Digital Economy:
Trends, Opportunities and Challenges

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25 YEARS OF
INSIGHT

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Digitization of everything
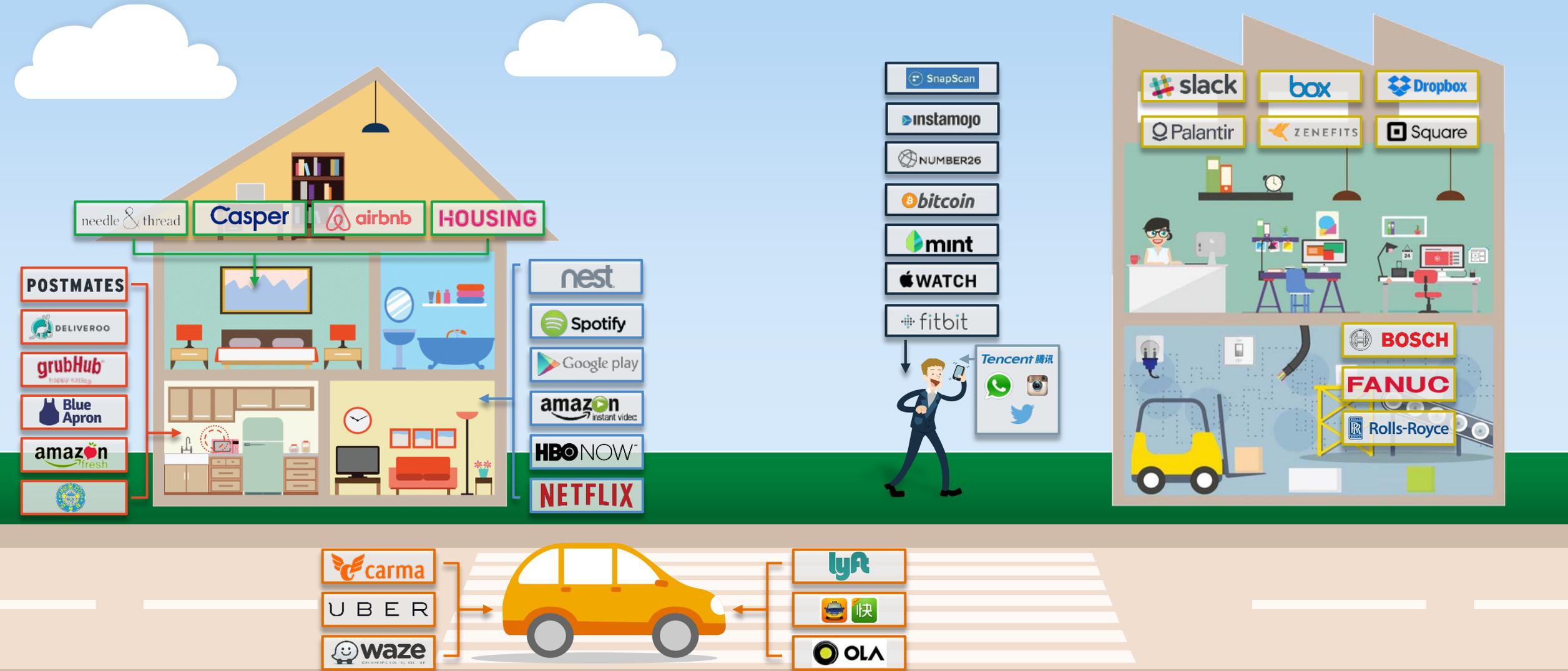
Size of the Digital Economy

Percent of US economy impacted by digitization

98%
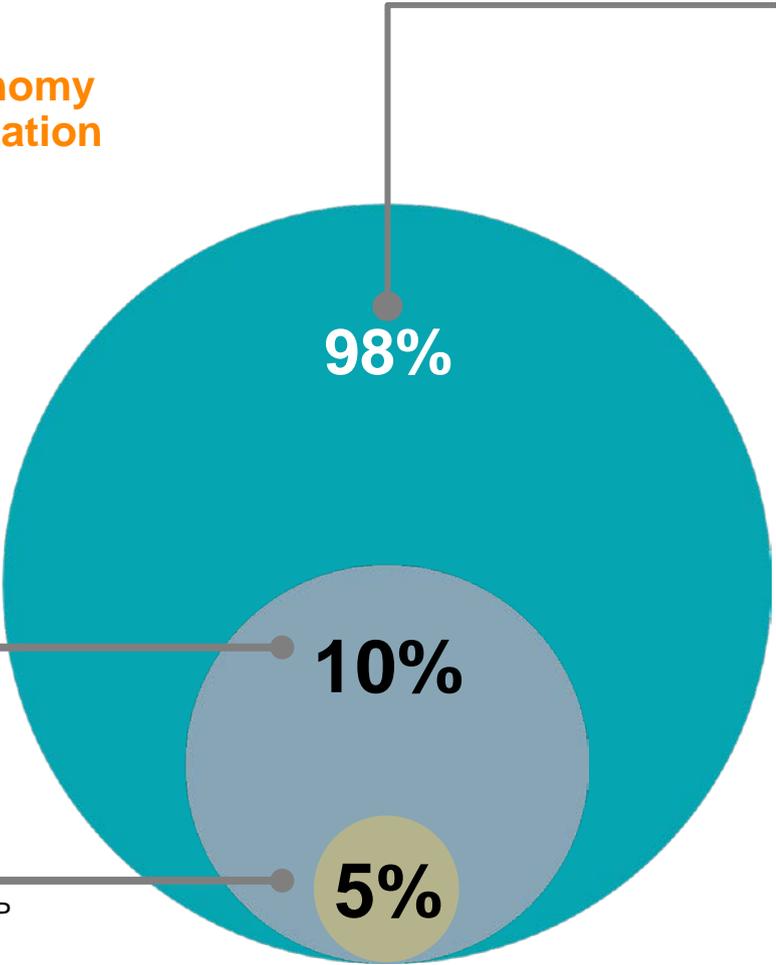
10%
ICT as a share of GDP, taking into account price effects

5%
ICT Sectors as a share of GDP in official statistics

Up to 98% Examples

|	
Retail via e-commerce	13%
Investment in ICT as a share of total investment	17%
Payments made digitally	28%
Households subscribing to online video streaming services	36%
Freelancers who have done work online	42%
Americans who get news from online aggregators	51%
Adults with smartphones	64%
Households with broadband	73%
Adults who use social media	74%
Taxes that are e-filed	85%
Adults who use the Internet	87%
Millennials who regularly use e-mail	90%
Americans with access to high-speed wireless Internet	98%
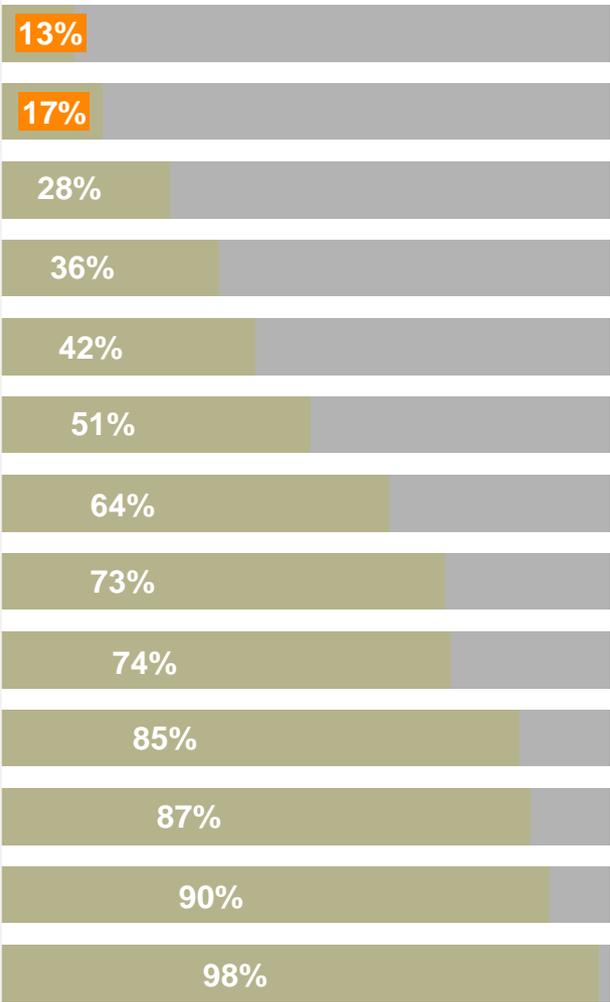
More to come as more technologies (mostly digital) continue to transform the economy

Disruptive Dozen – Selected for scope and scale over next 10 years

IT and how we use it

- Mobile internet
- Cloud technology
- Internet of Things (IoT)
- AI, Machine-learning Automation of knowledge work

New building blocks
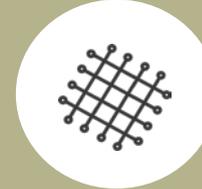
- Next-generation genomics
- Advanced materials

Machines at work

- Advanced robotics
- Autonomous and near-autonomous vehicles
- 3D printing

Rethinking energy comes of age
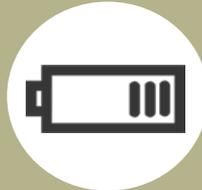
- Energy storage
- Advanced oil and gas exploration and recovery
- Renewable energy

More…

Blockchain/Cryptocurrencies

Human-Computer Interfaces (AR, VR etc)

Digital IDs/Biometrics

Quantum Computing

…

Three opportunities and challenges

1. Digitization for growth, productivity and innovation

2. Digitization of Globalization

3. Digitization of work

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Foundations to get right

Extent of Digitization varies by sector

MGI Sector Digitization Index
2015 or latest available US data
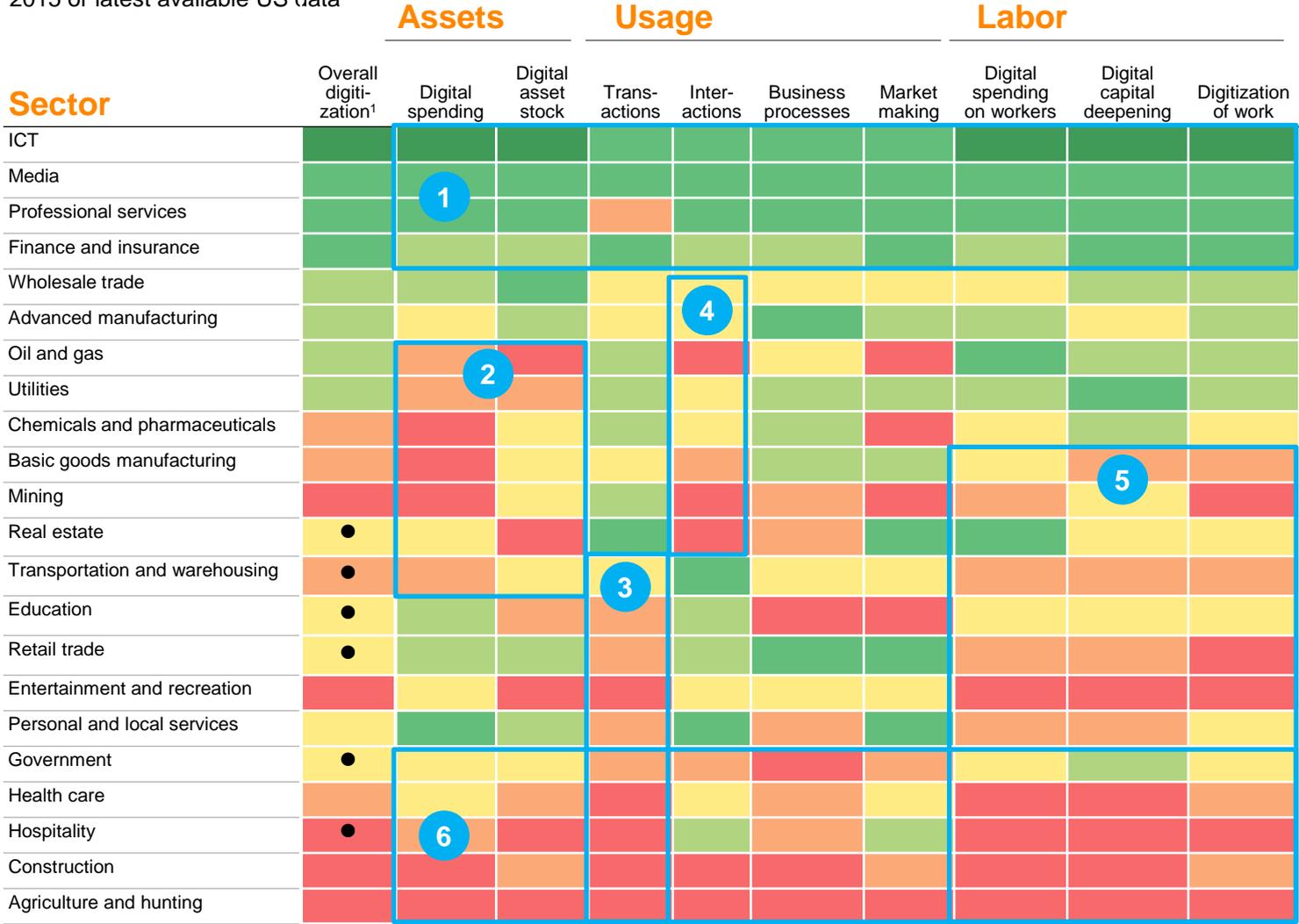
Relatively low digitization → Relatively high digitization

● Digital leaders within relatively un-digitized sectors

Sector	Overall digiti-zation[1]	Assets		Usage				Labor		
		Digital spending	Digital asset stock	Trans-actions	Inter-actions	Business processes	Market making	Digital spending on workers	Digital capital deepening	Digitization of work
ICT										
Media										
Professional services										
Finance and insurance										
Wholesale trade										
Advanced manufacturing										
Oil and gas										
Utilities										
Chemicals and pharmaceuticals										
Basic goods manufacturing										
Mining										
Real estate	●									
Transportation and warehousing	●									
Education	●									
Retail trade	●									
Entertainment and recreation										
Personal and local services										
Government	●									
Health care										
Hospitality	●									
Construction										
Agriculture and hunting										

1 Knowledge-intensive sectors, highly digitized

2 Capital-intensive, potential to further digitize their assets

3 Service sectors with long tail of small firms having room to digitize customer transactions

4 B2B sectors with the potential to digitally engage and interact with their customers and users

5 Labor-intensive sectors with the potential to provide digital tools and skills to their workforce

6 Large, localized, low productivity could transform for productivity and delivery of services

# Gap widening between the most digitized and the rest

Leading sectors in 1997 = 100%

Rest of US economy, degree of digitization relative to leaders

4.1x increase in digitization

1.7x increase in digitization

8%

12%

14%

1997

2005

2013
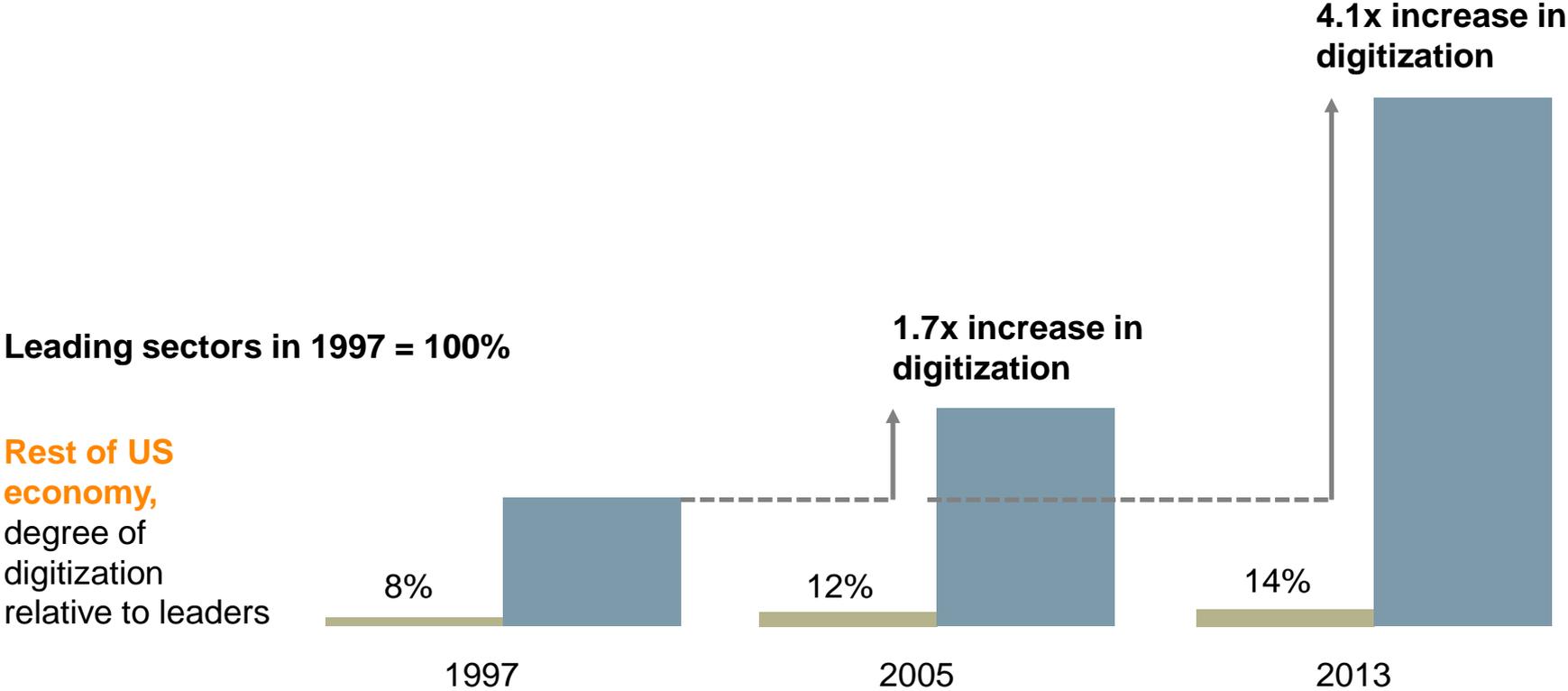
Even among businesses, there is a large gap between digital leaders and the rest

Digital Quotient score (sample of large corporations)

Legend: Established, Emerging, Med, Low

Average = 34

Emerging leaders

Established leaders
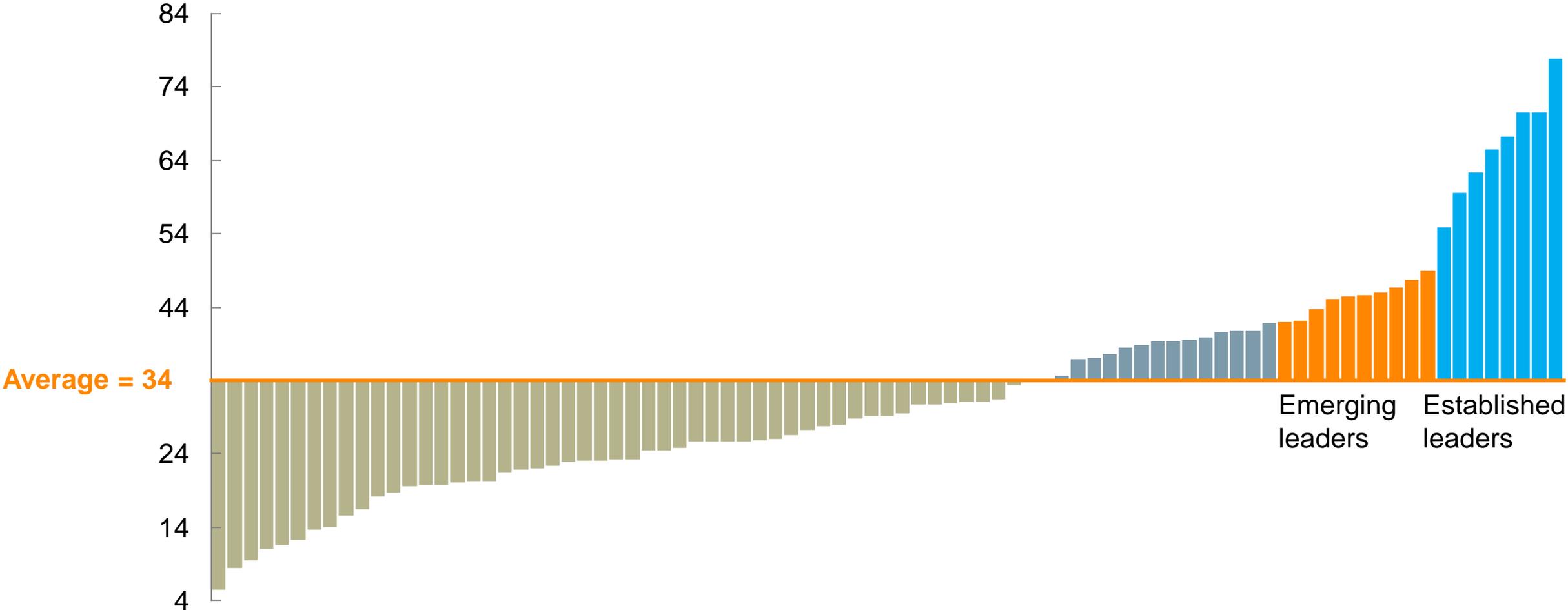
Digital "haves" and "have-mores"

| Faster revenue growth | 3x faster profit and margin growth | Higher productivity and innovation | 2x faster wage growth |

+...

Three opportunities and challenges

1. Digitization for growth, productivity and transformational innovation

2. Digitization of Globalization

3. Digitization of work

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Foundations to get right

Cross-border data flows surging and connecting more countries, companies and people

Used cross-border bandwidth

2005[1]
100% = 4.7 Terabits per second (Tbps)
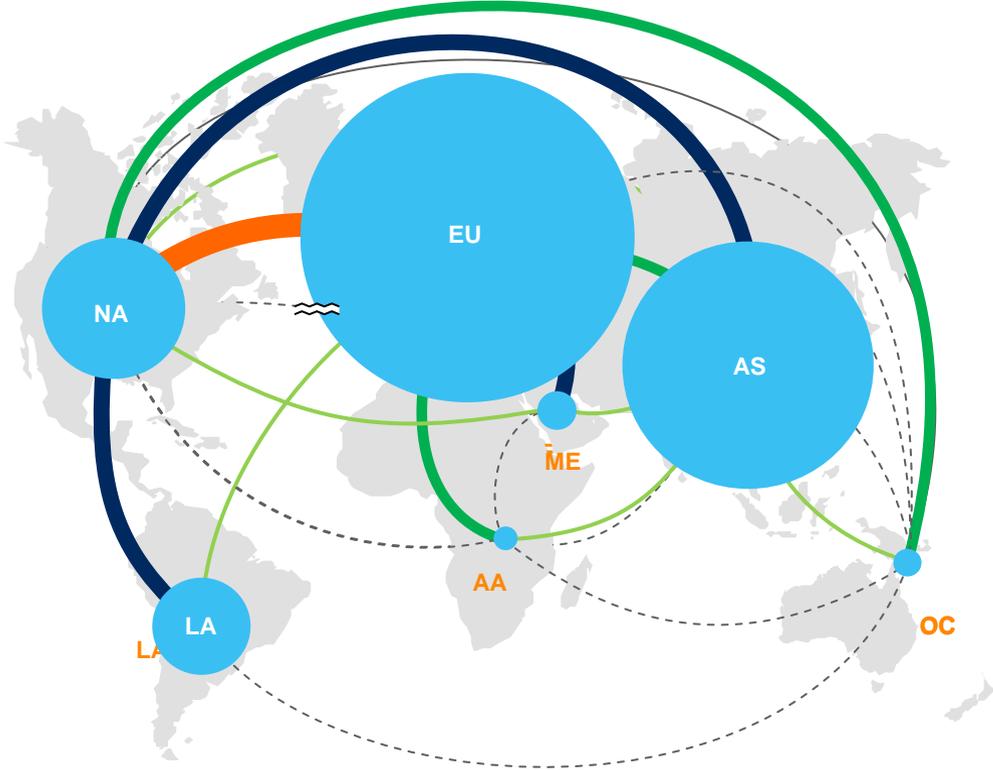
45x

Size of bubble represents intraregional used bandwidth

Regions		Bandwidth
		Gigabits per second (Gbps)
NA United States and Canada		<50
EU Europe		50–100
AS Asia		100–500
LA Latin America		500–1,000
ME Middle East		1,000–5,000
AA Africa		5,000–20,000
OC Oceania		>20,000
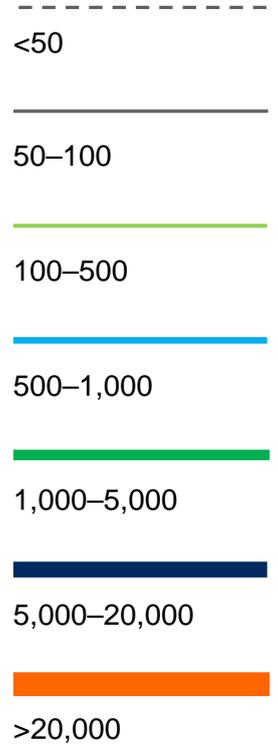
Individuals engaging globally, increasingly enabled by digital
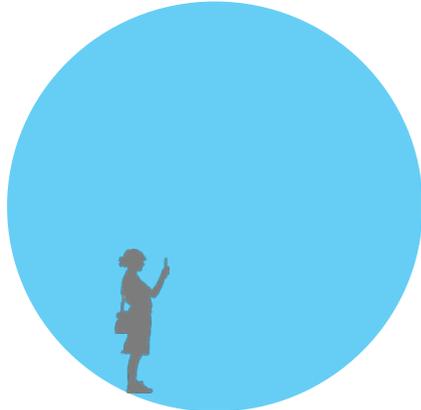
Social networking users with at least one foreign connection
914 million

International travelers
429 million

Cross-border e-commerce shoppers
361 million

People living outside home country
244 million

Cross-border online workers
44 million

Cross-border online students
13 million

Students studying abroad
5 million

NOTE: Numbers adjusted to account for overlap between platforms and for individuals making multiple international trips in the same year.

Three opportunities and challenges

1. Digitization for growth, productivity and innovation

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Foundations to get right

Labor Market Platforms Emerging

Platforms matching individuals with jobs

monster
[7,999 job searches/minute]

Linked in.
[364 million members]

careerbuilder®
EMPOWERING EMPLOYMENT
[24 million visitors/month]

SKILLFUL
A MARKLE INITIATIVE

Platforms for "OnDemand" work

Upwork
[12.5 million users]

UBER
[1 million drivers]

TaskRabbit
[25,000 service providers]

samasource
[6,500 workers]

freelancer.com
[14,300,000 users]

Talent management tools for recruiting and training

GOOD.CO

pymetrics beta

reviewsnap
Web-based Performance Management

PayScale

1 All companies are illustrative and not exhaustive, many span multiple functions

# Automation potential in high-wage, high-skill occupations as well as low-wage, low-skill occupations

Comparison of wages and automation potential for US jobs

Ability to technically automate
Percentage of time on activities[1] that can be automated by adapting currently demonstrated technology

File clerks

Landscaping and groundskeeping workers

Hourly wage
$ per hour

Over next 10 years
- 44% of activities ($2.2 trillion in wages) likely automated…

  but only <5% of whole occupations likely to be fully automated

- At least 30% of activities in 60% of occupations likely automated, redefining most occupations
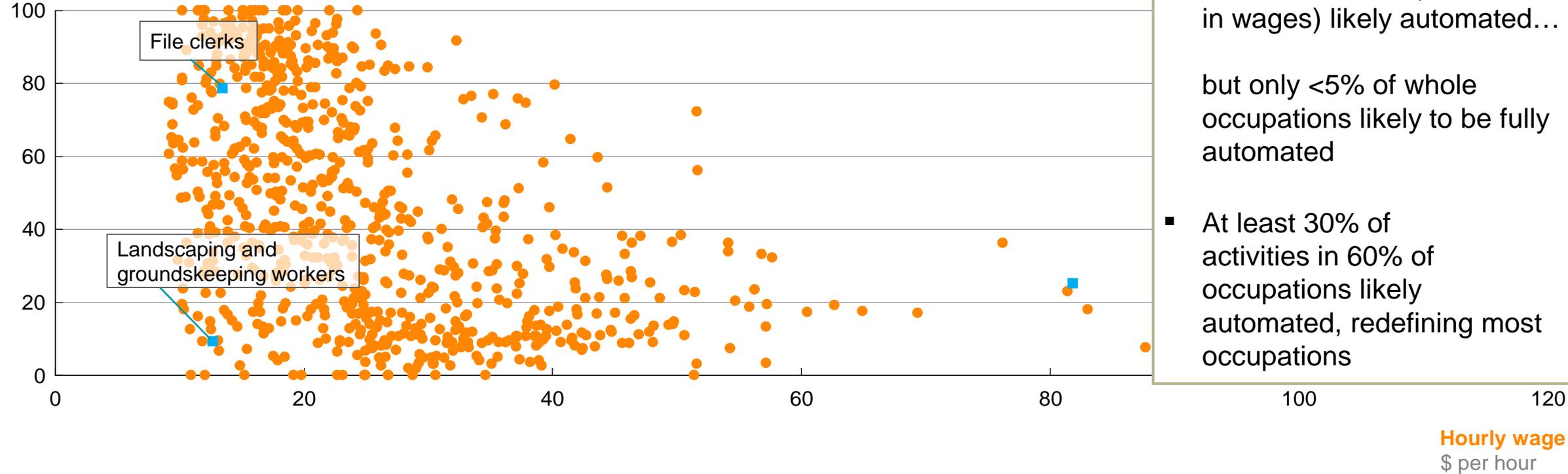
Historical rate of middle-skill job automation could double

US middle-skill occupations displaced due to technological change
% of middle-skill occupations
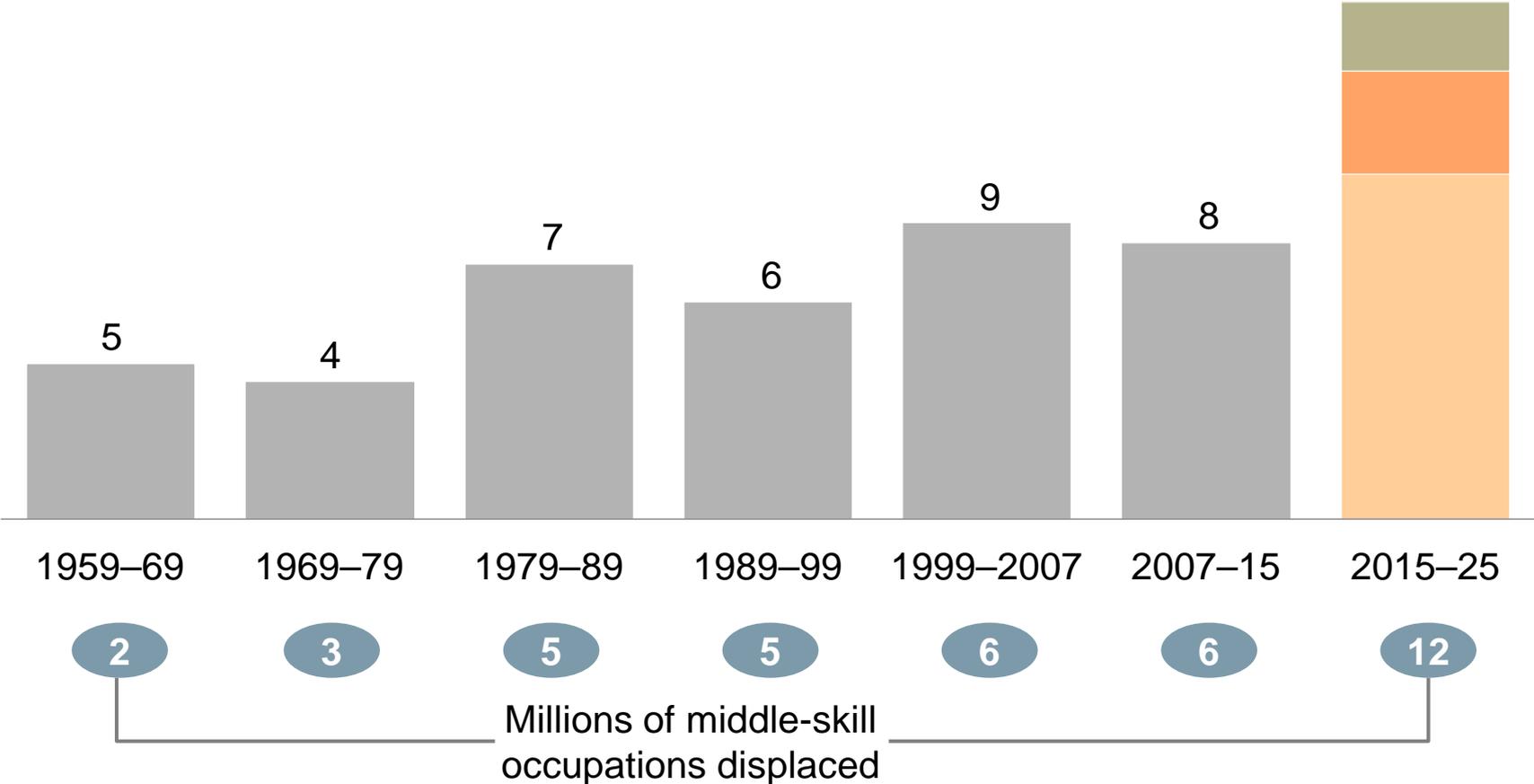
Estimate
- Hi
- Lo
- Med
- Base

Chart bar values by period (% of middle-skill occupations):
- 1959–69: 5
- 1969–79: 4
- 1979–89: 7
- 1989–99: 6
- 1999–2007: 9
- 2007–15: 8
- 2015–25 (estimate, Base/Lo/Med/Hi stacked)

Millions of middle-skill occupations displaced:
- 1959–69: 2
- 1969–79: 3
- 1979–89: 5
- 1989–99: 5
- 1999–2007: 6
- 2007–15: 6
- 2015–25: 12

Three opportunities and challenges

1. Digitization for growth, productivity and innovation

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Foundations to get right

Foundations to get right

To fully capture benefits to:

- Economy (growth, productivity, competitiveness)
- Businesses and entrepreneurs
- Individuals (workers, consumers, citizens)
- Society

Data and Privacy

Cybersecurity

Internet access and Governance

Measurement and classification challenges

Policy-making for a Digital era

Work and Wage effects

Skill, Capability, Infrastructure gaps