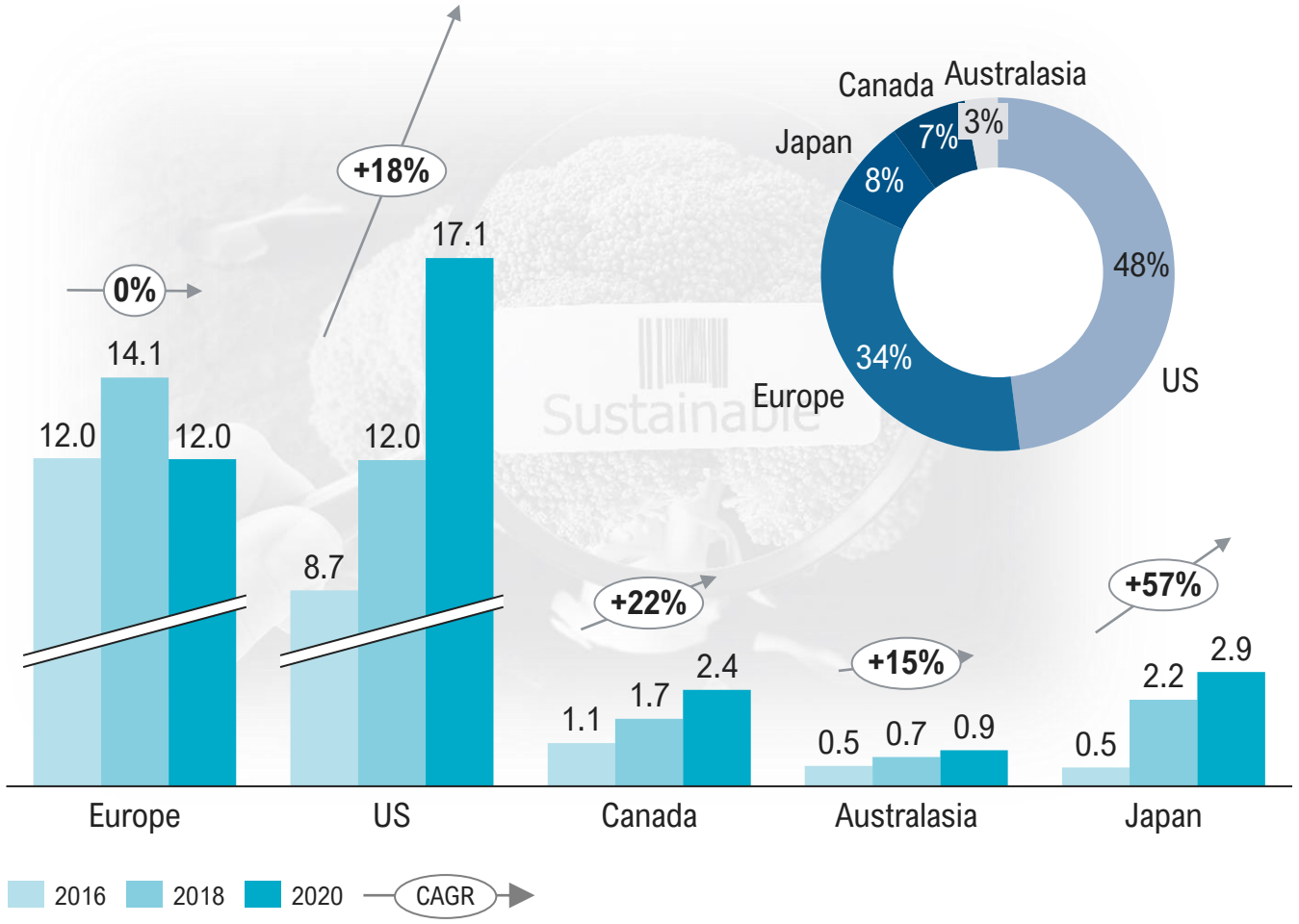


1) Base: 166,645 internet users aged 16-64 years
Sources: GoogleTrends; GlobalWebIndex; Roland Berger

- Topics such as **sustainability** and **environmental protection** have garnered **attention** in recent years, not least due to direct-action campaigns by **activists** such as Fridays for Future, Extinction Rebellion or PETA
- **Global search queries** for such topics – ranging from 'biodiversity loss' to 'sustainable' products – have seen a **steady rise** in recent years
- Increasing consumer awareness also translates into a **willingness to pay more**: Worldwide, most consumers stated that they would **pay a higher price for environmentally friendly products**
- Corporations in **consumer-facing industries are** already **responding** to this trend, particularly in cosmetics, fashion and food sectors
- For consumers, "**greenwashing**" – the exploitation of false or (externally) unverified sustainability claims and green credentials – **is a concern**, for example, as is the case in "WelFur", an animal welfare certificate awarded by the fur industry

The growing importance of sustainability will also be reflected in corporate finances – Raising equity will require ESG commitments

Development and share of sustainable investing assets in selected regions[1] [USD trillion, %]



1) Estimates for 2020
Sources: GSIA; Roland Berger

- Driven by the **increasing public engagement with environmental sustainability** and other societal and governance-related concerns, the **incorporation of sustainability goals into mainstream corporate culture** has increased significantly – as has the adoption of **environmental, social and governance (ESG) principles** in global capital investments
- **Global sustainable investment assets** have reached USD 35.3 trillion in 2020, an **increase** of more than **55%** compared to USD 22.8 trillion in 2016
- **Sustainable investment assets continue to rise worldwide**, except for Europe, which has recently seen a decline – however data comparison is not straightforward due to changes in sustainable investments definitions for the region under EU law
- Central banks such as the ECB have already taken up the cause of **green financing** and intend to promote environmentally friendly projects, such as **greener asset purchases**
- Commitment of companies to environmental, social and governance standards in the form of **ESG labels** can positively influence financing conditions in the future

A combination of transformative forces – including digitalization and sustainability aspects – will impact and reshape major industries

Transformation of selected sectors: Main drivers

Automotive

- Increased political and public pressure and stricter regulatory policies to reduce **carbon footprint**
- Technological **innovations**, especially in areas of new propulsion technologies (electrification, fuel cells), autonomous driving, increased digitalization, connectivity and artificial intelligence
- Increasing demand for **new mobility services**, rise of the **sharing** economy

Utilities

- **Carbon reduction goals** and **carbon pricing** lead to an increase in stranded assets – following the devaluation of existing fossil fuel-based assets – and high investments in new energy assets
- **Decentralization** of energy production
- **Increasing energy demand** in emerging economies due to an emergent middle class
- Increasing **electrification** and **new business models** due to **sector coupling**

Aerospace

- Declining demand for aircrafts as aviation is perceived as a **major contributor to climate change** by the public and regulators
- **New technologies** like electric propulsion of aircrafts
- **New design, manufacturing and service concepts**
- The race for space is slowly gaining momentum with the **New Space Initiative**

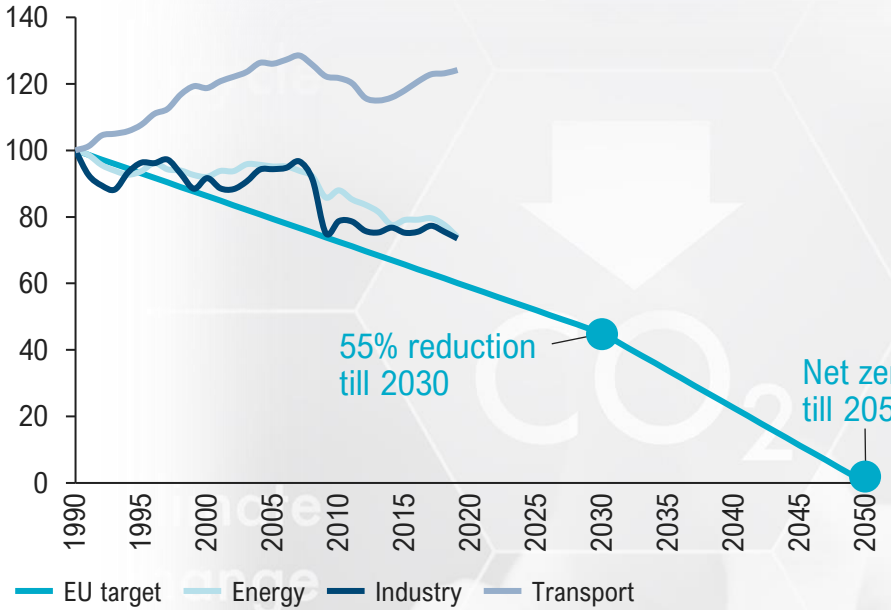
Financial Services

- **New technologies** such as AI, blockchain, cloud computing
- **Increased competition** due to new players (FinTechs) and new business models, such as peer-to-peer-financing
- **New analytics opportunities** like big data, customer intelligence

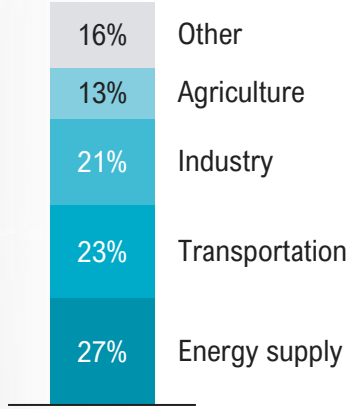
Source: Roland Berger

In the automotive sector, rising environmental standards increase pressure to move away from internal combustion engines, especially in Europe

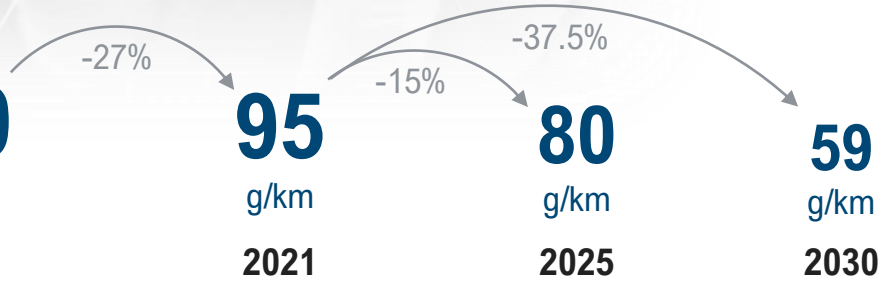
EU GHG emissions for different sectors and EU targets for 2050



EU sectoral CO_2 emissions, 2019



EU CO_2 emission targets for the automotive sector

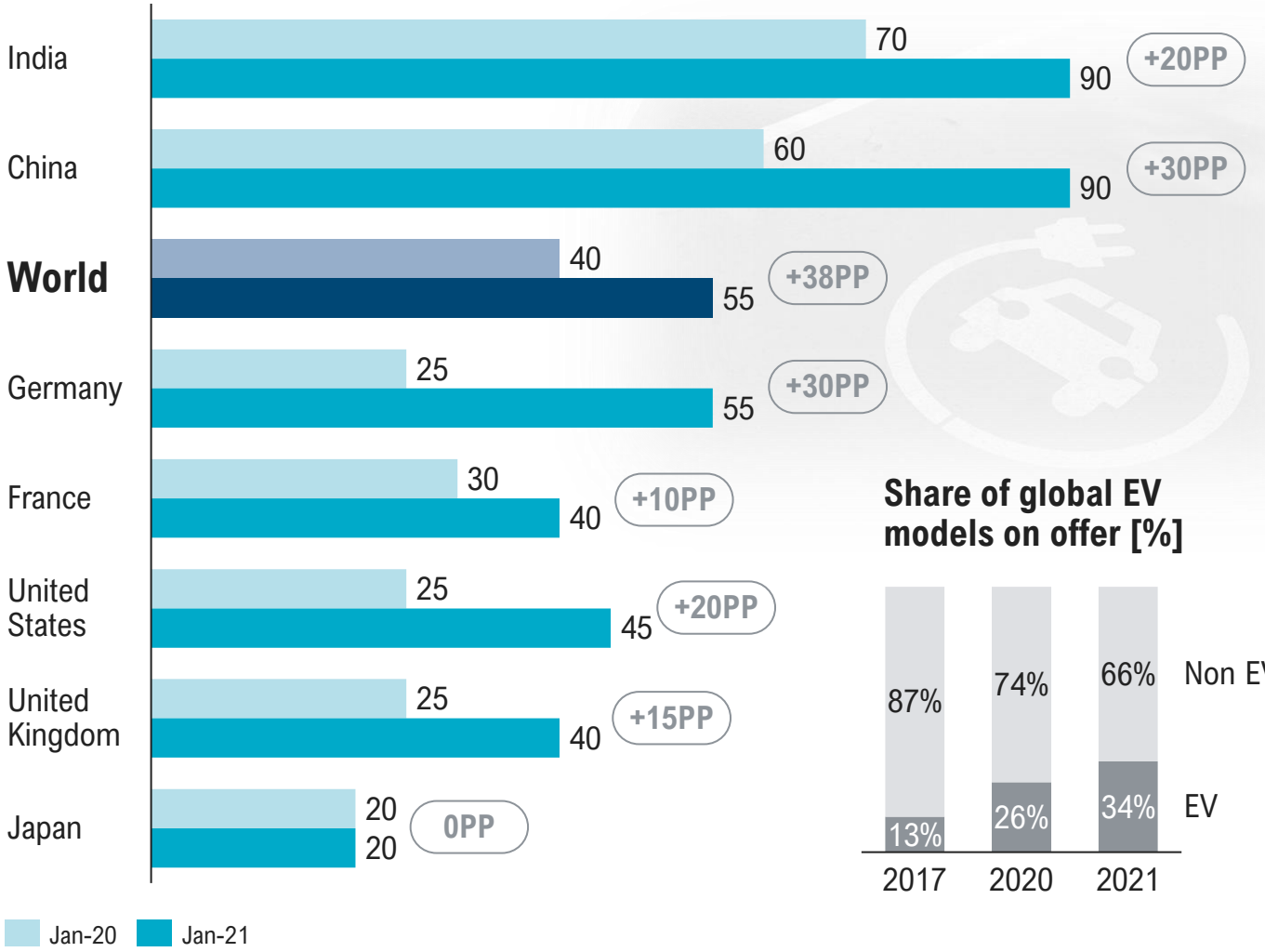


- While other economic sectors have been **reducing their emissions of greenhouse gases** since the 1990s in accordance with agreed climate targets, the **transport sector is off track**
- The transport sector accounts **for 23% of the EU's total CO_2 emissions**, with **passenger cars and vans accounting for more than two thirds** of these emissions
- Transport is also the **only sector** where **emissions have increased** since 1990, contributing to the increase in overall EU emissions
- In the automotive sector, particularly in today's developed economies, **strict regulations** govern CO_2 emissions. The stated **aim** of these countries is to **eliminate CO_2 emissions** in accordance with the Paris Climate Agreement
- To this end, European car manufacturers are planning to **move towards electrification**. Electric car production is **far less complex** than internal combustion vehicle production, thus leading to a shortening of the **production process** in the **long term**; in turn, suppliers must reposition themselves along reengineered processes

Sources: EEA; EC; Roland Berger

Driven not least by better infrastructure and generous subsidies, interest in electric vehicles is rising sharply and could lead to a consumer shift

Interest in buying an electric vehicle [% of potential car buyers]



Share of global EV models on offer [%]

- The **market for electric vehicles** is **becoming** increasingly **attractive** to car buyers, driven in part by generous government subsidies and the steady improvement of vehicle charging infrastructure
- A **survey** of **potential car buyers** conducted by Roland Berger concluded that the proportion of **people interested in electric cars** has **increased** in all the countries surveyed except Japan
- On global average, **55% of potential buyers** are **considering buying an EV** as their next car, compared to 40% in January 2020 and 35% in 2017
- **Actual sales are also on the rise**: While in 2017, the **EV penetration** of **total car sales** was only 1.5%, it **increased to 4.7%** in 2020
- Going forward, more is in the automotive pipeline: **General Motors** pledged to produce **30 new EV models by 2025**, and **Volvo** committed to produce **only hybrid or full-electric vehicles by 2030**. **Volkswagen** unveiled big plans to catch up with **Tesla's** battery technology by opening six gigafactories before 2030

Source: Roland Berger Automotive Disruption Radar

Subject to change: Vehicle propulsion technology as well as other aspects of transportation are undergoing transformative changes

How personal mobility might evolve in the future

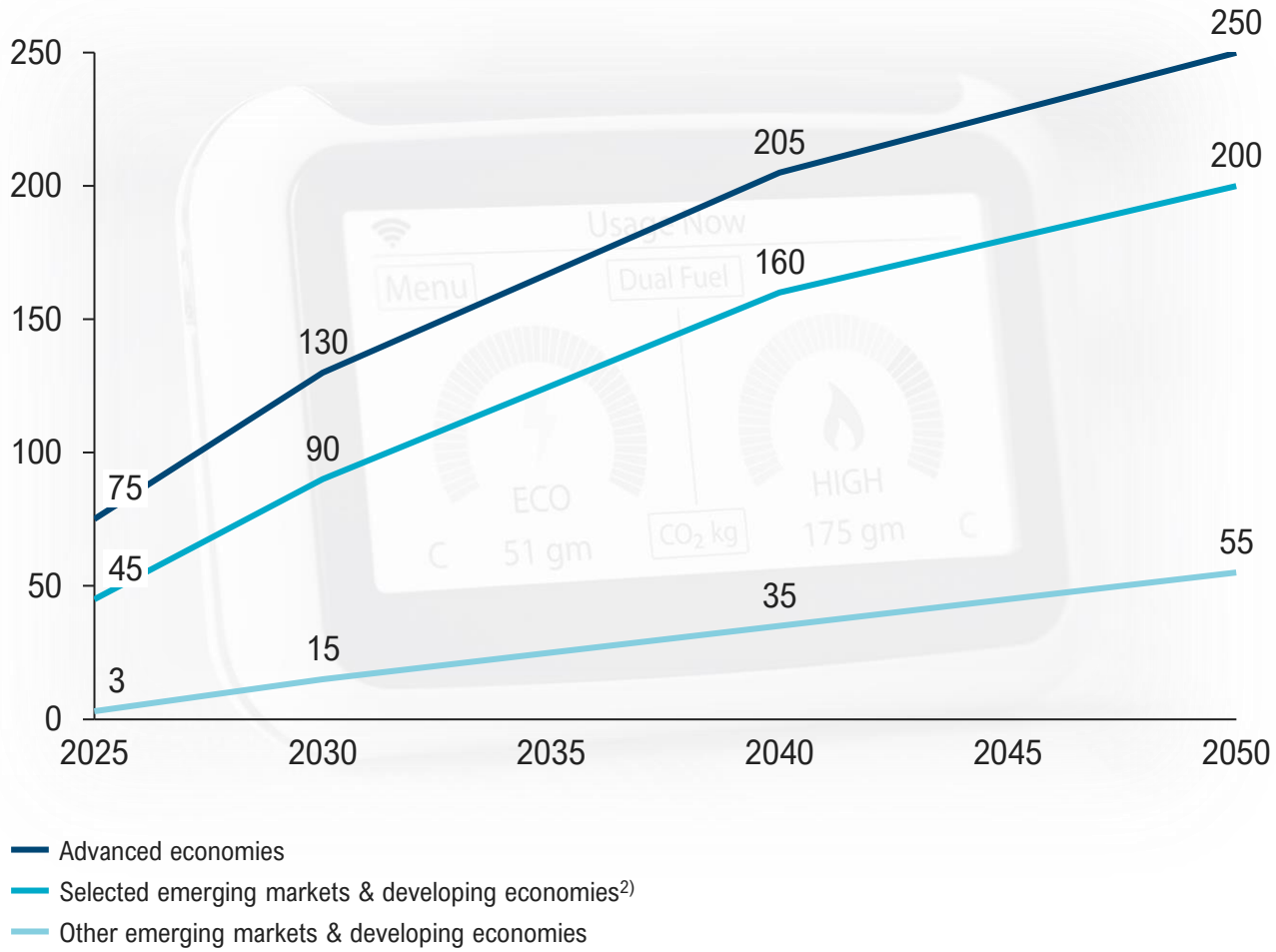
2021	2040
Car dominated	Co-modal
Large & heavy	Smaller & lighter
Engine powered by oil	Electric motors
Largely owned	Largely shared
Taxes on fuel	Charges on use
Drivers, human	Connected & driverless

- Today's personal mobility is **predominantly limited to internal combustion engine vehicles**, with a **trend** toward ever **larger and heavier SUVs**
- In many city centers, this is leading to issues of **space** as well as a **deterioration in air quality**, making current and future inner-city car use a target for new restrictive regulations: Most notably **cities in Europe,** such as Amsterdam, Brussels, Oslo or London, are pioneering ways to nudge their citizens toward **alternative mobility choices,** e.g. by **eliminating parking spaces**, or by **charging for car access to the city center**
- Many more countries are testing the use of a variety of **driverless vehicles**: In the future, cars will no longer be driven by a driver but will **operate autonomously**
- With the popularity of car clubs already in evidence, **car sharing is set to increase** in the future
- However, in **rural areas**, the **private car** will probably continue to be a **preferred and necessary means of transport** in the future
- With a future and newly **emergent middle class** stemming from today's developing countries, aspirations of owning a car may hold steady, leading to a **shift in sales markets**, particularly regarding Asia

Sources: Transport & Environment; Roland Berger

In the utility sector, a rising carbon price prompts major changes to ensure that future forms of energy generation are as fossil fuel free as possible

CO_2 prices for electricity, industry and energy production in the NZE[1] [USD/tCO_2]

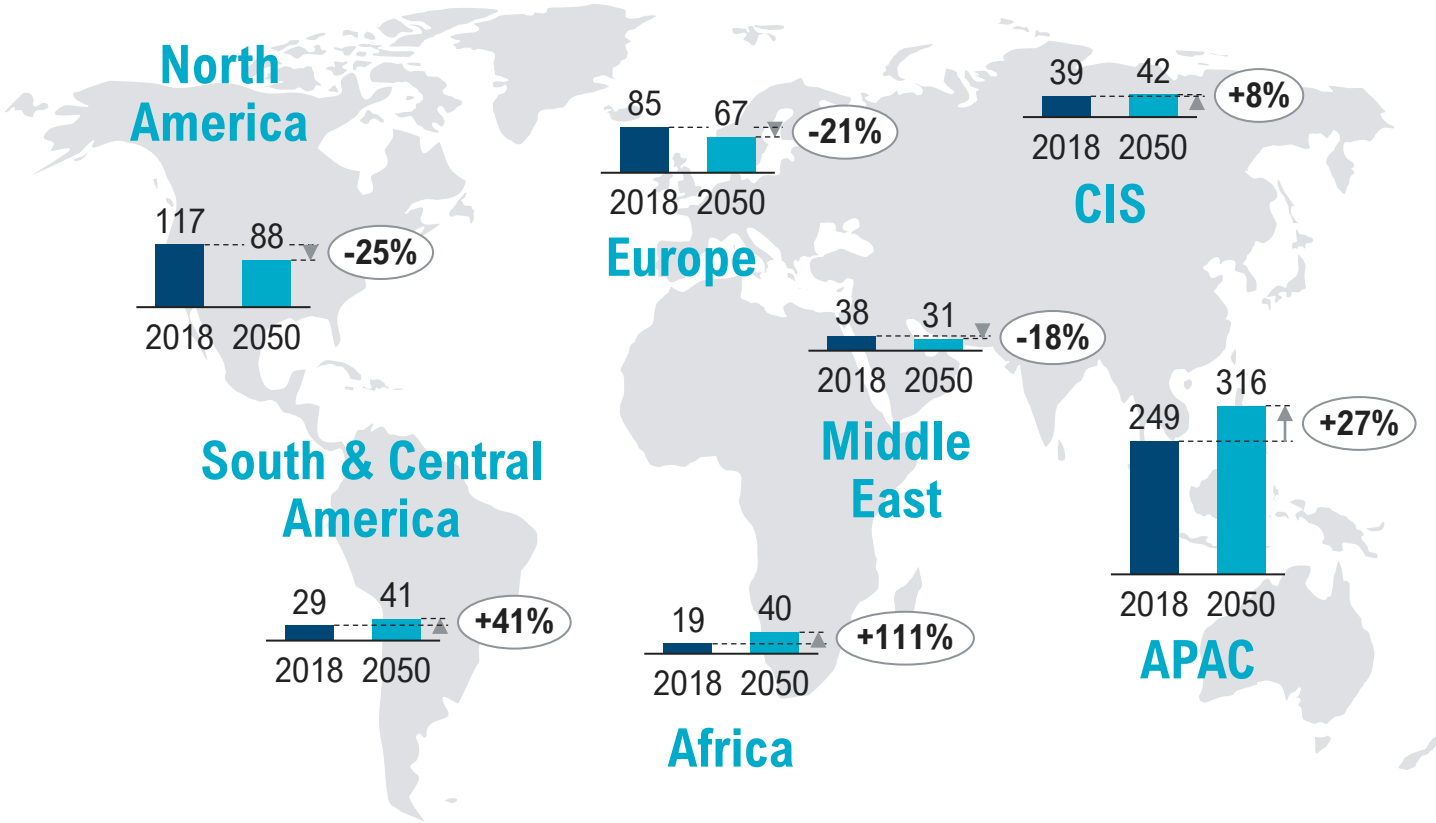


- **Setting the right price for CO_2 in order to incentivize renewable energy use** also acts as an important lever regarding the 2050 Paris agreement goals limiting global warming
- **Estimates** by the International Energy Agency (IEA) state that the **carbon price** will need to **increase** to fulfil the Paris targets
- A CO_2 price of over **USD 250/tCO_2** in **advanced economies** is necessary under the IEA's net zero emissions (NZE) scenario in **2050**
- In other **major economies such as China, Brazil, Russia and South Africa**, the price of CO_2 will also need to **increase to USD 200/tCO_2 by 2050**
- At the **end of 2021, European carbon prices** have been breaking records **above EUR 75** (USD 84)[3] a tonne since mid-November 2021
- The **power sector** is expected to continue to be the front-runner in a **new wave of investments in low-emission energy generation** technologies
- Due to higher carbon prices and the falling cost of new technologies, those **investments will become more profitable** so that renewables may reach parity in several markets in the foreseeable future

1) NZE: IEA net zero emissions scenario; 2) Including China, Russia, Brazil and South Africa; 3) Exchange rate of 1 Euro = 1.13 USD (Dec 1st, 2021)
Sources: IEA; Roland Berger

If the growing energy demand in emerging countries is to be met by green energy, advanced economies' financial and technological support is key

Total primary energy demand by region[1] [EJ]

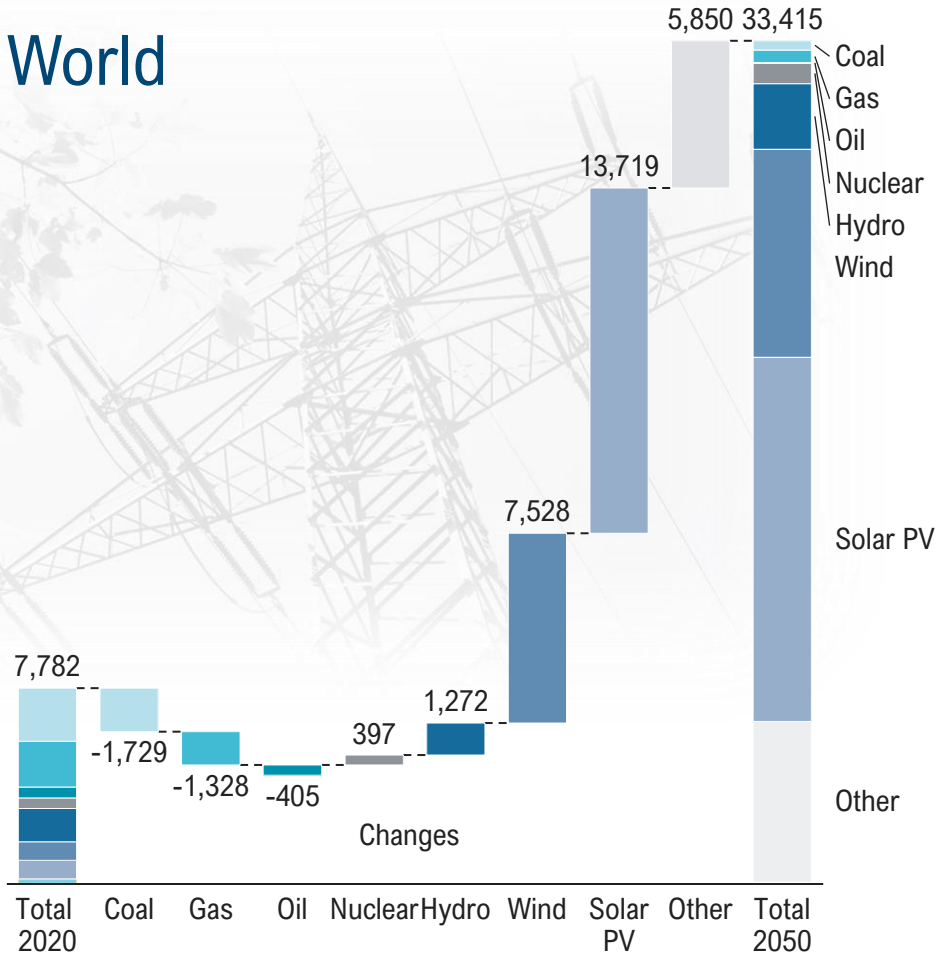


- While **advanced economies** work to decrease their primary energy demand until 2050, these **savings will be eclipsed by the growing energy demand in developing countries**
- With rapid population growth and increasing urbanization underway, **developing countries** require reliable, **affordable sources of energy to sustain their development**
- **Emerging markets and developing economies now account** for **more than 2/3 of global CO_2 emissions** and are likely to be responsible for **nearly all emissions increases** in the **future**
- **Smarter energy policies** for these countries should focus on curbing demand growth by **increasing energy efficiency** at the planning stage. According to the IEA, this could reduce emissions almost as much as using renewable energy – but at a much lower cost
- To drive the **transition** in emerging economies, advanced economies could make use of **international carbon credit trading mechanisms** set out in **Article 6** of the Paris Agreement[2]

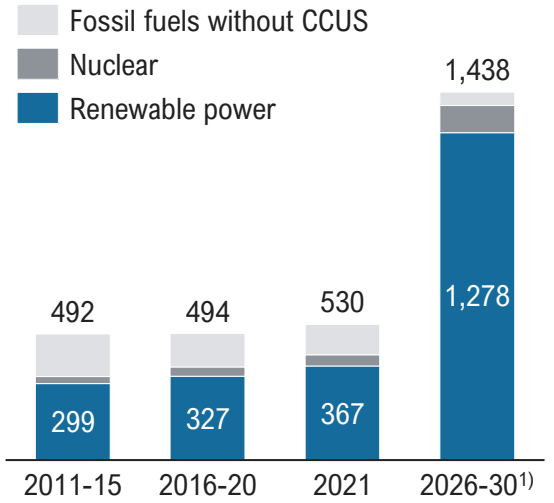
1) Assumption of the bp Net Zero-scenario
2) Article 6 is concerned with an international emissions trading system, leading to a global price on carbon: Low emitters could sell their exceeding allowance to larger emitters, with an overall cap of greenhouse gas (GHG) emissions, ensuring a net reduction. Supply and demand for emissions allowances would lead to a global carbon price creating new channels for climate finance, capacity-building and technology transfer
Sources: bp; ICC; Roland Berger

The need to cut CO_2 emissions will cause shifts in energy capacities as well as in investments over the next decades

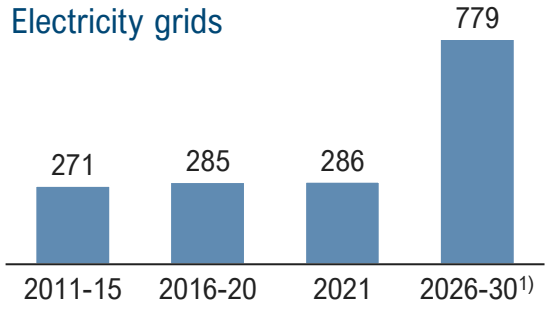
Development of energy generation capacities, 2020-2050[1] [GW]



Development of global annual investments [USD bn]



Electricity grids

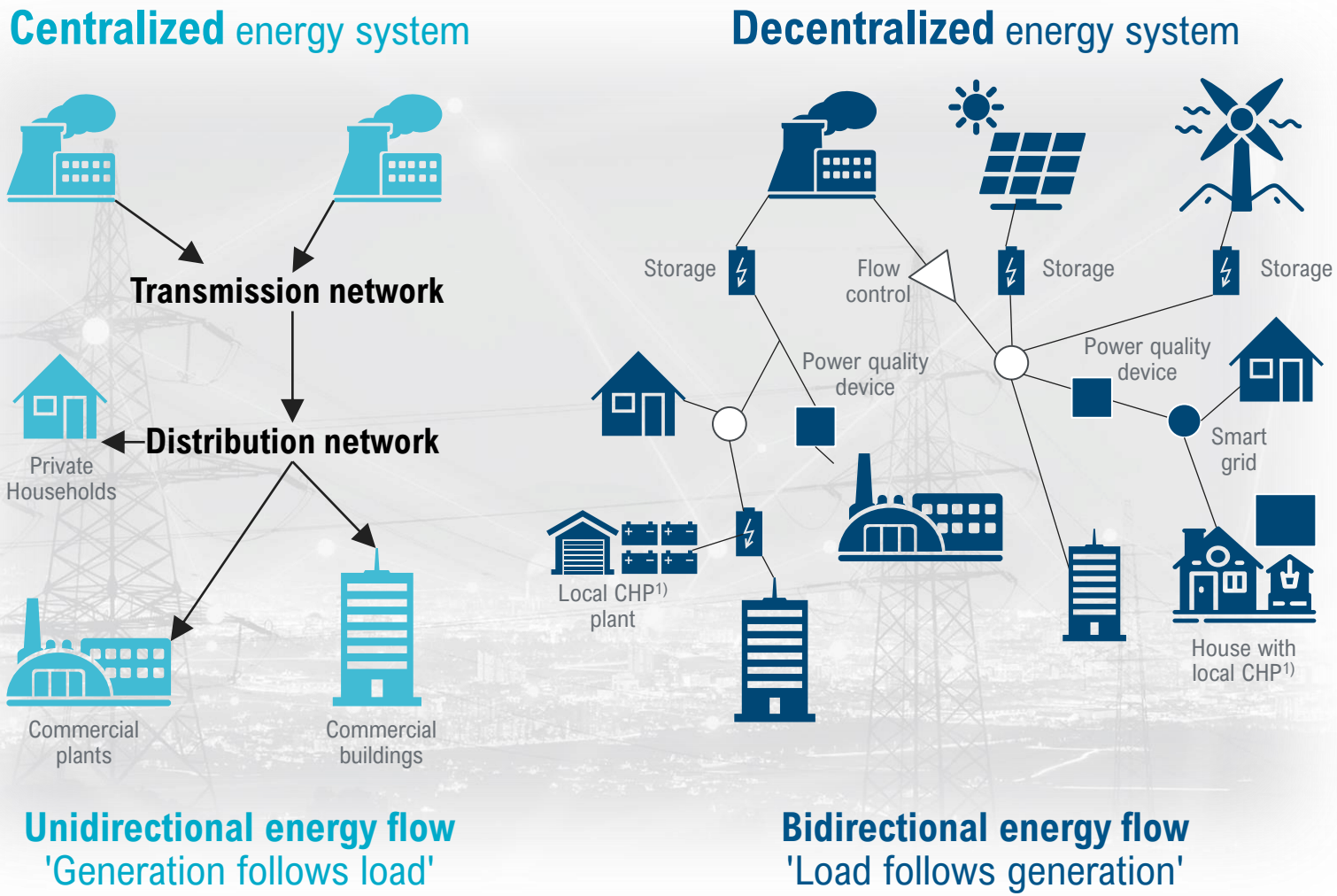


- **Solar, wind, and hydro** are expected to account for more than **85% of all capacity added globally** between 2020 and 2050
- **Fossil fuels** are by and large being **phased down**. By 2050, assuming the NZE scenario, hardly any energy will be generated from oil - the use of coal and gas will also be **significantly reduced**
- To push the energy transition further, **major investments** in power generation plants and electricity grids **are required**, as growth in **demand for equipment** for electricity grids will be driven by both **expansion and replacement**
- The **transition to decentralized energy systems** will also result in **additional investment** as well as changes in energy generation

1) Assumptions under the IEA's NZE scenario
Sources: IEA; Roland Berger

Near term, energy production facilities might be located closer to sites of energy consumption improving system inefficiencies and lowering costs

Differences between a centralized and decentralized energy system

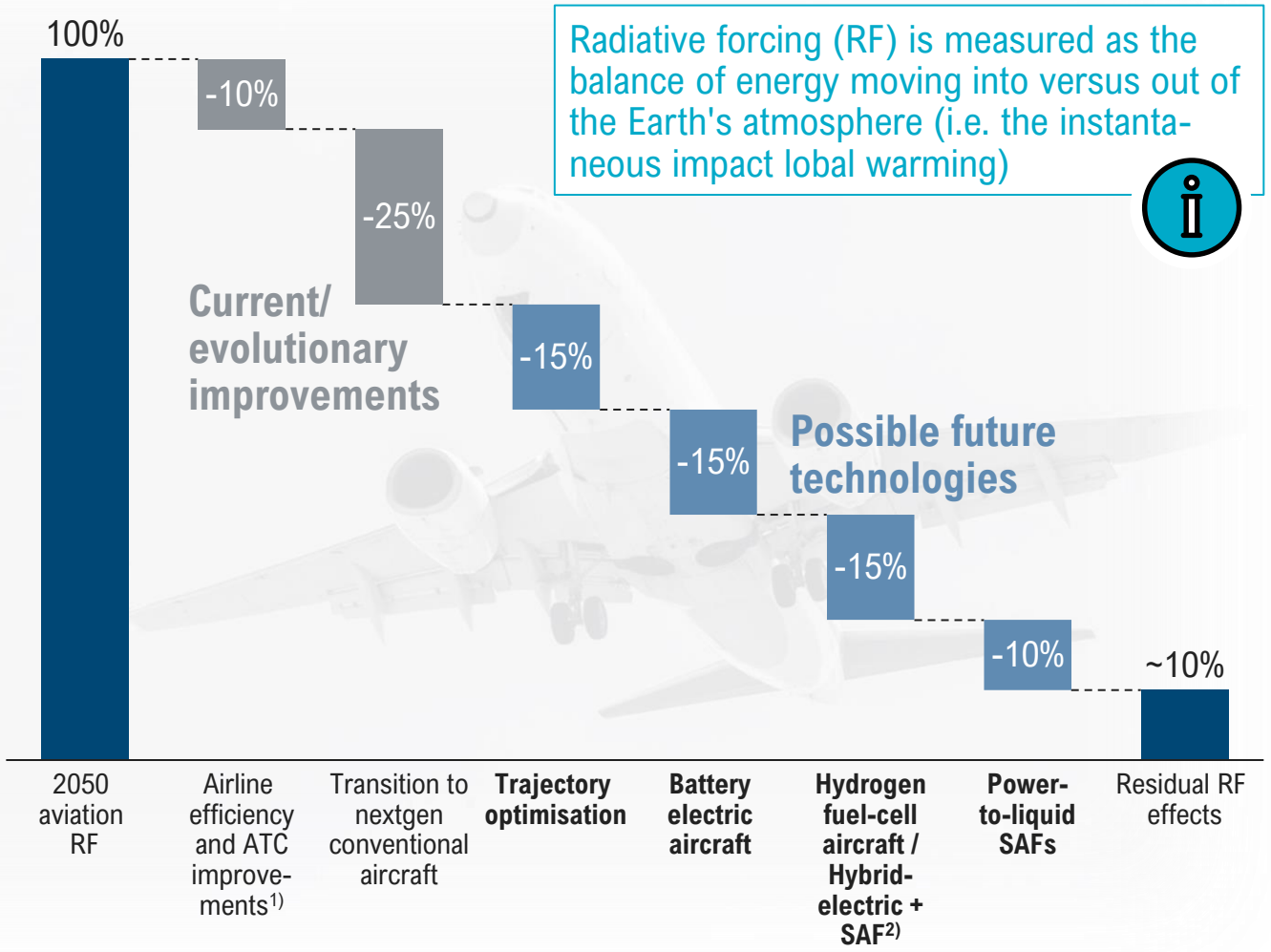


- **Decentralized** energy systems are characterized by **energy generation facilities located closer to places of consumption**
- **Decentralization** of energy production enables **optimized use of renewable energy sources** and CHP while reducing fossil fuel consumption under increased eco-efficiency
- Traditionally, power industry infrastructure has been **modelled on a system of large, centralized power plants supplying energy via far-ranging transmission networks** and downstream distribution networks, in turn supplying households and commercial sites
- As end users are widely distributed, **similarly distributed and decentralized power generation can reduce transmission** and **distribution inefficiencies** as well as **lower** associated **economic and environmental costs**

1) Combined heat and power (CHP) plants recover otherwise wasted thermal energy for heating
Sources: Farell; UN ESCAP; Roland Berger

Although aviation accounts for just 2% of global CO_2 emissions, its impact on global warming is significantly higher due to radiative forcing

Radiative forcing improvement potential of selected technologies



> Aviation's **carbon emissions** are **set to triple** from 2019 to 2050 reaching 3 billion tCO_2, despite a reduction in flights due to the global pandemic. Today, global **aviation accounts for around 2% of global CO_2 emissions**

> But, in addition aviation carries the risk of **non-CO_2 climate forcing impacts** due to **radiative forcing (RF)** which is understood to be **more significant**, though the science is still developing. **Estimates** suggest that the **impact of aviation on global warming** overall lies between **3% and 7%**

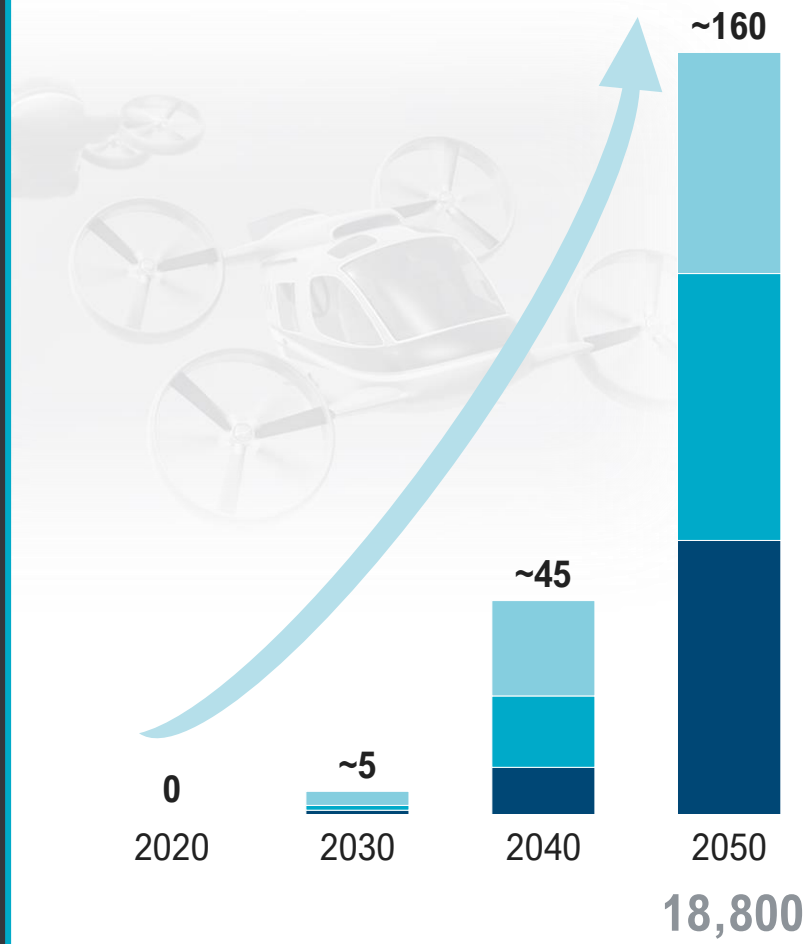
> Although an immediate solution is withstanding – besides ongoing efficiency improvements and the transition to next-generation conventional aircrafts – there are several revolutionary **technologies** to help **reduce** aviation's overall **climate impact**

> **Four technologies** have considerable **potential**: The **optimization of trajectories**, the **development** of **battery electric aircraft,** of **hydrogen fuel cell aircraft,** of **hybrid-electric aircraft using sustainable aviation fuel (SAF),** and the improvement of **power-to-liquid SAFs** – all four combined with current progressive improvements could **reduce** the sector's radiative forcing impact by **90%**

1) ATC: Air traffic control; 2) SAF: Sustainable aviation fuel
Sources: IPCC: Roland Berger Aviation Radiative Forcing Model; Roland Berger

In the future, ground transportation – already nearing its limits in many urban areas – could be eased by varied means of urban air mobility

Estimates of operating UAM passenger drones ['000]



City Taxi **36%**

On-demand flights between any available landing station (15-50 km)

Airport Shuttle **35%**

Scheduled flights on defined routes between airports and surrounding landing stations (15-50 km)

Inter City **29%**

Scheduled flights on defined routes (50-250 km)

Total distance

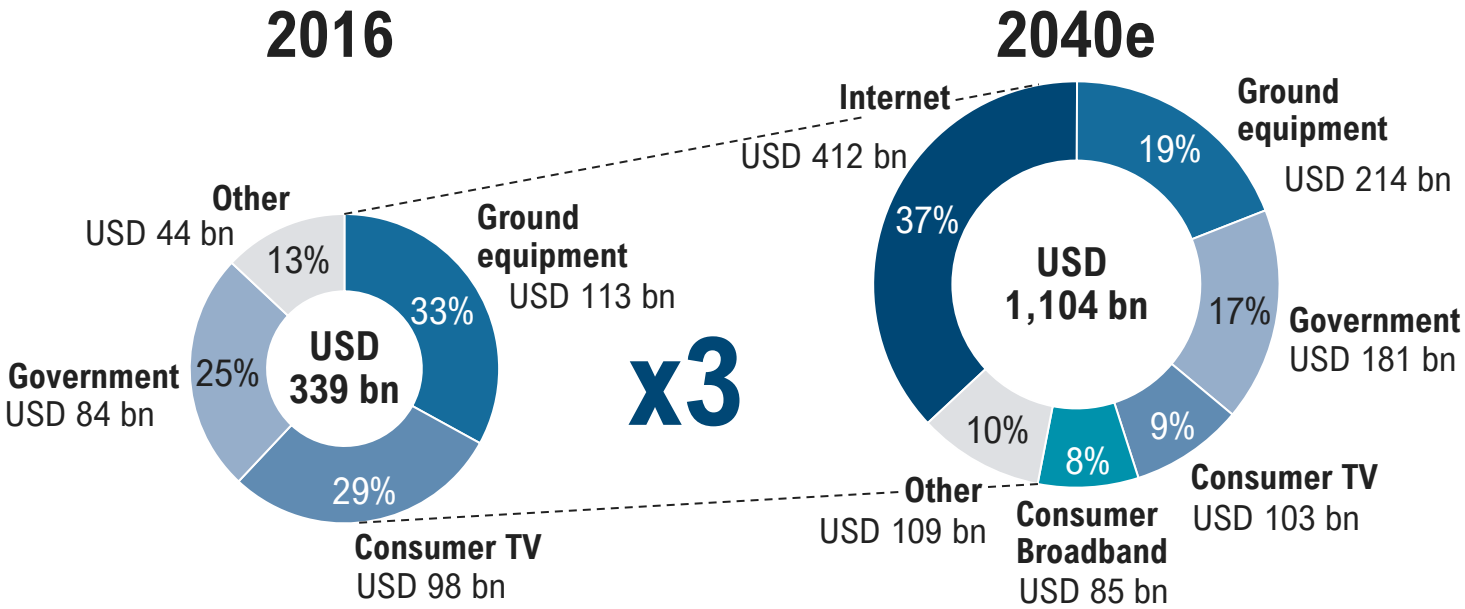
flown by passenger drones [million km]

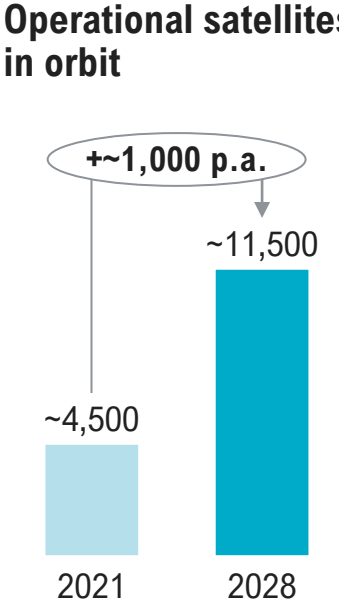
- With **ground transportation** in many towns and cities **stretched to the limit**, urban air mobility (**UAM**) could provide a much-needed **alternative**
- Since 1950, the world's **urban population** has **ballooned** from 751 million to 4.2 billion. By 2050, urban areas will be home to a further 2.5 billion people, with more than **two-thirds of the total world population living in cities**. Urban transport infrastructure is struggling to adapt, taking a toll on commuters, the environment and our economies
- In **London**, **drivers lost** an average of **227 hours** in 2018 due to **congestion**; **traffic** in the **United States** cost the country **USD 87 billion** in time lost last year – **costs**, that **can be avoided in the future** by new means of urban air mobility
- Around the globe, **aerospace giants** such as Boeing and Airbus as well as **well-funded startups** are working on necessary UAM technology to create this new mode of transport
- Test flights for **prototypes** are **already underway** and the vision of **flying taxis** is expected to become a **reality within a decade**
- But for all the excitement, there are **also concerns**: One is that as the development of UAM drones increases, so does **regulation**, which **imposes constraints** on producers. **Public acceptance** also still has to be won

Source: Roland Berger

While urban mobility may evolve to include new air-borne services and technologies, a new space industry is literally blasting off

Estimate of global space economy revenues





> Over the next decades, **humans** are expected to **enter space** in unprecedented numbers as the possibility of becoming a **space tourist** is taking shape

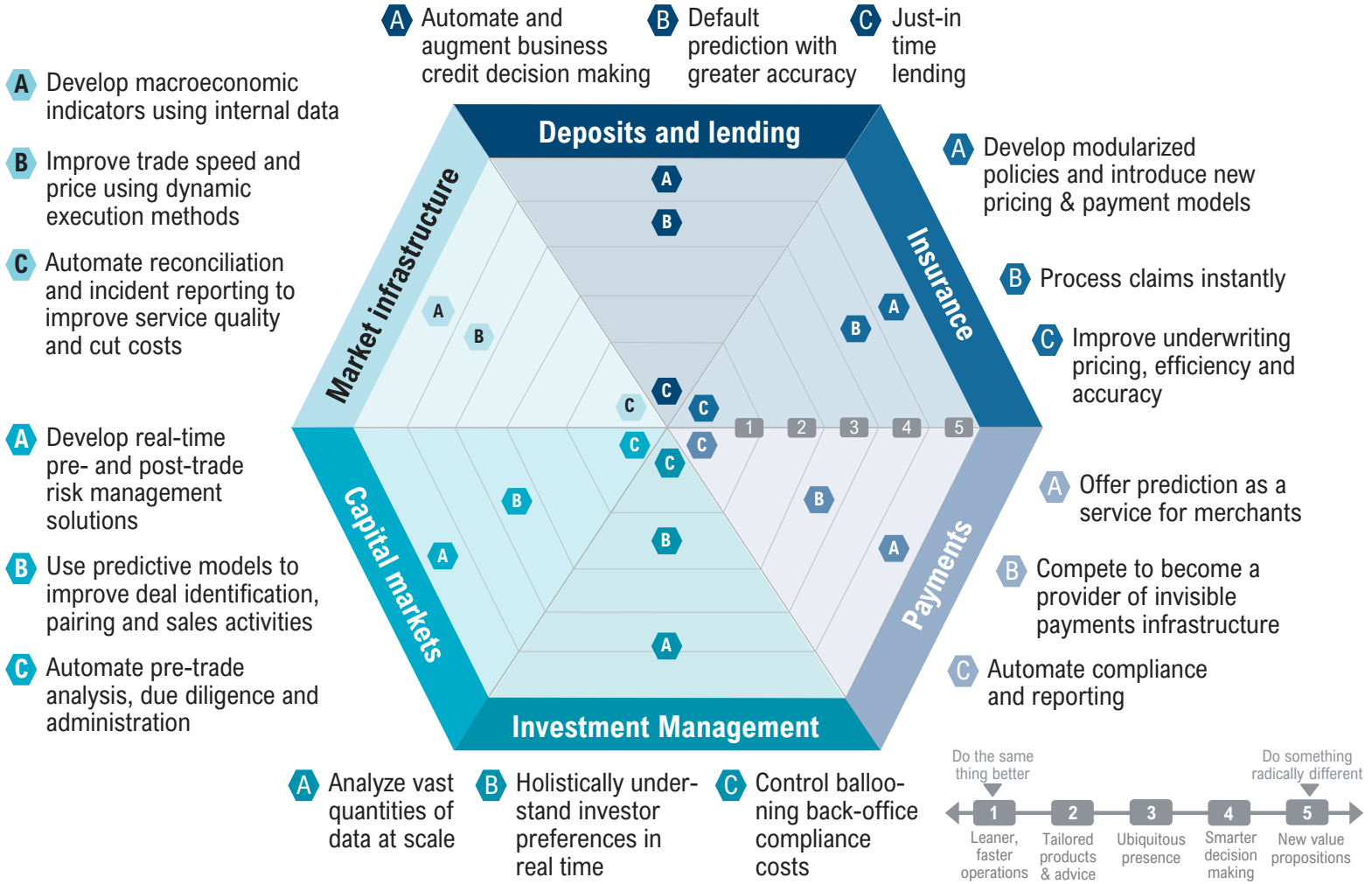
> Meanwhile, the **commercial space sector** – termed **NewSpace** – has been growing strongly: Various commercial entities have been **reducing the costs of launching payloads** by **leveraging new technologies** and **methods**. With the old **space race** involving two antagonistic superpowers **clearly over**, a much more **cooperative period of space endeavor** involving **six major participants** – the US, the EU, Russia, China, Japan, and India – along with many international commercial partners and smaller agencies is in evidence

> Between now and 2050, **Earth's orbital lanes will become a lot more crowded** as the region known as Low Earth Orbit (LEO) is further commercialized – mainly due to a **new internet sector** driven by projects like Starlink. Estimates predict that **revenues** in the **global space industry will triple by 2040**

Sources: Morgan Stanley; WEF; UCSUSA; Roland Berger

The use of AI in the financial services sector has entered the mainstream – Emerging technologies offer a wide range of cost saving opportunities

Selected use cases for AI in Financial Services



A Develop macroeconomic indicators using internal data

B Improve trade speed and price using dynamic execution methods

C Automate reconciliation and incident reporting to improve service quality and cut costs

A Develop modularized policies and introduce new pricing & payment models

B Process claims instantly

C Improve underwriting pricing, efficiency and accuracy

A Develop real-time pre- and post-trade risk management solutions

B Use predictive models to improve deal identification, pairing and sales activities

C Automate pre-trade analysis, due diligence and administration

A Offer prediction as a service for merchants

B Compete to become a provider of invisible payments infrastructure

C Automate compliance and reporting

A Analyze vast quantities of data at scale

B Holistically understand investor preferences in real time

C Control ballooning back-office compliance costs

> **AI is now deployed by most of the financial services sector**: According to a recent industry survey, most (85**%**) **firms say they have now made use of AI technology in varied business domains** such as risk management (56%) and revenue generation through new products & processes (52%)

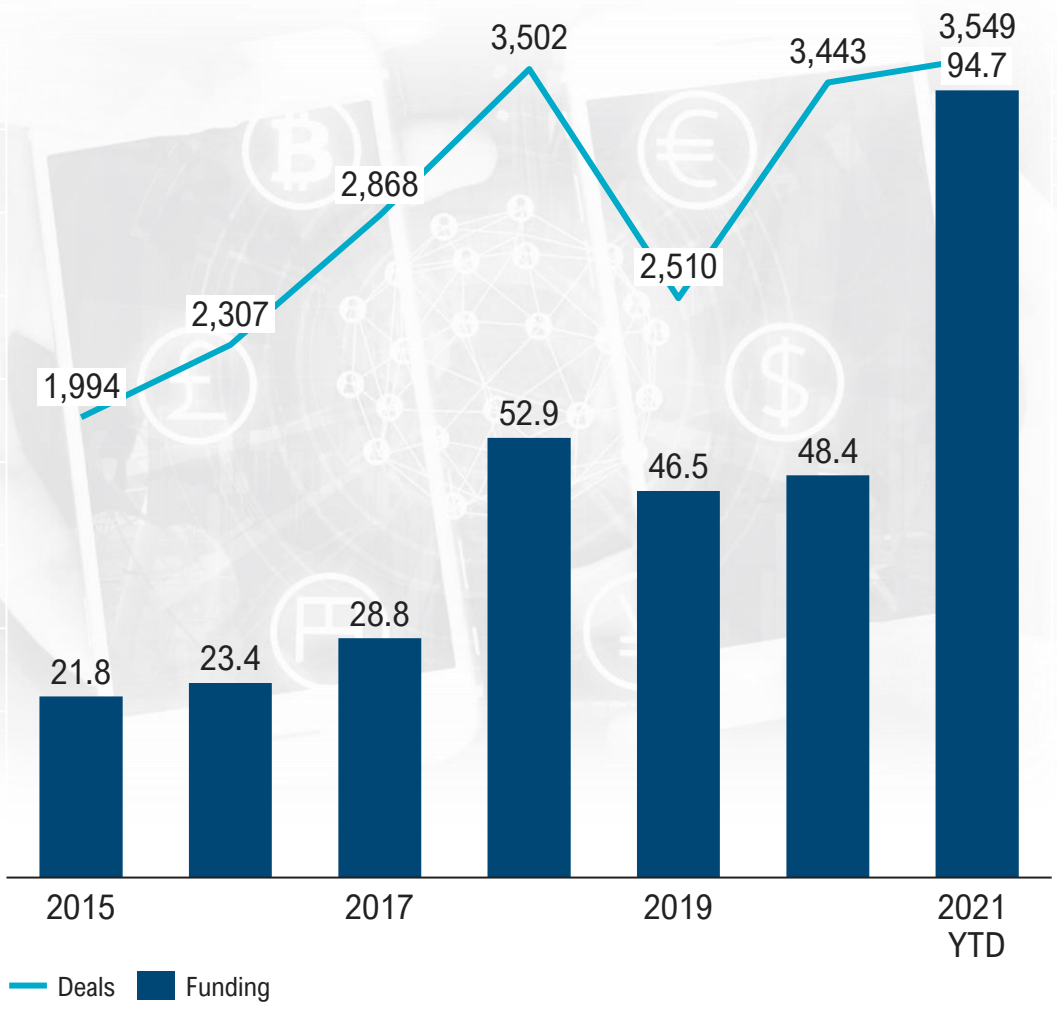
> Most firms (80%) are also very aware of the **potential benefits of AI** and machine learning – in fact, **75%** of the sector's larger firms **are actively planning to deploy AI solutions** – compared to only 46% in banks with less than USD 100 billion in assets

> **Leveraging AI**, especially by large, financially strong companies, can benefit their **economies of scale,** leaving **smaller companies behind** – AI can thus contribute to a **further consolidation** in the financial services sector

Sources: WEF; CCAF; Roland Berger

The financial sector is facing a new paradigm, mainly driven by new technology-enabled business models – FinTechs are booming

Global funding and deals in the FinTech sector



- Since the financial crisis of 2008, the banking sector has been faced with **low interest rates**, **low credit growth**, **increased regulatory requirements** and an overall damaged reputation
- Alongside this bundle of challenges, banks have encountered **new levels of digital disruption** stemming from novel competitors, namely financial technology (**FinTech**) and platform-based financial services companies – competing head on in every aspect of banks' traditional offerings, ranging from payment services to corporate lending
- A closer analysis of the **cost structure of traditional financial players** makes it clear that this was a sector ripe for disruption: Its **costs averaged around 2% of asset values** – a level that has remained remarkably **steady for a century**, seemingly unable to reap the benefits of technological improvements over that period
- Where efficiency gains were made, banks did not pass on such gains to customers; **imperfect competition** in the banking market, due to **high regulatory hurdles** for new players, meant that **banks held an information monopoly regarding client data** for a long time. Due to **big data** and digital platform innovations, FinTechs can undermine this historic information domination
- **FinTechs**, which are **generously funded**, are now able to offer traditional banking services at highly **favorable conditions –** making **customer attrition** an additional and increasingly large challenge for banks

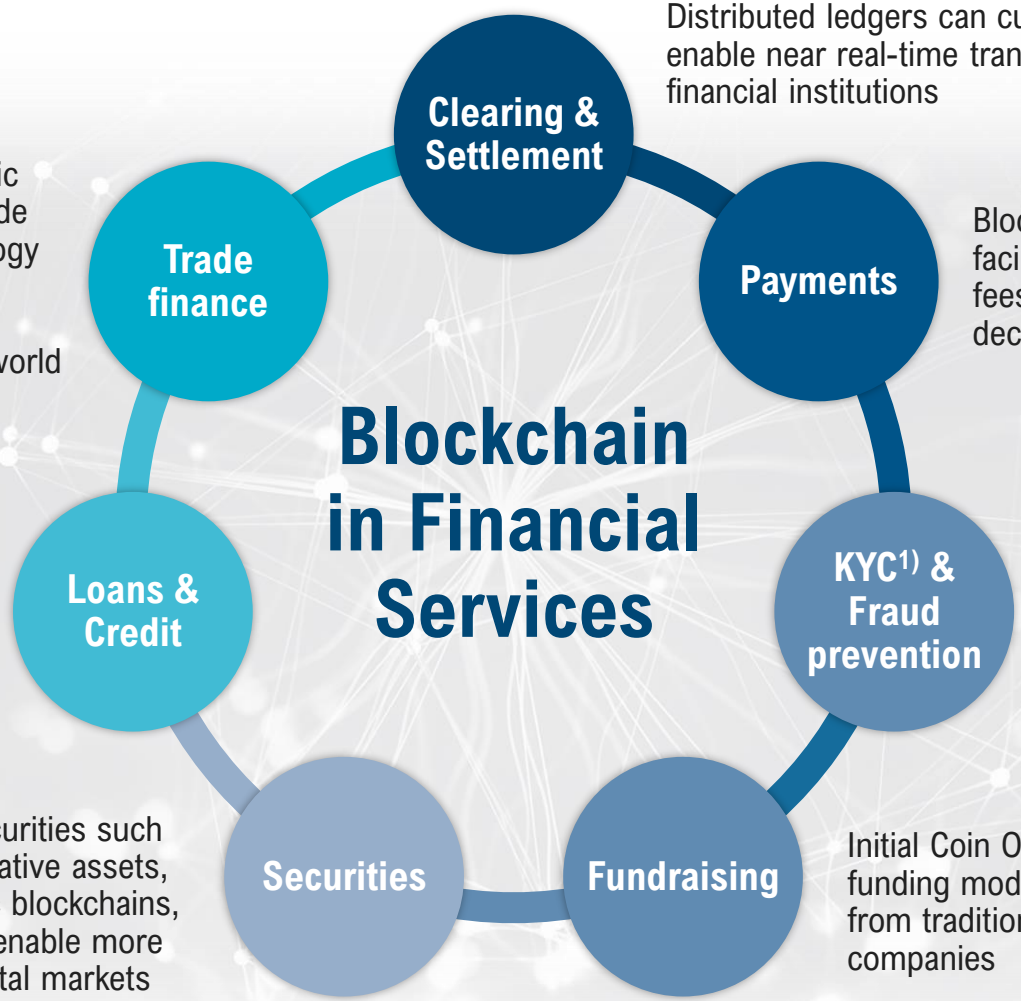
Sources: CB Insights; Roland Berger

Blockchain technology holds the potential to facilitate radical change – From payments and lending to how money is raised in capital markets

Distributed ledgers can cut operating costs and enable near real-time transactions between financial institutions

By replacing the bureaucratic consignment process in trade finance, blockchain technology creates more transparency, security, and trust between trading parties around the world

Blockchain technology could facilitate faster payments at lower fees than banks by establishing a decentralized ledger for payments



By removing the need for costly gatekeepers in the lending and credit industry, blockchain technology can make borrowing safer and provide lower interest rates

Blockchain technology can make information sharing between financial institutions easier and more secure by storing customer data in decentralized ledgers

By tokenizing traditional securities such as stocks, bonds and alternative assets, then placing them on public blockchains, blockchain technology can enable more efficient, interoperative capital markets

Initial Coin Offerings (ICOs) are testing a new funding model that decouples access to capital from traditional capital raising services and companies

1) KYC: know your customer

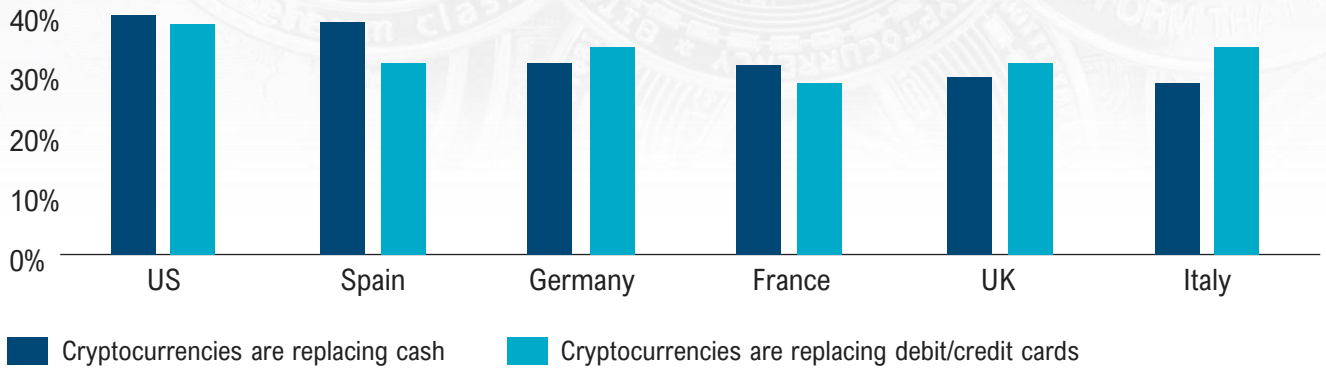
Sources: CB Insights; Roland Berger

Blockchain technology-based cryptocurrencies can increase competition for financial services firms in terms of payments as well as deposits

Comparison of conventional payments and crypto payment methods

Platform	Visa	Ripple	Bitcoin	Cash
Processing fees	1.29% + USD 0.05 to 2.54% + USD 0.10[1)]	USD 0.0036[2)]	~ USD 2.23[2)]	1.8% of sales value[4)]
Possible transactions per second	65,000	65,000[3)]	5-7	Unlimited
Time to confirm	up to 2 days	~4 seconds	~10 minutes (varying)	Immediately
Energy consumption (KWh/tx)	0.00649	0.00001133	118	0.08 KWh per printed banknote

Share of millennials who think that cryptocurrencies are replacing cash and debit/credit cards



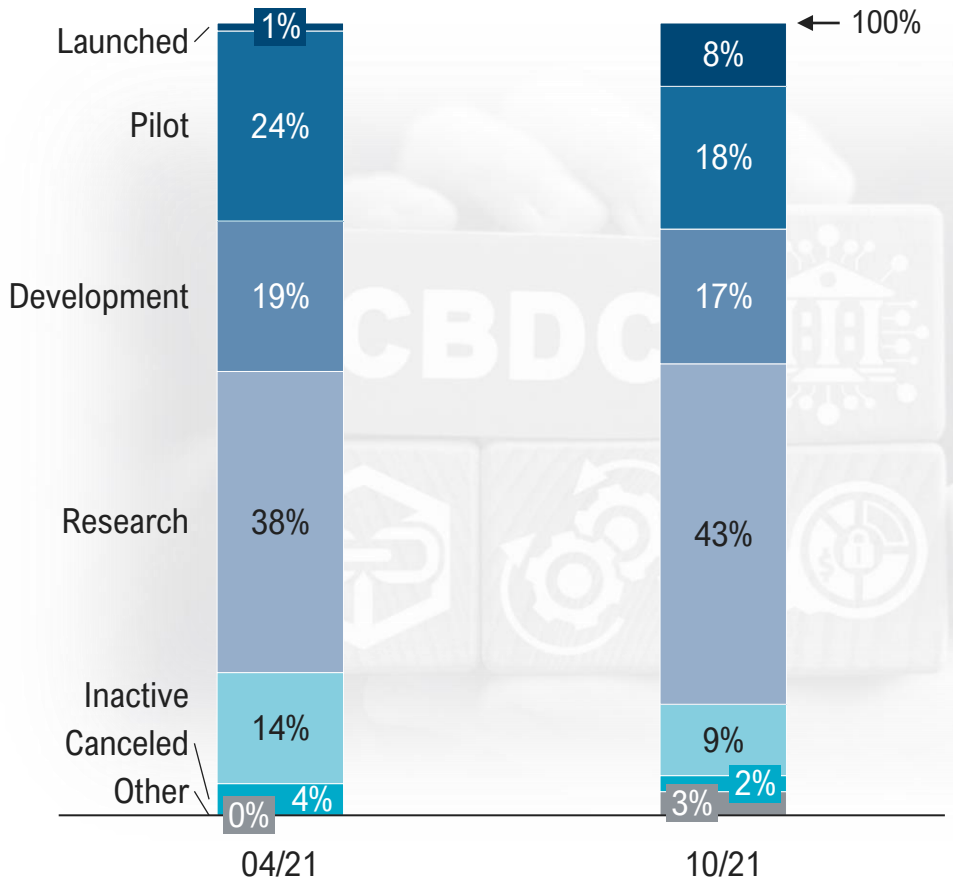
- **Cryptocurrencies** are becoming increasingly **mainstream**: Now, many big **companies** such as **Microsoft** or **Starbucks** are already **accepting cryptocurrencies** as a means of payment
- Most major **payment companies,** like Visa or PayPal, are **exploring possibilities** to provide cryptocurrency solutions in their networks
- **Payment providers** may **come under pressure** from **crypto-currency networks** such as **Ripple**, that now have the **technological capabilities** to **perform** the same **number of transactions faster** at **lower cost**, while being **less energy-hungry** in the process. **Bitcoin**, the best-known crypto-currency, is **not likely to be able to compete** in this area, mainly because of its power consumption
- Surveys by Deutsche Bank have also shown that many **millennials** already **believe** that **cryptocurrencies** have the **potential** to **displace cash and card payments**. This has an impact on banks: Money that is stored in digital wallets as opposed to bank accounts is not available to banks as a deposit, thus impacting banks abilities to lend

1) Visa US Interchange Reimbursement Fees were published on July 17, 2020; 2) The exact amount of the transaction fees depends on the respective price of the cryptocurrency. Current information refers to rates as of 07.12.2021; 3) Ripple consistently handles 1,500 transactions per second, 24x7, and can scale to handle 65,000 tx/s; 4) Cashless payments generate costs for change supply and cash removal

Sources: Deutsche Bank; Visa; Bitinfocharts; Roland Berger

Even central banks are not spared having to face the crypto-currency hype – Is future competition with financials services firms on the cards?

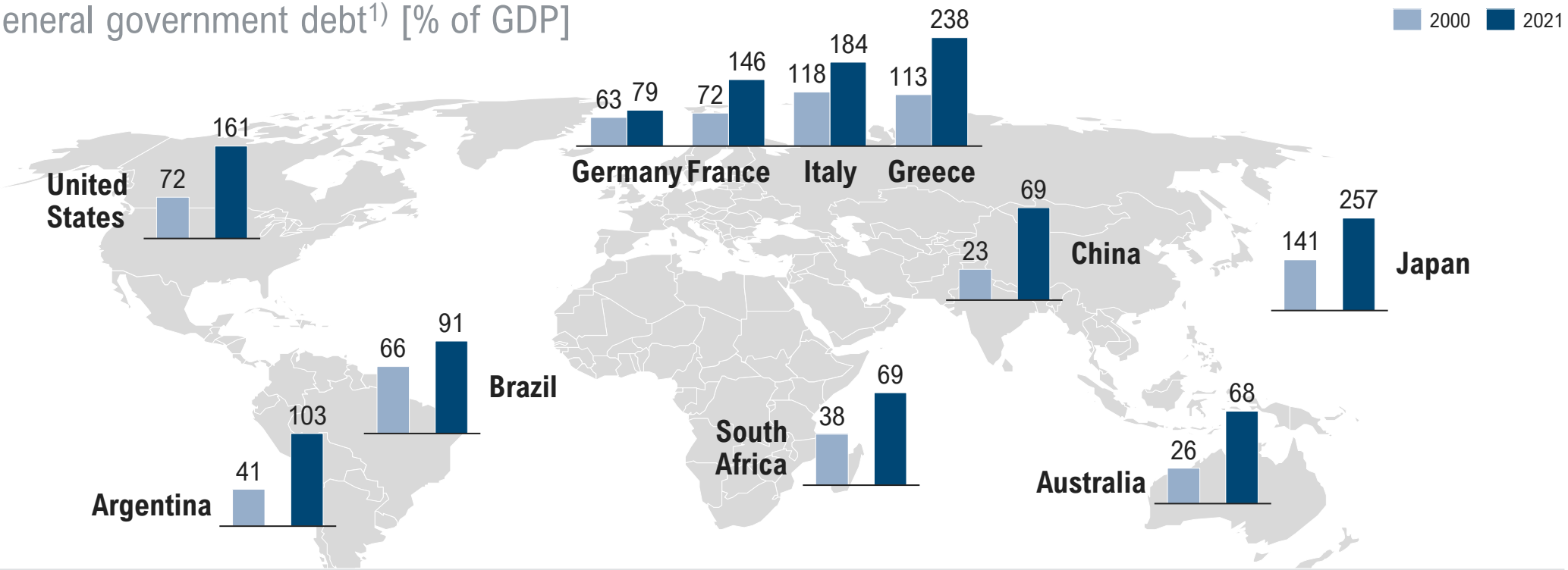
Status of 74 central banks in their central bank digital currency (CBDC) process



- A **central bank digital currency (CBDC)** is the **digital equivalent of a country's currency** and is also a claim on the country's central bank. Rather than printing money, the central bank issues electronic coins or accounts backed by the government's creditworthiness
- In 2021, the race for **digital central bank money** gained momentum: With the Peoples Bank of China's announcing plans to roll-out a **digital** version of the yuan until the 2022 Olympic games in Beijing, other central banks found themselves under pressure to act and explore the rollout of a CBDC
- Central banks have plenty of reasons to engage with **virtual currencies**: CBDCs are **less costly** than physical cash as they have lower transaction costs; they can **promote financial inclusion**, helping the unbanked to have easier and safer access to money via their phones; **CBDCs can compete with the private sector**, giving **incentives to meet transparency standards** and **curb illicit activity**; they can also **help monetary policy flow** more quickly and seamlessly
- By introducing a CBDC, **central banks could also compete for** traditional banking **deposits** – with the competitive advantage that central banks have no limits on their cost structure, and cannot, by definition, become insolvent
- There are already **thousands of virtual currencies** commonly referred to as **cryptocurrencies**. These might be **centralized** but are **not government-issued**, as in the example of **Diem issued by Facebook**. Fully decentralized types of cryptocurrencies include Bitcoin and its peers

Sources: Atlantic Council; Roland Berger

Public debt levels of many countries have risen significantly in recent years, in some cases reaching alarming levels



> Over the past two decades, many **governments** around the world have **increased their borrowing**. **Supported by central banks** – having made financing conditions bearable by cutting interest rates and market intervention – **debt ratios** have **risen vividly** almost everywhere, **not least** due to the global **pandemic**

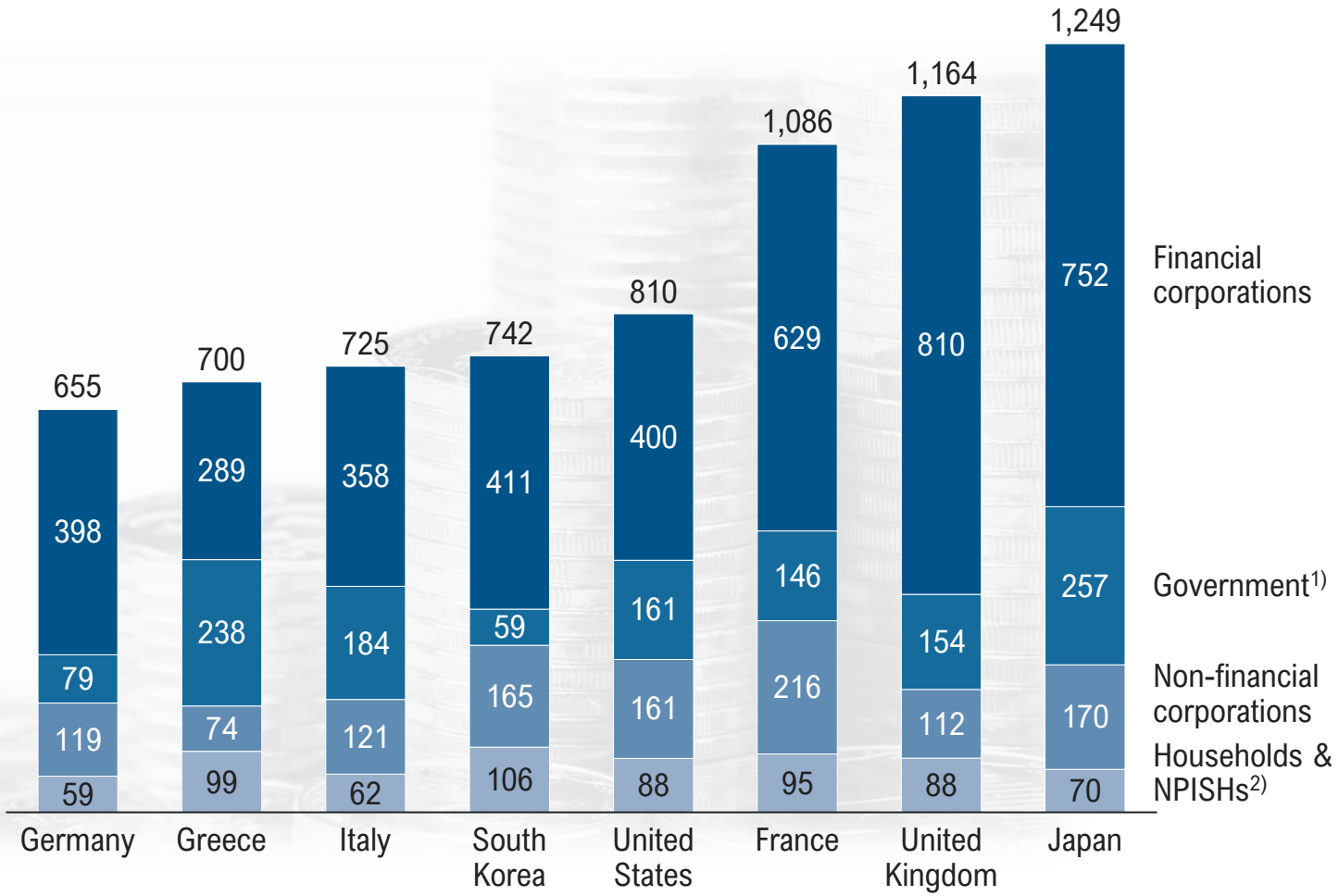
> Public debt must be viewed through a **differentiated, per country lens**: For instance, **Japan**'s public debt has been significantly higher than elsewhere for years; Japan has **its own currency** and can therefore **borrow cheaply from its own central bank**. Compared to **Greece**, where debt levels are similarly high, the situation is altogether different: Being part of the eurozone's currency union, **Greece cannot refinance itself so easily** as the ECB's **debt rules apply**

> A rising national debt carries consequences: Large sustained federal deficits result in **lower levels of investment and higher interest rates**. With increased public borrowing, a higher percentage of potential funds – otherwise directed at investment – go towards government securities. When interest rates recover from extended low levels, the government's burden of debt grows rapidly due to compounded interest; servicing public debt takes up more of the budget, thus government spending is reduced. Higher debt levels also incumber the ability to respond to emerging challenges or crises, thus increasing the risk of a fiscal crisis

1) General government debt relative to the country GDP. General government consists of central, state and local governments and the social security funds controlled by these units
Sources: IMF (Argentina, Brazil, China, South Africa); OECD (all other countries); Roland Berger

Although Japan, Italy and Greece are often cited in the context of high governmental debt, they are not the only major debtors

Sectoral distribution of debt for selected countries 2020 [% of GDP]



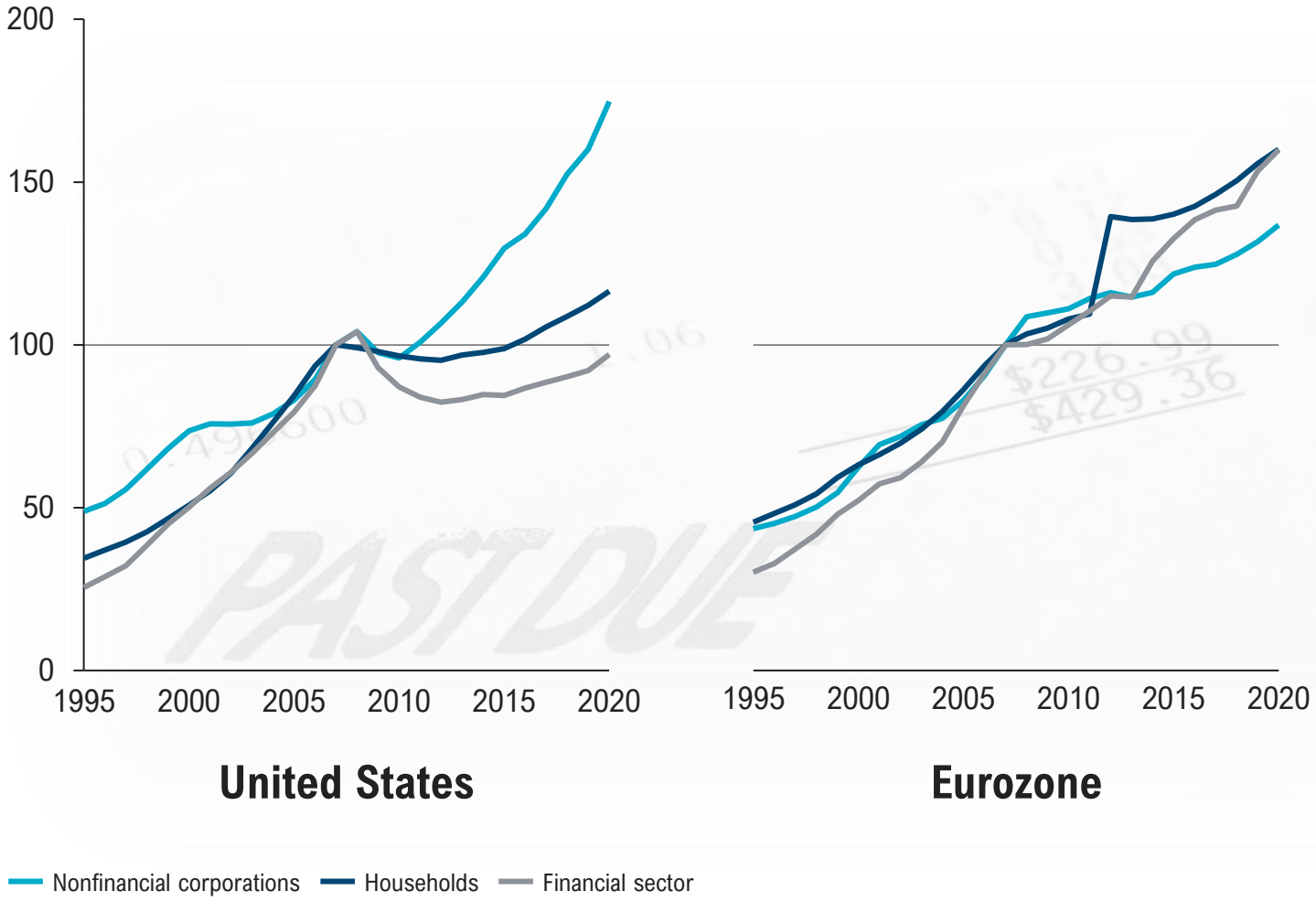
- When it comes to debt, discussions often **focus only** on **government debt** – although depending on national economic structures, government debt accounts for only a **small part** of an **economy's total debt**
- Japan, Greece or Italy are countries often mentioned in a debt context. Looking at public and private sectors, **Japan** remains the **world's debt leader. Italy's debt issues mainly concern government debt**, not private debt. **France** and **UK** have significantly **higher debt levels**, partly due to their **sizeable banking sectors**
- Since **debt** also includes **instruments** such as **deposits and refinancing loans**, by definition, **financial service** companies already have higher debt than other sectors. This alone is **not a reason** to **question the stability of the financial system**
- In **France** in particular, the **non-financial corporate sector** has the **highest level of debt**, at 216% of GDP

1) Government refers to general government debt; 2) As the OECD does not report household debt related to GDP, household & non-profit institution serving households (NPISH) debt as % of GDP has been calculated by subtracting given sectors from total economy debt as a % of GDP

Sources: OECD; Roland Berger

Looking at the private sector, leverage is still growing – and notably more so in the real economy, not the financial sector, especially in the US

Breakdown of private sector debt [Index: 2007 = 100]

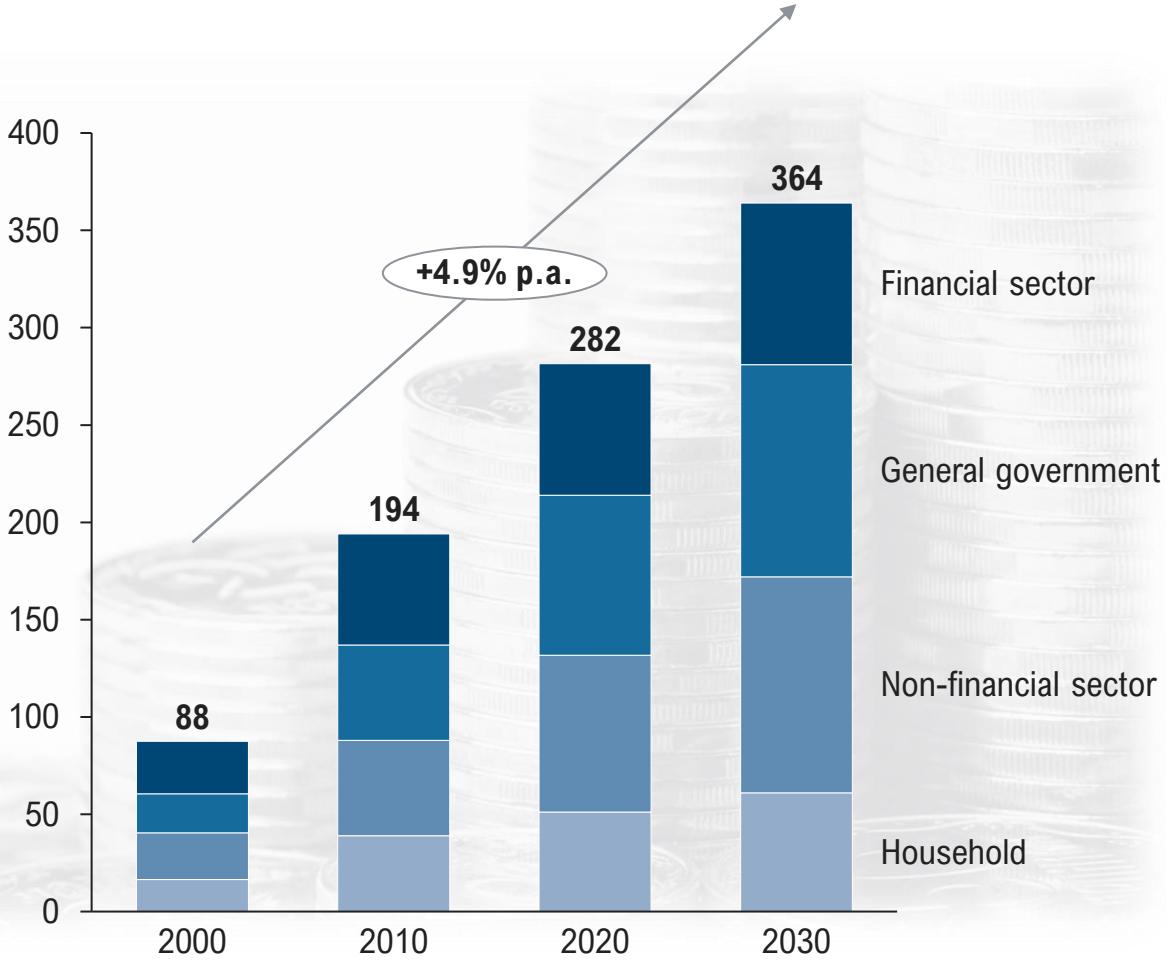


- While the **financial sector**, especially in the USA, underwent a **major restructuring** after the financial crisis reducing considerable amounts of debt, **real economy debt** has since become a notable issue
- The **low-interest-rate environment** has made it attractive, especially for **listed companies**, to **leverage themselves** and **buy back their own shares** – one of the reasons why many US stock market indices have been consistently hitting new highs over past years
- Although the loose financial conditions remain necessary to support the expected recovery from the COVID-19 fallout, such conditions could also **aggravate the buildup of leverage** and **exacerbate the downside risk** to future economic activity, further complicating issues for policymakers in the future

Sources: Federal Reserve Bank of St. Louis; Eurostat; Roland Berger

Further debt increases can be expected across all sectors of the economy up to 2030 – Post-pandemic, it is unclear how to deleverage

Global debt 2000-2030[1] [USD trillion]



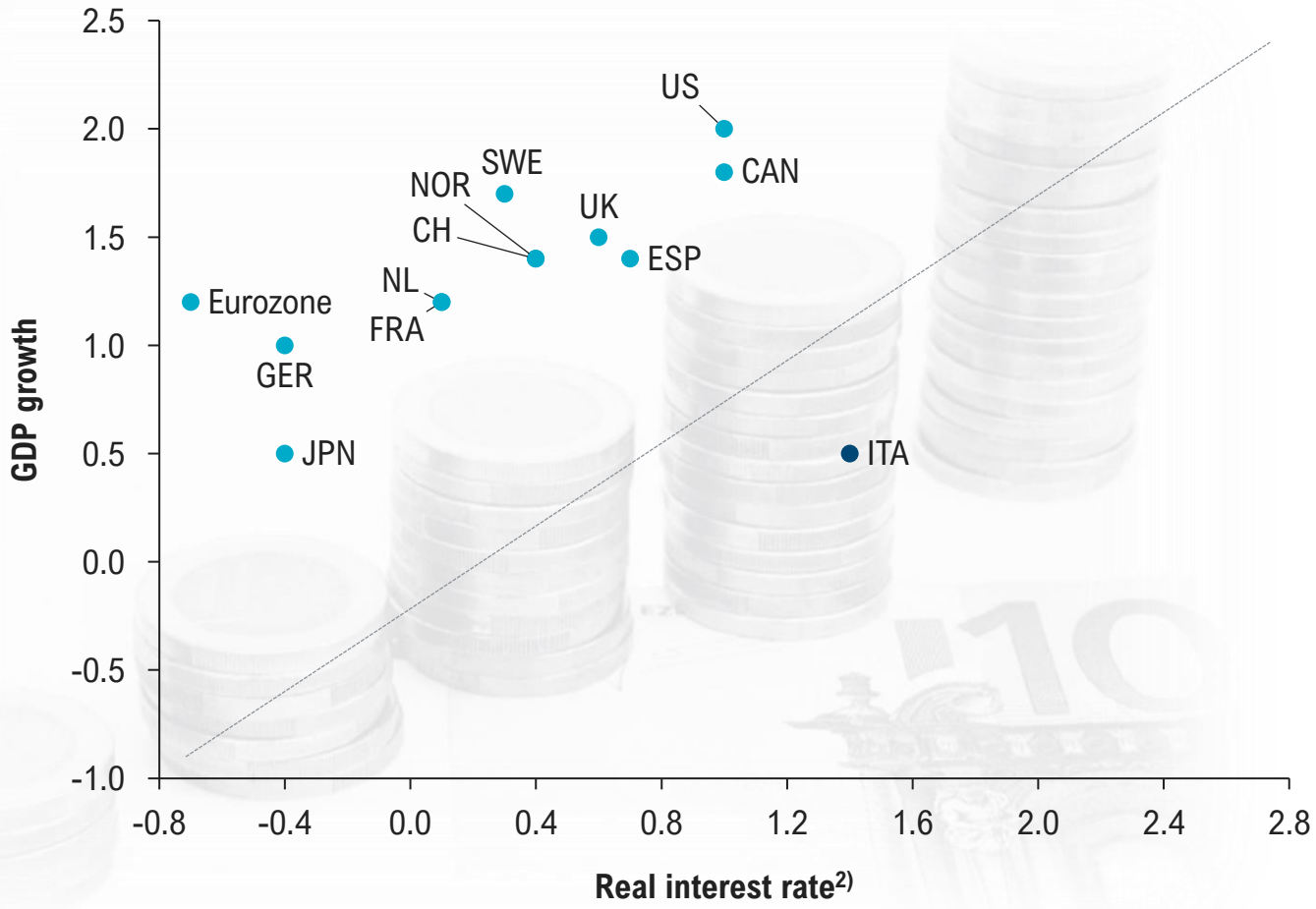
- The coronavirus **pandemic** caused a **sharp rise in government and corporate borrowing.** Experts estimate that **total global debt** has increased by USD 24 trillion at the **end of 2020** year on year, reaching **USD 282 trillion**
- At the end of 2020, global household debt is estimated at USD 51.1 trillion, debt of non-financial corporates at USD 80.6 trillion, general government debt at USD 82.3 trillion, and of the financial sector at USD 67.5 trillion. **Governments accounted for more than half of the USD 24 trillion increase** of global debt from 2019 to 2020
- The **global debt-to-GDP ratio increased** by **35 percentage points** to more than 355% of GDP in 2020. In fact, the **upswing** was **well above** the **increase seen during the 2008 global financial crisis**, when global debt-to-GDP increases were limited to 10 and 15 percentage points in 2008 and 2009, respectively.
- **What about the future?** There is significant **uncertainty about how the global economy can deleverage** without significant adverse implications for economic activity. The next decade could bring a reflationary fiscal response, in sharp contrast to the austerity measures exerted in the 2010s. If the global debt mountain continues to grow at the average pace of the last 15 years, experts estimate that global debt could exceed **USD 360 trillion by 2030**

1) The IIF calculates debt on a different basis compared to the OECD, so that debt in the financial sector in particular is significantly lower in this chart than in the previous slides

Sources: Institute for International Finance

Taking on (new) debt is not necessarily harmful if monies raised are put to productive use – Growth generated thereof must exceed real interest rates

Growth projections and estimated real interest rates, 2031[1] [%]



- In principle, **debt is a fundamental part of any functioning economy**. This is because debt is an important source for bridging short-term liquidity bottlenecks as well as financing investments – the latter applies to companies and governments alike
- Debt can be characterized in two ways: **Good debt** refers to debt that **finances investments** – these are expected to generate added value in the future, thus generating a return on investment above the cost of debt. **Bad debt**, however, refers to **monies used for the purpose of consumption**, therefore generating no return – it is unproductive i.e. unrecoverable debt
- If debt is **used efficiently** in a way that its **added value exceeds interest costs**, the amount of debt as such is generally of **less concern** – **at least** while **interest rates remain stable,** but, alarmingly, interest rate rises tend to outpace GDP growth rates
- On a **ten-year time horizon,** however, it is expected that this will **not apply** across all economies **equally**: In **Italy** in particular, **GDP growth is no longer sufficient** to beat cost of interest

1) Based on Oct 2021 consensus forecasts for growth, 10-yr treasury bond yields and inflation for 2031
2) Real interest rate is calculated as the difference between 10-yr treasury bond yields and inflation rate
Sources: Consensus Economics; Roland Berger

In recent years, taking on new debt is becoming less and less productive in terms of units of GDP added – Marginal debt productivity is decreasing

The recurrent GDP-generating capacity of global debt

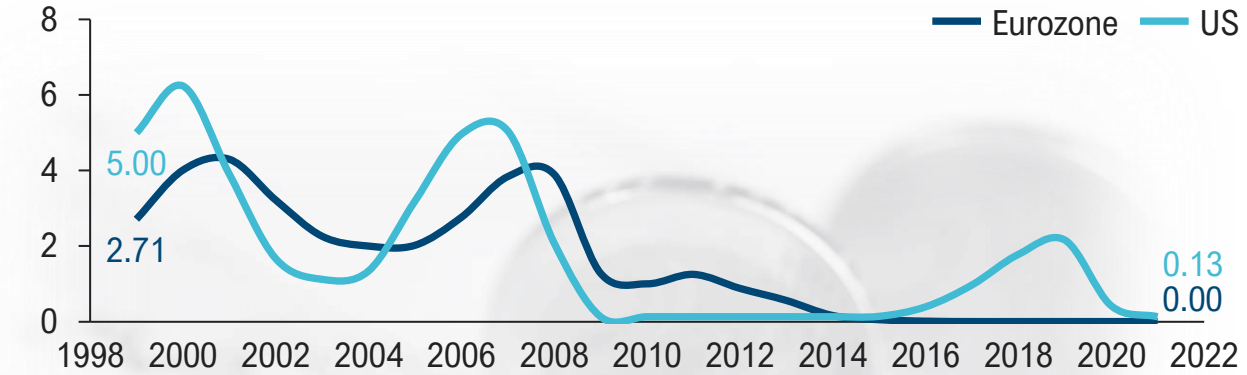
	Ratio of ΔGDP to Δdebt			
Countries/ Regions	Ø 1945-1997	Ø 2000-2020	Latest[1)]	% change between 2000/20 to latest
US total debt	0.59	0.28	0.25	-10.7%
US nonfinancial sector	0.68	0.43	0.35	-18.6%
Japan		0.18	0.15	-16.7%
Eurozone		0.24	0.20	-16.7%

- On the topic of **debt** and **new borrowing**, it is important to measure **outcomes**, namely **debt productivity**. Such analysis sheds light on the question if and by how much debt is used productively to further GDP growth – or in other words: **What is the marginal productivity of debt in terms of added units of GDP?**
- When comparing relevant data over longer periods, it is evident that **debt is becoming more and more unproductive** – the **marginal productivity of debt for major economies is declining, i.e. new debt generates less output**
- For the more recent period of 2000-2020, **each new one US dollar of debt generated only 28 cents of GDP** in the US, whereas in the period from 1945-1997, one new US dollar of debt resulted in 59 cents of new GDP generated. This trend is even more explicit in the US **nonfinancial sector**, where **corporate share buybacks** are **taking effect**
- Considering latest data especially under **pandemic effects**, the trend of more unproductive debt accelerated further in all regions under review. Wide ranging economic support measures were funded by unplanned public borrowing – however these interventions tended to **compensate for lost sales rather than stimulate investment** and thus growth

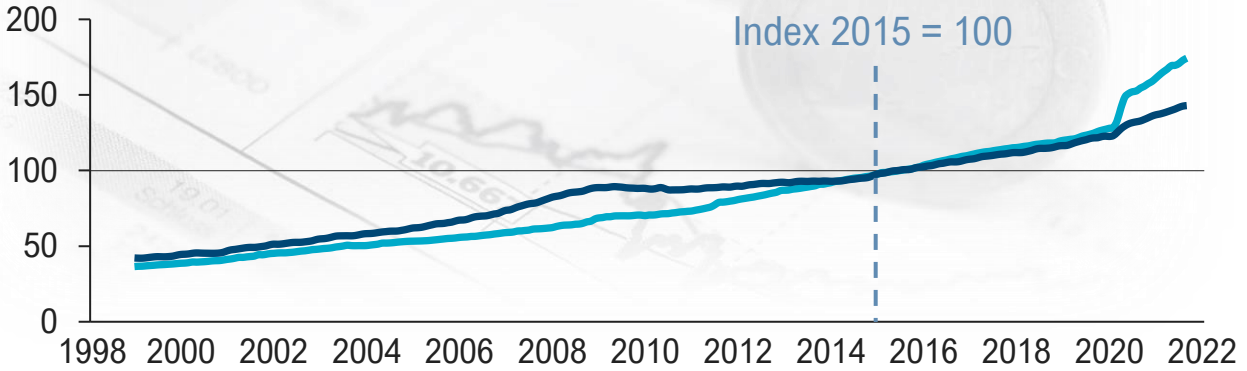
1) Latest values refer to Q1/2021 for Eurozone and Japan and Q2/2021 for United States
Sources: Hoisington; Roland Berger

Central banks have maintained support to keep debt levels tolerable by lowering interest rates and quantitative easing

Central bank interest rates[1] [%]



Money supply M3[2]



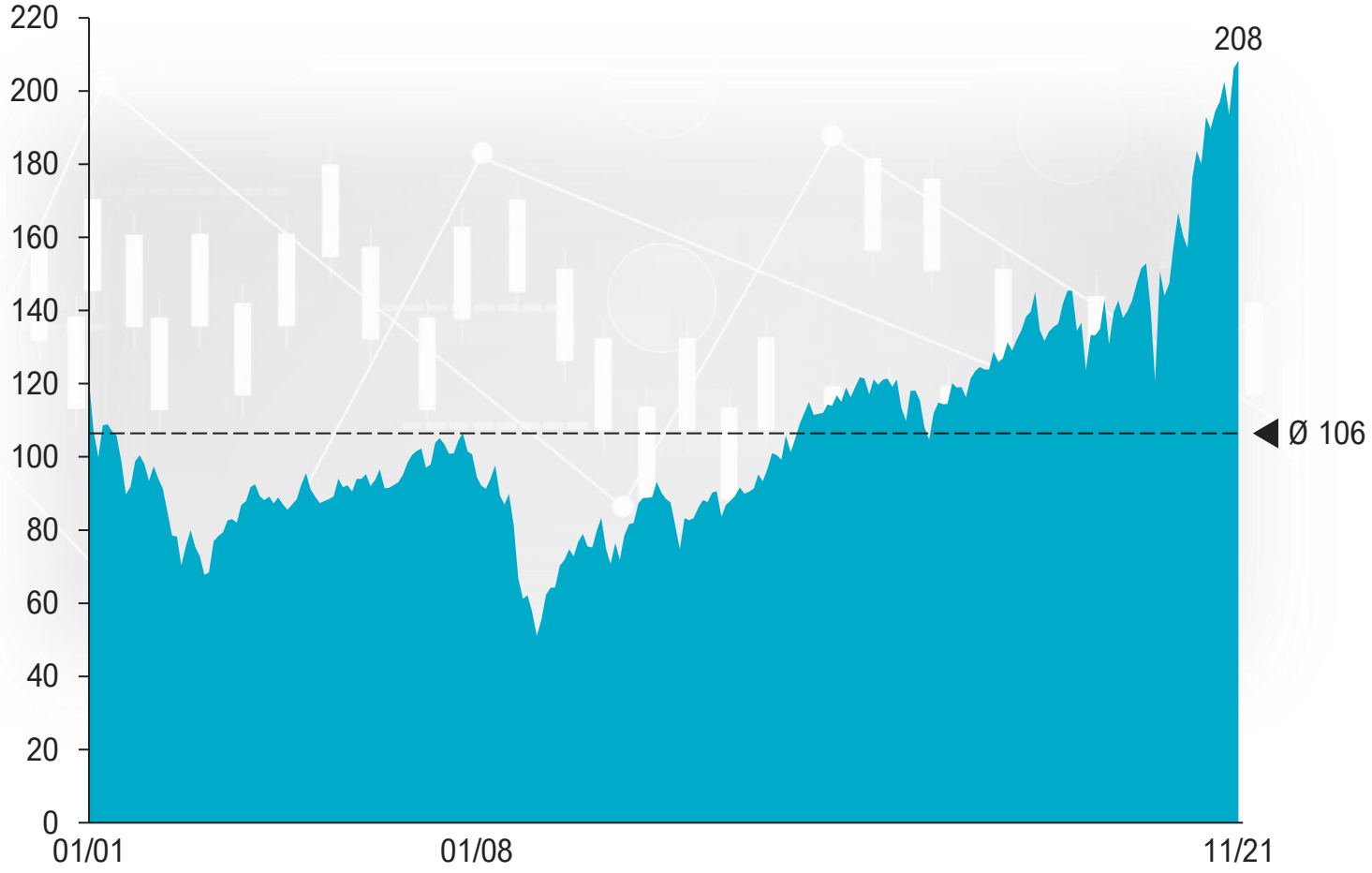
1) The central bank policy rate is the rate that is used by central bank to implement or signal its monetary policy stance, expressed as a yearly average. For the Euro area, it is referred to the main refinancing operation, for the US it is referred to the Federal funds target rate; 2) Broad money (M3) includes currency, deposits with an agreed maturity of up to two years, deposits redeemable at notice of up to three months and repurchase agreements, money market fund shares/units and debt securities up to two years. M3 is measured as a seasonally adjusted index based on 2015=100

Sources: Oxford Economics; OECD; Roland Berger

- For decades, central banks have responded to emerging crises with **asymmetric monetary policies,** i.e. **after interest rate cuts**, rates were **never raised** to **previous levels**. This has enabled central banks **to prevent wider distortions in financial markets**, but has also contributed to rising debt levels making the financial system more unstable
- Since **interest rates have remained at or close to zero** for a long time following the financial and sovereign debt crises, other additional instruments such as **quantitative easing** have increasingly been deployed to **dampen down** long-term (sovereign) interest rates at low levels in order to **back-up governments' efforts** to revive growth after a crisis
- Following the COVID-19 shock in 2020, **central banks** of the larger economies have **responded with unprecedented monetary expansions**
- The US Federal Bank, in particular, has significantly expanded its M3 money supply to help – amongst other pandemic relief measures – **fund COVID-19 stimulus checks** and to assist increased lending efforts to shore up troubled businesses
- Pushing **interest levels close to zero and floating markets with money** has led to **rising asset valuation,** increasing the risk for financial market bubbles

After an enormous rally since the outbreak of the pandemic, the US stock market might be overvalued at the end of 2021

Buffet Indicator for the United States[1)] [ratio]



- As a result of the massive monetary and fiscal response to the coronavirus pandemic, global stock markets only **briefly slumped** in early 2020 following announcements of major lockdowns, but **again rallied in the summer** months, ending in **new all-time highs for the most important stock market indices**
- In the US, the measure of issuing (personal) stimulus checks – as a means of mitigating the real economic impact of the pandemic – helped to drive **novice investors** funneling distributed money into financial markets: According to a CNBC survey, **almost 50% of stimulus recipients aged between 18 to 34 invested parts of this aid into financial markets**
- The valuation of the US stock market according to the **Buffet Indicator** is now more than 100 percentage points above the long-term average and significantly higher than, for example, during the financial crisis of 2007-2009

1) The Buffett Indicator is the ratio of total United States stock market valuation to GDP. Optimally, the country's market capitalization is not significantly higher than its economic output. Otherwise, this could indicate overvaluation in the market. The proxy for the aggregate value of the US stock market is the Wilshire 5000 Total Market Index

Sources: Federal Reserve; Roland Berger

Even though COVID-19 has dealt a blow to city life by accelerating the feasibility of remote working, house prices in major cities are overvalued

Real estate bubble risks[1)]

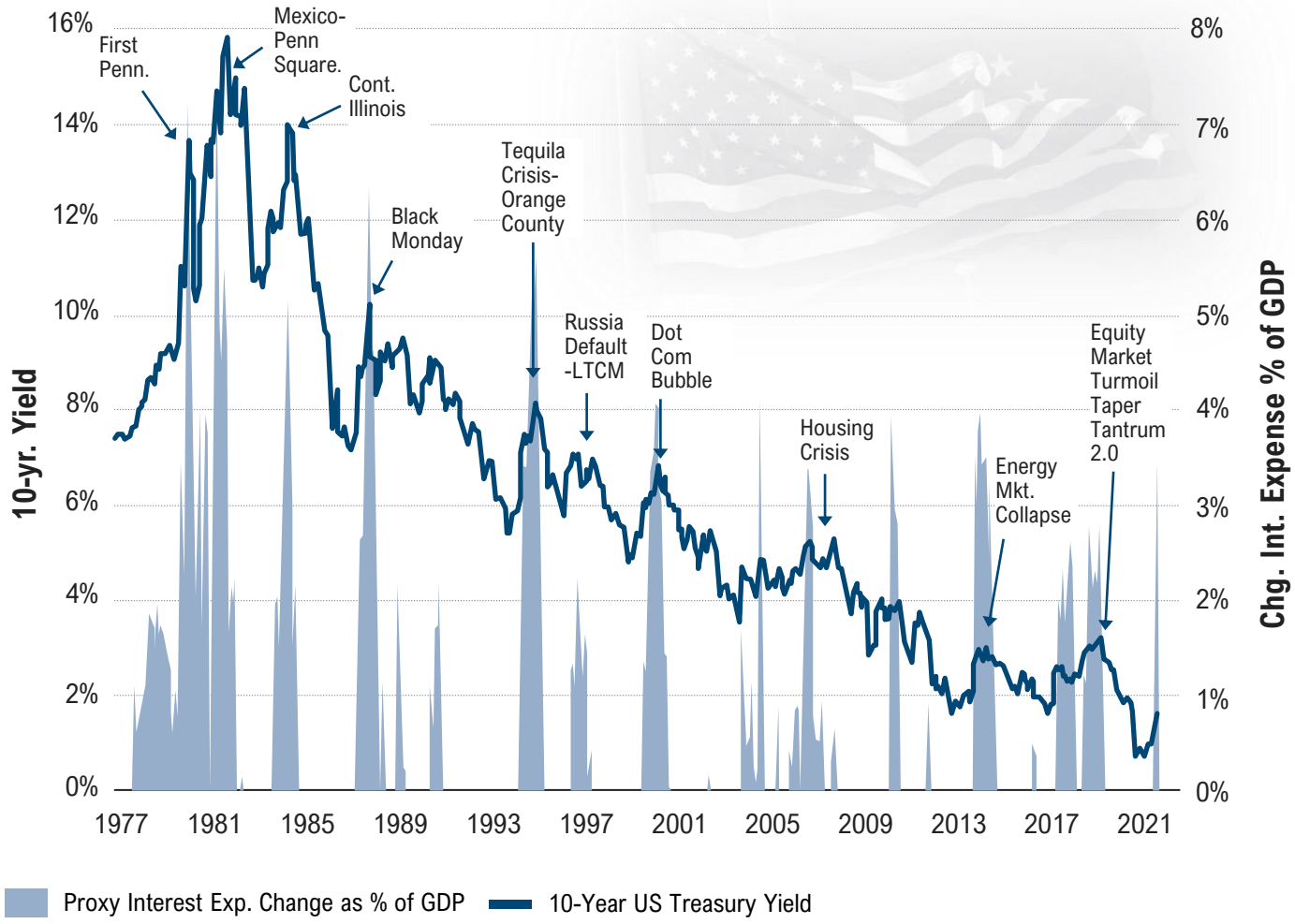
1) The UBS Global Real Estate Bubble Index traces the fundamental valuation of housing markets and the valuation of cities in relation both to their country and to economic distortions. The index score is a weighted average of the following five standardized city sub-indexes: price-to-income and price-to-rent (fundamental valuation), change in mortgage-to-GDP ratio and change in construction-to-GDP ratio (economic distortion), and relative price-city-to-country indicator

Sources: UBS; Roland Berger

- **House prices in major cities** have **risen significantly** in recent years. The entrenched expectation of assured **long-term value gains** in the property market combined with **record-low financing costs** have made owning a home so appealing that price i.e. **mortgage burden appears secondary**
- **However,** this **may prove to be a delusion.** Overall, housing markets have been highly dependent on very low interest rates, meaning that a **tightening of lending standards** could bring property **price appreciation to an abrupt halt** in most markets
- **In addition,** the **global pandemic has dampened the overall attractiveness of city life.** Working remotely has proved feasible for many companies and professions, thus decoupling a company's location from place of living in the long term – potentially deflating an overexcited housing bubble

Interest rate hikes have led to distortions in financial markets and the real economy in the past – Higher debt levels intensifies fragility

Historic debt, interest rates and crises: Example United States

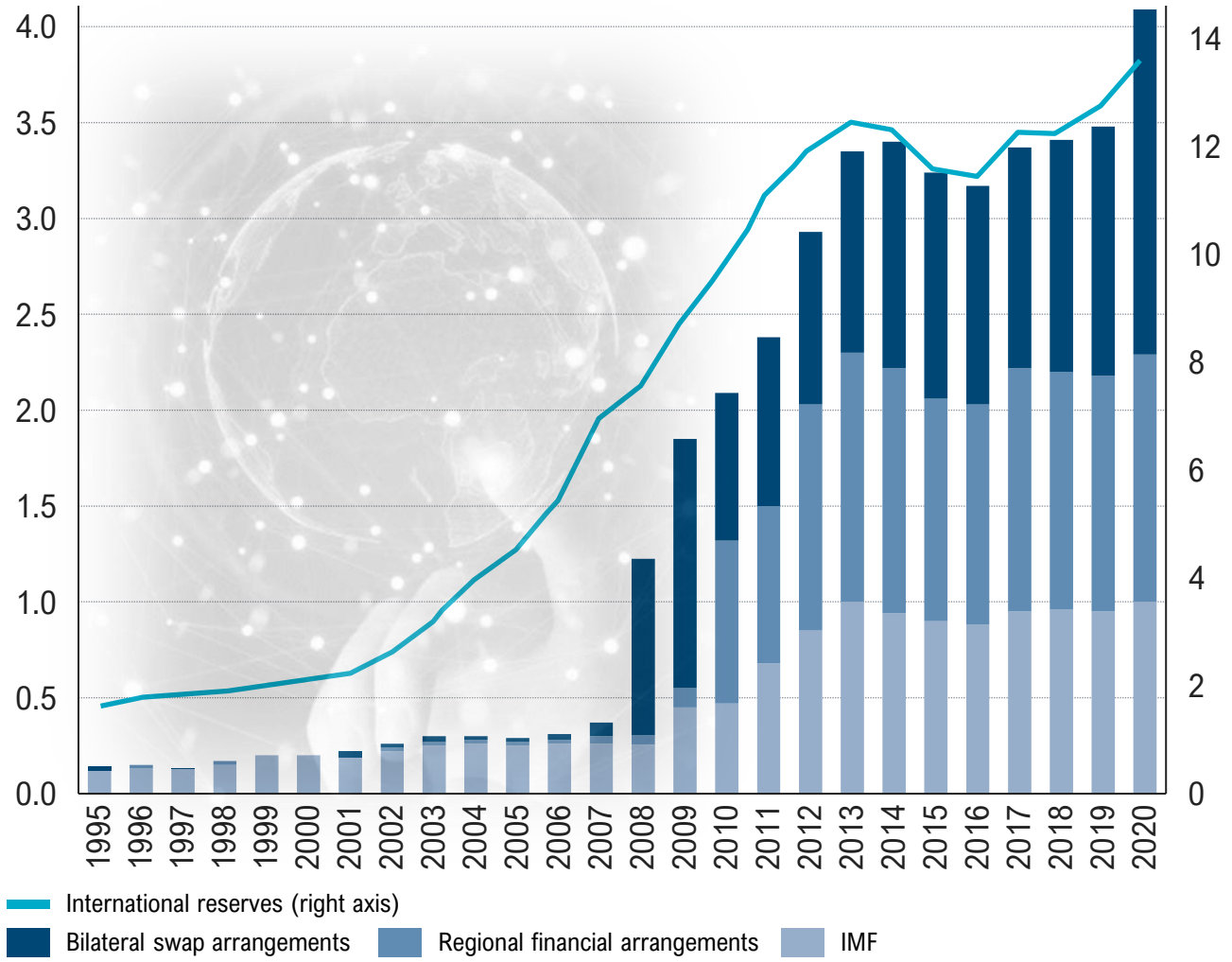


- In the past, **crises in financial markets** were at times **accompanied** by **rising interest expenditures**, often **triggered by short-term increases** in **treasury yields**. The shaded areas in the chart represent a proxy for the change in interest expenditures on all debt relative to GDP. The proxy is calculated by using total debt outstanding, one-year change in 10-year treasury yields, and GDP
- Although displaying an overall long term downward trend, nearly every time interest rates have reached an upper peak, a financial crisis of sorts occurred. As time goes on, **problems occur** at **even smaller increases of yields** as **debt levels surged** and growth of debt outpaced the growth of GDP and thus the ability to service the debt
- The speed of the **adjustment in yields witnessed in 2021 generated unwelcome volatility** in global financial markets
- In the wake of the COVID-19 pandemic, **massive fiscal stimulus as well as central bank action** has **prevented** the financial markets from **another major crisis** – but debt has been driven up even further in the interim

Sources: Real Investment Advice; Roland Berger

Since the financial crisis post-2007, increased fragility in financial markets is countered by a safety net of increased financial firepower

Development of the global financial safety net



> When economic crises hit, such as the one caused by the pandemic, countries have several financial resources – both internal and external – to draw on. The **global financial safety net is a set of institutions and mechanisms that provide assurance against crises** and **financing to mitigate their impact**

> This safety net has **four main layers**: A countries' **own international reserves**; **bilateral swap arrangements** whereby central banks exchange currencies to provide liquidity to financial markets; **regional financial arrangements** by which countries pool resources to leverage financing in a crisis, and the **IMF**

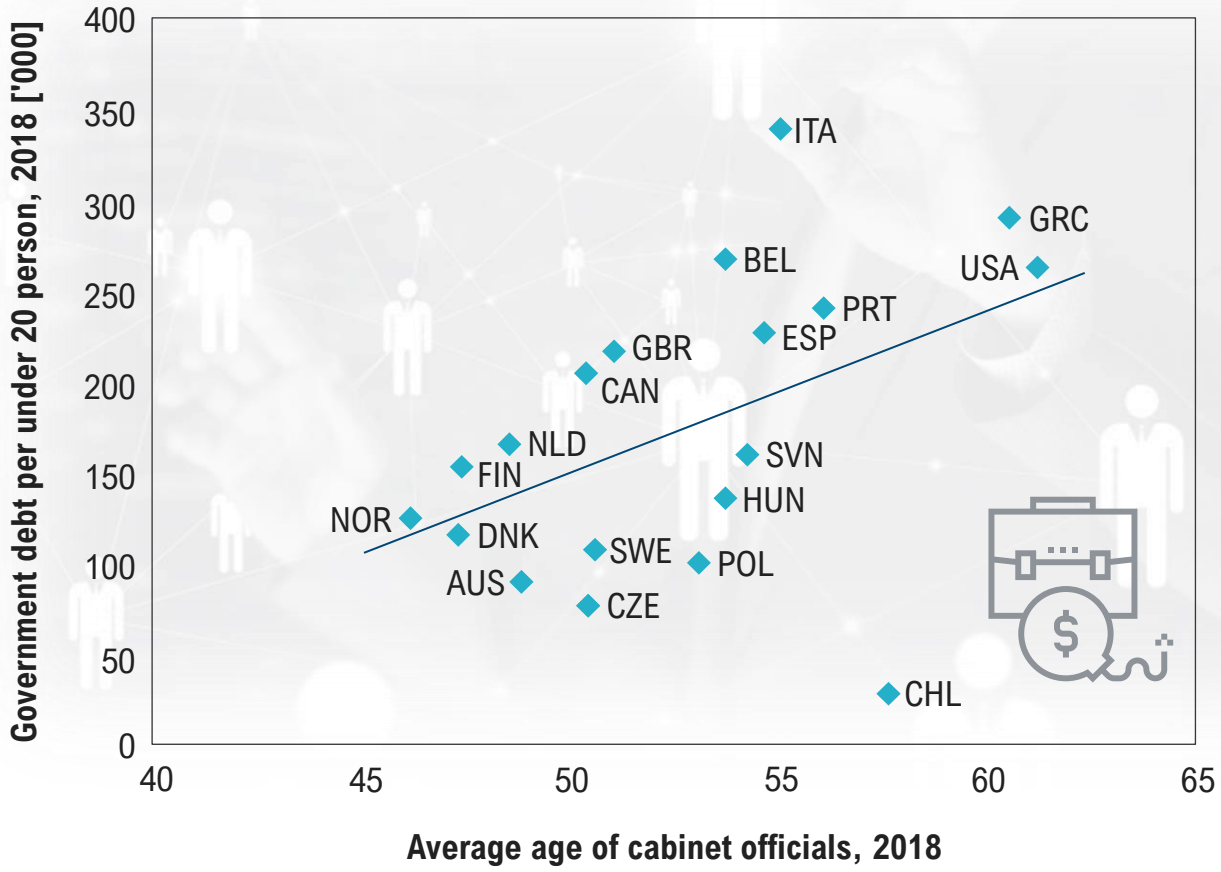
> Post 2007, the **total stock of international reserve holdings more than doubled**, reaching about USD 14 trillion by end-2020. **Other layers** of the safety net **increased about tenfold**, to around USD 4 trillion

> **This reinforced insurance helped effectively cushion the shock during the first year of the COVID-19 crisis**. The increased bilateral swap arrangements – primarily US Federal Reserve swaps – provided prompt liquidity support, helping to stabilize the global financial markets and capital flows to emerging market economies

Sources: IMF; Roland Berger

Rising debt, especially at the state level, often triggers debates about intergenerational equity

Correlation between Cabinet age and government debt per person aged younger than 20, OECD countries, 2018



- Discussing levels of public debt and their impact has the potential to bring about a heated debate on aspects of **intergenerational equity.** The generational aspect can by illustrated by the OECD's observation that the **higher the average age of a government's cabinet** officials **the higher** the **government debt per person under 20 years of age** – for OECD countries in 2018 at least
- However, there is room for discussion whether higher debts are **causing an inter- or intragenerational problem**
- From an **intergenerational perspective**, it is argued that the **older generation burdens the younger generation** as the **latter must repay that debt** in the future, while the older generation reaps the benefits from the debt being taken on by government in the first place. The idea is, however, accompanied by a **lack of empirical proof**
- **Empirical evidence** is found, however, on the issue of **intragenerational injustice**. People who are **wealthy enough today** to direct **savings to government bonds** can **pass them on to the next generation** while people who cannot save today will leave nothing to pass on to the next generation. However, the latter will **transfer an income to their wealthier contemporaries –** arising from means of general taxation – for the repayment of the then public debt

Sources: OECD; Roland Berger

History offers several lessons on how to handle high levels of public debt – For the most, reducing debt levels goes hand in hand with cutbacks

Historic efforts to reduce public debt: Orthodox policy options

Enhancing growth

Higher growth – in excess of interest rates – has helped some countries to lower their debt levels (relative to GDP). Going forward, however, several factors entail a cautious approach when relying solely on growth to reduce the burden of debt. For example, favorable past differentials regarding interest rates and growth rates may dissipate over the next decade as productivity declines. Also, interest rates may begin to rise if inflationary pressures build up

Privatization

Proceeds from the privatization of public assets have been used to raise debt service levels as well. While privatization can yield advantages regarding debt reduction, some of the required preconditions (e.g. agreements on market entry conditions, etc.) are not yet in place in all indebted countries

Fiscal consolidation

Fiscal consolidation can lead to primary fiscal surpluses to pay down debt by cutting expenditures or raising revenues. The real or potential loss of access to financial markets has sometimes forced countries into strict fiscal consolidation. However, such consolidation is usually accompanied by lower growth

Wealth taxation

Wealth taxes are again in the spotlight since the global financial crisis, partly due to perceptions of wealth inequality. However, governments face numerous challenges – from procedural risks and complexities stemming from existing taxation, to lobbying efforts by the ultra-rich and the risk of capital flight. Moreover, benefits of a wealth tax are far from clear: In historical precedents, for example in Germany, wealth tax ambitions were thwarted since determining the tax base would have consumed nearly one third of potential wealth tax revenue

Sources: World Bank; Roland Berger

Historically, also more controversial methods of debt reduction have been carried out – In some cases leading to negative societal effects

Historic efforts to reduce public debt: Heterodox policy options

Financial repression

Financial repression, including capital controls and specific measures to regulate the financial sector, are options to reduce the differentials between growth rates and real interest rates by locking up savings in special instruments. However, this strategy is a high-cost approach to reduce debt because it discourages a more productive use of savings. Moreover, decades of financial and capital account liberalization have reduced a government's room for financial control

Domestic debt default

Domestic debt default differs from external debt default and includes forced conversions, lower coupon rates, unilateral principal reductions (at times with currency conversion), and payment suspensions. However, governments that default on their domestic debt are still vulnerable to inflation risk and the risk of interest rate spikes if inflation expectations become unmoored

Inflation

Inflation reduces the real debt burden when the rise in nominal government income (e.g. tax payments) outpaces nominal interest payments. However, inflation as a debt reduction strategy also has drawbacks: For example, inflation is usually accompanied by an exchange rate depreciation, which increases debt if the share of short-term debt or debt denominated in foreign currency is large. If high debt is the result of persistent spending pressures or revenue weakness, unexpected inflation may also fail to reduce debt sustainably. Moreover, inflation can spiral out of control and undermine an entire economy's stability

Debt restructuring

Default and restructuring may sometimes be the only way for a country to deal with foreign-owned sovereign debt denominated in a foreign currency and adjudicated by foreign courts. While default and debt restructuring can provide immediate debt reduction, they also come with long-term costs. Protracted debt rescheduling negotiations prolong the loss of market access, can weaken financial institutions' balance sheets and undermine financial stability

Sources: World Bank; Roland Berger

1 Globalization Revisited

2 Power Shifts

3 Sectoral Trans-formation

4 Debt Challenge

Reevaluate your target markets and use localized and decentralized strategies to build strong foundations in selected markets

Actions recommended for companies across all sectors to proactively steer their future

- As globalization slows down, companies need to undergo efforts to **reassess target markets** and be open to **define new strategies** that are based on revised evaluations. Companies should differentiate clearly between lower growth markets and markets in newly emerging countries that are expanding and promise high growth rates for companies. As a **new middle class arises** in the latter, companies should **adapt according to market developments** and **diversify their product and service offering** accordingly
- In times of increasing protectionism, all input factors are affected including human capital. Deploying talent across borders is no longer as easy an option when administrative/red tape barriers are increasing. A stable foundation in new markets can be achieved by **developing and supporting know-how and talent locally**. Such an approach delivers on **home-grown trust** plus it **carries the longer-term advantage that local expertise is crucial** when markets undergo phases of consolidation in the future
- Given that different markets require varied degrees of differentiation in terms of operations, companies must start to **decentralize decision-making** where necessary. In times of profound structural change, managing a wide array of competing demands of governmental and regulatory institutions will require managers and other **employees depending on level to be endowed with more authority.** Solid, independent decision-making is a trained skill and will also **make the company more flexible,** when it comes to demand shocks in markets

Source: Roland Berger

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Supply chains have proven highly vulnerable in the pandemic – Companies should rethink their operations strategy and adjust it where needed

Actions recommended for companies across all sectors to proactively steer their future

- The COVID-19 pandemic is painfully demonstrating how **vulnerable international supply chains** are to **external, temporary shocks**. By now, the question of what tomorrow's supply chains may look like should already have been asked – if not answered – today. Companies must examine **whether their supply chains are strong enough** to withstand future external shocks
- In answering this question, companies should consider whether their **business is heavily dependent** on specific inputs such as **raw materials** or on a limited number of **trading partners** – and to what extent these **dependencies can be reduced or become more flexible.** Companies that succeed in reducing their dependencies on raw materials and suppliers are better prepared for future shocks and bottlenecks and thus increase their overall planning security
- Extra-ordinary crises aside, companies would do well in making their **supply chains more resilient overall**. The level of **uncertainty regarding the geopolitical landscape** makes it more **difficult to predict** what will happen with barriers to trade such as tariffs and quotas. Companies therefore need to have **better contingency planning in place** and re-examine the potential of **stockpiling crucial raw materials** compared to previous decades

Source: Roland Berger

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Sustainability will have an impact on almost all sectors in the form of increasing regulation and changing consumer behavior

Actions recommended for companies across all sectors to proactively steer their future

- The topic of **sustainability is becoming notably to the fore** – a development that will affect all sectors but in different ways. Companies should **evaluate** whether important input factors of production such as **raw materials** as well as **energy are affected by changes in demand**, thus leading to **changing price structures**, as can be observed, for example, in the energy transition. In addition to **intensifying the use of renewable energy**, potential **savings** should be **quantified** in order to **lower costs and CO_2 emissions** – this applies to energy as much as certain raw materials. In particular, the option of reducing CO_2 emissions must be examined, as such emissions will become significantly more expensive in the future – a development that can already planned for today
- In addition, forthcoming **environmental regulations** should be **screened on a regular basis** so that companies can retain access to important target markets and thus anticipate and **counteract new restrictions.** In line with new regulation, public bodies often **provide financial incentives** ranging from **subsidies** to tax rebates in order to encourage a sustainable transformation, e.g. to level up energy efficiency. It pays to see regulation as an **opportunity** to investigate possible grants and allowances
- **Consumers** are also becoming more and more aware of the effects of climate change and **are changing their behavior** accordingly. In many countries, consumers are increasingly **attaching importance to sustainable and more durable products**, for which they are also **willing to pay a premium**

Source: Roland Berger

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Bearing in mind current ESG developments, not all planned investments will be able to source financing in future – Examine your financing

Actions recommended for companies across all sectors to proactively steer their future

- Central banks, as well as asset managers and commercial banks, have set their eyes on **increasingly financing green investments** – or **giving preference to such projects,** for example by offering advantageous conditions compared to other investments. Thus, companies should **examine their financing structure** and **prioritize refinancing** existing assets particularly at the **early stage**, to counteract high refinancing costs in the future impacting project profitability
- In addition, **companies** that can demonstrate a **sustainability track record today should apply for ESG labels** to reduce future financing costs. ESG maturity matters: Companies that do not currently meet criteria for ESG labels should consider changing direction and try to improve their performance in order to fulfill ESG criteria with a view to access to better financing in the future
- Companies should **raise capital more locally**. For a long time, global companies have benefited from a kind of "**carry trade**" whereby money borrowed at low interest rates in one market is invested in a range of emerging markets that **generate higher risk-adjusted returns**. But in a **world imposing increasing hurdles to cross-border capital flows**, companies could benefit from **raising more money** in **markets** where investment takes place

Source: Roland Berger

1 Globalization Revisited

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