MEASURING TECHNOLOGY DIFFUSION AND THE IOT

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5th International Seminar on Big Data for Official Statistics, 29-31 May 2024, Xiamen, China

OECD
BETTER POLICIES FOR BETTER LIVES

Why care about measuring technology diffusion and effective use?

- Access and effective use of digital technologies are critical for equal opportunity and inclusion.
- Technology adoption is a key driver of productivity growth.
- Access to key inputs, including data, helps level the playing field among firms, boosting competition.

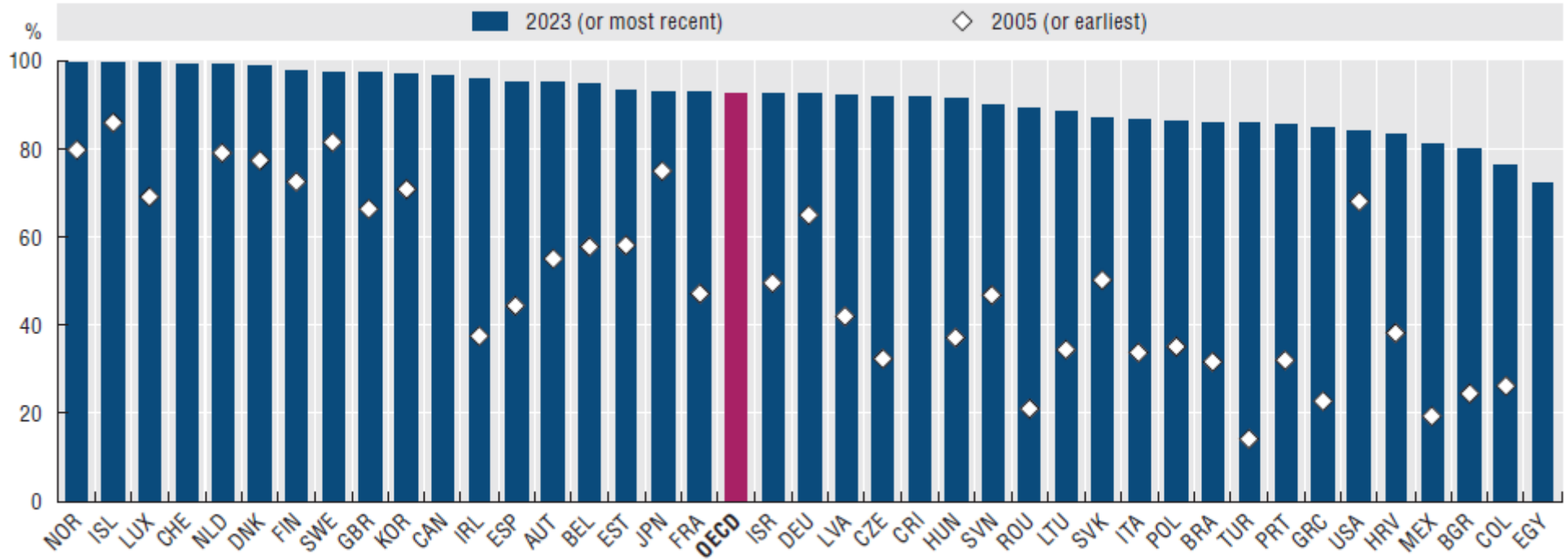
Outline

1. Measuring technology diffusion in ICT Access and Usage surveys
2. Spotlight on measuring the Internet of Things

MEASURING TECHNOLOGY DIFFUSION IN ICT ACCESS AND USAGE SURVEYS

Internet adoption across countries has increased

Internet use at least once during the last three months among adults (aged 16-74), 2005 (or earliest) and 2023 (or most recent)



Note: See endnote 3.

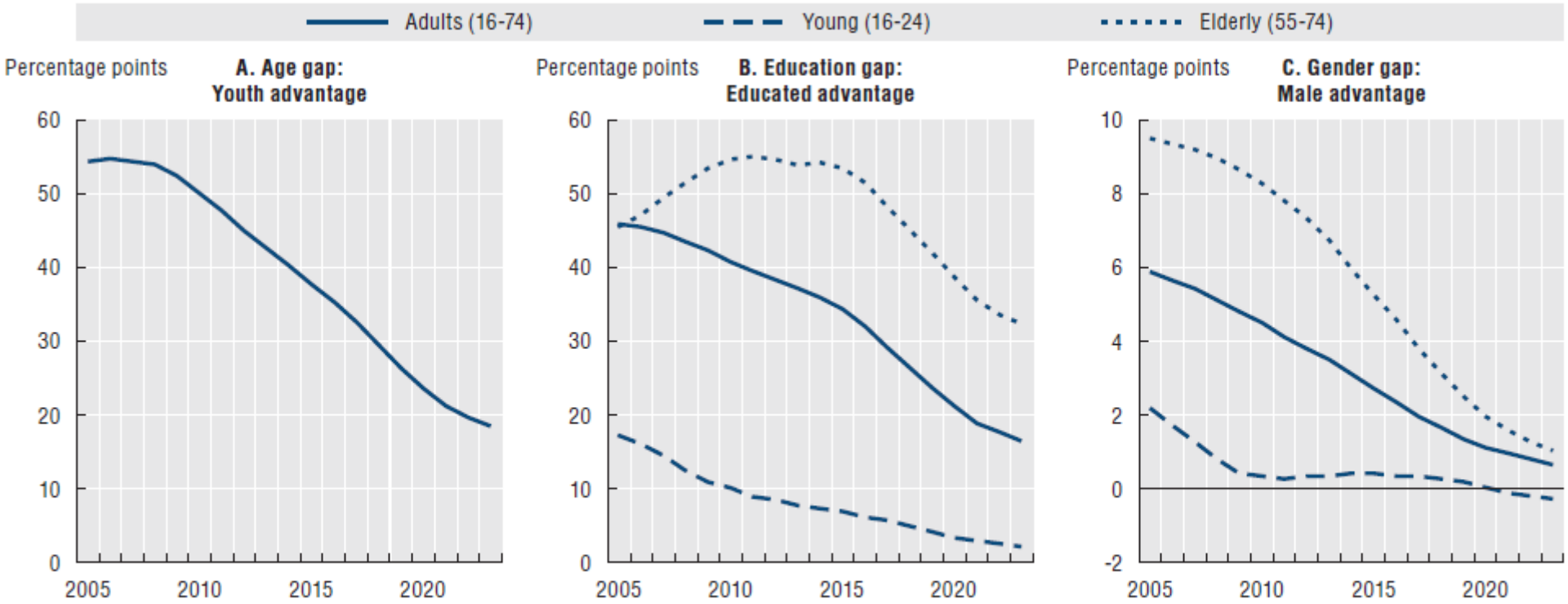
Source: Authors' elaboration based on data from OECD (2023[5]).

StatLink https://stat.link/803gwr

Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

Gaps in Internet use are narrowing, but remain pronounced among the elderly

Average gaps across OECD countries, 2005-23



Notes: Estimates based on a local polynomial with a bandwidth of unity. See also endnote 4.

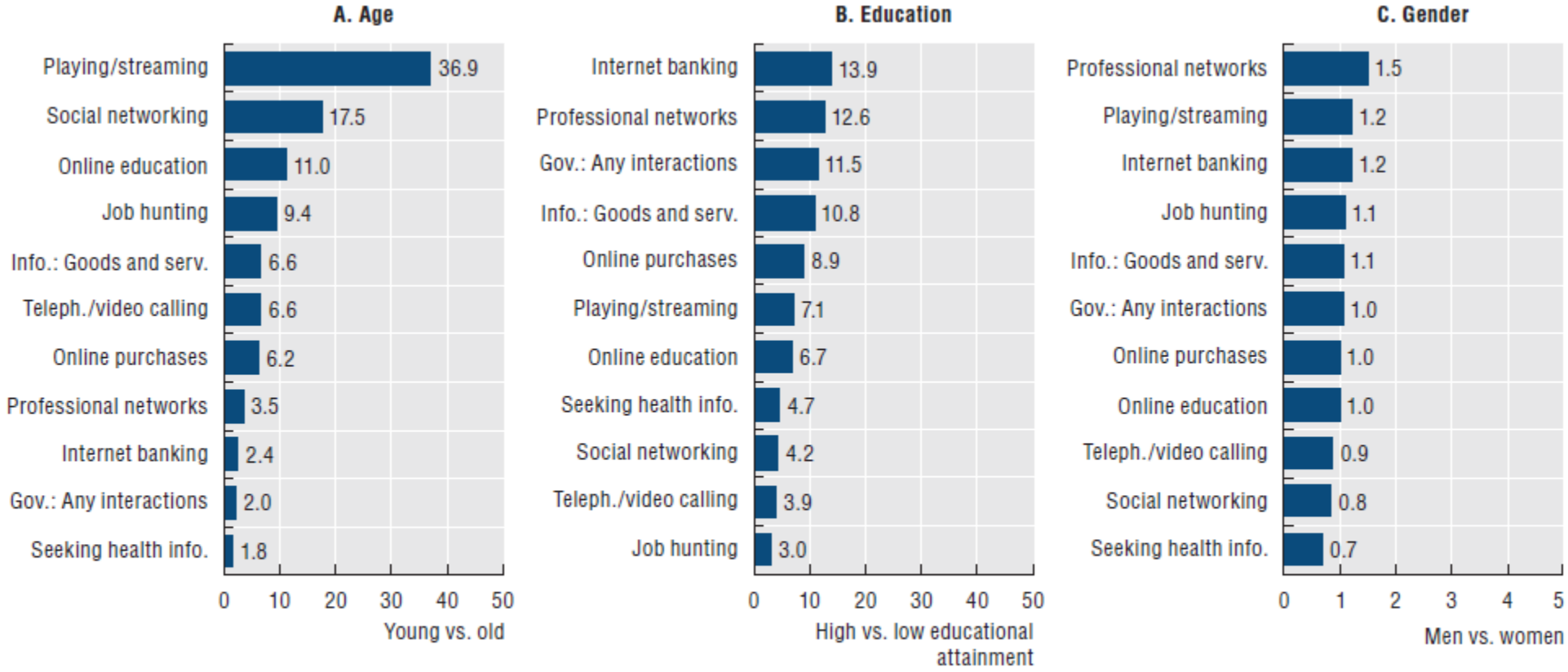
Source: Authors' elaboration based on data from OECD (2023[5]).

StatLink https://stat.link/uzcyvg

Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

Younger and more educated Internet users engage in a larger variety of online activities

Average odds ratios for uptake rates of online services, adult Internet users, 2023 (or most recent)



Note: See endnote 8.

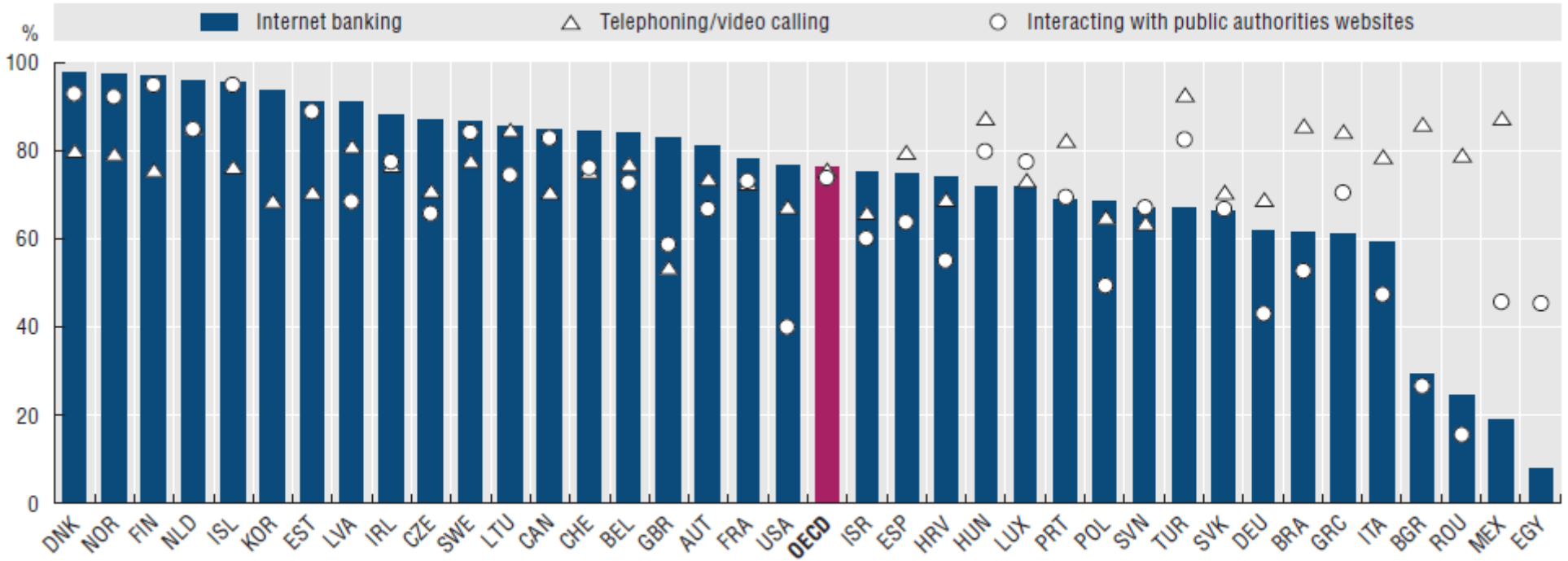
Source: Authors' elaboration based on data from OECD (2023[5]).

StatLink https://stat.link/ir3b8z

Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

Uptake of Internet banking and online government services varies across countries

Uptake of Internet banking, video calls, and interactions with public authorities' websites among adult Internet users, 2023 (or most recent)



Note: See endnote 8.

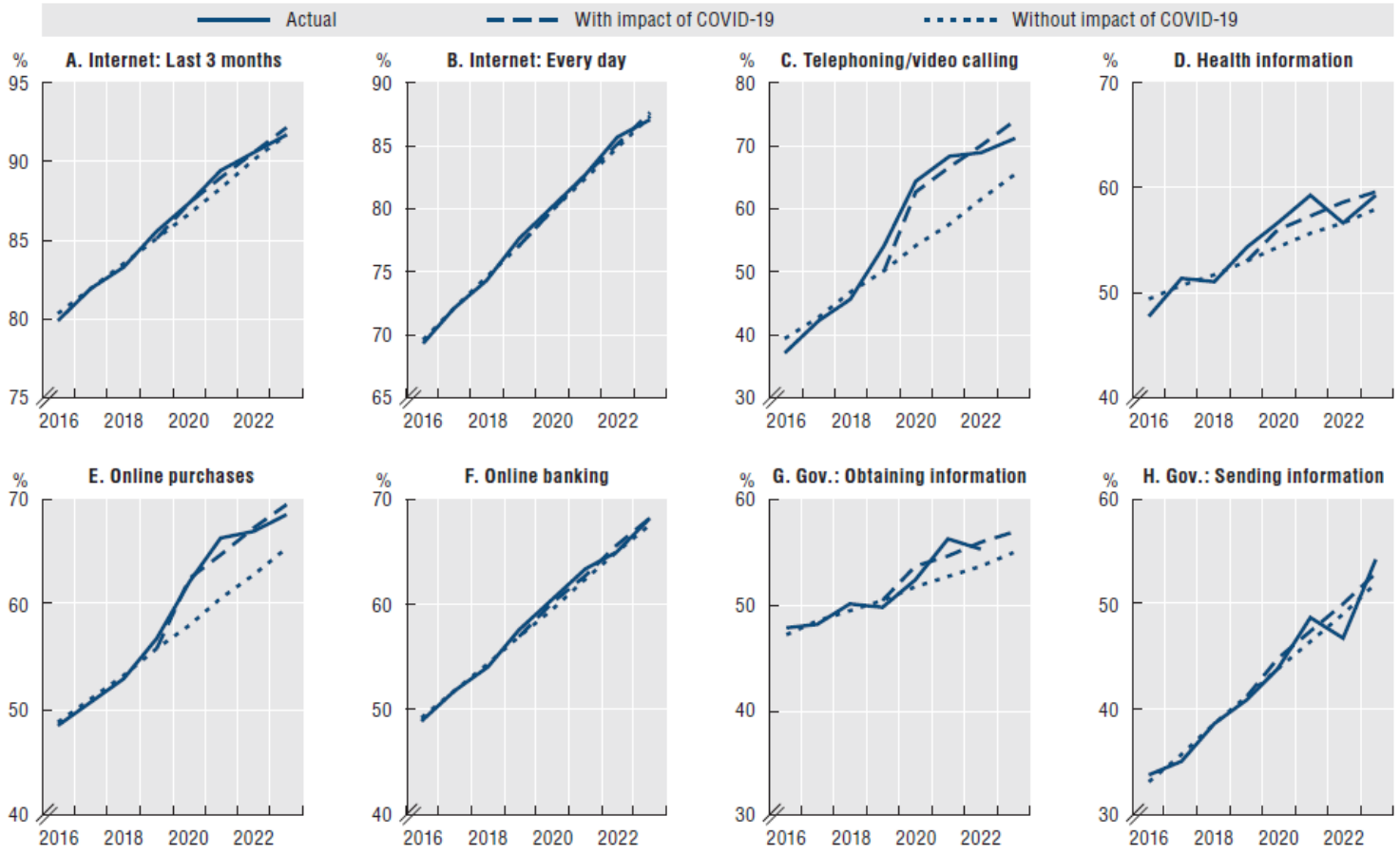
Source: Authors' elaboration based on data from OECD (2023[5]).

StatLink https://stat.link/5kwtya

Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

Uptake of online services increased during the COVID-19 pandemic

Average uptake rates of online services and pre-pandemic trends across countries, 2016-23



Notes: Averages reported for the "Actual" series are adjusted for variation in sample sizes across years. See also notes to Annex Table 3.A.2.

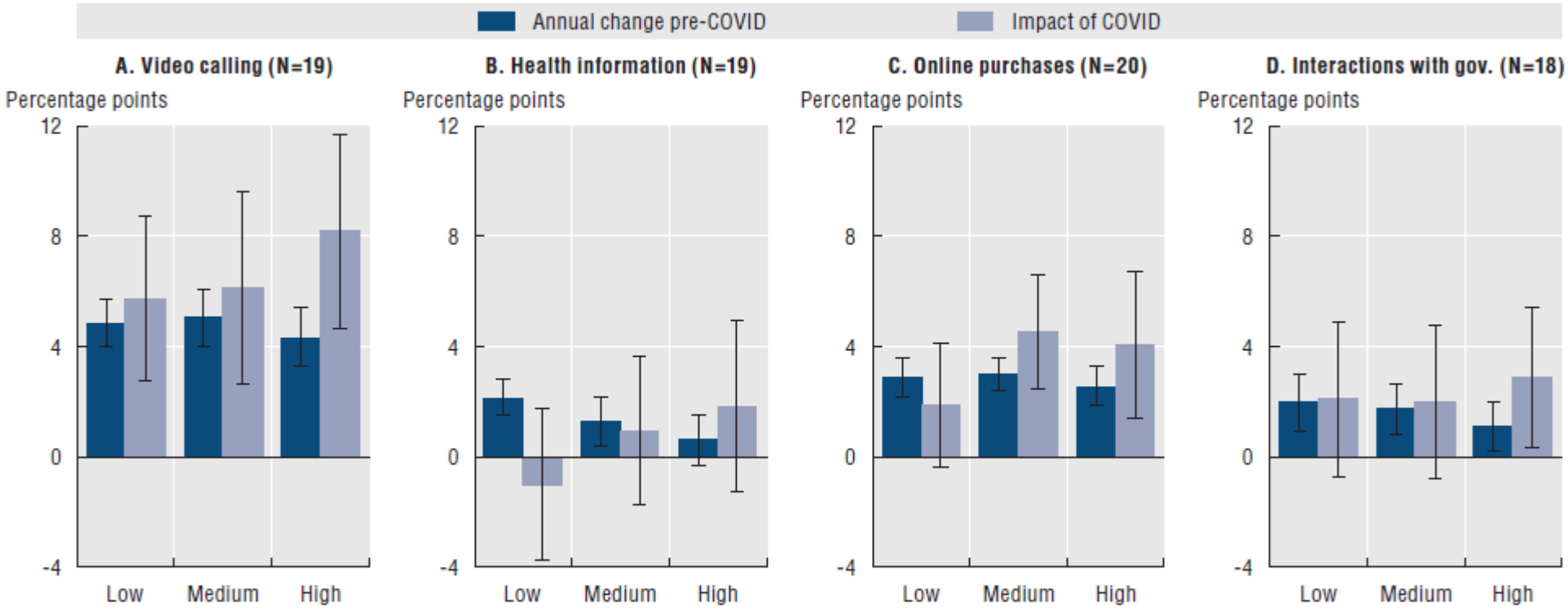
Source: Authors' elaboration based on data from OECD (2023[5]).

StatLink https://stat.link/1vxzoh

Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

COVID-19 is often associated with slowing convergence in uptake of online services

Annual changes in uptake rates and impact of COVID-19 by educational attainment, adults aged 16-74, 2016-23



Note: See Annex Table 3.A.3.

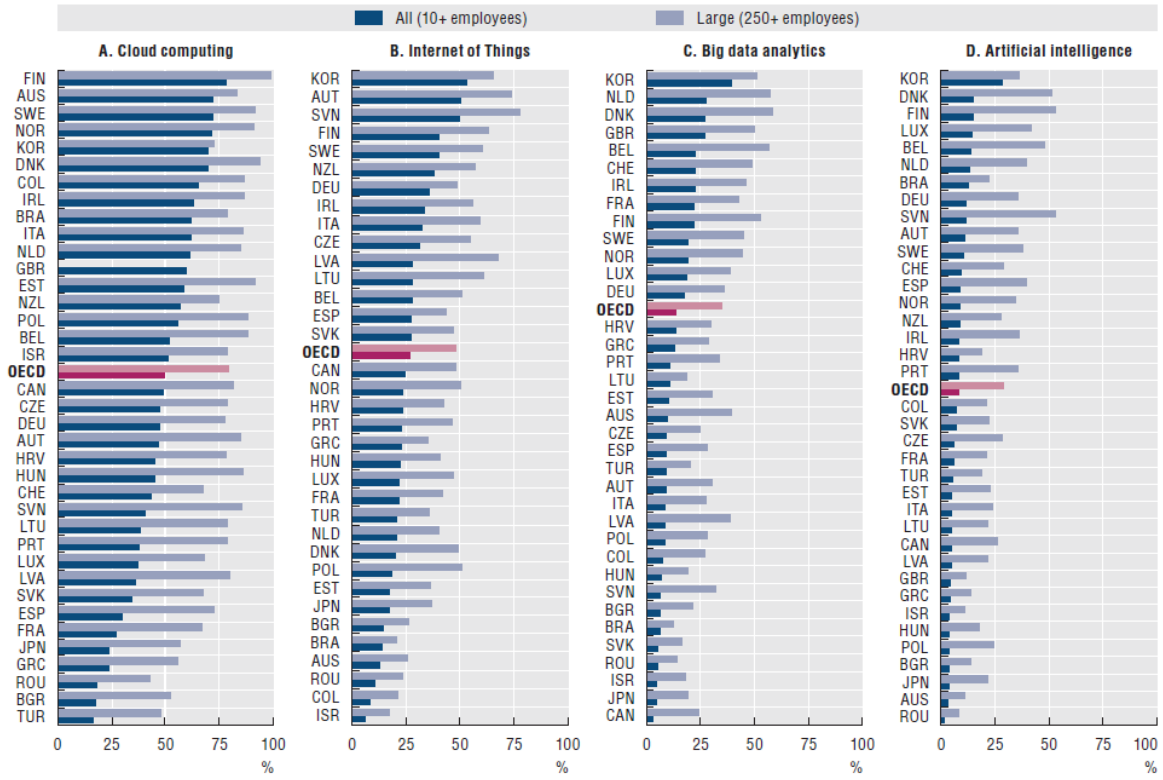
Source: Authors' elaboration based on data from OECD (2023[5]).

StatLink https://stat.link/7gnxyz

Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

Adoption of data-driven technologies remains low

Adoption rates of cloud computing, IoT technologies, big data analytics and AI by enterprises with ten employees or more in the business sector (excluding financial services), 2023 (or most recent)



Note: See endnote 15.

Source: Authors' elaboration based on data from OECD (2023[5]).

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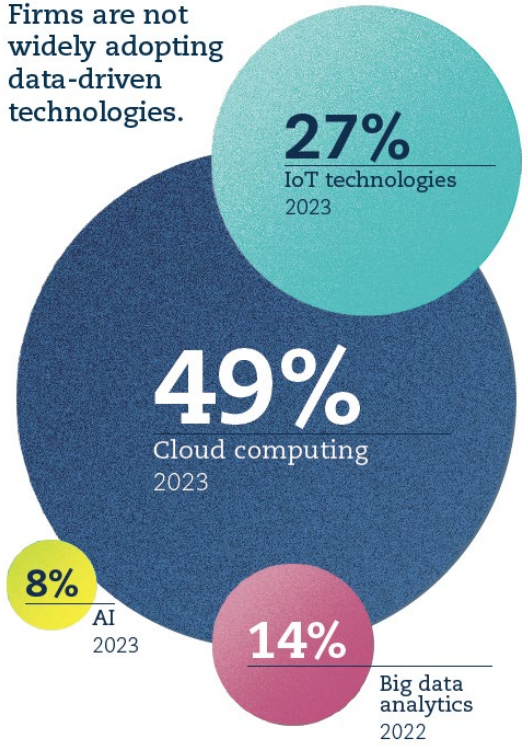
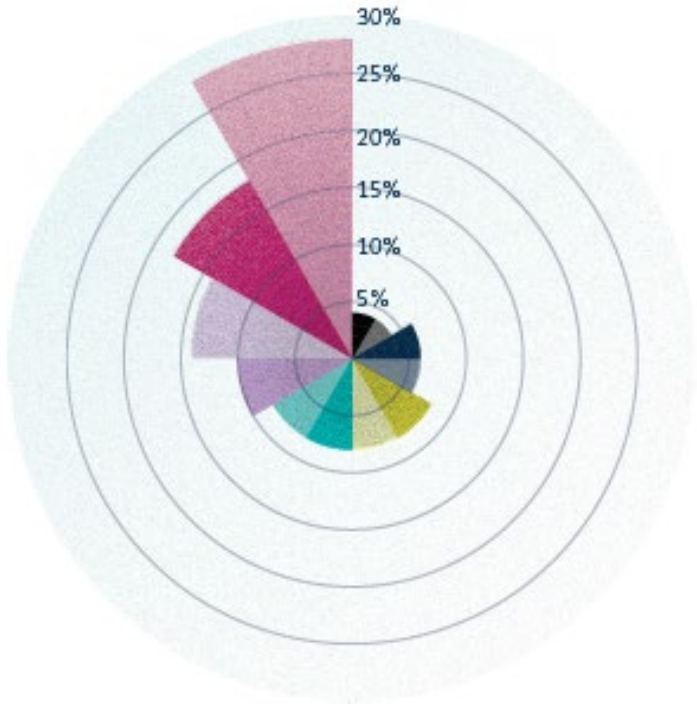


Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

AI adoption is concentrated in the ICT sector

4% Construction
4% Accommodation and food services
6% Retail trade
6% Transportation and storage
8% Administration and support
8% Manufacturing
8% Electricity, gas, water and waste mgt.
8% Wholesale trade
10% Real estate
15% Professional and technical activities
18% Finance and insurance
28% Information and communications tech.

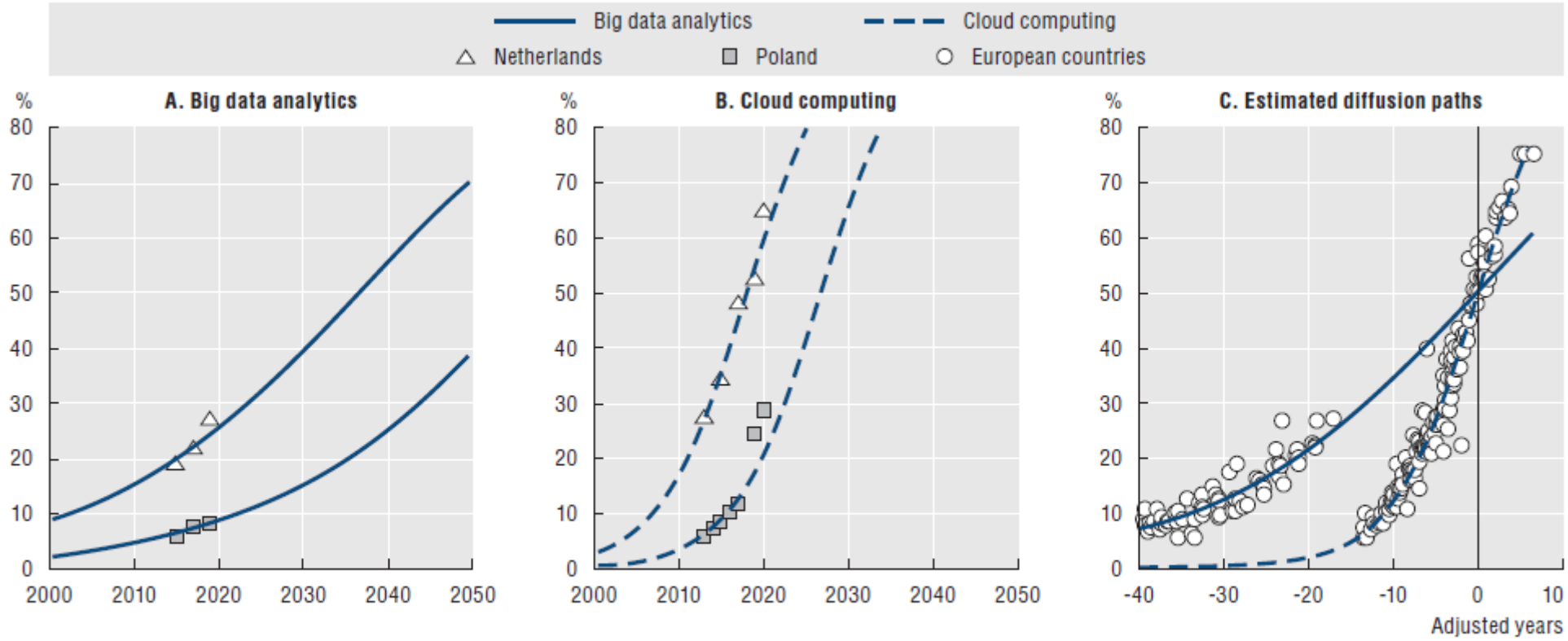
28% of ICT firms used AI in 2023 in the OECD, higher than any other sector.



Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

Cloud computing has been diffusing three times more rapidly than big data analytics

Adoption rates of big data analytics and cloud computing by enterprises, 2000-50



Notes: Based on columns (2) and (6) of Annex Table 3.A.5. See also notes to the table.

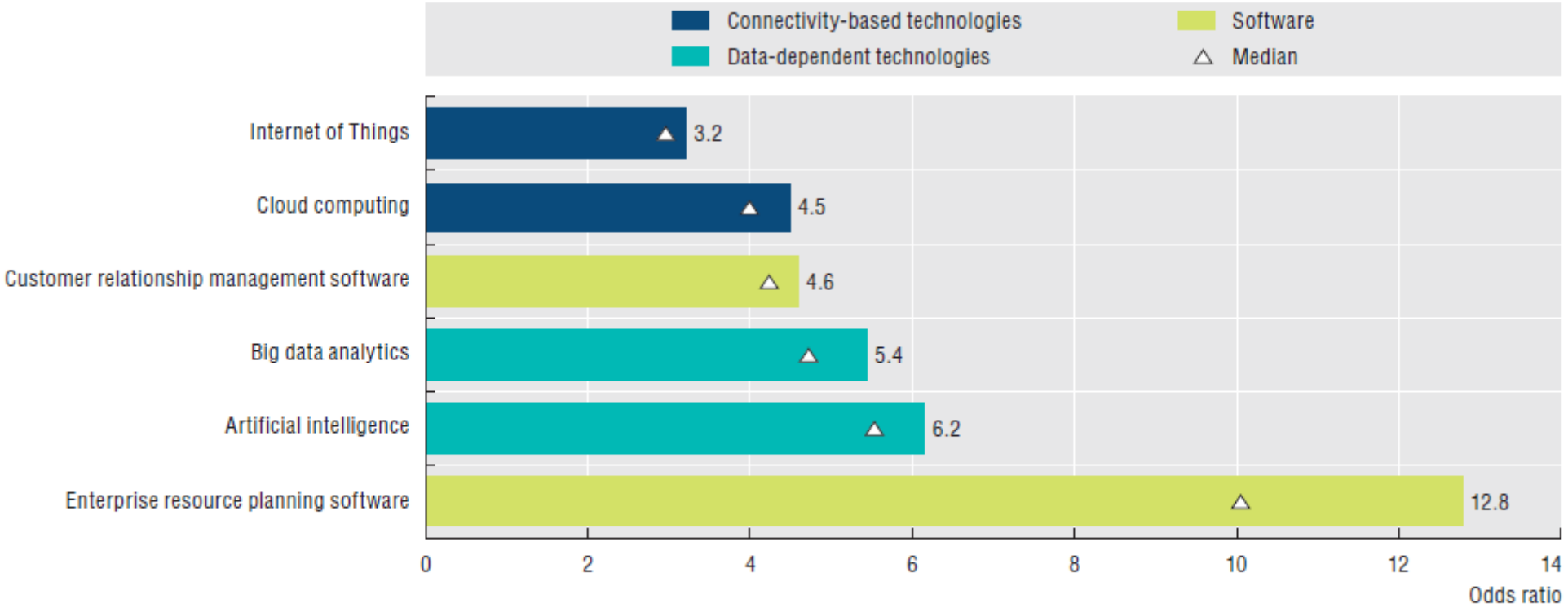
Source: Authors' elaboration based on data from Eurostat (2022[55]).

StatLink https://stat.link/s2kc7x

Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

Firm size matters more for the adoption of AI, big data analytics and software than for IoT and cloud computing

Average odds ratios of adoption in large enterprises vs. adoption in small enterprises, 2013-23



Note: Odds ratios are defined as the odds of large enterprises (250 employees and more) adopting a specific technology divided by the odds of small enterprises (10-49 employees).

Sources: Authors' elaboration based on OECD (2023[5]) and Eurostat (2024[95]).

StatLink https://stat.link/ivxyd1

Source: *OECD Digital Economy Outlook (Volume 1)*, Chapter 3 : https://doi.org/10.1787/a1689dc5-en.

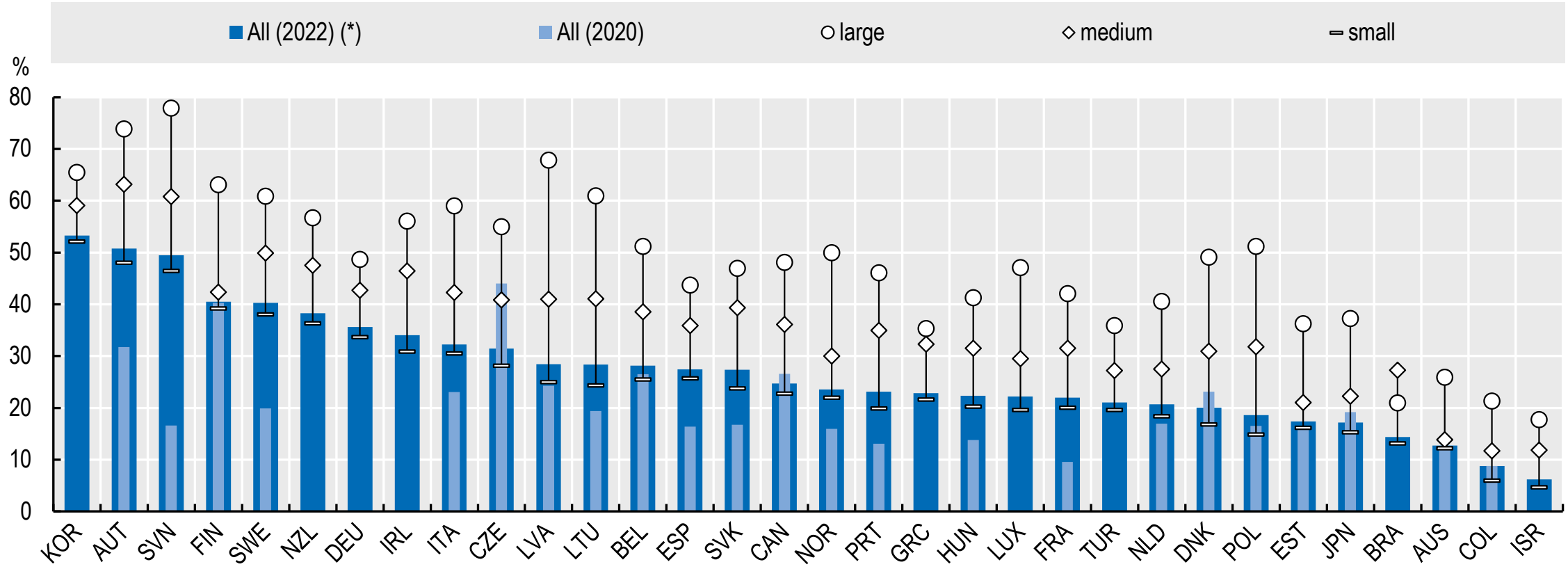
SPOTLIGHT ON MEASURING THE IOT

Measuring the IoT in ICT Access and Usage Surveys

- Does your enterprise/you use IoT technologies?
- What are your reasons for using IoT technologies?
- What are your reasons for not using IoT technologies?

Enterprises using IoT

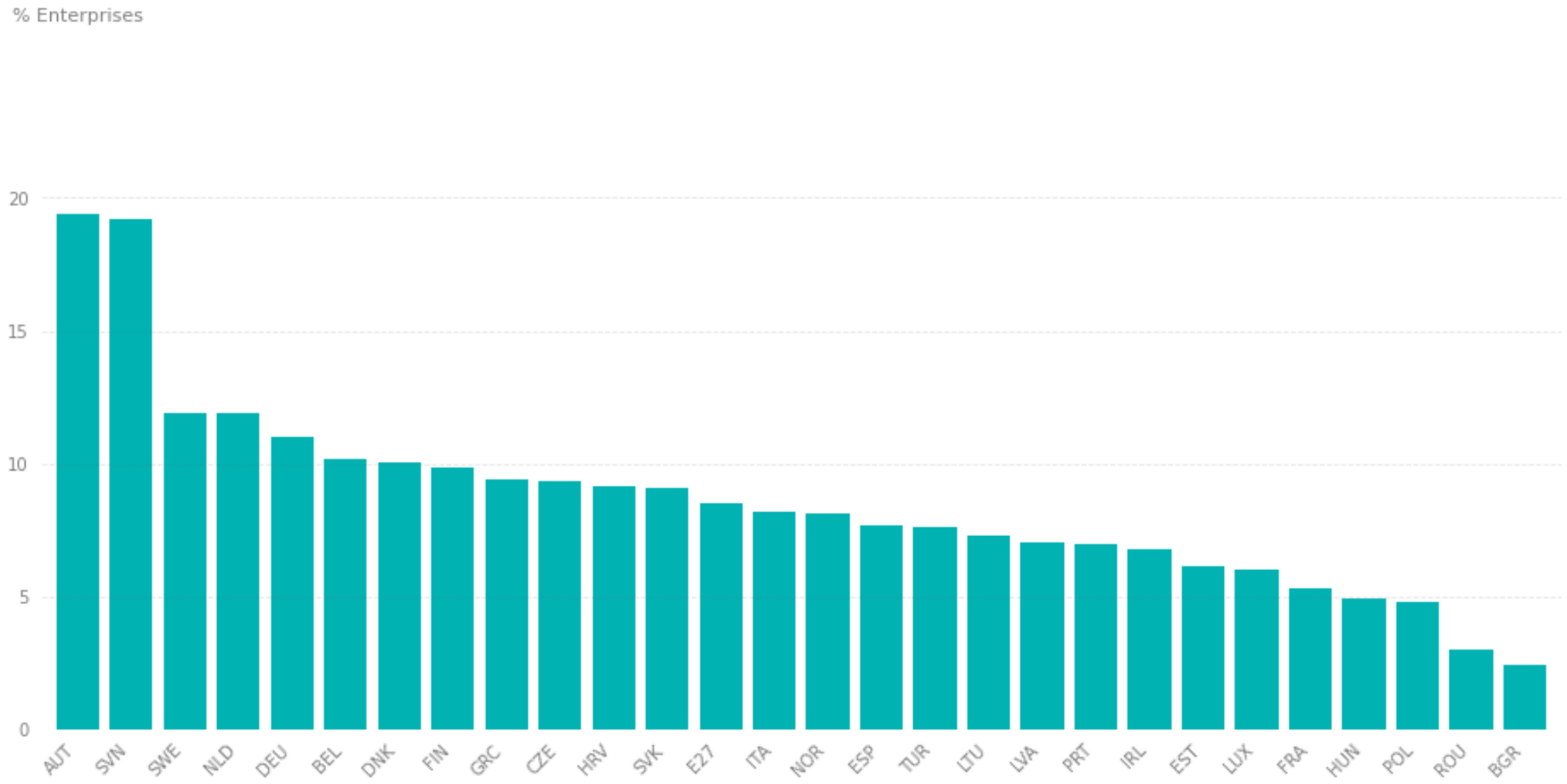
As a percentage of enterprises in each employment size class



(*) Notes: Data for Korea and New Zealand refer to 2022. Data for Australia refer to the 2021-22 reference period ending on 30 June 2022. Data for Colombia and Israel refer to 2020. For all remaining countries, data refer to 2021. Data refer to businesses with 10 or more employees. Small: 10 to 49 employees. Medium: 50 to 249 employees. Large: 250 and more employees.

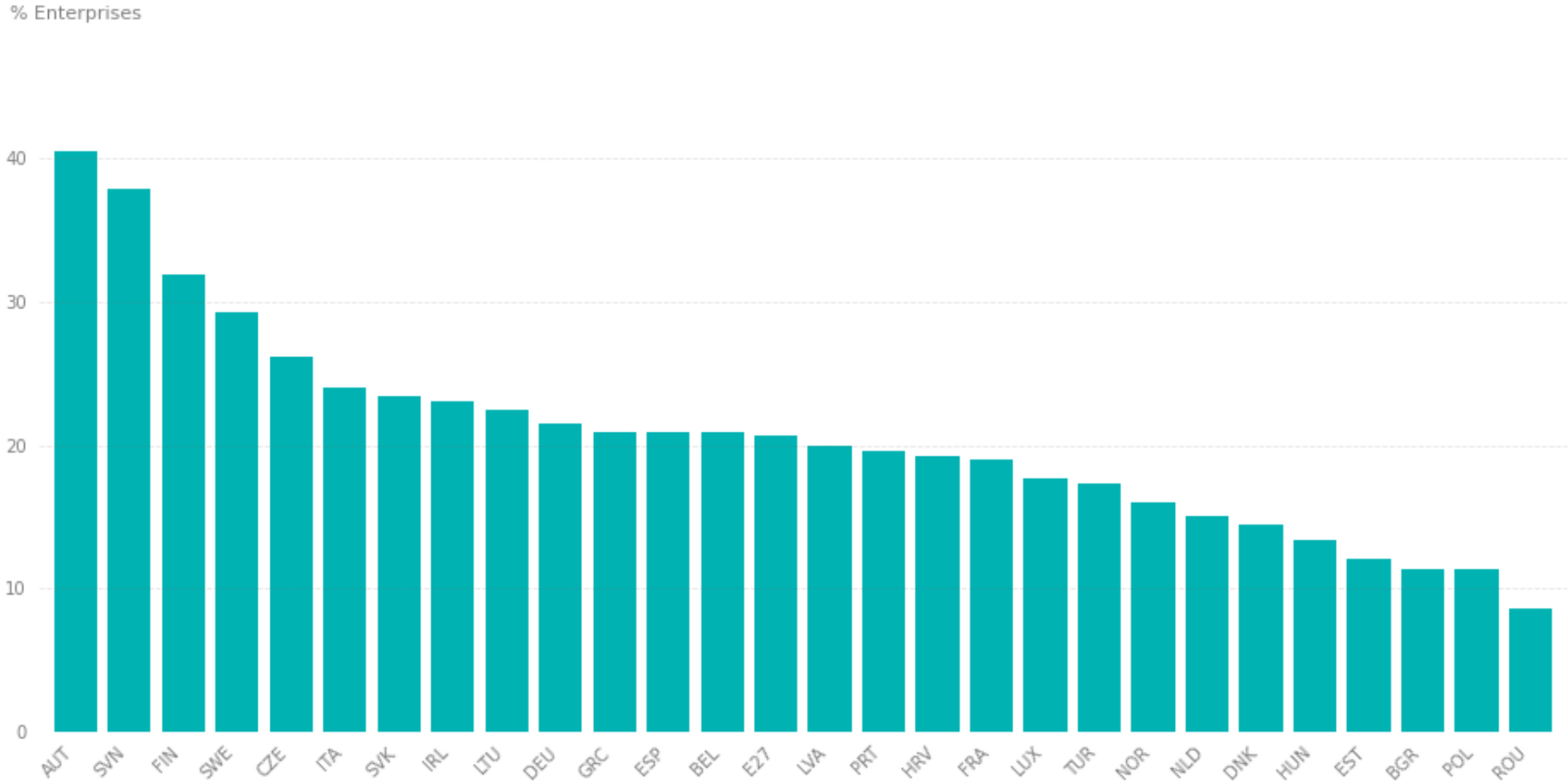
Source: OECD (2024), ICT access and usage" (databases), https://oe.cd/dx/ict-access-usage (accessed 18 May 2024).

Enterprises use IoT for Energy Consumption Management (e.g. smart-meters, thermostats, lights)



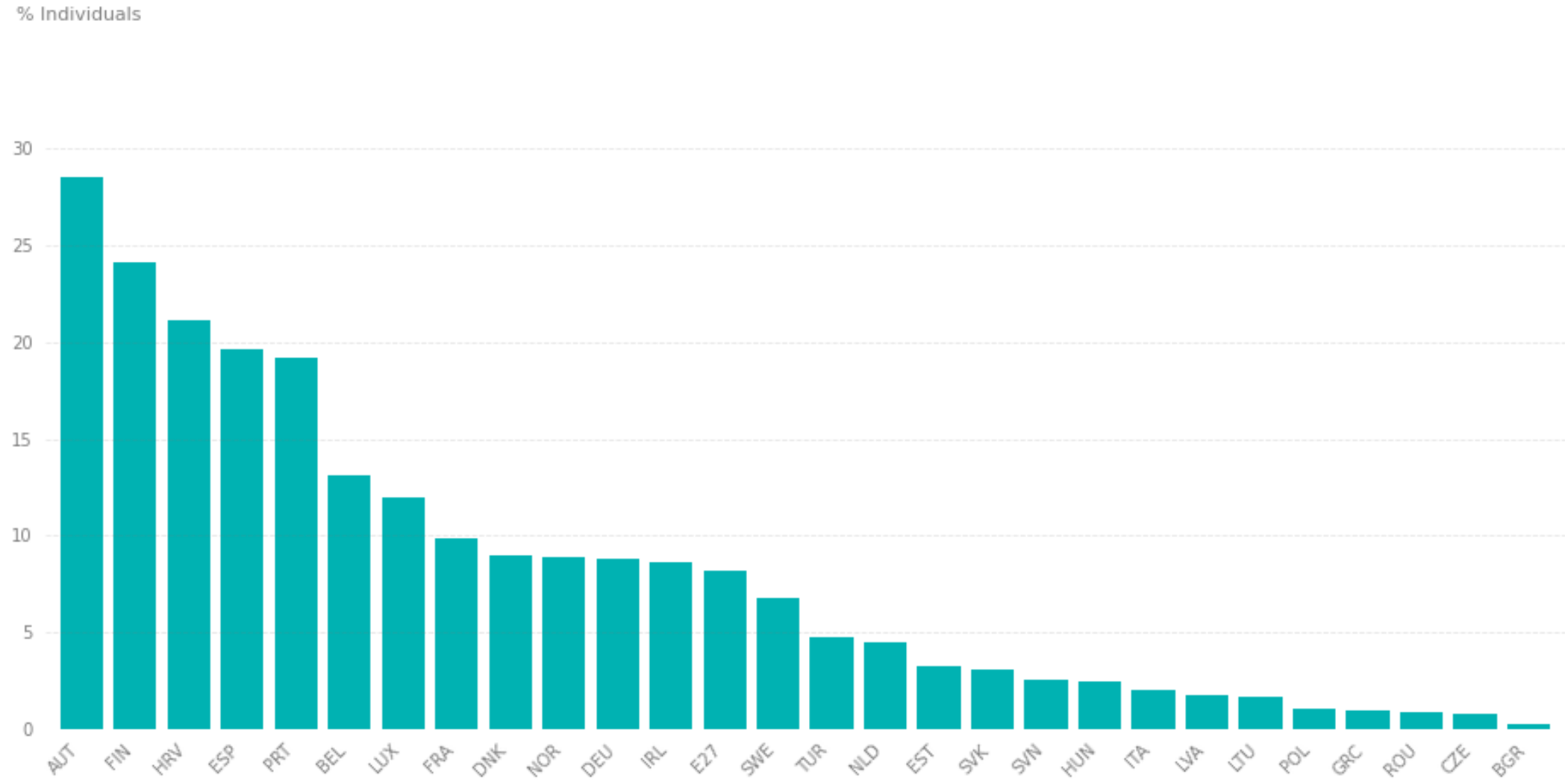
Source: Eurostat. Data refers to 2021, for businesses with 10 or more employees.

Enterprises use IoT for premises' security (e.g. alarm systems, smoke detectors, security cameras)



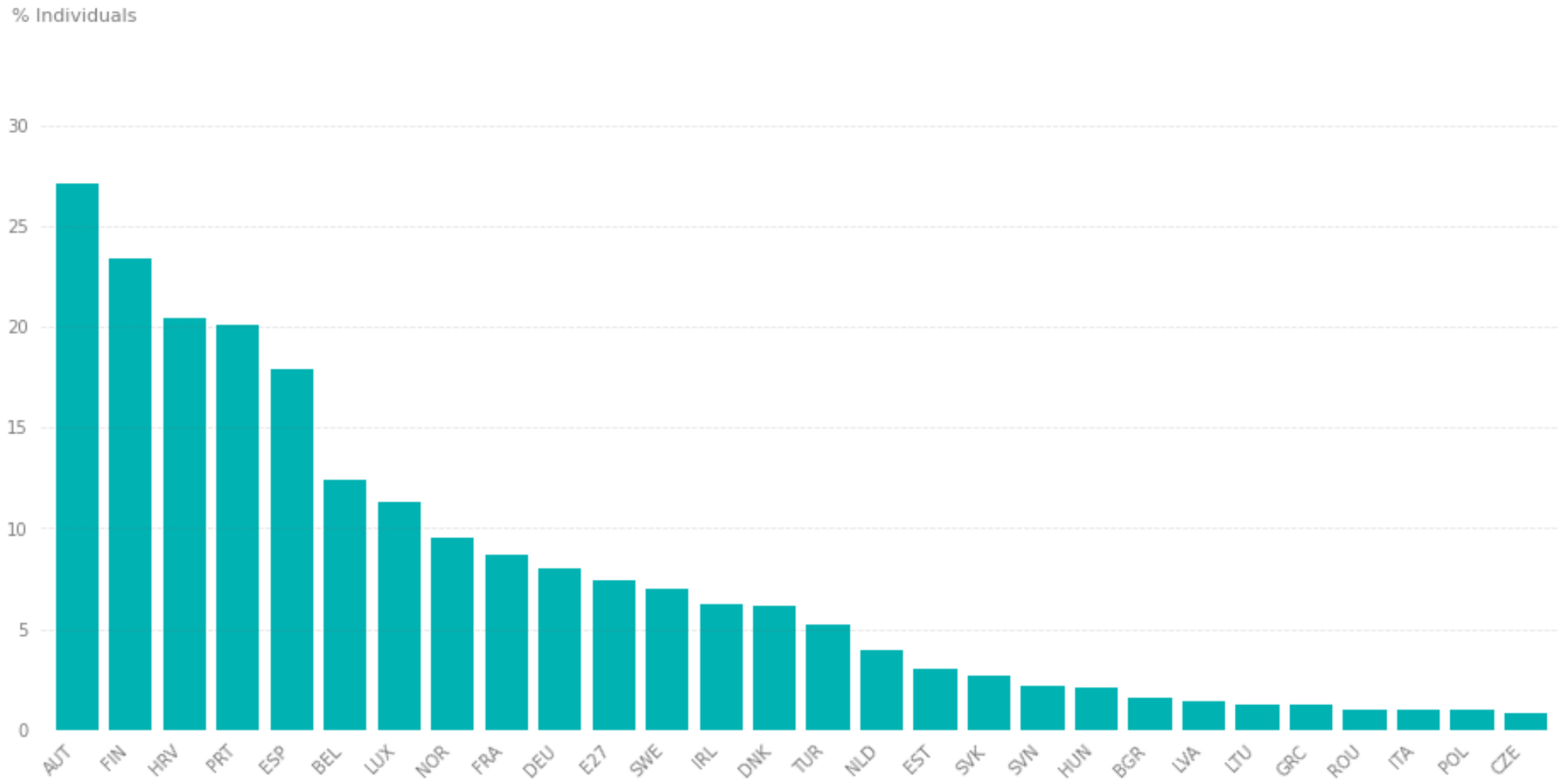
Source: Eurostat. Data refers to 2021, for businesses with 10 or more employees.

Individuals have concerns about the privacy and protection of personal data generated by IoT devices or systems



Source: Eurostat. Data refers to 2022.

Individuals have concerns about IoT security

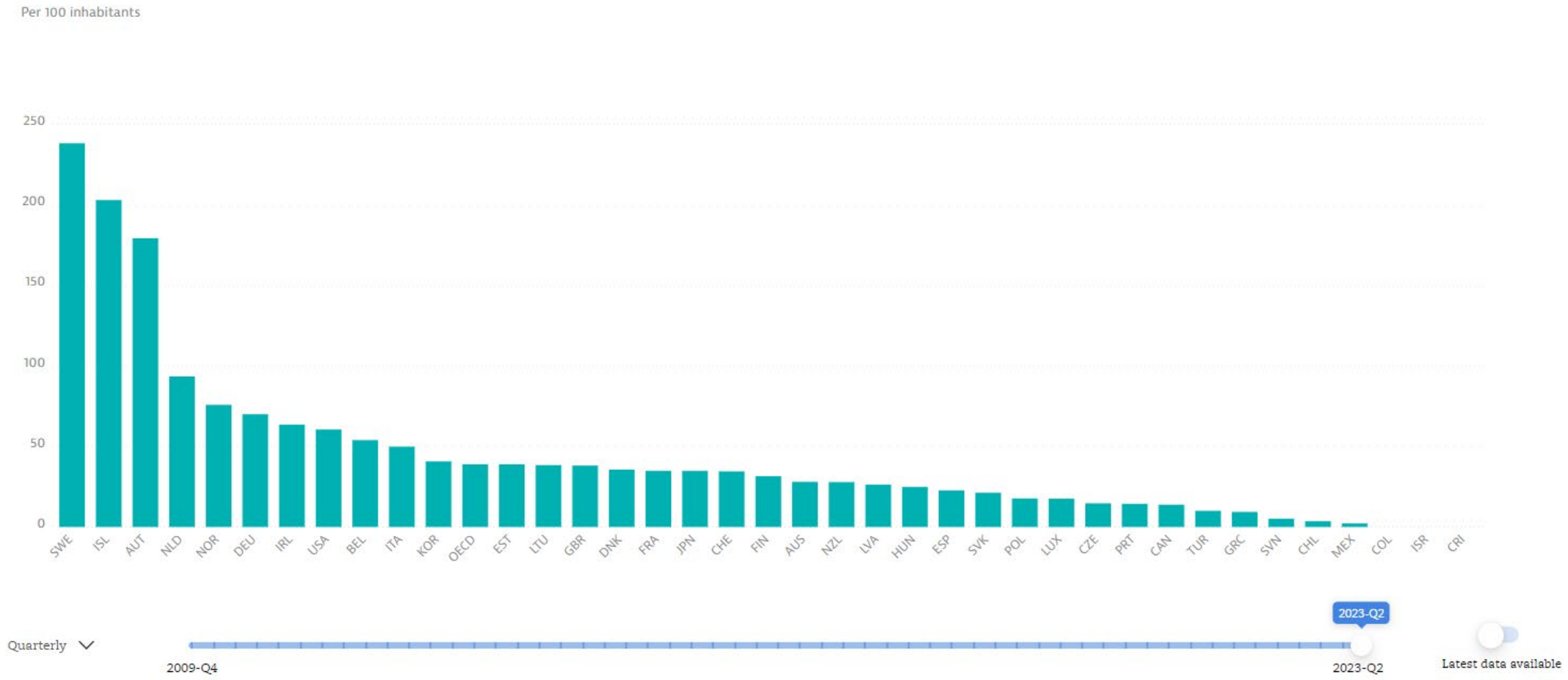


Source: Eurostat. Data refers to 2022.

Other data sources used to measure the IoT

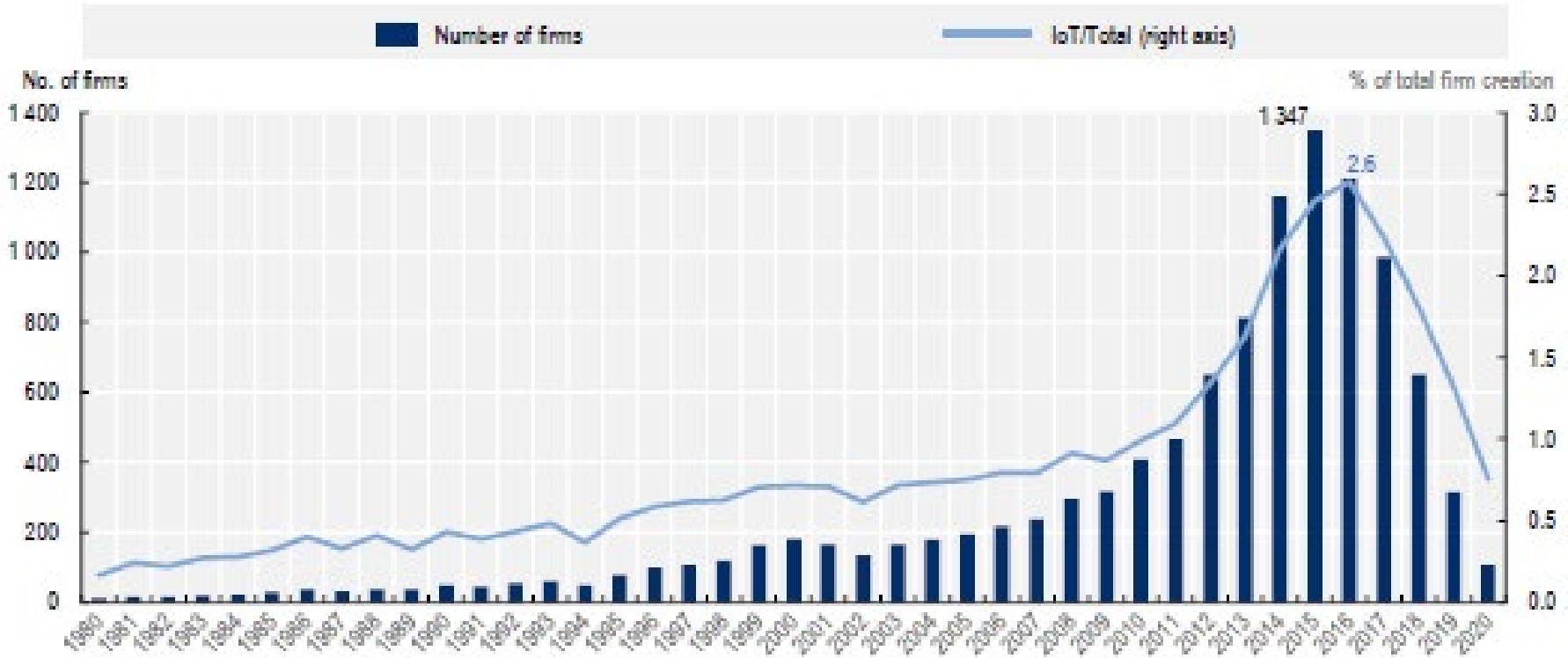
- Patent data (patent offices)
- Data from telecom regulators (e.g. M2M SIM cards)
- Private data sources, including at the firm level (e.g. Crunchbase)

M2M SIM Cards



Source: OECD Going Digital Toolkit, https://goingdigital.oecd.org/indicator/12.

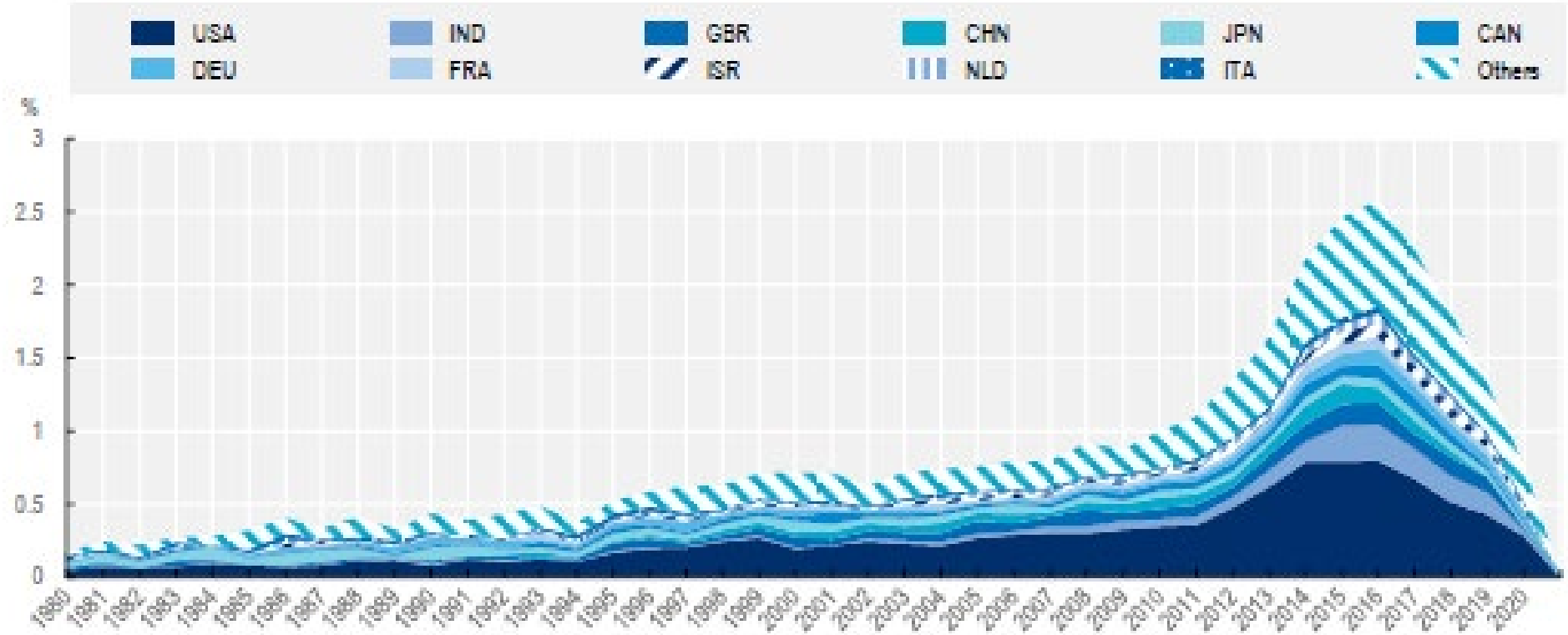
IoT firm creation, 1980-2020



Source: OECD (2023), *Measuring the Internet of Things*, OECD Publishing, Paris, https://doi.org/10.1787/021333b7-en.

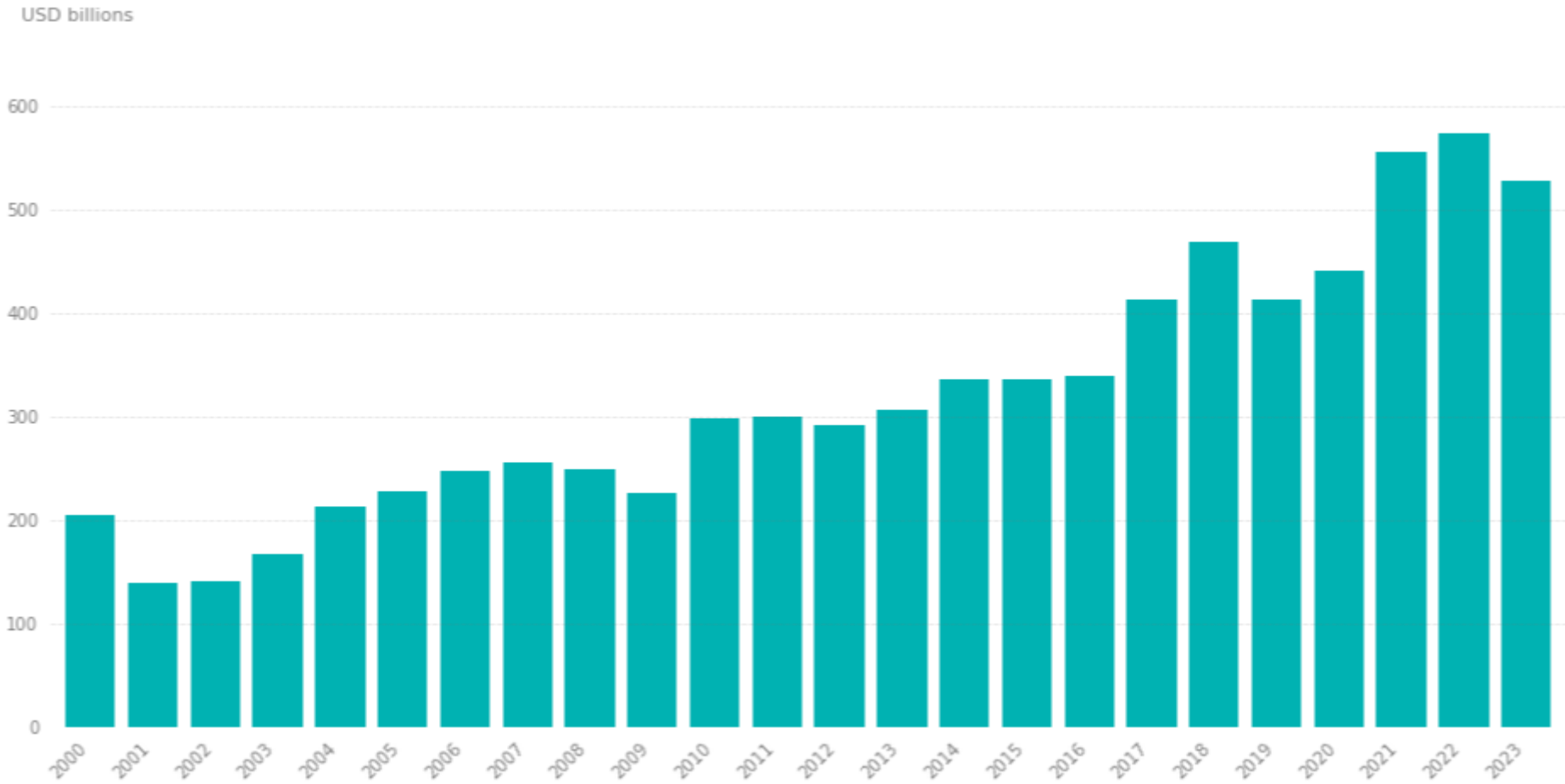
IoT firm creation by country

As a percentage of IoT firm creation worldwide



Source: OECD (2023), *Measuring the Internet of Things*, OECD Publishing, Paris, https://doi.org/10.1787/021333b7-en.

Semiconductor revenue



Source: WSTS, Market Statistics, https://www.wsts.org.

Want to learn more?

https://www.oecd.org/publication/digital-economy-outlook/2024/

https://doi.org/10.1787/021333b7-en

Thank you for your attention

For any questions, please contact:

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