Can technology and productivity save the day?

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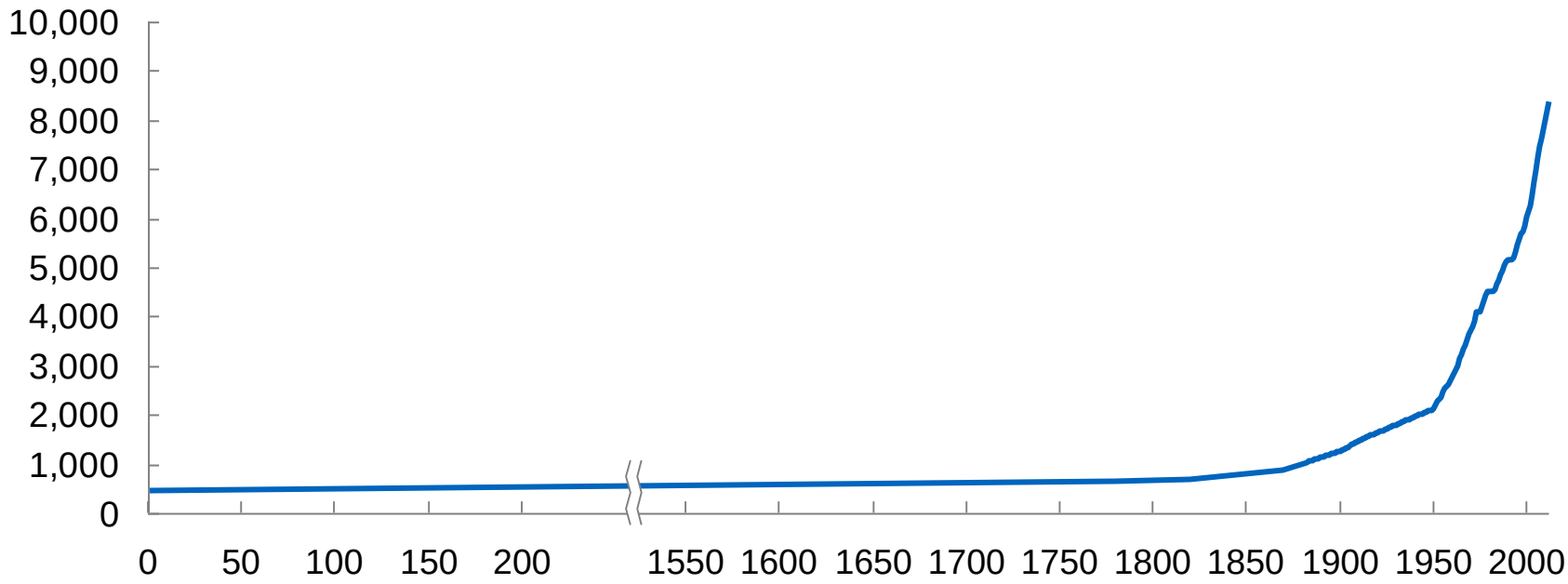
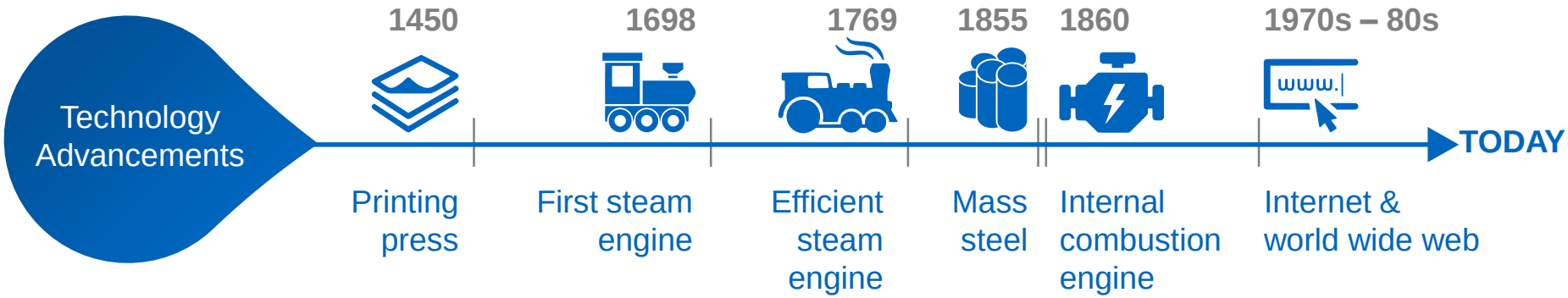
Extracts from McKinsey Global Institute research

A brief history of economic growth and prosperity

Since 1750, the world has experienced an unprecedented rise in economic growth, fueled by innovation

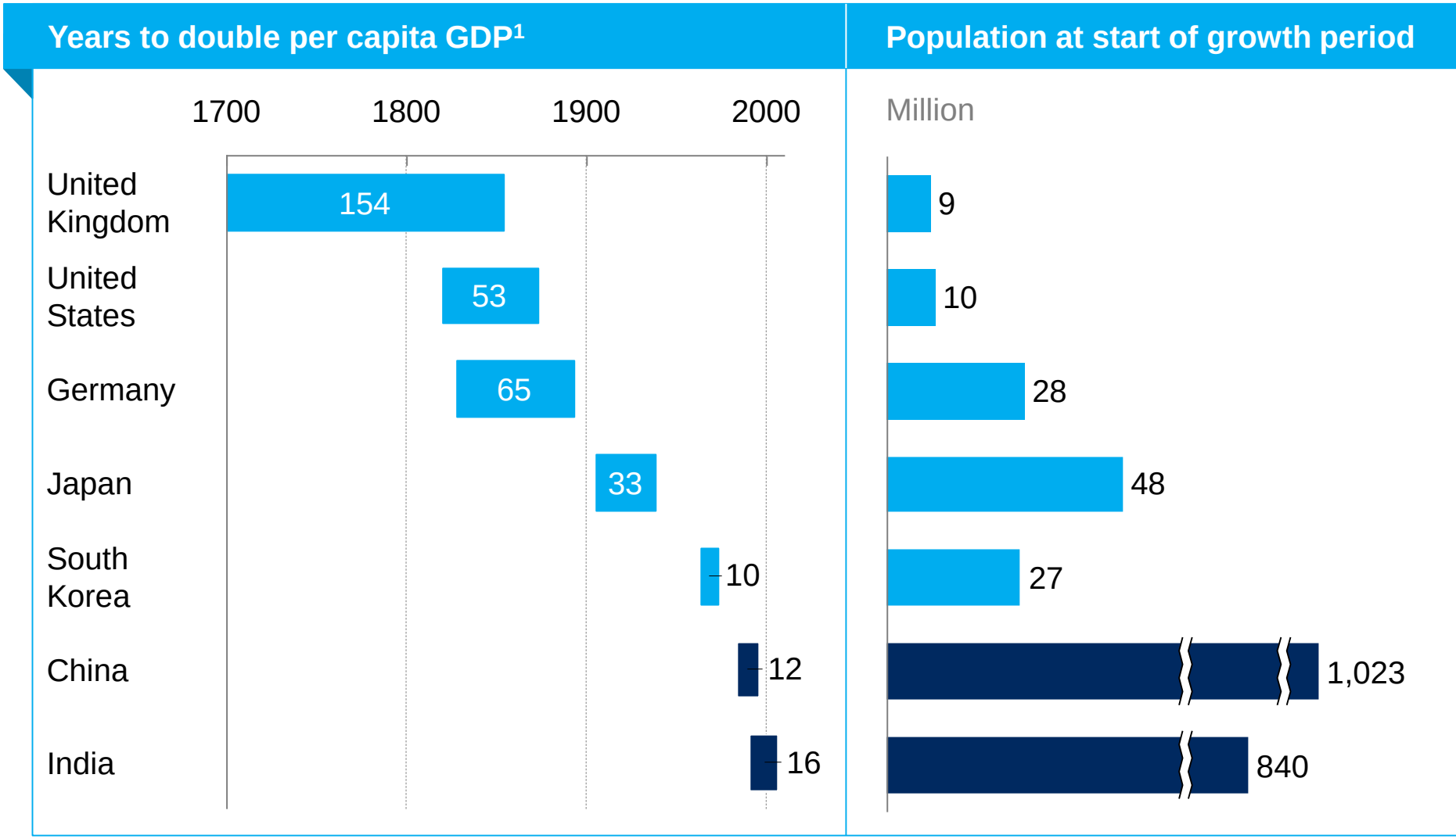
Estimated Global GDP per capita, real USD





SOURCE: Angus Maddison's "World Population, GDP and Per Capita GDP, 1-2003 AD"; Projection based on Global Insight economic data; WIPO IP Statistics

And prosperity has growth faster and at greater scale that ever

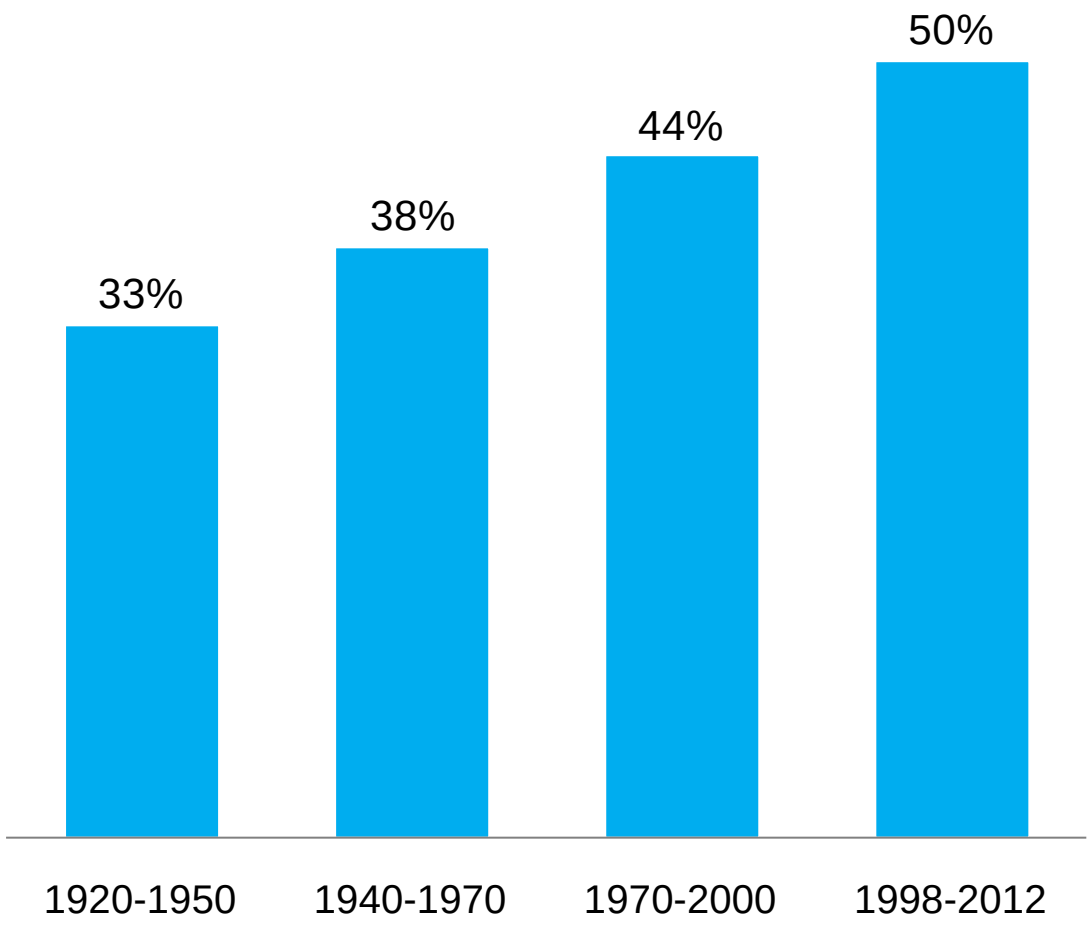


1 Time to increase per capita GDP in purchasing power parity (PPP) terms from $1,300 to $2,600

SOURCE: Angus Maddison; University of Groningen; McKinsey Global Institute

Technology's contribution has continued to grow

Solow residual % contribution of technology change to world output growth



SOURCE: R. Solow; Hall; Wikipedia; Annals of Statistics; McKinsey estimates

More transformational technologies on the way

(the next decade+)

Technology trend “lists” everywhere

Twelve potentially economically disruptive technologies

(selected for step-change economics, scope and profit pools/economics at stake)

Mobile Internet

Increasingly inexpensive and capable mobile computing devices and Internet connectivity

Cloud technology

Use of computer hardware and software resources delivered over a network or the Internet, often as a service

The Internet of Things

Networks of low-cost sensors and actuators for data collection, monitoring, decision making, and process optimization

Automation of knowledge work

Intelligent software systems that can perform knowledge work tasks involving unstructured commands and subtle judgments

Advanced robotics

Increasingly capable robots with enhanced senses, dexterity, and intelligence used to automate tasks or augment humans

Autonomous and near-autonomous vehicles

Vehicles that can navigate and operate with reduced or no human intervention

Next-generation genomics

Fast, low-cost gene sequencing, advanced big data analytics, and synthetic biology (“writing” DNA)

Energy storage

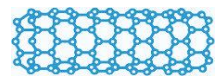
Devices or systems that store energy for later use, including batteries

3D printing

Additive manufacturing techniques to create objects by printing layers of material based on digital models

Advanced materials

Materials designed to have superior characteristics (e.g., strength, weight, conductivity) or functionality



Advanced oil & gas exploration and recovery

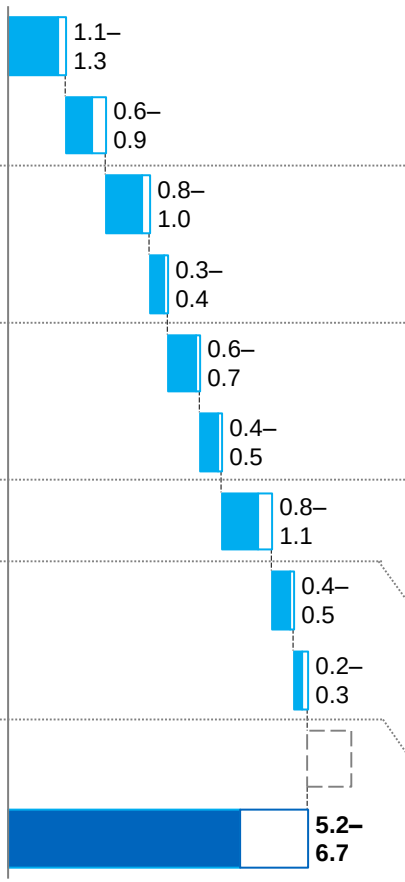
Exploration and recovery techniques that make extraction of unconventional oil and gas economical

Renewable energy and use management

Generation of electricity from renewable sources with reduced climate impact

SOURCE: McKinsey Global Institute analysis

Example:
Impact of automation of knowledge work could be > $5 trillion per year in 2025



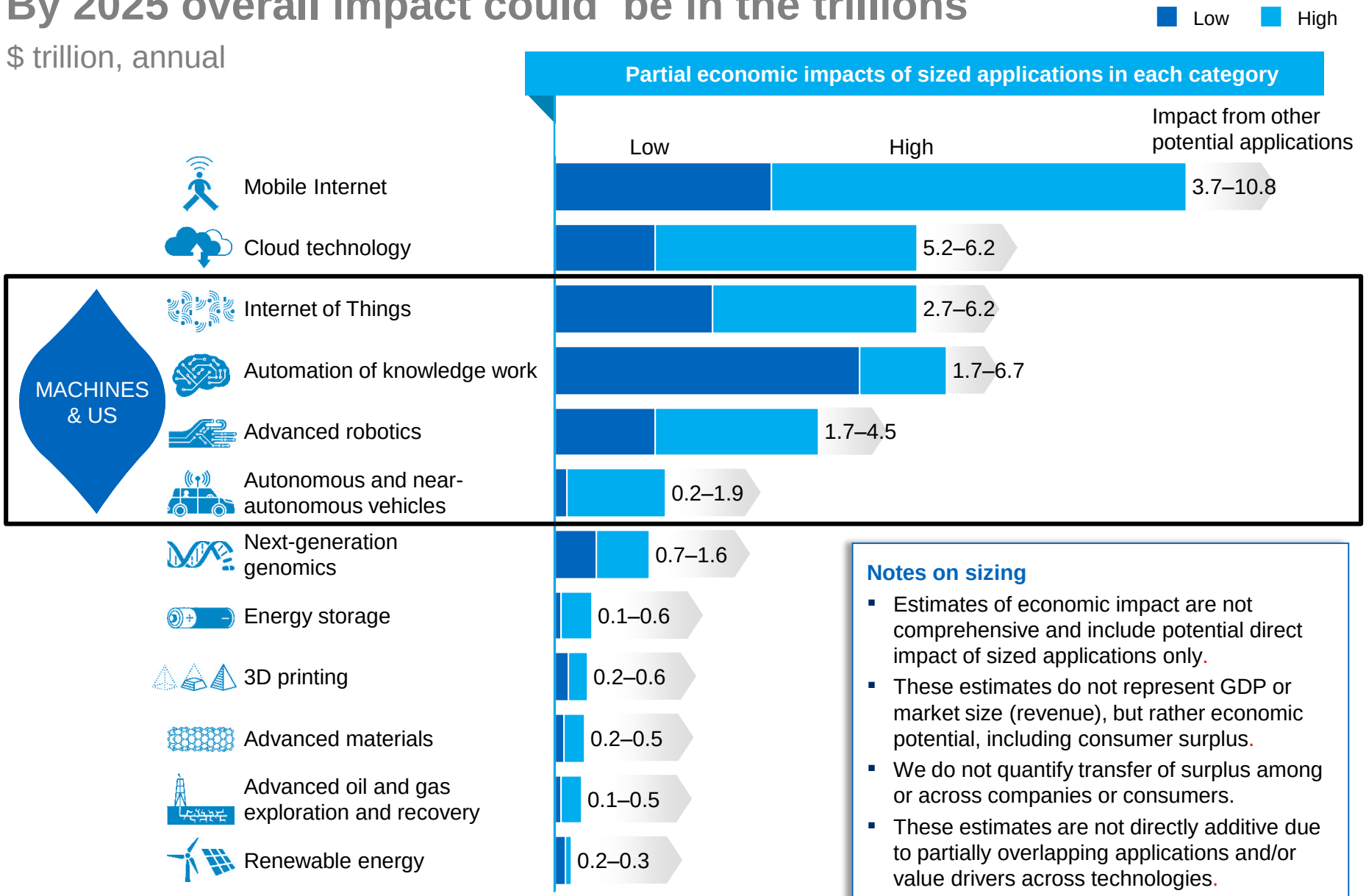
Sized knowledge worker occupations		Potential economic impact of sized applications in 2025 ($ trillion, annually)	Estimated scope in 2025	Estimated potential reach in 2025 (FTEs of work potentially automatable)	Potential productivity or value gains in 2025 (Value per FTE of additional productivity)
Common business functions	Clerical	1.1–1.3	$4.4 trillion in knowledge worker costs	50–65 million full-time equivalents (FTEs) of work potentially automatable	$35,000
	Customer service and sales	0.6–0.9	125 million knowledge workers		
Public sector services	Education	0.8–1.0	$2.8 trillion in knowledge worker costs	20–30 million FTEs of work potentially automatable	$50,000
	Health care	0.3–0.4	55 million knowledge workers		
Technical professions	Science and engineering	0.6–0.7	$2.2 trillion in knowledge worker costs	15 million FTEs of work potentially automatable	$60,000
	IT	0.4–0.5	35 million knowledge workers		
	Managers	0.8–1.1	$2.9 trillion in knowledge worker costs	15–20 million FTEs of work potentially automatable	$60,000
Professional services	Finance	0.4–0.5	50 million knowledge workers		
	Legal	0.2–0.3	$1.5 trillion in knowledge worker costs	10 million FTEs of work potentially automatable	$65,000
Other potential applications (not sized)			25 million knowledge workers		
Sum of sized potential economic impacts		**5.2–6.7**			

NOTE: Estimates of potential economic impact are for some applications only and are not comprehensive estimates of total potential impact. Estimates include consumer surplus and cannot be related to potential company revenue, market size, or GDP impact. We do not size possible surplus shifts among companies and industries, or between companies and consumers. These estimates are not risk- or probability-adjusted. Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

By 2025 overall impact could be in the trillions

$ trillion, annual



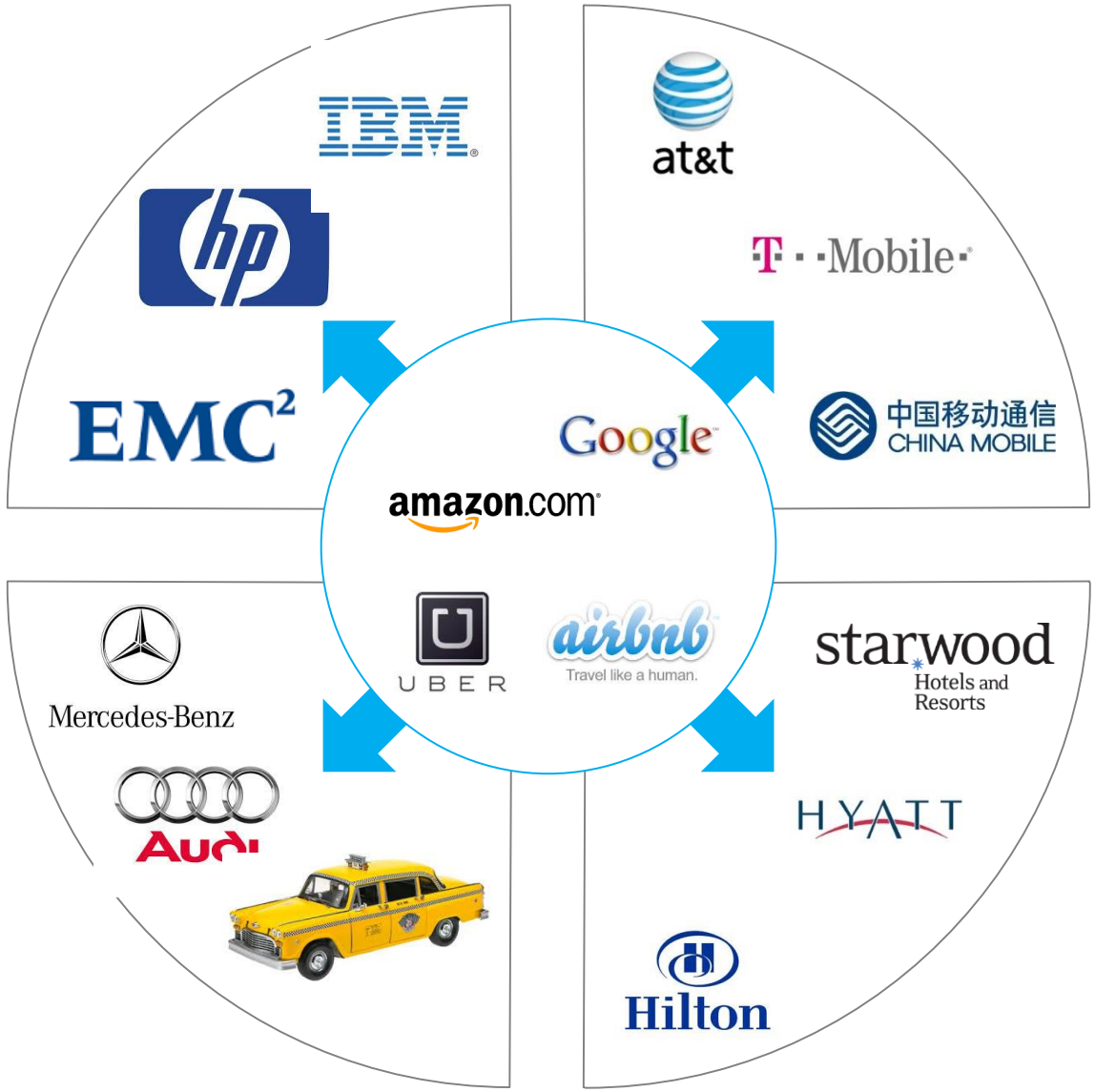
Notes on sizing

- Estimates of economic impact are not comprehensive and include potential direct impact of sized applications only.
- These estimates do not represent GDP or market size (revenue), but rather economic potential, including consumer surplus.
- We do not quantify transfer of surplus among or across companies or consumers.
- These estimates are not directly additive due to partially overlapping applications and/or value drivers across technologies.

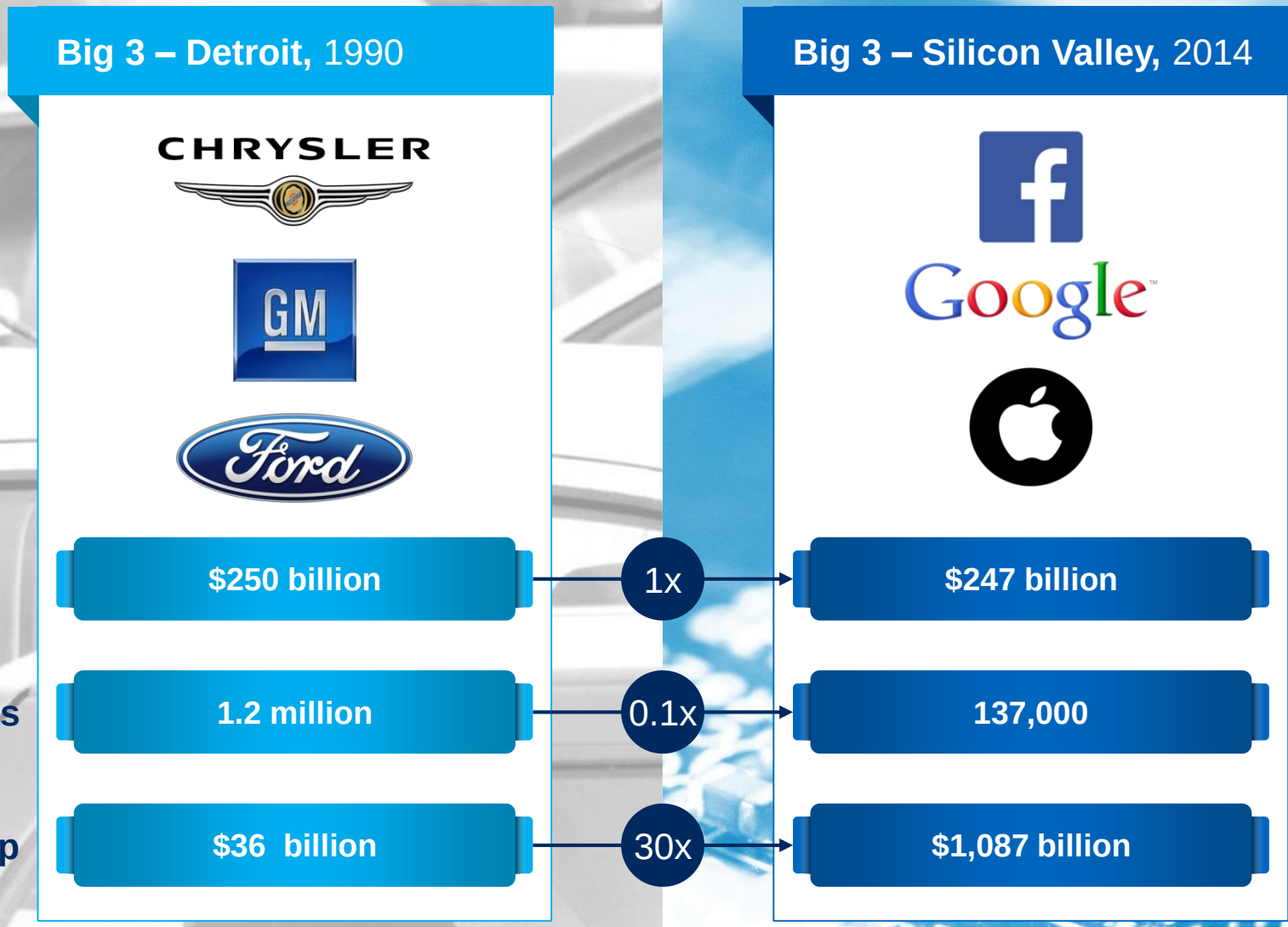
SOURCE: McKinsey Global Institute analysis

Some business and economic implications

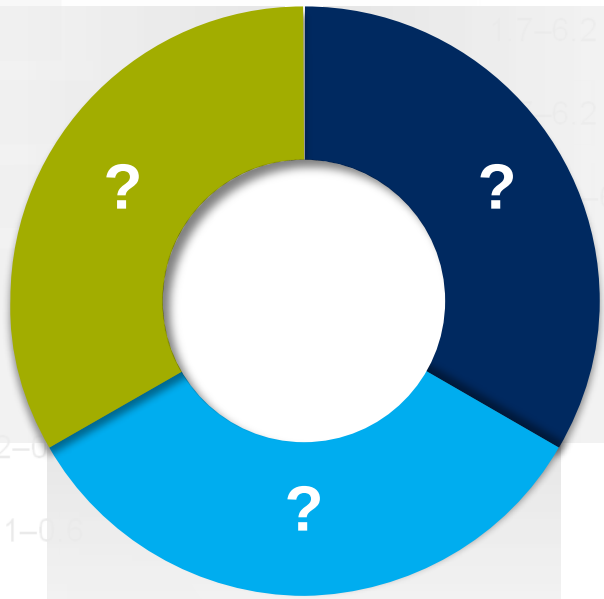
What business are we in again?



The digital economy?



Surplus anyone?



Consumer surplus

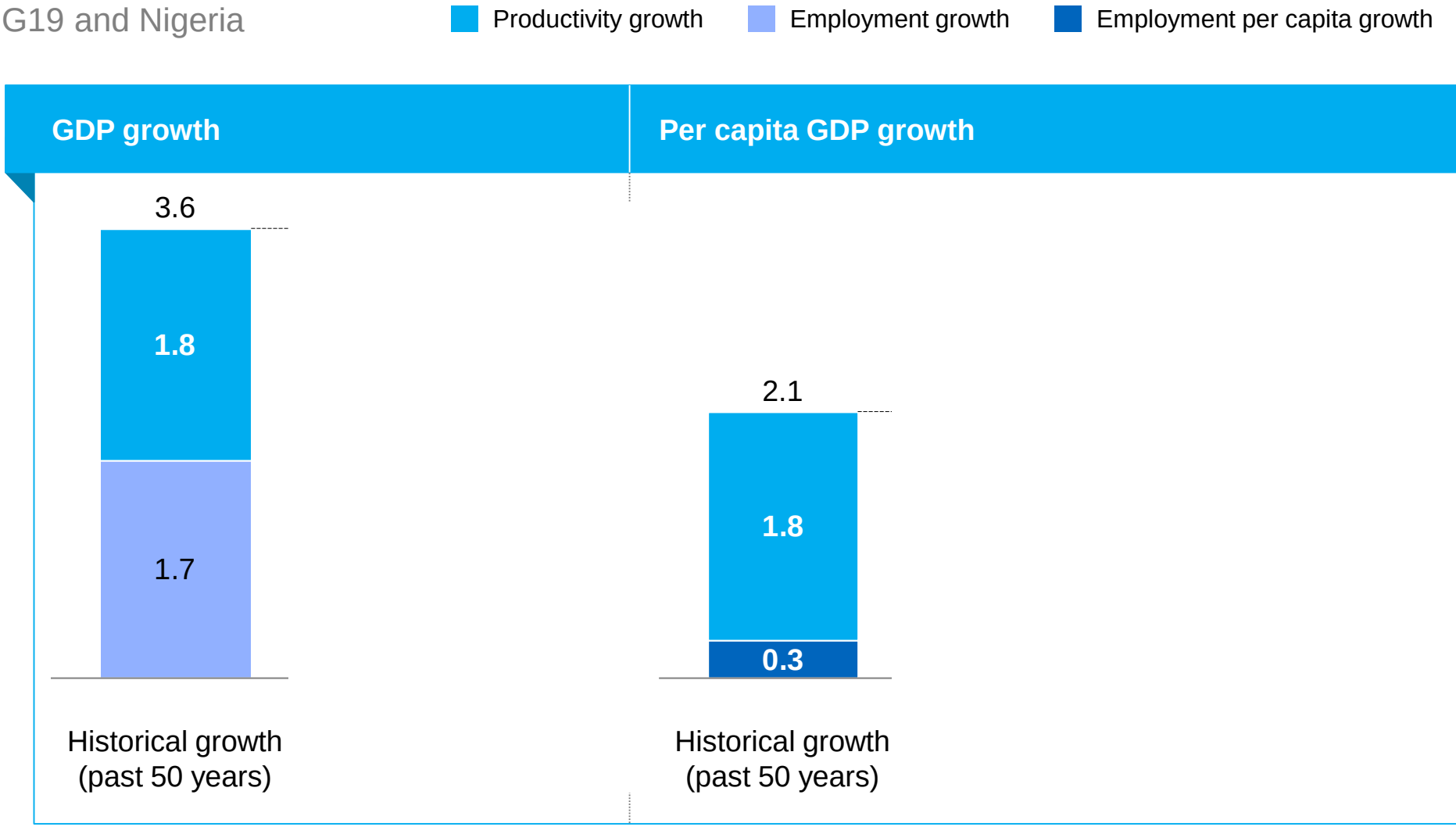
Net new revenue capture

Surplus shifts between sectors and companies (from everywhere)

Prospects for economic growth and prosperity

Exceptional growth of the last 50 years

G19 and Nigeria

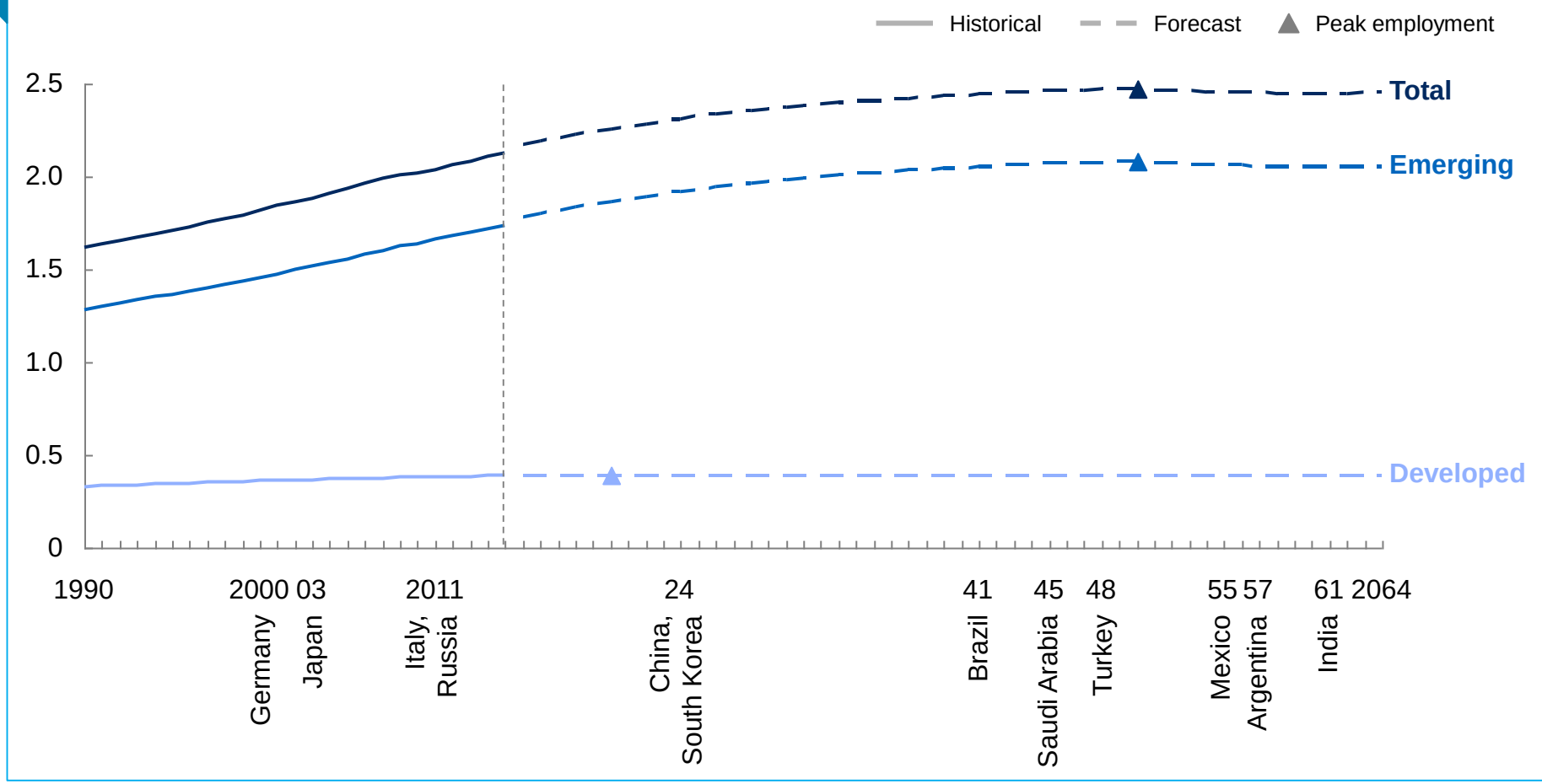


NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

The global supply of employees is likely to peak around 2050

Employees in G19 and Nigeria, 1990 – 2064E (Billion, at best of 2007 or 2012 activity and unemployment rates)

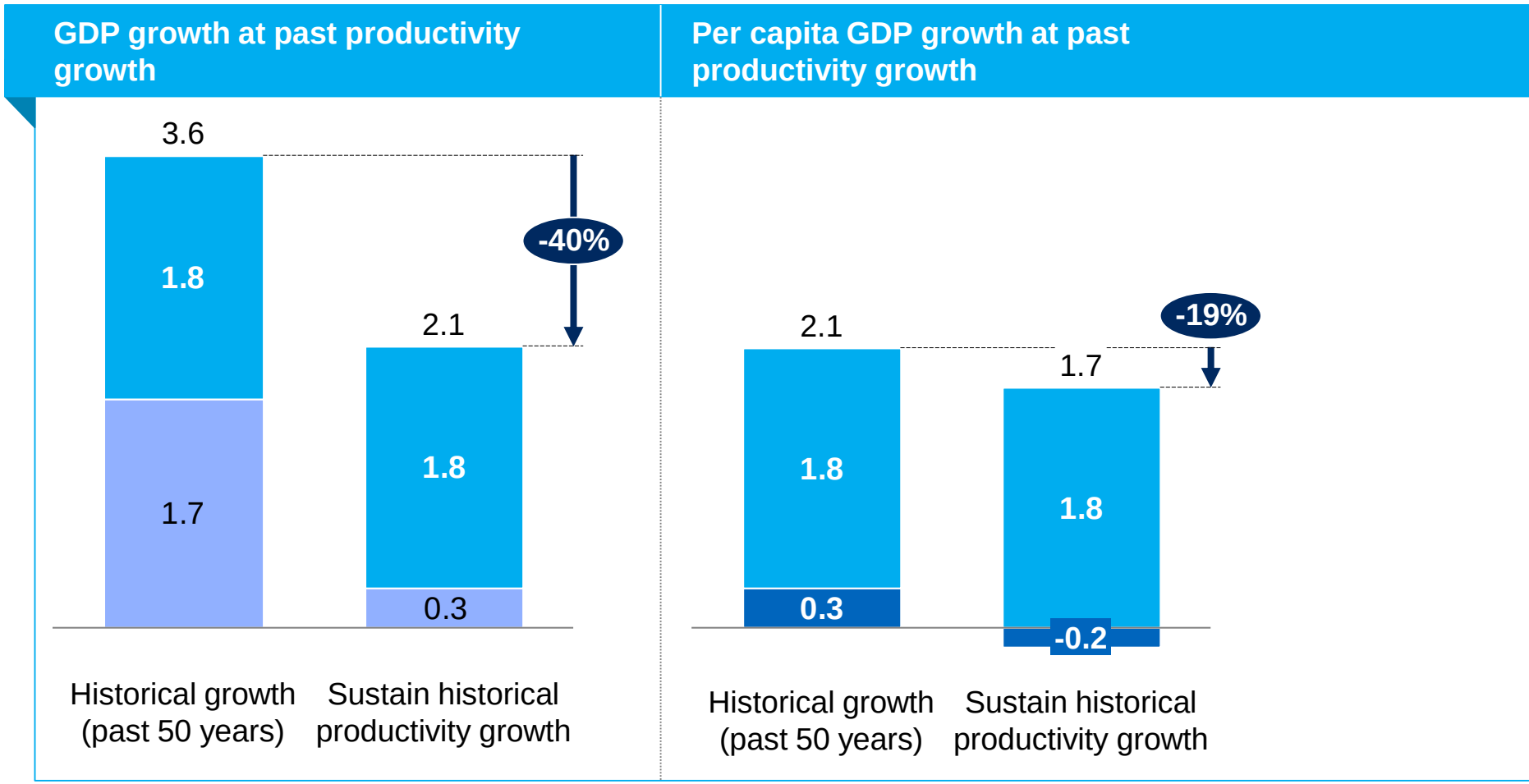


SOURCE: The Total Economy database of the Conference Board; UN Population Division statistics; World Bank; International Labour Organisation; McKinsey Global Institute analysis

By sustaining productivity growth of the last 50 years, GDP growth over the next 50 years would slow down by about 40 %

G19 and Nigeria

Productivity growth | Employment growth | Employment per capita growth

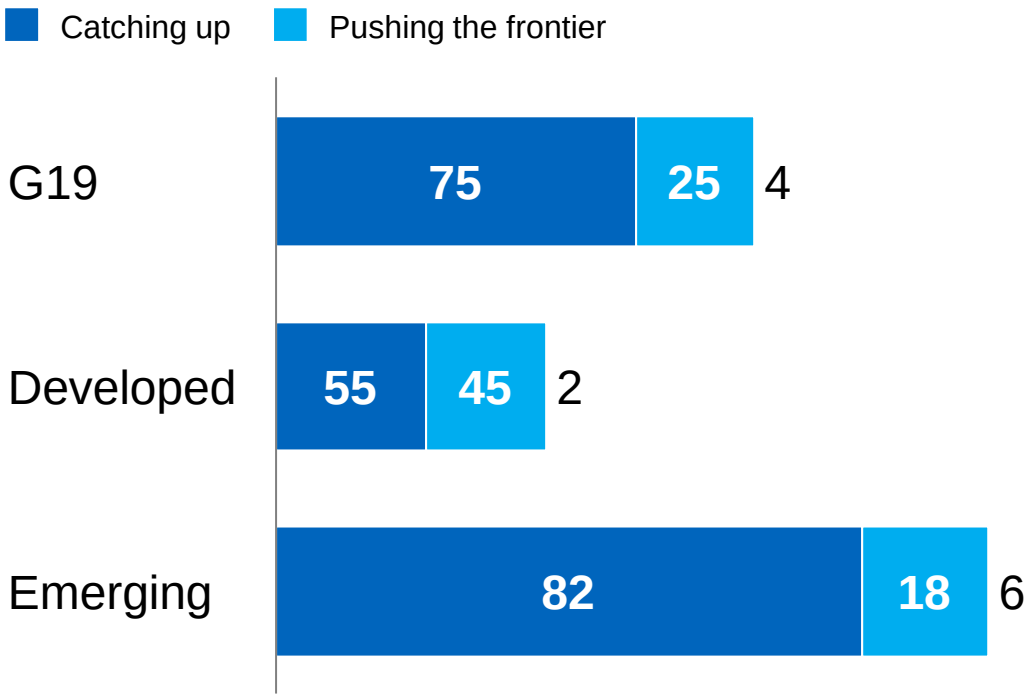


NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

Of the productivity growth needed, as much as 3/4 can come from catching up, and the rest from pushing the frontier

Potential per annum productivity growth rate, percent



Pushing the Frontier will likely come from the application of transformational and technologies offering step-changes in productivity

SOURCE: McKinsey Global Institute analysis

What does this all mean?

- Good news for Consumers and Entrepreneurs
- No industry safe from disruption and transformational innovation (new competitors, value chains, economics, assets & capabilities)
- Surplus shifts will be more widespread – good for consumers, challenging for incumbents, challenge what we measure
- The nature of work will change (jobs vs. incomes, work as a portfolio etc)
- “The Great decoupling” will likely require old and new solutions
- More complex societal challenges to manage (privacy, security, health safety, inequality, safety nets…) Policies and rules will have a hard time keeping up (but must)
- Critical to address key enablers needed to sustain economic growth (10 identified)
- *Technology, innovation and productivity may still save the day*