European Commission

2025 EU Industrial R&D Investment Scoreboard

Contact information
European Commission – Joint Research Centre
Directorate Fair and Sustainable Economy – Industrial Strategy, Skills & Technology Transfer
Edificio Expo; c/ Inca Garcilaso N° 3
E-41092 Seville (Spain)
Email: JRC-B6-SECRETARIAT@ec.europa.eu
Tel.: +34 954488318

The Joint Research Centre: EU Science Hub
https://joint-research-centre.ec.europa.eu

DG Research and Innovation
https://commission.europa.eu/about/departments-and-executive-agencies/research-and-innovation_en

JRC144638

Print	ISBN 978-92-68-34802-4	ISSN 2599-5731	doi:10.2760/6526424	KJ-01-25-623-EN-C
PDF	ISBN 978-92-68-34801-7	ISSN 2599-574X	doi:10.2760/7802619	KJ-01-25-623-EN-N

Luxembourg: Publications Office of the European Union, 2025

How to cite this report: Nindl, E., Napolitano, L., Confraria, H., Rentocchini, F., Fako, P. et al., *The 2025 EU Industrial R&D Investment Scoreboard,* Publications Office of the European Union, Luxembourg, 2025, https://data.europa.eu/doi/10.2760/7802619, JRC144638.

Contents

Abstract

The 2025 edition of 'The EU Industrial R&D Investment Scoreboard' monitors and analyses industrial research and development (R&D) investment trends in the context of the EU's 3% of GDP R&D investment policy target and the related policy initiatives by the Competitiveness Compass.

The 2025 Scoreboard analyses the world's top 2 000 corporate R&D investors, responsible for over 90% of R&D performed by the business sector globally, based on the financial information in the latest published audited accounts of firms. Following the introduction, Chapter 2 analyses the main global trends and benchmarks the EU's top R&D investing companies against global competitors. Chapter 3 provides details by sector, and Chapter 4 does a deep-dive on a subsample of the EU's top 800 R&D investing firms. Chapter 5 analyses R&D internationalisation and Chapter 6 key green technologies.

Foreword

The 2025 edition of the EU Industrial R&D Investment Scoreboard shows some promising opportunities for Europe. In 2024, EU companies in the electricity and renewable energy sectors increased their R&D and capital investments by 19.8% and 17.8% respectively – an important step towards achieving the goals of the Clean Industrial Deal. The health sector also showed promise, with EU companies seeing a 13% increase in R&D investment – significantly higher than in other parts of the world. We are also pleased to see that the European aerospace and defence industry is investing 4.8% more to increase Europe's defence readiness.

But while these signs are encouraging, Europe's companies still face difficulties when it comes to attracting investment in the areas where they are needed most. For instance, Europe is lacking the ICT companies that are needed to lead our digital transition and protect our digital sovereignty. Another structural challenge is the automotive sector, Europe's traditional stronghold, whose R&D investments stifled in 2024, reflecting the pressure of our global competitors such as China, which is catching up rapidly, particularly when it comes to electric vehicles.

At 2.9%, the EU's R&D investment growth rate for the last year is the lowest since the COVID-19 pandemic. More must be done. We must dial up the volume of Mario Draghi's wakeup call to Europe if we are to fix the challenges of today and seize the opportunities of tomorrow.

The Commission is already taking action. Informed by the Letta, Draghi, Niinistö and Heitor reports, we created the Competitiveness Compass – our roadmap to restoring Europe's dynamism and boosting our economic growth. We have also launched important initiatives in the last year, each aimed at boosting investments and innovation in advanced technologies.

The EU Startup and Scaleup Strategy will be essential to this mission. With this strategy, we intend to make Europe a top destination for launching and growing global, technology-driven companies. We will also focus on emerging and advanced technologies to support our crisis preparedness and defence readiness – and with our 2030 deadline looming, there is not a moment to lose. Additionally, the Clean Industrial Deal relies on advanced technologies, meaning that we urgently need to set up a global market to mobilise R&D.

The European Strategy on Research and Technology Infrastructures, which was adopted earlier this year, will also play a key role in helping companies obtain world-class support for their R&D efforts. The framework conditions for R&D investments will be further improved with the European Research Area Act, European Innovation Act as well as the Advanced Materials Act, all of which are planned for 2026. So, as you can see, much has already been done – but there is still much to do.

In conclusion, this edition of the Scoreboard is a call for action to policymakers, industry leaders, and innovators. We must harness the transformative power of R&D investments for our society, economy and resilience. This year's Scoreboard shows again how much we need to increase these investments in Europe, and how we urgently need to become a better place for starting, growing and retaining innovative ventures in strategic sectors.

Bernard Magenhann
Director-General
European Commission
Joint Research Centre
(JRC)

Marc Lemaître
Director-General
European Commission
Research and Innovation
(RTD)

Acknowledgements

The 2025 EU Industrial R&D Investment Scoreboard has been published within the context of the Global Industrial Research & Innovation Analyses (GLORIA) project that is jointly carried out by the European Commission's Directorate General for Research and Innovation (DG RTD) Directorate E 'Prosperity', and the Joint Research Centre (JRC) Directorate B 'Fair and Sustainable Economy'. GLORIA has received funding from the European Union's Horizon Europe research and innovation programme under a specific action for scientific and technical services by the JRC over the period 2022-2025. The main expected impact of GLORIA is the better understanding of corporate Research & Development (R&D) efforts in relation to the EU's long-term 3% of GDP R&D investment policy target and the EU policy objectives regarding competitiveness, the green deal and sustainability.

During 2025, the GLORIA project has been coordinated from 1 July onwards by Diana Ognyanova and before by Evgeni Evgeniev (both Policy Officers, DG RTD.E1 'Industrial Research, Strategy and Coordination') and Alexander Tübke (Team leader, JRC.B6 'Industrial Strategy, Skills & Technology Transfer') under the leadership of Doris Schröcker and Dominik Sobczak (respectively, Head and Deputy Head of DG RTD Unit E1 'Industrial Research, Strategy and Coordination') and Asunción Fernández-Carretero and Fernando Hervás (respectively, Head and Deputy Head of JRC Unit B6 'Industrial Strategy, Skills & Technology Transfer').

This edition of the Scoreboard was produced by Elisabeth Nindl, Lorenzo Napolitano, Hugo Confraria, Francesco Rentocchini, Péter Fákó, James Gavigan, and Alexander Tübke (JRC Unit B6 'Industrial Strategy, Skills & Technology Transfer') and Aliki Georgakaki and Ela Ince (JRC Unit C7 'Energy Transition Insights for Policy') as the main authors. Doris Schröcker, Dominik Sobczak, Diana Ognyanova, Panagiota Tsitsou, Paolo Panjek, Agata Janaszczyk and Constantin Belu (all from DG RTD Unit E1 'Industrial Research, Strategy and Coordination') provided substantial comments, inputs and suggestions for improvement on earlier drafts and offered strategic advice related to the structure and policy orientation of the report.

The data underlying this report have been collected by the team of Alepro Data Analysis & Consulting, under leadership by Alberto Cáceres Guillén and with special expertise by Nicola Grassano.

We are grateful to the editorial and communication support from the teams at the Directorate General for Research and Innovation and the JRC, as well as Beatriz Pavón for the design of the cover. A special thanks goes to Anja Suurland for supporting the publication of the report.

Authors

Elisabeth Nindl, Lorenzo Napolitano, Hugo Confraria, Francesco Rentocchini, Péter Fákó, Ela Ince, Aliki Georgakaki, James Gavigan, and Alexander Tübke.

Executive summary

Introduction

Published annually since 2004, the EU Industrial Research & Development (R&D) Investment Scoreboard provides detailed financial data and analysis of global corporate R&D investors, with a particular focus on firms headquartered in the EU. The **2025 Scoreboard covers the world's top 2 000 firms investing in R&D,** which together account for about 90% of business-funded R&D globally. In addition, it provides a detailed look at the **top 800 EU-based firms**. They threshold for inclusion in the 2025 Scoreboard, at rank 2 000, is EUR 63 million in R&D investment.

Policy Background

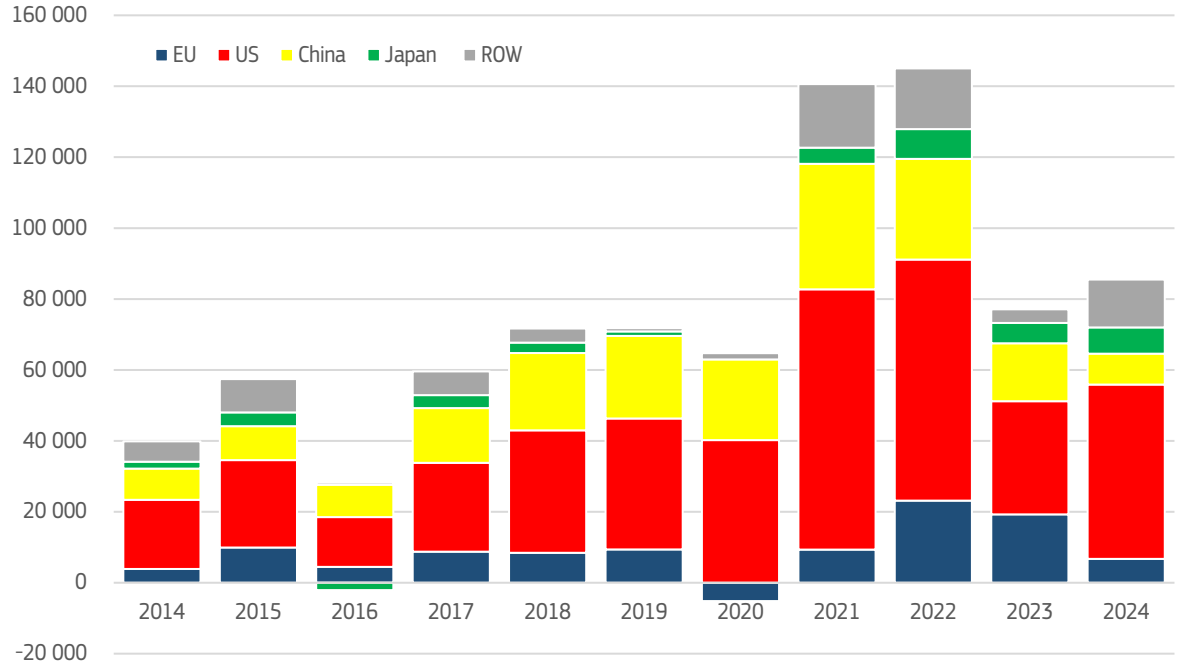
In a year marked by **geopolitical tensions that have raised costs and slowed GDP growth,** the **importance of R&D and innovation has been highlighted** by the 2025 Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel awarded to Joel Mokyr, Philippe Aghion, and Peter Howitt 'for having explained innovation-driven economic growth'. At the EU level, Commission President von der Leyen reshaped the research and innovation policy agenda with the introduction of the **Competitiveness Compass** in January 2025. This new roadmap aims to stimulate economic growth by increasing investment, bridging the "innovation gap", and expanding the Single Market, building on recommendations from the Draghi, Heitor, Letta, and Niinistö reports. The Compass is pushing forward **policy initiatives** such as the EU startup and scaleup strategy, the European Innovation Act and the proposed 28th regime to boost competitiveness. Other sector-specific initiatives, such as the Advanced Materials Act, the Biotechnology Act, the Circular Economy Act, the life sciences strategy and the AI in science strategy also aim to address specific challenges in EU research and innovation.

Main findings

Global R&D investment growth maintained last year's momentum

In 2024, global R&D investment grew by EUR 85.8 billion (6.3% nominal growth rate), totalling **EUR 1 446 billion**, slightly above last year's rate (6%) but below the average annual growth rate since 2014 (7.5%). Among the Scoreboard companies, the 291 companies from the rest of the world (ROW) recorded the highest yearly growth (8.1%), followed by the 674 US firms (7.8%) and the 192 Japanese firms (7.1%). Growth was more moderate among the 318 EU-based companies (2.9%) and the 525 Chinese firms (3.9%). For the EU, the figure constitutes the lowest R&D investment growth rate since the COVID-19 pandemic in 2020 (see **Figure 1**), and for China the lowest R&D investment growth rate on record signalling a slowdown of innovation activity in both regions (see **section 2.4**).

Figure 1. R&D investment growth by regions, top 2 000 companies, 2014-2024



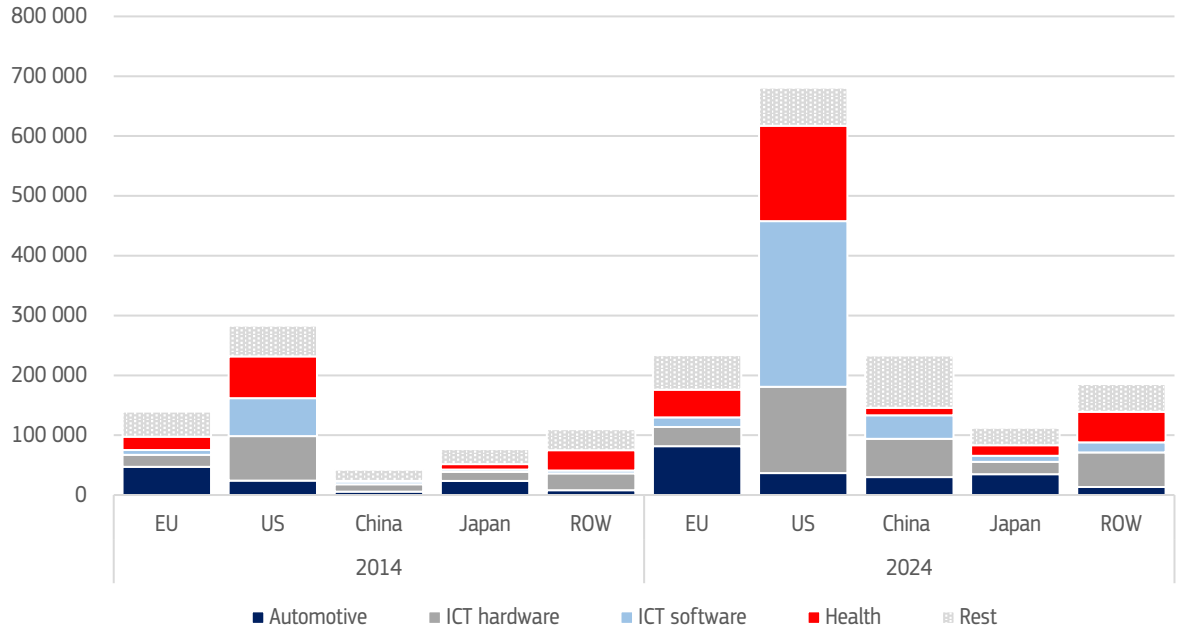
Notes: The vertical axis displays the change in R&D investment by the 2 000 companies (in EUR million). Switzerland and the United Kingdom are included in the ROW.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

EU retains strength in automotive R&D, while US dominates ICT and health

Four key sectors – ICT software (24.9% of total Scoreboard R&D), ICT hardware (22.0%), health (19.9%), and automotive (13.6%) – continue to account for the bulk of R&D investment and its growth (see **Chapter 3**). These four sectors **accounted for over 80% of total R&D investment** by the top 2 000 companies, the highest share so far. Leadership within these sectors has remained stable: **US companies dominated in ICT software, ICT hardware and health**, while **EU firms maintained leadership in automotive R&D**. The EU's automotive sector, a cornerstone of EU innovation, reached EUR 87 billion of R&D investment in 2024, more than twice that of US or Japanese firms. However, global R&D growth in automotive was led by Chinese (11.9%) and Japanese companies (12.3%), with EU (0.8%) and US firms (down 1.7%) slowing down. **EU companies also faced challenges in ICT software** (down 8.9%), with exits from the top 2 000 and significant reductions in R&D from key players. This is particularly concerning as the ICT software has been the fastest-growing sector globally over the past decade (see **Figure 2**), increasing from 13% of global R&D in 2014 to 24.9% in 2024. **On a positive note**, **certain strategic sectors in the EU demonstrated strong performance in 2024.** EU energy companies providing **electricity and renewable energy** significantly raised their R&D (up 19.8%). The European **aerospace and defence** industry showed a 4.8% growth in R&D investment, aligning with Europe's efforts to enhance preparedness and defence readiness. Additionally, EU companies in the **health sector** also raised R&D investments well above their global peers (EU 13% vs US 7.1%, Japan 9.1%, China 0.1%).

Figure 2. R&D top sectors – R&D investment across regions 2014 and 2024



Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

Sectoral specialisation explains the gaps in R&D intensity and R&D investment per employee between the EU and the US

Structural specialisation differences explain why aggregate R&D intensity (R&D investment over net sales) and R&D investment per employee are much higher in the US than in the EU and other regions (see **section 2.5.4**). In 2024, **US companies had an average R&D intensity of 8.4%, compared to 4.4% for EU companies**, 4.2% for Japan, 4% for China, and 3.8% for the ROW. **US companies** also invested an average of over **EUR 48 700 per employee in R&D,** almost triple the **EU** value of **EUR 16 800**. The sectors with the highest R&D investment per employee were health and ICT software, while ICT hardware and automotive companies invested significantly less per employee.

Newly added Amazon leads the global ranking

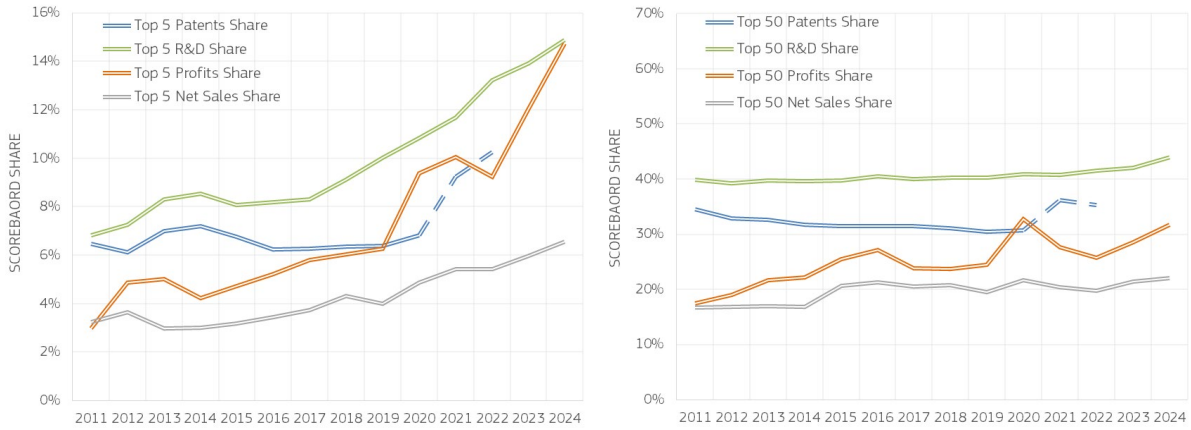
US-based Amazon tops the global ranking with **EUR 65.3 billion R&D investment** (equivalent to 4.7% of the total R&D investment of the top 2 000 companies in 2024), while **the largest EU-based R&D investor, Volkswagen,** remains in the 8th place (EUR 20.9 billion). Among the top 50 R&D investors, the US dominates with 25 companies (see **section 2.2**), followed by the EU (11 companies), China (5), Japan (3), Switzerland (3), and one company each from South Korea, Taiwan and the United Kingdom. The largest contributors to global R&D growth in 2024 include Meta, Amazon, Samsung Electronics, Nvidia and Alphabet (each adding more than EUR 4 billion to their R&D investment levels), reflecting substantial investment in generative and agentic AI, advanced robotics and semiconductor design and materials (see **section 2.2.3**).

Rising concentration of R&D investment

Global R&D investment is **becoming increasingly concentrated**, **driven largely by US technology giants** (Amazon, Alphabet, Meta, Microsoft and Apple). Over the past decade, the top 5 companies have nearly doubled their share of global R&D investment among the top 2 000 firms, now **accounting for approximately 15% of the total R&D investment in the Scoreboard**

(see **Figure 3**). This concentration is mirrored in profits and sales, with the top 5 firms' profit share rising from 3% to 15% and their sales share from 2.3% to 6.6% between 2011 and 2024. By contrast, the combined share of the top 50 companies increased more modestly, by 1.5 percentage points to 43%, indicating that concentration has intensified mainly at the very top of our ranking. These trends suggest that **innovation capacity is increasingly concentrated in a handful of companies in ICT software and hardware**, reinforcing their competitive edge and raising implications for market dynamism and broader innovation diffusion within the global economy (see **section 2.3**).

Figure 3. Evolution of top 5 (left) and top 50 (right) share of R&D, profits and sales among the top 2 000, 2011-2024



Note: The 'Top 5' and 'Top 50' refer to the leading 5 and 50 companies, respectively, in each year's Scoreboard ranking, determined by their R&D investment denominated in EUR. 'Patents' refers to families of patent applications filed in at least two of the world's top 5 patent offices: CNIPA (China), EPO (Europe), JPO (Japan), KIPO (Korea), and USPTO (US). Patent data for 2024 and 2023 (and to some extent 2022 and 2021) are incomplete due to the lengthy patent process, which includes the stages of priority, application, and publication.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

US tech giants invest heavily in capital expenditure in their quest to develop the most advanced AI

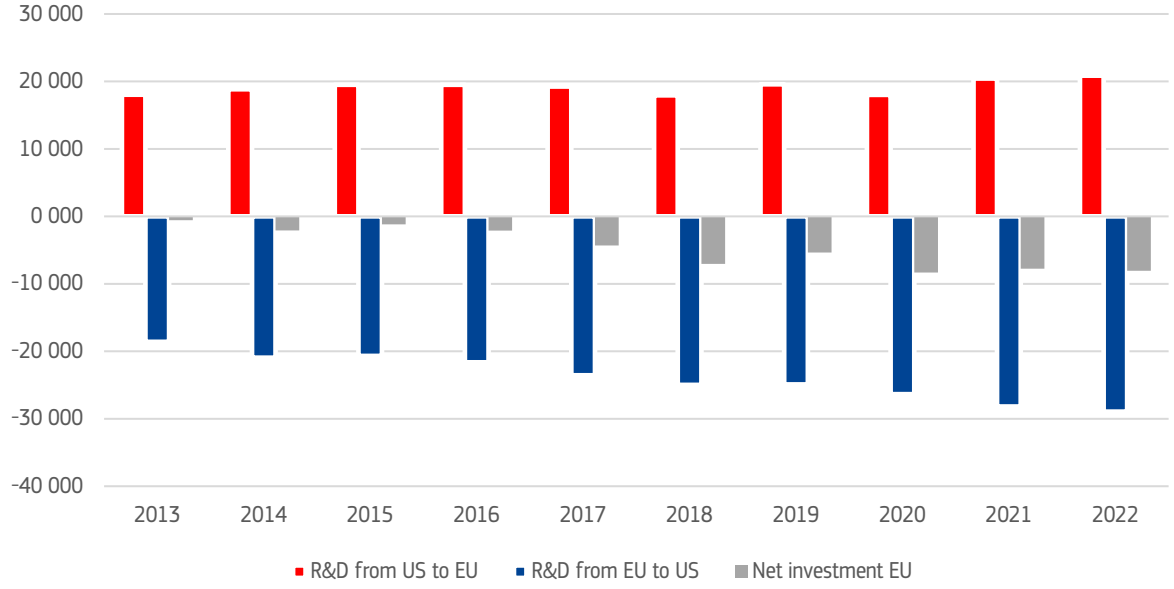
Total **capital expenditure (capex)** by Scoreboard companies rose by 7.7%, driven primarily by **US ICT software firms, whose capex surged by 50.5%** as they rushed to build data centres and related infrastructure for the AI boom, while EU ICT hardware and ICT software firms reduced their capex (see **section 2.5**). By contrast, **EU energy companies strongly increased their capex** (up 23%), signalling a sustained focus on the green transition. **China's capex fell by 2.2% – its first decline since 2016** – reflecting pronounced contractions in construction & materials, automotive and industrials that were only partly offset by higher investment in ICT software and energy.

EU multinationals conduct relatively more R&D in the US than vice versa

A new analysis of R&D investment flows between US multinational enterprises and their foreign affiliates, and foreign multinationals' affiliates in the US, reveals **substantial two-way R&D links between the EU and the US**. The **EU remains the largest destination for US R&D abroad**, even though its share **has declined over time** (see **Chapter 5**). Between 2013 and 2022, US-based firms increased their R&D performed abroad by 65%, but the EU's share of these investments fell by around one quarter, to 30.6%. In 2022, US corporate R&D conducted in EU affiliates represented 3.9% of total US corporate R&D in the Scoreboard, whereas the share of EU

corporate R&D (as measured in the Scoreboard) performed in US affiliates was 14.3%. Emerging economies such as **China and India are attracting a growing share of R&D from the US**, while the EU's R&D flow balance with the US has shifted further into deficit (see **Figure 4**). This widening deficit is also a consequence of the sectoral specialisation of US companies, which are shifting their R&D investments abroad towards service sectors and less into manufacturing.

Figure 4. R&D investment flows US-EU and net R&D investment, 2013-2022



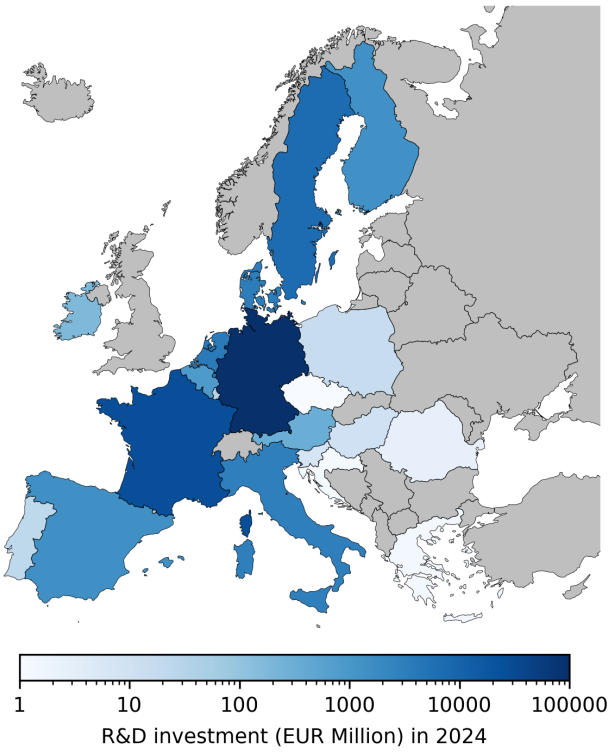
Note: R&D investment in million euro at 2023 end-of-year exchange rates. R&D outflows from the US were transformed with a negative sign for better visualisation. BEA data were retrieved from https://www.bea.gov/data/intl-trade-investment/activities-us-affiliates-foreign-mnes on August 26, 2025.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Framework conditions in EU innovation leader countries boost R&D-intensive firms

The EU 800 companies are located in 20 Member States and together invested EUR 245.5 billion in R&D in 2024, with Germany and France remaining the countries with the largest number of companies and the highest R&D investment (see **Figure 5**). This year, the EU 800 sample includes a **new breakdown** of EU Scoreboard companies **by European Innovation Scoreboard (EIS) country groups** (innovation leaders, strong innovators, moderate innovators, see **section 4.2**). The analysis shows that most EU 800 R&D investment is concentrated in strong innovator countries, which include the largest Member States, but that the **share of companies from innovation leader countries** (Denmark, Finland, the Netherlands, Sweden) has **increased** over the past decade. Over the 10-year period, companies located in the innovation leader countries registered an annual growth rate of R&D investment of 6.8%, significantly higher than the growth rates of companies located in strong innovator countries (4.6%) and those located in moderate innovator countries (2.5%). The analysis indicates that framework conditions in **innovation leader countries** are more conducive to the creation and scaling of **small, R&D-intensive Scoreboard firms**, whereas **moderate innovator countries** see **fewer R&D-intensive new entrants and relatively low R&D investment per employee** among incumbents.

Figure 5. Map of EU 800 absolute R&D Investment by country

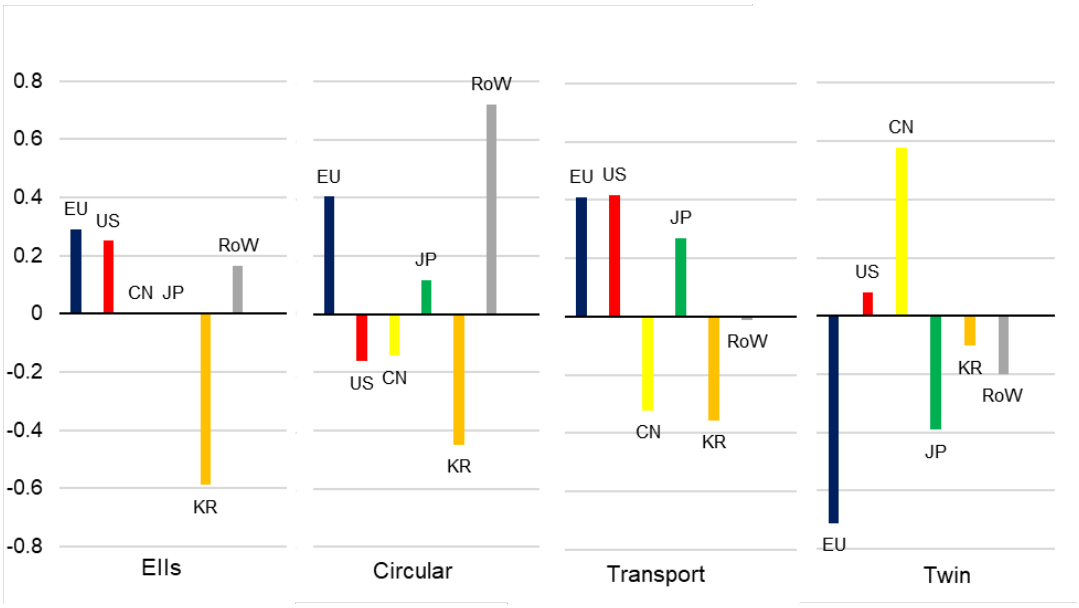


Notes: Map - colour darkness proportional to R&D investment in 2024 by companies headquartered in the country.
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

EU leads globally in green inventions related to circularity, energy-intensive industries and clean transport, while lagging in twin transition related inventions.

The **EU continues to lead** in cumulative international **green patent filings** alongside Japan, though China is rapidly catching up (see **Chapter 6**). As of 2021, the EU demonstrated specialisation in three of four critical technology areas (see **Figure 6**) aligned with its decarbonisation agenda: leading globally in energy intensive industries and circularity, ranking second to Japan in clean transport, **but underperforming in green and digital (twin transition) inventions**. Germany and France remain the dominant contributors across most key technology areas, while several Member States–including Sweden, Finland, and Ireland–show strengths in the twin transition domain, supported by advanced technology industries, digital infrastructure, and favourable policy environments.

Figure 6. Specialisation index in key technology areas by major economy (2021)



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

1. Introduction

The EU Industrial R&D Investment Scoreboard provides data and analysis on the top corporate R&D investors from the EU and worldwide. It is based on data extracted directly from each company's latest publicly available financial accounts. Since 2004, the Scoreboard has been published annually to monitor and analyse the state of corporate R&D activity in Europe, particularly in relation to the R&D investment target of 3% of GDP, which remains central to the EU's long-term competitiveness agenda (European Commission, 2025). As pointed out in the Draghi (2024) report, the effective mobilisation of investments is urgent to close the persistent innovation gaps to main competitors.

The 2025 EU Industrial R&D Investment Scoreboard provides economic and financial information based on the most recent audited balance sheets of the **world's top 2 000 R&D investors, which are responsible for over 90% of R&D carried out by the business sector**. It benchmarks companies headquartered in the EU compared to those in the US, China, Japan and the rest-of-the-world (ROW) in 2024, and follows R&D investment dynamics over the past decade. In addition, we have used recent data that allows to analyse R&D investment flows between parents and subsidiaries of multinational companies, shedding light on R&D internationalisation dynamics.

The Scoreboard contains a **special focus on an extended sample of the top EU 800 R&D investing companies**. To enable a better integration of the Scoreboard's results across policy fields, we **added new analyses by applying the European Innovation Scoreboard (EIS) performance groups**. The grouping of the EU 800 sample in innovation leaders and followers connects the broader innovation systems perspective with corporate and sectoral developments. Moreover, we analyse this extended EU sample by novel **company size classes (SMEs, small mid-caps, mid-caps and large companies)** as suggested in the EU Competitiveness Compass in order to shed light on heterogeneities across companies of different sizes.

As an up-to-date benchmarking tool, the Scoreboard allows to **analyse and compare developments** in companies, sectors and geographical areas, as well as for the **monitoring and analysis of investment** trends and patterns. The **Scoreboard dataset is made publicly available** each year to enable benchmarking, encourage firms to disclose R&D, and foster its use by the scientific community.[1] As a **policy support instrument**, the Scoreboard provides the latest performance data on global private R&D, which is widely used in other monitoring tools and policy reports such as the EIS, WIPO Global Innovation Index (GII), Digital Decade Dashboards, European Research Area Reports, and the Science, Research & Innovation Performance (SRIP) reports. Further articles using Scoreboard data and exploring causal relationships are published regularly in academic journals (e.g. Rezende et al., 2019; Szücs, 2020) and the JRC Publications Repository (e.g. Czarnitzki & Confraria, 2025; Martinez Cillero et al., 2025).

1.1. Economic context

Over the past year, both the global and especially the European economy, have been buffeted by **geopolitical upheaval**, the **wars in Ukraine and the Middle East, US politics, uneven growth and energy-market volatility** where price spikes have continued to expose EU industry to costs

[1] The data are available here: https://iri.jrc.ec.europa.eu/data

well above pre-pandemic levels. Political and private stakeholders across the EU struggle to navigate these evolving tensions and emerging scenarios and their impacts on industrial competitiveness.

In 2024–the reporting year for this Scoreboard edition–**GDP increased by 1.0% in the EU**, up from 0.5% in 2023, though elsewhere it was much higher: in the **US it increased by 2.9%** in 2024 and 2023 (Eurostat, 2025), and despite some slowdown, Chinese GDP growth was still robust in 2024, being still close to the official 5% growth target. The slowdown is partly due to large fiscal deficits ran at the regional level leading to reduced government-sponsored investment. Japan saw it's GDP stagnating in 2024 with a marginal increase of 0.1%, down from 1.5% in 2023 (World Bank, 2025).

Throughout 2025, the global economic situation has shown mixed signals with **growth projections being revised both upward and downward.** The IMF's October forecast revised global economic growth to **3.2% for 2025 and 3.1% for 2026**, representing modest upward adjustments from April projections. This is due to stronger-than-expected consumer spending and front-loaded imports ahead of tariff increases and a reduction in effective US tariff rates from 24.4% to about 19%. For the US, the forecast states 2.0% GDP growth in 2025 and 2.1% in 2026, for China 4.8% and 4.2%, and for Japan 0.2% and 1.1% (International Monetary Fund, 2025). **In the EU**, the European Commission's Autumn 2025 forecast put GDP growth at **1.4% in 2025 and 2026**, with euro area GDP growth somewhat lower at 1.3% in 2025 and 1.2% in 2026 (European Commission, 2025b).

Inflation trends diverge across regions. While headline inflation is generally declining, it remains above central bank targets in many countries, with services price inflation proving particularly persistent. The OECD projects global inflation to reach 3.2% in 2025 and 2.9% in 2026–lower than previously anticipated. The inflation rates for the US are projected to 2.7% in 2025 and 3.0% in 2026, while in **China deflation will continue in 2025** with -0.2%, and low inflation in 2026 with 0.3%. Inflation is forecast to remain rather high in Japan with 3.1% in 2025 and 2.1% in 2026 (OECD, 2025). The European Commission's Autumn 2025 forecast projects **EU inflation to 2.5% in 2025, and 2.1% in 2026**, and for the euro area 2.1% and 1.9%. There is large **heterogeneity in the inflation rates in the EU**, with France forecasted at 1% in 2025, Italy at 1.7%, Germany at 2.3%, and Spain 2.7%, whereas the forecasts for eastern EU countries, the Baltic states or Austria range between 3.5% and 4.8% (European Commission, 2025b).

Globally, central banks have implemented coordinated **interest rate reductions since mid-2024**, with the US Federal Reserve maintaining 4.00-4.50% and the ECB cutting to 2.15%. This trajectory reflects declining inflation pressures, though rates remain high by historical standards, following the exceptional 2022–2023 tightening cycle that constrained business investment through 2024. **Financing conditions also remain heterogeneous by firm size**: the OECD (2025b) reports that SME lending declined 4.7% globally in 2023, while the ECB's Q3 (2025) survey shows large firms benefited from net 31% interest rate reductions versus SMEs facing net 2% increases, with SMEs encountering rising collateral requirements and access barriers despite the easing cycle.

The ongoing **challenges of the economic environment are leaving their mark on the global corporate landscape**. According to Schwartz et al. (2025), the elevated pace of large corporate bankruptcy filings that began in early 2023 continued through the latter half of 2024 and into the first half of 2025. Companies have cited that high inflation and interest rates have slowed customer demand substantially. Shifts in consumer behaviour and competition are difficult to tackle where changes in trade tariffs and framework conditions become cost drivers.

1.2. US Policy Context

The US Presidential elections in November 2024 spurred **an investment and consumption boom** in the US **fuelled by anticipated business-friendly politics and tax breaks** for the high-income class. However, since January 2025, President Trump's second term is having major stop-start impacts on transatlantic relations, global trade dynamics and geopolitics with **tariff policies** creating both challenges and opportunities, prompting corporates to reassess their manufacturing and R&D location strategies. An **EU-US trade deal finalised in July 2025** capped US tariffs on most EU exports at 15% for key sectors such as automobiles, pharmaceuticals and semiconductors, while the EU agreed to eliminate tariffs on US industrial goods and expand market access for American agriculture and energy exports. The agreement averted the planned escalation to 30% blanket tariffs threatened earlier in the year, stabilizing the trade environment.

Beyond shaking up tariffs, the US President also triggered important changes in some policy areas that the country had been spearheading, reversing its stance on green investments and further increasing support to defence and dual use spending. Congress approval of a USD 350 billion fiscal expansion in subsidies for emergency infrastructure, defence and semiconductors before the 2024 presidential elections, and anticipation of the new customs duties and tariffs imposed by the US administration, **have drawn R&D and manufacturing investment back to the US**. The 'America First' policies have encouraged significant announcements, with corporations like Apple, Nvidia and Micron committing to substantial US-based R&D and manufacturing investments. However, his policies also create **uncertainty for international R&D collaborations and supply chains**. Meanwhile, European automotive firms are delaying European EV plant expansions, and pharma companies have expanded US clinical-trial sites to secure incentives before policy drifts away from Biden's Inflation Reduction Act. Pharmaceutical companies are balancing market access with cost optimization, leading to more distributed R&D models.

Meanwhile, **US big tech companies** are increasingly focusing on artificial intelligence (AI), cloud and quantum computing, driven by future opportunities, competition and supportive public policies. The impact of AI, particularly in terms of productivity gains, skill enhancement, and potential labour displacement, is gaining significant attention. The **widespread adoption of AI technologies** is also fuelling a growing demand for data centres and energy resources to support its applications. These dynamics further underscore the EU's urgency to reinforce its own policy toolkit to effectively address these evolving challenges and opportunities.

1.3. EU Policy Context

The EU policy landscape has experienced substantial transformation since the previous Scoreboard, with several **landmark initiatives launched by the second European Commission led by President von der Leyen**. A new policy stance **puts competitiveness at the focus of the Commission's agenda** guided by the Draghi (2024) report and building on the efforts to achieve the 3% of GDP R&D investment target.

The Draghi (2024) report was an 'urgent call' for a **competitiveness strategy** and the **upscaling of strategic technologies** pivoting policy areas towards industrial development via **increasing R&D investments and innovation uptake**. While the Green Deal remains on the agenda, emphasis has shifted to **reshoring strategic value chains, strengthening defence-related industries and supporting large industrial champions**. Draghi's report emphasised that the

European economy risks a 'slow agonizing' decline if reforms lag and has recently been rephrased by Draghi as a 'brutal awakening' due to geopolitical crises.

The **European Commission's Competitiveness Compass**, adopted on 29 Jan 2025, represents the **most significant policy response** to the Draghi (2024) report. Its overarching principle for EU action has three imperatives: **closing the innovation gap, joint roadmap for decarbonization and competitiveness, and reducing dependencies while enhancing security**. It is supported by five horizontal enablers: simplification, single market integration, financing competitiveness, skills development, and better policy coordination.

A cornerstone of the competitiveness agenda is the **EU Startup and Scaleup Strategy**, launched on 28 May 2025. This strategy aims to make Europe the premier destination for starting and growing global technology-driven companies. It has **five key pillars**: innovation-friendly regulation, better financing, market uptake acceleration, talent attraction and retention, and infrastructure access. It also announces the development of a **'28th regime'** – a harmonized EU-wide legal status for startups and scaleups. The Draghi (2024) report has also inspired the Commission to propose a EUR 50 billion budget line within the next Multiannual Financial Framework for scaling-up, manufacturing and deploying strategic technologies.

As announced in the Competitiveness Compass, in 2026 the Commission expects to adopt the **European Research Area (ERA) Act** to address longstanding challenges in the EU's research and innovation (R&I) ecosystem, including fragmented regulatory frameworks, uneven R&D investment, and barriers to knowledge sharing. Key priorities:

- **Investment target**: The ERA Act will focus on national commitments to reach a 3% R&D investment target relative to GDP, supported by new legal mechanisms.
- **Alignment of policies**: Enhanced coordination of investments and policies will be promoted between the EU and Member States, particularly in strategic priority areas.
- **Research framework improvements**: The initiative aims to improve conditions for researchers by facilitating improved research careers, geographical and intersectoral mobility, and open science measures.
- **Safeguarding values**: It seeks to uphold fundamental values, including scientific freedom, ethics, integrity, gender equality, and equal opportunities across the ERA.

In response to the Ukraine war, under the European Defence Fund the Commission has **fast-tracked a defence industry business accelerator** – a co-investment platform for armaments R&D and proposed an Aerospace Competitiveness Act to secure EU leadership in satellites, drones and space-launch systems. Member States have committed to increase defence spending, creating new market opportunities for pan-European consortia.

Additional policy developments impacting industrial R&D investment include:

- The **Advanced Materials Act** and **Apply AI Strategy**, both flagged in von der Leyen's political guidelines, which are moving forward with concrete implementation plans.
- The **Clean Industrial Deal** (launched in Q1 2025) which aims to support energy-intensive industries to decarbonize while maintaining competitiveness.

- The **European Innovation Act** (expected Q1 2026) which will promote regulatory sand-boxes and innovation-friendly policymaking.
- Enhanced defence R&D spending across OECD countries, with the EU developing its **White Paper on the Future of European Defence**.

Looking ahead, the **effectiveness of these policy initiatives will be crucial** for maintaining Europe's competitive position as global R&D spending continues to grow. This underscores the **urgency of implementing effective policies** to enhance European industrial competitiveness in an increasingly challenging global environment.

The success of policy initiatives will be measured not only through increased R&D spending levels but also through improved R&D productivity, enhanced innovation outcomes, and the EU's ability to maintain technological leadership in critical sectors while building capabilities in emerging technologies. The 2025 EU Industrial R&D Investment Scoreboard provides crucial benchmarking data to assess progress against these ambitious policy objectives.

This report is structured as follows.

Chapter 1: Introduction.

Chapter 2: Global R&D investment in 2024 and dynamics

Chapter 3: R&D investment by sector

Chapter 4: A closer look at the EU

Chapter 5: Internationalisation of R&D – analysis of R&D investment flow data

Chapter 6: Patenting trends in key green technologies

2. Global R&D investment in 2024 and dynamics

This chapter provides an overview of the development of the world's top 2 000 R&D companies measured by annual investment in R&D. For this overview, we build on the firm identification and data collection process that we piloted for the 2024 edition of the Scoreboard (see Annex 2). In total, the 2025 Scoreboard covers companies from 45 countries and is **the first edition to include Amazon Inc**.

As discussed in the 2024 Scoreboard (Box 1, Nindl et al 2024), Amazon does not publish data on R&D investment, but instead only on 'Technology and Infrastructure' expenses which encompasses a broader range of expenses beyond R&D activities as defined by the Frascati Manual (OECD, 2015). However, given its significant role in the global R&D landscape we decided to include an **estimate of Amazon's R&D investment** based on the R&D intensity of comparable Scoreboard companies in the same sector (ICT software). This estimation puts Amazon at the top of the ranking, affecting regional and sectoral R&D distributions.[2] To maintain consistency across the dataset, Amazon has also been included in the world rankings for the entire time series, preventing artificial jumps in the statistics. Even though Amazon's data are based on estimates, we are confident that its inclusion will help us analyse even better the global corporate R&D landscape.

Moreover, **we revisited the country classification of the companies** in the Scoreboard and amended the **country of headquarter** to the country where a company has its operational (not legal) headquarters. In 2024, we changed the country of headquarters for 58 companies with a total R&D investment of EUR 38.5 billion. The countries most affected by this change were Ireland (with 17 companies moving to the US), the Netherlands and Luxembourg, all three of which exhibit attractive taxation regimes for international corporations. The regional distribution of R&D remained mostly unaffected by this change, as the largest changes occurred within the EU sample. These changes are discussed in detail in Annex 4. Notwithstanding these adjustments, we ensured that the underlying data are qualitatively unchanged, and the current dataset is fully linked to the past. The **properties of the sample** in terms of distribution of companies and R&D investment across regions and sectors are largely stable compared to previous editions of the Scoreboard.

The chapter is structured as follows: Section 2.1 provides an overview of global R&D investment and dynamics across regions. Section 2.2 focuses on the firm level and presents the technologies under development by the top 10 contributors to R&D investment growth. Section 2.3 analyses the concentration of R&D investment in the top companies. Section 2.4 describes the development of R&D investment since 2014 across the regions. Section 2.5 analyses key performance indicators, and Section 2.6 investigates the subsidiary structure of the Scoreboard companies. The chapter also includes a box that presents the distribution of Scoreboard companies and R&D investment across size classes by employment in each region. The chapter concludes with key points in Section 2.7.

[2] If Amazon were excluded, the ICT software sector's share of R&D in 2024 would drop from 24.9% to 21.3%, making it the second-largest sector for R&D investment, behind ICT hardware. Regionally, removing Amazon would reduce the US's share of total R&D from 47.1% to 44.5%, while the EU's share would increase from 16.2% to 16.9%.

2.1. R&D investment across countries/regions in 2024

The 2 000 companies in the world with the highest levels of annual R&D spending invested a total of **EUR 1 446.2 billion** in R&D in 2024[3], representing an absolute increase of EUR 85.8 billion compared with 2023.[4] After the strong expansion in R&D investment by these companies in 2021 and 2022 when they increased investment by 14.1% and 12.7% respectively, the growth rate of corporate R&D investment slowed down in 2023 to 6.0%, and remained at about the same level in 2024 with 6.3%. The growth rate in 2024 was below the compound average growth rate since 2014 of 7.5%. The **growth rate** of nominal R&D investment by **EU-headquartered Scoreboard companies in 2024 was 2.9% (down from 9.3% in 2023),** well below the ROW with 8.1%, the US with 7.8%, and Japan with 7.1%. Chinese companies continued their downward trend in the growth rate of R&D investment with 3.9%, the lowest value for China so far. The **minimum R&D investment needed to enter the Scoreboard ranking** this year was EUR 63 million. **Table 1** gives an overview of the distribution of the companies by headquarter country and their R&D investment (in nominal terms) for 2024. In total, the Scoreboard features companies from 45 countries (46 in 2023).

Table 1. Countries: R&D investment (in EUR billion) and number of companies, 2024

EU countries	Companies	R&D	Non-EU countries	Companies	R&D
Germany	109 (110)	114.6	**US**	674 (705)	680.8
France	53 (52)	46.4	**China**	525 (518)	233.2
Sweden	26 (26)	17.4	**Japan**	192 (183)	112.4
Netherlands	24 (19)	12.5	**South Korea**	41 (41)	45.2
Denmark	23 (20)	11.3	**UK**	57 (55)	38.7
Italy	21 (21)	10.5	**Switzerland**	37 (37)	34.9
Spain	13 (12)	6.5	**Taiwan**	56 (52)	27.8
Finland	12 (9)	5.8	**Canada**	23 (24)	8.5
Belgium	11 (12)	4.1	**Australia**	9 (9)	6.9
Austria	10 (13)	1.8	**India**	17 (17)	6.4
Ireland	8 (6)	1.4	**Israel**	19 (19)	4.7
Luxembourg	2 (1)	0.37	**Singapore**	7 (7)	2.7
Poland	1 (1)	0.25	**Saudia Arabia**	2 (2)	1.9
Portugal	2 (2)	0.24	**Brazil**	5 (5)	1.9
Hungary	1 (1)	0.24	**Uruguay**	1 (1)	1.6
Slovenia	1 (1)	0.18	**Norway**	2 (2)	0.96
Romania	1 (1)	0.09	**12 other countries**	15 (15)	3.6
Total EU	**318 (308)**	**233.7**	**Non-EU Total**	**1 682 (1 692)**	**1 212.5**

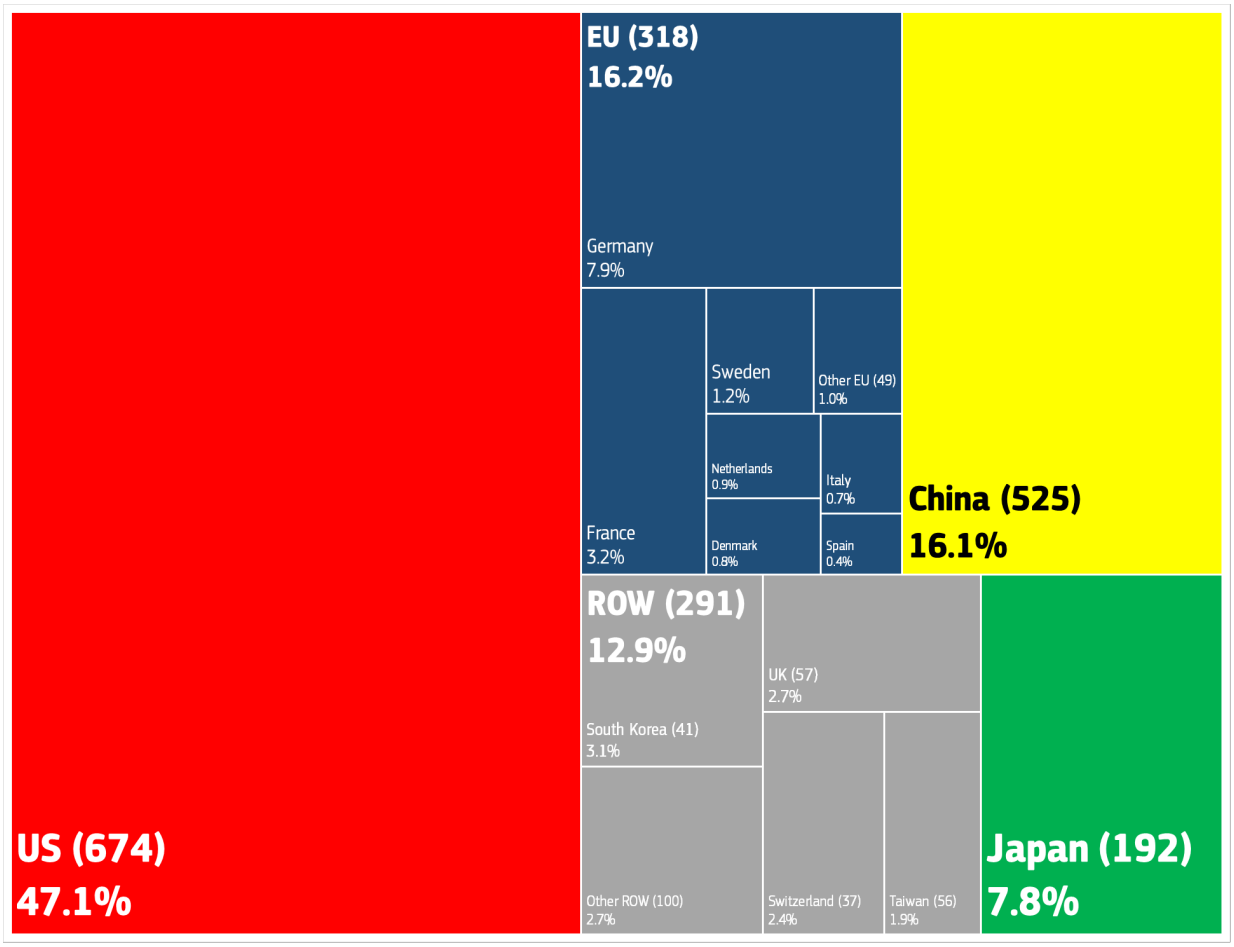
Notes: Figures in brackets show the number of companies in the 2024 edition of the Scoreboard.
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

[3] The Scoreboard data are collected from the companies' latest published annual reports. For most companies, this corresponds to the calendar year 2024. However, a significant number of companies' financial years ended on 31 March 2025, in particular for Japanese and UK firms. Some companies have financial years that ended as late as end of June 2025. Therefore, we refer to the data for the last available year as 2024/2025 and to the previous year as 2023/2024, etc. For reasons of clarity, we refer to the last year as 2024, the previous year as 2023, etc.

[4] The Scoreboard expresses all monetary values at one common exchange rate – the 2024 end-of-year exchange rates to the euro. With the 2024 exchange rates, the 2023 R&D investment is EUR 1 360 billion and not EUR 1 316 billion when measured at 2023 exchange rates.

The US hosts the most companies in the ranking (33.7%), followed by China (26.3%), the EU (15.9%) and Japan (9.6%). The remaining 14.6% are headquartered in countries grouped into the ROW aggregate (including the UK and Taiwan with 2.9% and 2.8% of Scoreboard companies each, South Korea with 2.1%, and Switzerland with 1.9%). Compared with the year 2023, the number of EU firms among the world's top 2 000 R&D investors increased by 10 (of which 3 each are based in Denmark and Finland), while the number of US firms fell by 31, China gained 7, and Japan increased by 9. The ROW group comprised 25 countries and had 5 companies more than in 2023 (the number for Taiwan increased by 4 and by 2 for the UK). **Figure 7** shows the number of firms per region/country and the corresponding share in total R&D investment in 2024.

Figure 7. Distribution of companies and R&D investment across regions, 2024



Notes: Figures in brackets show the number of companies per region/country; the percentages refer to the regions'/ country's share in total Scoreboard R&D investment.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

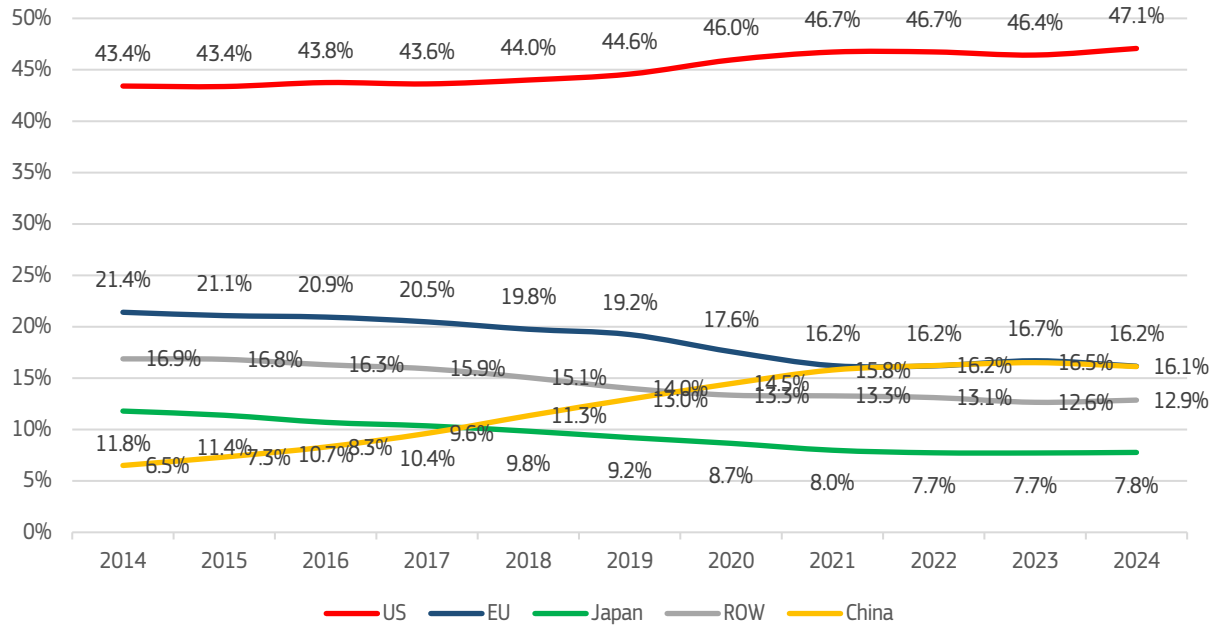
Figure 8 shows the distribution of nominal R&D investment for each year from 2014-2024 across the five major countries/regions. US companies consistently account for over 43% of total global R&D investment in each year. Since the COVID-19 crisis, US companies have been able to increase their share to over 46%, driven mainly by large R&D investments by companies operating in the ICT and health sectors. EU-headquartered companies accounted for 16.2% of total in 2024, down from 16.7% in 2023, while Chinese companies accounted for 16.1% (down from 16.5% in 2023). The R&D investment shares of Japan and the ROW increased somewhat in 2024 to 7.8% and 12.9%.

When comparing the regional shares presented in **Figure 8** with the previous edition of the Scoreboard, it is important to recognise the effects of the further adjustment made to the operational headquarter countries (see Annex 4). This methodological adaptation had a

disproportionate impact on the ROW aggregate as many US companies registered their headquarters in the UK (5) and Switzerland (4), and also the EU (mainly Ireland with 17 companies). However, as discussed in more detail in Chapter 5 on the internationalisation of R&D, US companies also have significant R&D investments in their Irish-based subsidiaries. For China, only a few new adjustments were made as a result of the headquarters modification. China has 96 companies registered in tax-haven islands states such as Cayman Islands, but these have been assigned to China throughout. For Japan, no reclassification of headquarters was necessary. Therefore, the adjustment of headquarter countries meant that the US share of global R&D investment increased, and the shares of the EU and China decreased, while Japan and the ROW maintained their shares, in part due to increases in the number of companies.

However, the **inclusion of Amazon** had a larger effect on the regional R&D shares than the reassignments of the country of headquarters. Amazon's R&D investment of **EUR 65.3 billion** in 2024 amounted to **4.7% of the 2024 total.** Without Amazon's investment, the US share would have remained at around 44% as in the past editions of the Scoreboard.

Figure 8. Top 2 000 R&D investment shares by region/country, 2014-2024

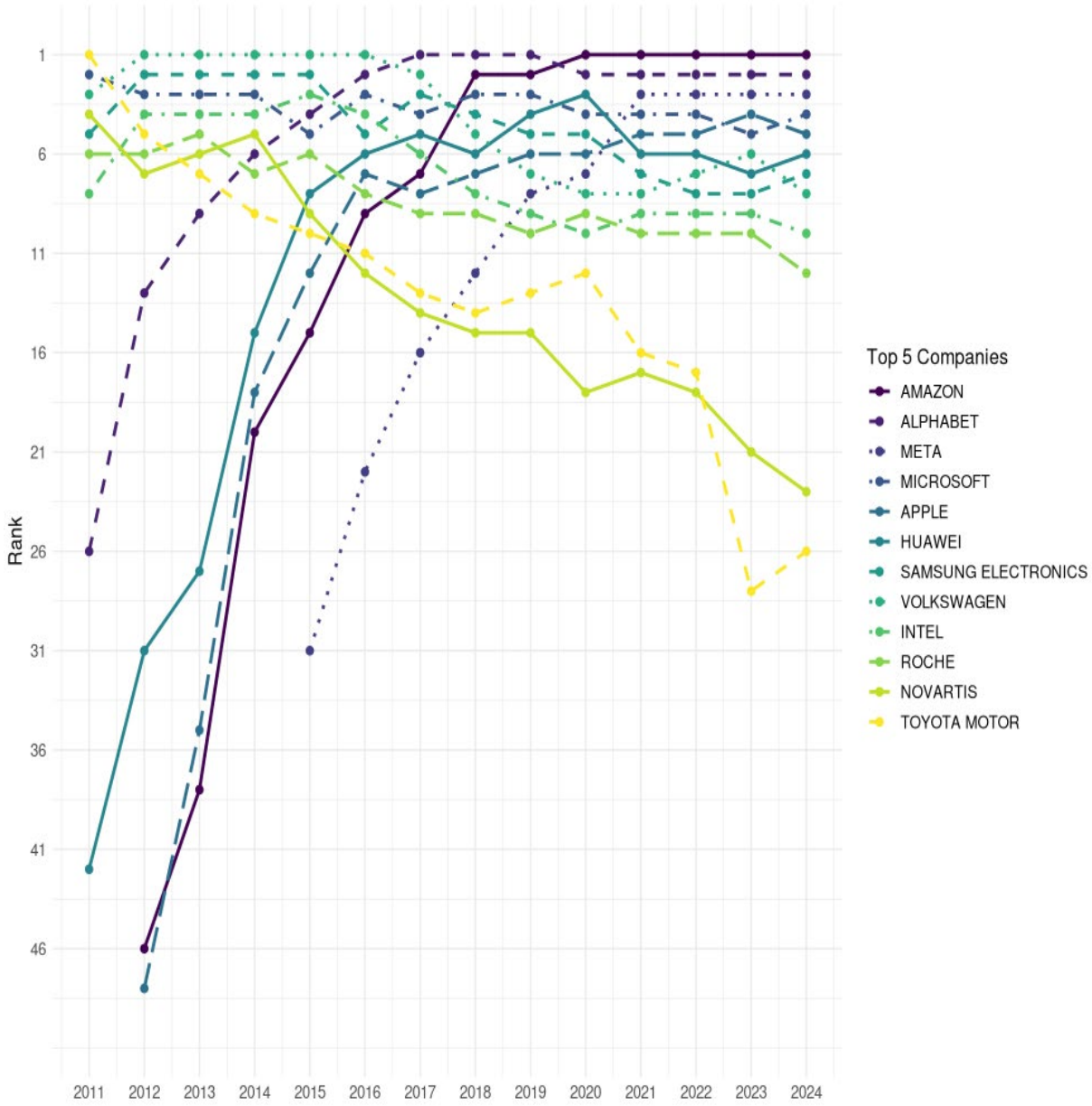


Note: Shares of total nominal R&D investment per year and region at 2024 end-of-year exchange rates to euro.
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

2.2. Top R&D investors – company level analysis

As described above, an important novelty this year is the inclusion of Amazon in the ranking. As discussed in the 2024 Scoreboard (Box 1), we estimated the R&D investment of Amazon using the R&D intensity of the ICT software and service sector and the net sales as reported by Amazon. To avoid a large artificial jump in the Scoreboard statistics, we decided to include Amazon in the previous rankings. Based on the estimates, **Amazon climbed to world rank 1 in 2020**. Before that, Alphabet had topped the ranking since 2017. **The strong growth of the US ICT companies put an end to the era of automotive companies as the world's leading R&D investing companies**. These ICT companies dominate the distribution of R&D in a way unseen in the past and with a lead growing larger and larger, as we discuss in more detail in Section 2.3 of this report. The adapted top 5 positions in the global ranking since 2011 are displayed in **Figure 9** below.

Figure 9. Ranking of the top 5 companies by R&D investment each year incl. Amazon, 2011-2024

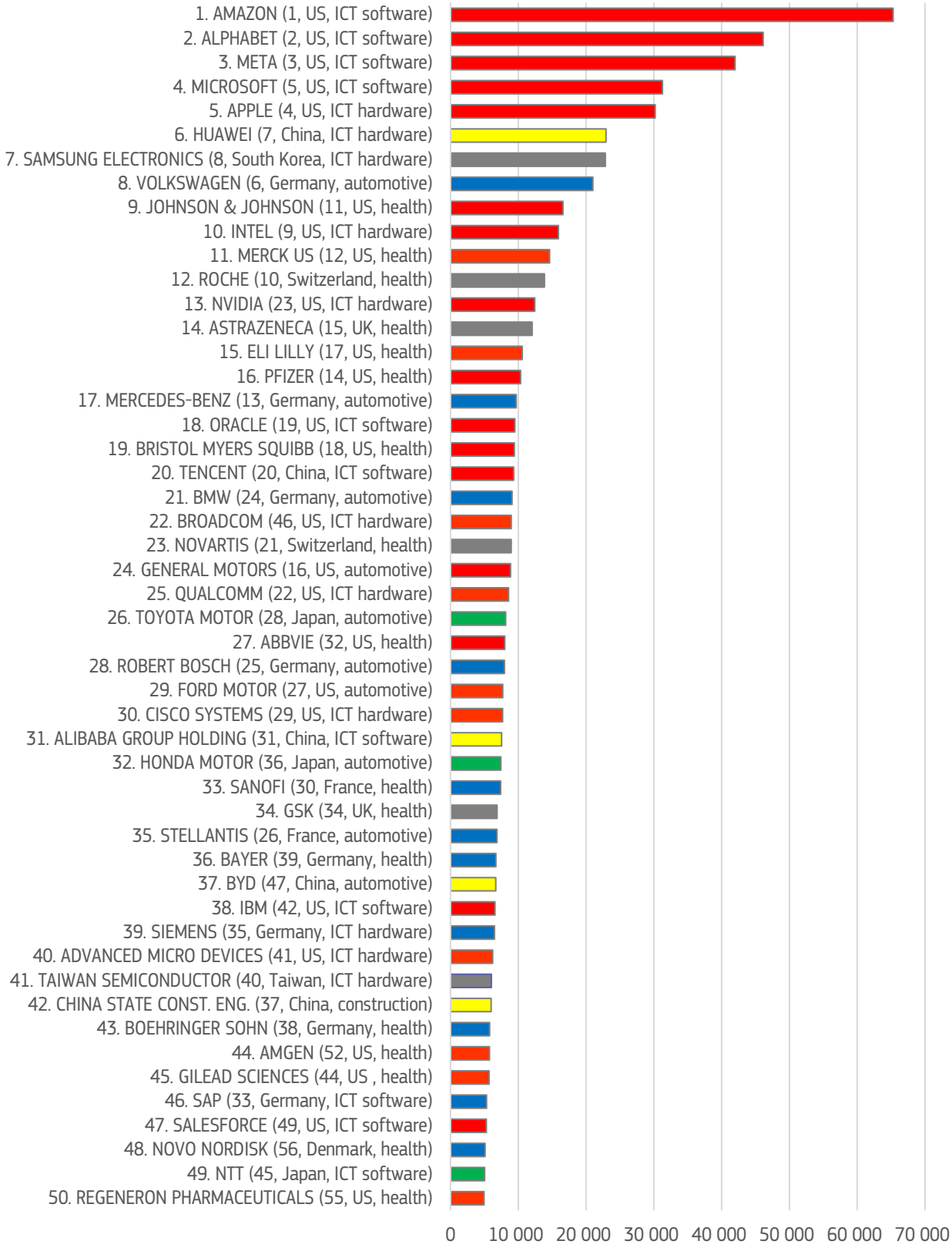


Notes: The figure shows the rankings of the 12 companies that had a position among the top 5 companies between 2011 and 2024. Only ranks 1-50 of these top 5 companies are shown.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

2.2.1. Top 50 companies ranked by R&D investment

Figure 10. World top 50 R&D investors in the 2025 Scoreboard



Note: Ranking based on 2023 R&D investment in brackets, R&D in EUR million (colours: US, China, EU, Japan, ROW)

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

The world's top 50 companies invested EUR 633 billion in R&D in 2024, which accounts for **44% of the total Scoreboard R&D investment** that year, representing a 1.5 percentage point increase in the share of total R&D compared to 2023. US-based companies continue to lead the ranking: all of the top 5 companies are headquartered in the US, as are 7 out of the top 10, and 25 of the top 50 companies. The US companies in the top 50 were active mainly in ICT (14 firms) and health (9). EU companies are the second most numerous in the top 50 (11 firms), albeit at lower rankings than their US counterparts. Volkswagen continued to be the only EU company in the top 10, but it fell two positions compared with 2023. Japanese (3 companies) and Chinese (5 companies) companies are less well represented in the top 50. Huawei (ranked 6) and Toyota (ranked 26) were the highest ranked companies for these two countries (**Figure 10**). Compared with 2023, the number of EU and US companies in the top 50 increased by one and two respectively at the expense of Japanese and ROW firms, while the number of Chinese companies remained unchanged.

The US presence also strengthened in terms of R&D investment: the **62.9% share of R&D investment by the US companies in the top 50 represents a 2.1 percentage point** increase in 2024. This came at the expense of the share held by Japanese companies (3.3% of the top 50 R&D investment, down by 1.5 percentage points), the ROW (11.1%, down by 0.5 percentage points) and EU companies' (14.4%, down by 0.3 percentage points). The share of top 50 corporate R&D investment accounted for by Chinese companies remained stable. The R&D investments of EU firms in the top 50 increased the most in the health sector (growth by 44.8% in 2024), thanks to the massive investment increases made by Bayer and Novo Nordisk.

The growth of R&D investment by the top 10 companies was 10.6%, while it was 10.7% in the top 50 (**Table 2**). The R&D investment growth rates of both groups exceed that of the top 2 000 companies which only increased their R&D investment by 6.3%. The R&D intensity in the top ranked companies remained unchanged because of the similar growth of both R&D and net sales; in the top 50 the ratio increased slightly due R&D increasing more than net sales.

Table 2. R&D investment and financial data of the top 5, top 10 and top 50 companies, 2024

	R&D	Net sales	Operating profit	Capex	R&D intensity	Operating profitability
Top 5						
2025 Scoreboard	214 902	1 756 894	482 932	237 547	12.2%	27.5%
2024 Scoreboard	193 599	1 583 875	373 643	161 403	12.2%	23.6%
Growth rate	11.0%	10.9%	29.2%	47.2%		
Top 10						
2025 Scoreboard	314 197	2 528 210	543 185	322 035	12.4%	21.5%
2024 Scoreboard	284 105	2 282 601	422 498	248 618	12.4%	18.5%
Growth rate	10.6%	10.8%	28.6%	29.5%		
Top 50						
2025 Scoreboard	633 334	5 884 573	1 043 579	569 388	10.8%	17.7%
2024 Scoreboard	572 555	5 522 714	868 062	464 406	10.4%	15.7%
Growth rate	10.6%	6.6%	20.2%	22.6%		

Notes: Capex stands for capital expenditure. R&D, net sales, operating profit and capex are in EUR million. R&D intensity is R&D investment divided by net sales, and profitability by dividing operating profits by net sales. *: including Amazon

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

The top ranked companies are also the most profitable ones. The world's top 5 companies are in the lead in this respect both in terms of magnitude with operating profitability of 27.5% vs 21.5% for the top 10, and 17.7% for the top 50. The increasing profitability may indicate that the

top R&D investors, and especially the top 5, are becoming more efficient, but it could also point to increasing markups and monopoly power[5].

Most companies in the Scoreboard and in the top rankings are more than 21 years old (**Table 3**). **The further up the ranking, the fewer younger companies there are**. While the top 5 and top 10 companies are typically mature companies aged between 21 and 50 years, the top 50 contain an equally represented mixture of both mature companies (21 to 50 years) and more established companies (51 years or more). **There are no young companies (younger than 10 years old) in the top 50** and there are only 2 (Abbvie and China State Construction Engineering ranked 31 and 40, respectively) that could be considered as in their growth phase (11 to 20 years).

Table 3. Top rankings by age group, 2024

	Top 5		Top 10		Top 50		Top 2 000	
Age	firms	R&D	firms	R&D	firms	R&D	firms	R&D
Up to 10 years	0	0	0	0	0	0	122	30 573
11 to 20 years	0	0	0	0	2	13 993	339	149 204
21 to 50 years	5	214 902	6	237 844	24	381 029	967	749 982
51+ years	0	0	4	76 354	24	238 312	572	516 468
Total	5	214 902	10	314 197	50	633 334	2 000	1 446 226

Notes: R&D in EUR million.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

Greatest contributors to R&D investment growth and decrease

Several companies in the world's top 50 corporate R&D investors significantly increased their R&D investments in 2024, with Broadcom and Nvidia being the most impressive in this respect. Overall, **the top 14 companies continue to be the top contributors to the absolute growth of R&D** of the entire Scoreboard sample (**Table 4**).

Table 4. Top 10 contributors to absolute increase in R&D investment, 2024 vs 2023

	2025 Rank	2024 R&D	2023 R&D	Difference	Growth	Year inc.	Sector
Meta (US)	3	41 986	35 123	6 863	20%	2004	ICT software
Amazon (US)	1	65 318	59 204	6 114	10%	1994	ICT software
Samsung Electronics (South Korea)	7	22 843	18 497	4 346	23%	1969	ICT hardware
Nvidia (US)	13	12 430	8 350	4 080	49%	1993	ICT hardware
Alphabet (US)	2	46 131	42 072	4 059	10%	1998	ICT software
Broadcom (US)	22	8 961	5 056	3 905	77%	1991	ICT hardware
Microsoft (US)	4	31 272	28 405	2 866	10%	1981	ICT hardware
Merck US (US)	11	14 614	12 371	2 243	18%	1970	Health
Huawei (China)	6	22 941	20 755	2 186	11%	2003	ICT hardware
Astrazeneca (UK)	14	12 033	10 044	1 989	20%	1992	Health
Total top 10		**278 529**	**239 878**	**38 651**	**16%**		
Total 2 000		**1 446 226**	**1 355 233**	**90 994**			
% top 10		**19%**	**18%**	**42%**			

Notes: R&D in EUR million. R&D 2024 is measured at 2024 exchange rates, R&D 2023 is measured at 2024 exchange rates, therefore the R&D 2023 figures may differ from those in last year's edition of the Scoreboard. Year inc. refers to the year of incorporation.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

[5] Big tech's higher profitability is partly driven by efficiency, scale, and network effects, and partly by mark-up and market power. The dominant channel depends on the firm, the industry segment, and the time period.

The largest year-on-year declines of investments continued to be relatively moderate in 2024 compared with the largest increases. The largest declines in R&D investment were by SAP (minus EUR 965 million) and Volkswagen (minus EUR 781 million). Each of these declines are individually equivalent to less than half the additional investments made by the lowest ranked of the 10 largest contributors to increases. Of the top 10 contributors to declines in absolute R&D investment there is only one company in the top 10 (Volkswagen), four are in the top 50 (including the one from the top 10), while the rest are ranked between 66 and 416. Of these companies, three are in the automotive sector (EUR 2.1 billion decrease), three from ICT software (EUR 2 billion decrease), one is from the health sector (EUR 415 million decrease), and three are in other sectors (EUR 1.5 billion decrease). Regionally, four companies are headquartered in the EU, three in the US, two in China and one company in ROW. Compared with the top contributors to the increase in R&D investment, the **companies in this group are older, with an average age of 104 years.** However, four companies are between 21 and 50 years old (**Table 5**).

Table 5. Top 10 contributors to absolute R&D investment decrease, 2024 vs 2023

	2025 Rank	2024 R&D	2023 R&D	Difference	Growth	Year inc.	Sector
SAP (Germany)	46	5 317	6 282	-965	-15%	1972	ICT software
Volkswagen (Germany)	8	20 998	21 779	-781	-4%	1904	Automotive
General Motors (US)	24	8 856	9 529	-674	-7%	1908	Automotive
Stellantis* (France)	35	6 854	7 484	-630	-8%	1899	Automotive
General Electric (US)	206	1 238	1 836	-598	-33%	1998	Industrials
Yandex (Russia)	416	542	1 105	-563	-51%	1991	ICT software
Telecom Italia (Italy)	408	558	1 064	-506	-48%	1981	ICT hardware
China Railway (China)	67	3 480	3 923	-443	-11%	1950	Construction
Metallurgical Corporation of China (China)	117	2 144	2 585	-441	-17%	2003	Construction
Biogen (US)	134	1 943	2 369	-426	-18%	1992	Health
Total top 10		**51 929**	**57 955**	**-6 026**	**-10%**		
Total 2 000		**1 446 226**	**1 355 233**	**90 994**			
% top 10		**4%**	**4%**	**7%**			

Notes: R&D in EUR million. R&D 2024 is measured at 2024 exchange rates, R&D 2023 is measured at 2024 exchange rates, therefore the R&D 2023 figures may differ from those in last year's edition of the Scoreboard. Year inc. refers to the year of incorporation. *we take for Stellantis the year of incorporation of PSA Group from France as it was the largest part before the merger, and also allocate the company to France.

Source: The 2024 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

2.2.2. Entry to and exit from the ranking

Entry and exit in the Top 50

The world's top 50 corporate R&D investors continued to be a rather stable 'club' this year. With the exceptions of Novo Nordisk, Amgen and Regeneron Pharmaceuticals, the same 47 companies in 2023 continued to be the largest R&D investors in 2024. The 3 companies that exited the top 50 were SK Hynix, which saw only moderate R&D growth, Sony, which fell to rank 51, and Takeda Pharmaceutical which did not increase R&D investment in 2024. Novo Nordisk and Amgen increased their R&D investment by EUR 1.1 billion each, Regeneron's R&D grew by EUR 667 million, bringing the company to 50th place this year. **Table 6** sets out the differing growth rates in corporate R&D by sector and geography. The most notable regional and sectoral developments are summarised in the bullet points below.

— R&D investment of all countries/regions in the top 50 increased significantly in 2024, except for Japan (25% year-on-year decrease) as a result of Takeda and Sony dropping out of the

top 50. The highest growth was recorded by US companies with 15%, followed by Chinese with 11% and the 11 EU companies in the top 50 with 8% growth.

- Growth in R&D in the automotive sector was stronger in China and Japan than in the EU or the US.
- In the health sector, R&D investments by EU and US companies grew strongly, resulting in significant increases in their global R&D shares. While the increase in R&D by the 3 incumbent EU health companies was also significant (EU 2.6 billion together), the main driver of growth in the EU was the entrance to the top 50 of Novo Nordisk (Denmark). In the US, 5 companies can be identified behind the significant growth: Johnson & Johnson, Merck US, Eli Lilly, Abbvie (increase by EUR 6.9 billion together) and the newly entered Amgen (which spent EUR 5.7 billion on R&D in 2024).
- R&D investment growth in the EU was driven mainly by the health sector, thus also raising the region's share in the sector (reflected by the 3-percentage point increase of its share in the total top 50 health R&D investment). In contrast, the share of the automotive sector decreased by around 2 percentage points because of the halt in R&D investments of the EU's 5 automotive companies in the top 50 (who together increased their R&D by a mere EUR 20 million).
- Chinese R&D growth in the top 50 was mainly due to massive investment growth by Huawei (ICT hardware) and BYD (automotive). The former increased its R&D investment by EUR 2.2 billion, and the latter by EUR 1.7 billion.
- The US companies in the top 50 continue to lead in the ICT and health sectors. Their already high shares increased by 1 percentage points in both ICT software and ICT hardware, and by 2 percentage points in health. However, behind these apparently small changes was an absolute increase of EUR 22.3 billion in ICT software, EUR 10.9 billion in ICT hardware and EUR 18.5 billion in health (see **Table 4**).
- Japanese companies in the top 50 lost their already small share of R&D in health (4.8% in 2023) as a consequence of the exit of Takeda Pharmaceutical from the top 50. In contrast, Japan's share in automotive R&D increased by 2 percentage points to 17% as a result of the EUR 1.4 billion increase by Honda Motor in 2024.

Table 6. Top 50 – Regional shares and growth rates of R&D investment in the main sectors, 2024

	EU	US	China	Japan	ROW	Total
Automotive	58% (60%)	18% (19%)	7% (5%)	17% (15%)	0% (0%)	100%
Health	16% (13%)	56% (53%)	0% (0%)	0% (3%)	27% (30%)	100%
ICT hardware	4% (5%)	61% (60%)	15% (16%)	0% (0%)	19% (20%)	100%
ICT software	2% (3%)	88% (87%)	7% (7%)	2% (2%)	0% (0%)	100%
Growth y-o-y						
Automotive	0%	-5%	36%	16%		3%
Health	45%	27%			7%	19%
ICT hardware	5%	14%	11%		9%	12%
ICT services	-15%	12%	10%	-2%		11%
Total	8%	15%	11%	-25%	8%	

Notes: Values are shares of R&D investment of the top 50 in 2024 (2023 in parenthesis). Summing up the regional figures might differ from the totals due to rounding.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

Entry to and exit from the top 500 companies

R&D investment by the world's top 500 corporate investors in R&D accounted for over 80% of the total of the total R&D investment by the world's top 2 000 companies, both in 2023 and 2024 (82.2% and 81.5% respectively). The common set in the top 500 in the two consecutive years

comprises 471 companies, leaving 29 companies that entered/exited[6] the top 500. The share of R&D of the common set was more than 98% of the volume invested by the top 500 companies in both years, meaning that **there was neither a significant drop in the investments of any major player, nor a remarkable rise of any hitherto smaller investor.** Out of the 29 companies exiting the top 500, 26 companies dropped to lower positions, typically to the second quartile (ranks 501-1 000). The lowest rank to which a company dropped was 738. Another two companies in the top 500 were subject to M&A deals: Vitesco which merged into Schaeffler (presently still a Scoreboard company) and Vilmorin which merged into Limagrain (which does not disclose R&D investment anymore). Another company, Solvay SA., made a significant divestment in 2023 resulting in a decrease in its R&D of around EUR 400 million to a mere EUR 34 million, forcing the company out of the top 2 000.

Table 7. Top 500 – Entries and exits, number of companies and R&D investment across regions (in EUR million), 2024

	Number of companies						R&D investment					
Entries	**EU**	**US**	**China**	**Japan**	**ROW**	**Total**	**EU**	**US**	**China**	**Japan**	**ROW**	**Total**
Automotive	0	1	1	0	0	2	0	436	441	0	0	877
Health	0	6	0	0	0	6	0	3 200	0	0	0	3 200
ICT hardware	0	2	0	0	2	4	0	880	0	0	933	1 813
ICT software	0	4	2	0	1	7	0	2 213	951	0	1 213	4 377
Others	3	4	2	0	1	10	1511	3 173	974	0	477	6 135
Total	3	17	5	0	4	29	1 511	9 902	2 365	0	2 623	16 401

Exits	**EU**	**US**	**China**	**Japan**	**ROW**	**Total**	**EU**	**US**	**China**	**Japan**	**ROW**	**Total**
Automotive	0	1	0	0	0	1	0	444	0	0	0	444
Health	1	3	0	0	0	4	395	1 421	0	0	0	1 817
ICT hardware	1	0	1	1	0	3	842	0	449	399	0	1 691
ICT software	0	2	2	0	1	5	0	967	879	0	412	2 259
Others	6	3	6	0	1	16	2 807	1 382	2 857	0	457	7 503
Total	8	9	9	1	2	29	4 044	4 215	4 185	399	869	13 713

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

Companies newly entering the top 500 came mostly from lower positions of last year's edition (typically from the second quartile, 733 being the lowest rank), with three exceptions: Naver Corporation, Coinbase Global Inc, and GE Vernova Inc. The first two of these entered the Scoreboard due to improvements in the data collection and quality control process, while GE Vernova was spun off of General Electrics.

On the regional structure, both entering and exiting firms to/from the top 500 are mainly from the US and China. The presence of the four top sectors under scrutiny (i.e. automotive, health, and the two ICT sectors) has been strengthened both in terms of companies (19 entries, 13 exits) and of R&D (EUR 10.3 billion of the R&D investment by entrants, vs EUR 6.2 billion by the exiting companies). This strengthening has come at the expense of other sectors in which the number of companies present in the top 500 decreased by 6 and the R&D investment which decreased by

[6] An entry means a company that is present in the ranking in a certain year of investments (here: 2024), but absent from it in the reference year (here: 2023). An exit means a company that is present in the reference year (2023), but no longer in the other year (here: 2024). The number of entries in the full Scoreboard corresponds by definition to the number of exits. However, in the quintiles, the two are not necessarily equal, as the exit does not mean exiting the quintile, but disappearing from the full list of 2 000 companies.

EUR 1.4 billion. The net effect of entry/exit dynamics on the total R&D invested by the world's 500 largest corporate R&D investors is EUR 2.6 billion (**Table 7**).

2.2.3. Technologies by the top contributors to R&D investment growth

In this section we briefly describe the main research strands of the 10 companies that contributed the most to R&D investment growth in 2024. The aim of this is to arrive at a deeper understanding of the quantitative indicators from **Table 4**. The technologies in which these R&D investments are made are state of-the-art and most topical in the areas of ICT software and services, ICT hardware, and health. The most recent technologies and the companies researching them are set out below. Overall, these 10 leading companies are focusing their efforts on frontier technologies in generative and agentic AI, advanced robotics, semiconductor design, next-generation communications, biopharmaceuticals, and healthcare solutions.

1. Meta (ICT software)

Meta's most recent R&D spending targets the areas of **AI-centric development** (foundational AI, retrieval augmented generation, reasoning frameworks, and open science initiatives), **harware innovation** (ultra-wide field-of-view headsets, smart glasses with neural interfaces, enhancements to the 'metaverse' by faster world loading and supporting over 100 concurrent users, as well as AI-assisted tools for creating immersive content and environments), and **research** (data science application for advertising – still in an experimental phase) (Meta, 2025).

2. Amazon (ICT software)

In 2025, Amazon's research initiatives are concentrated on several advanced technological domains. In **agentic and generative AI,** it focuses on developing a foundation model designed to perform actions autonomously within a web browser, enabling the development of reliable agents that can break down complex browser workflows into smaller, dependable commands. In the area of **robotics and automation** Amazon research concentrates on robots with advanced sensing for flexible handling, natural language command interpretation, and AI-guided demand forecasting and mapping technologies for optimised delivery. In **computer and hardware infrastructure,** it prioritises custom-built chips for high machine learning training as well as high-performance computing resources, and cloud training. In **IT security and trust in AI**, Amazon is directing its research efforts towards AI-driven research to improve cybersecurity and privacy protection, on adversarial robustness, safe AI assistants, automated red-teaming, and measuring privacy leakages in AI systems. In ad-tech and marketing technology Amazon is researching the use of AI-powered creative assistants to automate multimedia ad campaigns (Amazon 2025, Amazon 2025b).

3. Samsung Electronics (ICT hardware)

R&D activity is centred around three key areas. First, in **AI and robotics** it is 1) expanding AI integration across smartphones, wearables, tablets and PCs; 2) developing generative AI (LLMs) and agentic AI models (systems capable to plan, reason and act autonomously); 3) embedding more on-device AI and home AI in smart appliances, robotics and the SmartThings platform, adding ambient sensing, personalisation and autonomy; 4) accelerating humanoid robotics, 'digital twin' simulations and advanced AI-driven automation; and 5) including AI in chip design, inspection and yield optimisation. Second, in the area of **semiconductors**, Samsung's research focuses on memory, foundry and next-generation processes and packaging. It focuses in particular on 1) integrated memory and system-LSI, 2) V-NAND technology for hyperscale and AI storage, as well as 3D DRAM architectures for AI, 3) high-NA EUV tools and advanced deposition/materials in next-generation

nodes, 4) advanced chip packaging, wafer bonding, and wafer-to-wafer technology, and 5) logic chips. Third, in the **next-generation communications, the internet of things and displays**, Samsung targets 1) 6G & AI-native networks and AI tools for RAN, 2) SmartThings and SmartThings Pro, and 3) display technology, such as MicroLED, the high-resolution signage called 'The Wall', and Color E-paper near-zero power solutions (Samsung, 2025).

4. Nvidia (ICT hardware)

In 2025, Nvidia centred its R&D efforts around seven areas. First, it is advancing **agentic AI (autonomous systems** capable of reasoning, planning, and acting) by integrating **multimodal models** that process diverse data types. This approach aims to increase industry innovation and efficiency. Second, the company is developing **neural rendering and world-simulation technologies** to create realistic 3D environments supporting robotics, autonomous vehicles, and immersive content creation. Third, within the realms of **AI driven scientific discovery,** where Nvidia is collaborating with the US National Science Foundation to accelerate scientific research by developing AI systems that support the creation of multimodal language models. A fourth domain is **health** where Nvidia's research aims to develop biomedical AI for drug development and discovery by developing a tool to help scientists rapidly review literature, formulate hypotheses, and identify potential protein targets. As a fifth subject area, in collaboration with MIT, Nvidia is focusing on optimising **GPU-accelerated AI models** to increase performance, improve resource-efficiency and facilitate scalable deployment. The sixth area of research is **autonomous vehicles,** where Nvidia is exploring high-fidelity sensor simulation, in-vehicle computing, and safety systems. Finally, it is exploring **quantum computing and high-performance-computing** to model complex systems, analyse large datasets, and perform simulations across various scientific fields (Nvidia, 2025).

5. Alphabet (ICT software)

Backed by massive infrastructure spending[7] Alphabet's research continues to be centred mainly around AI, including **AI integrated search enhancements** (conversational interface, query summaries generator, research-oriented multi-step search, camera-assisted real-time projective search), **generative media tools** (high-quality video generation, video editing and storytelling, image-generation and music generation), **agentic**[8] **ecosystem solutions** (multi-agent orchestration and no-code creation, open-source framework for building applications, interoperable agent communication), and **YouTube enhancements** are among the most important **generative AI** product solutions (Vivarekar, 2025). In addition to its generative/agentic AI projects, Alphabet puts great emphasis on **health and medicines technologies**, such as medical research, accelerating drug discovery, health-tech related to retinal scanning, clinical trial management, and chronic care (Business Insider, 2024), and **robotics** (sensing, interaction, and cross-modality; extend AI reasoning into physical tasks). Alphabet also invests in certain **'moonshot' projects** in the area of **health**, such as AI-driven pharma (Financial Times, 2025), **interne**t (beams of lights instead of satellites), and **energy** (AI-powered electric grid optimization).

---

7 The 2024 consolidated capital expenditure (capex) of Alphabet was EUR 44.8 bn. It is invested mainly on data centers, servers, chips, fiber network, etc (Alphabet 2024)

8 AI systems acting on behalf of users

6. Broadcom (ICT hardware)

Broadcom's 2025 R&D priorities span semiconductors, networking, infrastructure software, and hybrid cloud platforms. Like other ICT hardware producers, Broadcom is putting strong emphasis on **AI-driven workloads**. Thus, in the area of **custom AI accelerators**, the company is building custom silicon ('XPUs') for hyperscalers and large enterprise customers. This will enable computer self-sufficiency and expand its qualified customer base for AI racks (Prickett Morgan, 2025). In the area of **AI networking and high-speed interconnects** Broadcom is developing next-generation networking ASICs designed for low-latency, high-bandwidth AI data centre interconnects. A third domain of activity is in **optical networking and transition beyond copper,** where the firm is investing in optical networking technologies (e.g. CPO and coherent pluggables) to meet growing AI traffic demands and replace legacy copper interconnects in data centres. Fourthly, Broadcom is doing research in the areas of **intelligent buffering, congestion management, and scalable fabrics** for distributed AI training and inference across large-scale data centres. **Private and hybrid cloud AI infrastructure** is a fifth area of research, where Broadcom is integrating Nvidia Blackwell GPUs, DPUs, and high-speed I/O through VMware Cloud Foundation, and enabling private AI and hybrid AI deployments that have a strong focus on security, compliance, and cost predictability (Broadcom, 2025).

7. Microsoft (ICT software)

Microsoft focused its research in 2024 exclusively on AI and centred this research around a number of key areas of applications. The company made progress has been made in six main areas: 1) **AI for science and scientific discovery** to accelerate scientific modelling, materials discovery, and astronomical (galaxy) data; 2) **large language models (LLMs), causal reasoning, and model robustness** by improving the LLM's causal reasoning, improving performance on complex tasks, safety, and by combining LLMs with retrieval; 3) **human-centred and generative AI** focusing on the way AI interacts with human cognition, on support for critical thinking and metacognition; 4) **AI for health** to make progress in medical diagnostics, genomics, and precision medicine; 5) **occupations, jobs, societal impacts of AI, and responsible AI** with the aim of studying how AI affects jobs and occupations; and 6) **climate, environment, renewable energy** where AI research seeks to support the environment, energy infrastructure, land use, renewable deployment, datasets for solar PV, and wind turbines (Microsoft, 2025).

8. Merck US (Health)

Merck & Co. focuses its research on six main areas: 1) in **oncology** the company is focusing on expanding indications and earlier-stage studies for pembrolizumab, antibody-drug conjugates and targeted small molecules; this is a clear, company-stated R&D priority for 2025. 2) HPV vaccines and pneumococcal conjugate vaccines, which are the two main new elements of Merck's **vaccines** portfolio; 3) in the area of **infectious diseases** the company focuses on HIV, antibiotics, Ebola and dengue; 4) **cardio-metabolic disorders**, where Merck is making progress in the area of cholesterol reduction, pulmonary arterial hypertension, chronic lung disease, and oral agents for HIV regimens; 5) **neuroscience,** where the company is advancing in the symptomatic treatment of Alzheimer's disease, the development of biomarkers for Parkinson's disease, and in the treatment of multiple sclerosis; 6) ophthalmology, where the company is mostly interested in retinal diseases, such as diabetic macular oedema and neovascular age-related macular degeneration (Merck, 2025).

9. Huawei (ICT hardware)

A first key area of research for Huawei is **AI chips & computing infrastructures**. The company is putting strong emphasis on its Ascend AI chip roadmap. Part of this involves developing in-house high-bandwidth memory (HBM) to reduce reliance on foreign suppliers[9] as well as building large computing clusters/supercomputers to support large-scale AI model training and inference. In **AI algorithms,** the company is developing a 'multimodal fusion perception network and an innovative end-to-end cognitive architecture that supports brain-like thinking'. These technologies are used in human-like intelligent driving. In **networking**, Huawei developed the industry's first collective communication algorithm for asymmetric, heterogeneous links, solving the issue of reusing bandwidth for buses and networks while improving communications performance. In **optical networking**, Huawei developed a new model for assessing damage to optical fibre channels, and it also develops bandwidth modulation technologies to help build a data centre interconnect solution. Another area of interest is **basic/theoretical research.** Examples include work in game theory (e.g., 'prophet inequalities') and basic AI theory, such as using reinforcement learning combined with tree search to improve reasoning in large language models. The company is also investing heavily in **cloud infrastructure, digitalisation**, and platforms that support both enterprises and services. In its **consumer business**, the most important technologies are: advanced precision hinge system for foldable phones, ultra-thin, flexible glass technology, Ultra Chroma Camera with 1.5 million spectral channels, AI assisted voice enhancer, AI cloud enhancement to improve photo quality, and improved accuracy in smart watches through high-precision sensors (Huawei, 2025). Due to trade sanctions, Huawei is investing in technologies that enable more in-house production or production in China, and is therefore emphasising **designing architectures** (supernodes, superPoDs, and superclusters) that work well using Huawei's own chips (Brenda Goh, 2025).

10. Astrazeneca (Health)

Astrazeneca has four main research areas: 1) in **oncology**, lung cancer is main focus of cancer research for Astrazeneca, but the company also made progress made in improving both overall and progression-free survival in metastatic breast cancer and lung cancer, and in reducing of the risk of disease progression in early-stage gastric cancer patients; 2) in **cardiovascular and renal metabolism** advancement has been achieved in reducing 24-hour ambulatory systolic blood pressure in patients with resistant hypertension as well as in chronic kidney disease and heart failure treatment; 3) **respiratory illness and immunology,** where the company made improvements to the treatment of both chronic obstructive pulmonary disease and in uncontrolled asthma; 4) in **rare diseases** Astrazeneca continues to focus on rare neurological diseases (Astrazeneca, 2025).

2.3. Concentration of R&D investment in the Scoreboard

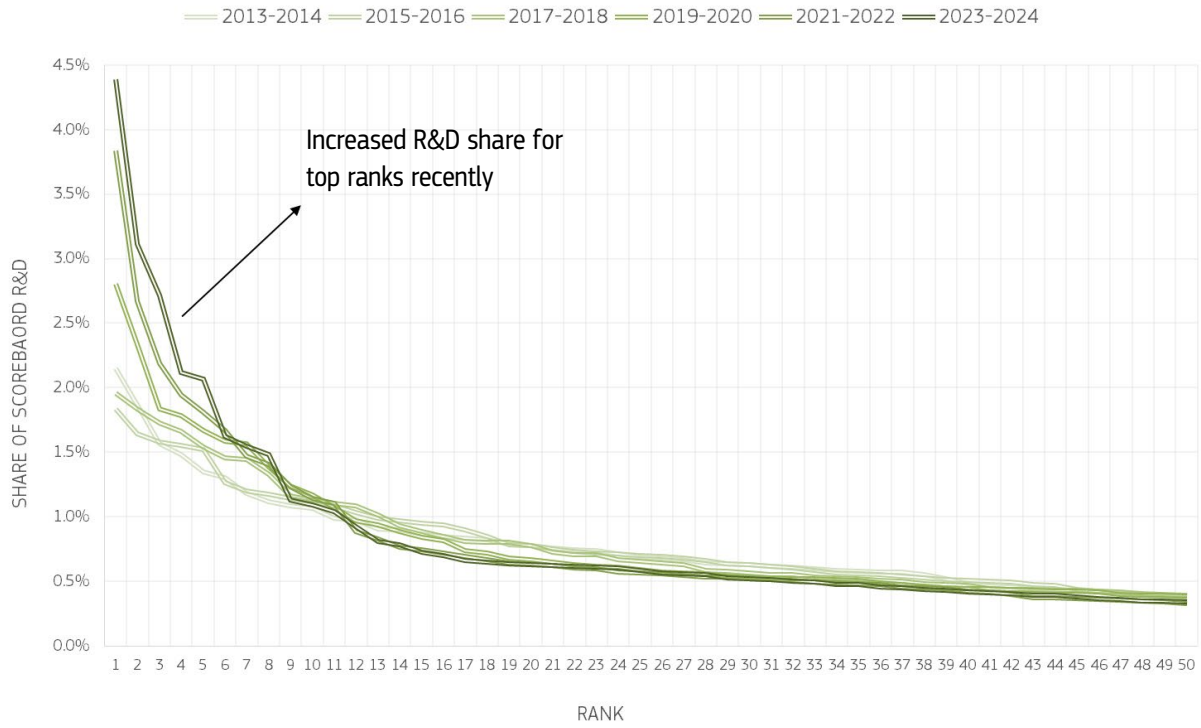
The concentration of innovation activities among a small number of dominant firms has attracted significant attention in recent years. This interest stems from broader economic trends where globalisation and technological progress, particularly in ICT, have facilitated **the rise of 'superstar firms'** that dominate their industries (Autor et al., 2020). These firms can arguably **use their**

[9] As an example, the 950PR chip is expected to have 128 GB HBM with ~1.6 TB/s bandwidth.

market power and technological capabilities to invest increasingly more and capture a larger share of overall R&D investment, thereby reinforcing their competitive edge and market dominance. Technological innovation and changes in market structure have been identified as the root causes of increased market power. **For the US,** it has been argued by De Ridder (2024) that the decline in business dynamism and the rise of market power are due to the **increased use of intangible inputs, such as software**. Intangibles reduce marginal costs and raise fixed costs, providing firms with high-intangible adoption a competitive advantage that deters competition.

Because rising market power increasingly depends on technological innovation and the accumulation of intangible assets, **R&D investment plays a major role in this rising market power** both: (i) as a mechanism that contributes to economies of scale (high fixed costs, low marginal costs), and (ii) as an activity disproportionately conducted by already dominant companies. Therefore, examining changes in the distribution of R&D across companies is valuable, as it can show whether R&D efforts are becoming more unevenly distributed, potentially leading to even greater technological advantages for dominant firms.

Figure 11. Distribution of R&D share by rank across two-year periods, 2011-2024



Notes: Top 50 refers to the leading 50 companies in each year's Scoreboard ranking based on their R&D investment in EUR. Darker shades of green refer to more recent years.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

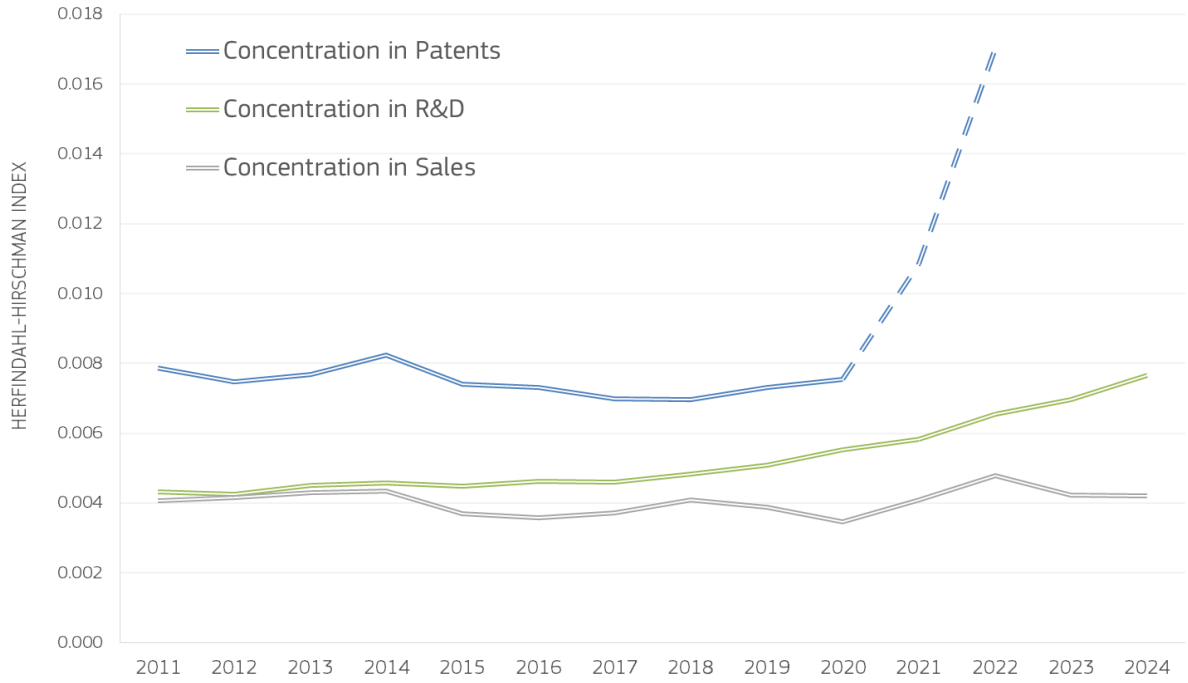
In the following we describe the evolution of R&D concentration among the Scoreboard companies using different indicators. We start by **analysing the R&D shares** across two-year periods for the top 50 companies in each period, starting from 2013-2014.[10] **Figure 11** presents this distribution for the world's top 50 corporate R&D investors, as differences beyond this group (rank 51 onwards)

[10] Two-year averages are used to smooth out volatility and provide a clearer visualization.

were found to be minimal (see Section 2.2). The data reveal that in recent years, **the world's top 5-8 companies have significantly increased their share of total R&D investment**. For instance, the world's largest corporate investor in R&D, Amazon, doubled its Scoreboard share of R&D from 2.1% in 2013-14 to 4.4 % in 2023-2024. Similarly, **Figure 13** shows an increase in the **top 5 R&D share** within the total R&D investment of the top 2 000 companies, rising **from 6.8% in 2011 to 14.9% in 2024**. In turn, companies ranked 12 to 25 have experienced a decline in their R&D shares in recent years (e.g., 2021-2022, 2023-2024), suggesting that **the concentration is primarily driven by the top 5 firms** rather than a broader group.

Another approach to examine concentration is through the **Herfindahl-Hirschman Index** (HHI), an indicator commonly used to both measure market concentration and evaluate the competitive landscape of specific sectors[11]. Typically, a lower HHI indicates a more competitive market, while a higher HHI points to less competition and greater concentration. In our analysis, however, we focus on understanding the changes in the concentration of R&D activities, rather than assessing market competitiveness. To understand these changes and trends, we therefore compare changes in the concentration of R&D and patents among the world's top 2 000 R&D investors to changes in sales by these same companies between 2011 and 2024. We calculate HHI for these dimensions (R&D, patents and sales) for each year during this period. **Figure 12** shows three main findings.

Figure 12. Concentration dynamics in R&D, patents and sales, Herfindahl-Hirschman Index, 2011-2024



Notes: 'Patents' refers to families of patent applications filed in at least two of the world's top five patent offices: CNIPA (China), EPO (Europe), JPO (Japan), KIPO (Korea), and USPTO (US). Patent data for the 2024, 2023, and, to some extent, 2022, 2021, are incomplete due to the patenting process, which includes the stages of priority, application, and publication.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

[11] The Herfindahl-Hirschman Index (HHI) is calculated by summing the squares of the market shares of all firms within the industry. It ranges between 0.0005 (lowest concentration) to 1 (highest concentration).

The first finding is that **the concentration of R&D increased from 2018 onwards**. Between 2011 and 2017, the HHI for R&D remained stable, ranging from 0.0043 to 0.0048 but started to rise thereafter, peaking at 0.0076 in 2024. This trend is consistent with the observations in **Figure 11**, where the R&D share of the top 5 (or 8) companies shows a marked increase from 2017-2018 onwards.

The second finding is that, while the **sales concentration index remained stable**, the R&D concentration index increased, indicating that trends in sales concentration are uncorrelated with the increase in R&D concentration. In 2011, both R&D and sales concentration indices were at similar levels. However, from 2015 onwards, the R&D concentration index rose, while the sales concentration index remained fairly constant.

Third, the pattern of patent concentration differs, as the patent concentration index consistently exceeds that of R&D concentration. This disparity is expected, as not all Scoreboard companies operate in sectors with high patenting activity. The patent concentration index follows a similar pattern as concentration in sales until 2020 with a slight decline from 0.0079 in 2011 to 0.0076 in 2020. However, from 2020 onwards, the index rises rapidly. It is important to note that the increases observed in 2021 and 2022 should be interpreted with caution, as the data for patent families during these years are incomplete.

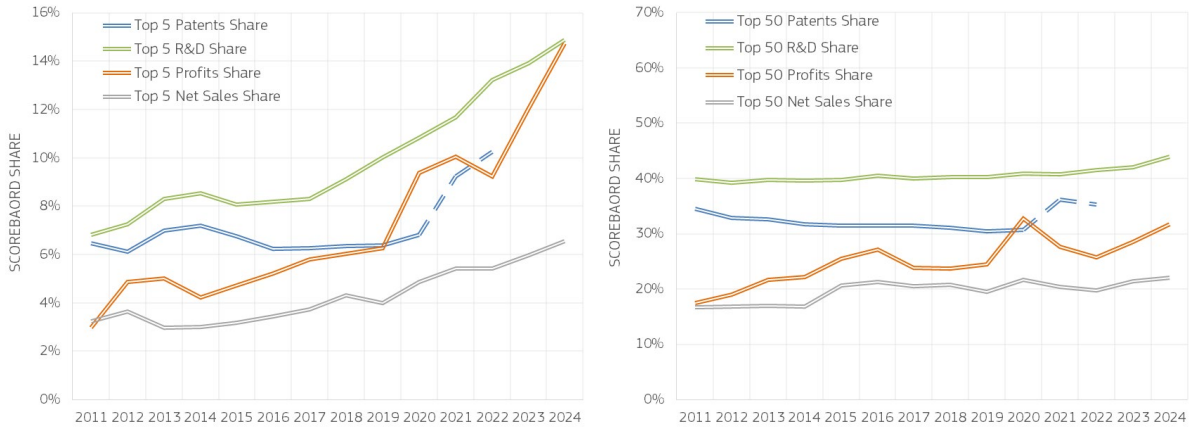
Another way to assess the concentration of R&D activities is by examining the cumulative shares of R&D investment held by the top 5 and top 50 R&D investors. **Figure 13** uses this approach to display the distribution of R&D, patents, sales, and profits for the top 5 (left panel) and top 50 R&D investors (right panel) each year, among the top 2 000 R&D investors.

For the **top 5 companies** (left panel), their R&D share remained stable at around 7-8% until 2018, after which their share increased steadily, reaching 15% by 2024. This represents remarkable annual growth of 1 percentage point in the total R&D share for the top 5, **clearly indicating rising concentration in R&D** among the very top firms. In contrast, the growth in the R&D share for the top 50 companies (right panel) was less pronounced, becoming noticeable only in 2023 and 2024.

The rise in R&D share for the top 5 is accompanied by **significant increases in both profit and sales shares**. The **share of the profit** earned by the top 2 000 corporate investors in R&D taken by the **top 5 corporate R&D investors quintupled from 3% to 15%,** and their sales share almost tripled from 2.3% to 6.6% between 2011 and 2024. While the top 50 companies also experienced increases in their profit and sales shares, these gains were not as pronounced as those for the top 5. Interestingly, the top 5 R&D investors have remained the same since 2021 (Amazon, Alphabet, Meta, Microsoft, and Apple), **indicating reduced dynamism at the top of the R&D distribution** and suggesting that these leading R&D performers have successfully increased their profitability in recent years.

On patents, the trend follows a different pattern, with patent concentration for the top 5 R&D investors appearing uncorrelated with the rising concentration of R&D and profits at the top. Firms with a large global patent share are not necessarily among the top 5 or top 50 R&D investors each year, reflecting sectoral differences and strategies that drive higher patenting propensity. Because the composition of the top 5 changed frequently before 2021, years when high-propensity patentees entered the top 5 (for example, Samsung in 2013–2014) saw a marked increase in the patent share of the top 5, which receded when such firms exited. This fluctuation also helps explain why patent concentration among the top 5 and top 50 (**Figure 13**) is lower than R&D, compared to the patent concentration measured by the HHI (**Figure 12**).

Figure 13. Evolution of top 5 (left) and top 50 (right) share of R&D, profits and sales among the top 2 000, 2011-2024



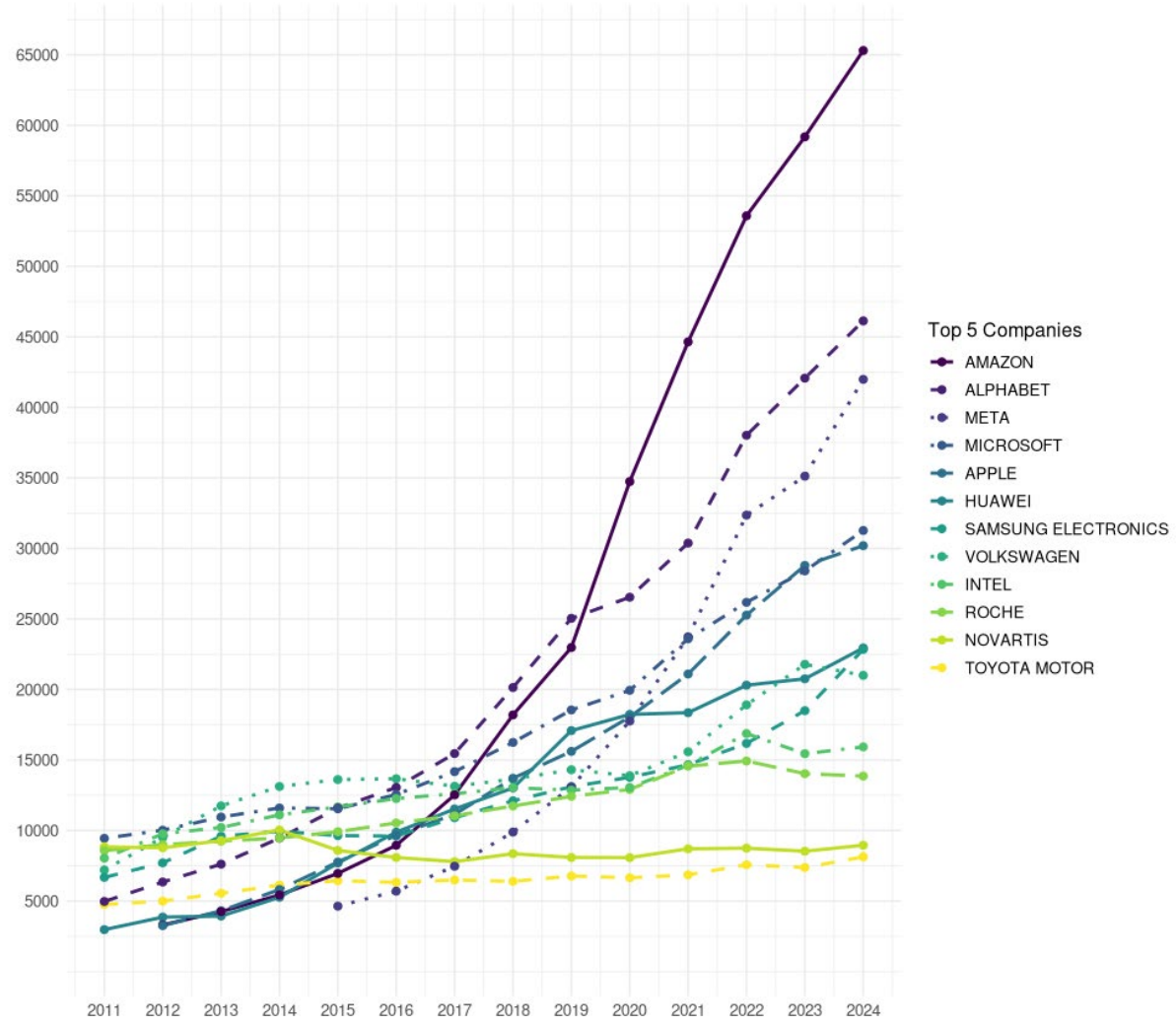
Notes: The 'Top 5' and 'Top 50' refer to the leading 5 and 50 companies, respectively, in each year's Scoreboard ranking, determined by their R&D investment denominated in EUR. 'Patents' refers to families of patent applications filed in at least two of the world's top 5 patent offices: CNIPA (China), EPO (Europe), JPO (Japan), KIPO (Korea), and USPTO (US). Patent data for 2024 and 2023 (and to some extent 2022 and 2021) are incomplete due to the lengthy patent process, which includes the stages of priority, application, and publication.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

The two graphs clearly demonstrate a more rapid increase in the share of R&D investment by the top 5 companies compared to the top 50 in the Scoreboard. Since the top 50 companies showed relevant changes only in 2023-2024, it logically follows that the rising share of the top 5 came at the expense of other companies within the top 6-50 for the period 2011-2022. This is another clear indication of increasing concentration of R&D investment among a small number of leading companies. Given that the share of Scoreboard firms' R&D in total global business R&D has remained stable between 89% and 93% (as shown in **Annex 3**), this also means that the share of R&D by the top 5 in total global business R&D has also increased over this period.

To better understand these elite top 5 companies, their composition was analysed from 2011 to 2024. **Figure 14** below displays the companies that were in the top 5 each year, their respective ranks, and their R&D investment. Over the past 14 years, only 12 different companies have been in the top 5. Since 2017, US ICT companies have dominated the rankings, whereas before that, automotive companies like Volkswagen (and earlier Toyota Motor) were at the top of the ranking. As of 2024, the top 5 were Amazon, Alphabet, Meta, Microsoft, and Apple, with only Microsoft being also in the top 5 in 2011. This shows the remarkable growth dynamics of these companies that climbed the ranking. The current gap in R&D investment among the top 3 (Amazon, Alphabet, and Meta) compared with the others clearly contributes to the increasing levels of R&D concentration since 2018-2019 (**Figure 13** left panel) and in the last two years (**Figure 13** right panel).

Figure 14. R&D investment of the top 5 companies, EUR billion, 2011-2024



Notes: The Figure shows the R&D investment of the 12 companies that had a position among the top 5 in the rankings between 2011 and 2024. R&D investment in billion euro at 2024 end-of-year exchange rates.
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I

Our analysis indicates an **increase in the concentration of R&D investment** among Scoreboard companies since 2019, **primarily driven by five US tech firms**.[12] **This concentration of R&D can have significant implications for business dynamics.** There is evidence that rising market power leads to weaker innovation diffusion from innovation leaders to followers (Akcigit & Ates, 2023; De Loecker et al., 2024), and some mixed evidence pointing to increasing concentration reducing business dynamics (Akcigit & Ates, 2021). However, other research indicates that these mega firms increasingly generate positive spillovers (Aka, 2025) and new technological trajectories (Braguinsky et al., 2023), especially since the 2010s.

[12] We also examined whether a similar concentration of R&D activities occurred within the EU sample between 2011 and 2024. Our analysis found no evidence of such concentration. The HHI and the share of R&D held by the top 5 EU companies within the EU peaked between 2014 and 2018, declined during the COVID-19 period, and slightly increased afterward, but did not reach previous peak levels.

Box 1. M&A by the 'GAFAM' companies

An outsized role in contributing to R&D concentration play the so-called GAFAM companies (Google, now known as Alphabet, Amazon, Facebook, now known as Meta, Apple, and Microsoft). With their R&D investment, these companies dominate software and computer services, thus contributing to increasing overall R&D concentration. An important tool available to large players to expand their R&D is M&A activity (Martinez Cillero et al., 2025). However, the list of acquisitions of other Scoreboard companies by the GAFAM companies is surprisingly short: Meta and Amazon have never acquired a single company that was ever listed among the top R&D investors. Apple acquired only one company from the ranking in 2012 with an R&D investment of EUR 21 million. Alphabet (Google) made three acquisitions of Scoreboard companies in 2016, 2021 and 2022 (combined R&D of EUR 550 million). The most significant acquisitions of Scoreboard companies were performed by Microsoft. It acquired four Scoreboard companies between 2016 and 2022. The most significant in terms of R&D was the acquisition of Activision Blizzard in 2022 (R&D EUR 1 650 million), followed by Linkedin in 2016 (R&D EUR 795 million). The two other acquisitions took place in 2020 and 2021 and involved R&D investments of EUR 270 million. This is interesting insofar as Microsoft was the top 5 company with the lowest rate of R&D growth and was never in the top 3. This suggests that the acquisition of companies with large R&D investments cannot serve as a sufficient explanation for the rise in concentration of R&D investment (note that all acquired companies were from the US, and only one from the UK). However, the GAFAM companies are much more active in acquiring startups than established firms. They have acquired hundreds of startup companies, many with valuations below traditional review thresholds by competition authorities (Gugler et al., 2025).

In the absence of large-to-large M&As, two mechanisms can explain rising R&D concentration. On the one side, pre-emptive early-stage acquisitions of startups can decrease future competition and dampen firm dynamism (the 'killer acquisition' channel). Recent evidence shows that venture capital (VC) investments in certain technology fields decrease up to 70% after a GAFAM acquisition (Gugler et al., 2025). Furthermore, there is typically a decline in startup patenting which is not offset by a corresponding rise in the acquirer's own innovation activity (Berger et al., 2025). On the other side, when targets are highly complementary to incumbents' capabilities, synergies can be activated, and integration can raise the output of the resulting R&D activity and speed diffusion along new trajectories. This resonates with evidence finding that mega firms produce more novel patents and have opened new technological trajectories since 2007, in particular by combining ICT with non-ICT components (Gugler et al., 2025).

The **policy and academic challenge ahead** is to distinguish the cases where early acquisition kills future competition from those where it solves a scale-up constraint and can potentially increase innovation activity. The Scoreboard is well placed to help in this task by linking its data to startup data sources.[13]

2.4. Development of R&D investment 2014-2024

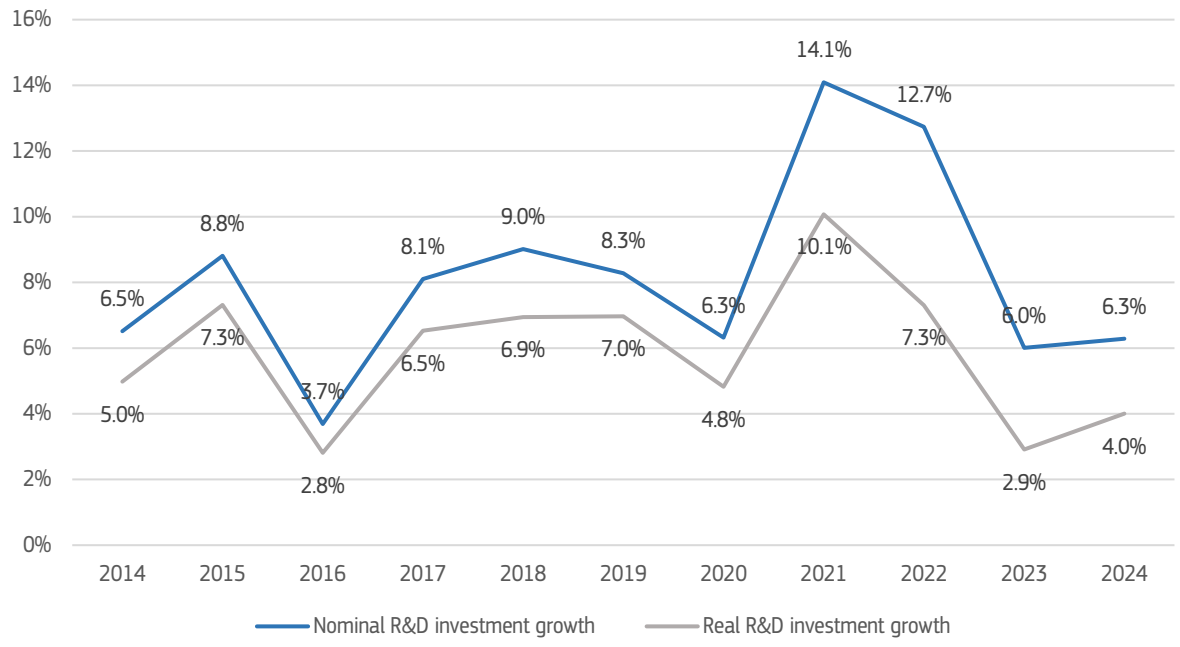
Since its inception in 2004, the Scoreboard ranking has been based on nominal R&D investments as reported in consolidated company accounts. If reported in the company accounts, R&D investment data are adjusted for R&D undertaken for governments or other companies and excludes the companies' share of any associated company or joint venture R&D investment. However, R&D investment includes research contracted out to other companies or public research organisations (see Annex 2 for methodological details).

[13] A recent example is the study by Gavigan, Fako and Compaño (2024) that connects the VC investments of a sample of automotive companies from the Scoreboard into startups.

Figure 15 displays the growth rate of worldwide R&D investment by the 2 000 Scoreboard companies in nominal and inflation-adjusted (real) values. For the inflation adjustment, we transformed the firm-level data in original currency values using the country-specific GDP deflator[14] of the country in which they are headquartered and then converted to euro values. All R&D investment by a company is allocated to the country in which it is headquartered as there is no information available on the actual location of a company's R&D investments. The country-specific inflation rate may therefore not always accurately capture the true increase in prices that a company faced, as the country where a company has its headquarters is not necessarily the country where it performs all–or even part of–its R&D activities. Many firms have R&D locations in various countries (see **Chapter 5** on R&D internationalisation) and are thus exposed to a set of different inflation rates. Depending on the firm, the deflated series might therefore overestimate or underestimate the inflation-adjusted R&D investment.

In the low-inflation period up to 2020, the difference between nominal and real values was only 1.5% on average. However, the inflation rate rose to 4% in 2021 and 5.3% in 2022, substantially reducing the real increases in R&D investment. In 2023, the average inflation rate decreased to 3.1%, and in 2024 to 2.3%, reducing the nominal increase in R&D investment from 6.3% to 4.0% real R&D investment growth. The **nominal and real growth rates in 2024 are lower than the compound average annual growth rates (CAGR) of 7.5% and 5.4%** over 2014-2024.

Figure 15. Nominal vs real R&D investment growth rates, top 2 000 companies, 2014-2024



Notes: The base year for the inflation adjustment is 2020 (GDP deflator in 2020 = 100), apart from South Korea (2015) and the US (2017).

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

[14] The GDP deflator is defined as the ratio of GDP in current local currency to GDP in constant local currency in linked series; data is taken from the World Bank with the base year 2020 for most countries apart from the US (2017) and South Korea (2015). However, this does not affect the growth rates but only the level of the inflation adjusted values.

Since inflation rates have differed across countries, **Table 8** displays the growth rates of R&D investment for the main countries/regions and compares the nominal to the inflation-adjusted development since 2014[15]. After two years with high R&D investment growth rates, **the EU companies recorded a considerable slow-down** to 2.9% in 2024 in nominal terms, and in inflation-adjusted terms the EU Scoreboard **R&D stagnated** (0.1%). Thus, after a slight catching up with the US, the EU companies fell further behind again in 2024 (see also **Figure 16**), which is also reflected in the decrease in the EU's share of global R&D by the top 2 000 companies (from 16.7% to 16.2%, **Figure 8**). In addition, the EU's growth rate in 2024 **remained under its long-run average** of 4.8% in nominal terms between 2014 and 2024 (2.5% in inflation-adjusted values).

The EU's main competitors, the US and China, showed differing trends. In 2024, the **US companies invested 7.8% more** in R&D than in 2023 in nominal terms–the inflation-adjusted growth rate of 5.2% exceeded the EU's by over 5 percentage points. Nevertheless, nominal US R&D investment growth remained **below its long-run average** of 8.3% (5.8% when adjusted for inflation) for a second consecutive year. In **China**, **R&D investment growth in 2024 was the lowest on record** at 3.9% (4.6% when adjusted for inflation)–and far below the 10-year CAGR of 16.8% since 2014. As can be seen in **Figure 16** the annual growth rates in China's R&D investment have been in decline since 2021, and the speed of the decline accelerated. As pointed out in last year's Scoreboard, China has a considerable share of state-owned enterprises (SOEs), and these SOEs were responsible for ca. 27% of corporate R&D investment by Chinese Scoreboard companies and 16% of the firms. **These SOEs increased their R&D by only 0.9% in 2024,** while the **privately-owned Chinese companies increased their R&D investment by 5.0%**. The fall in Chinese corporate R&D investment growth is thus mainly driven by the SOEs, although private companies also had a difficult year 2024.

Table 8. Regional R&D investment growth 2014-2024, nominal and inflation-adjusted, top 2 000 companies

	EU		US		China		Japan		ROW	
	nominal	**real**	**nominal**	**real**	**nominal**	**real**	**nominal**	**real**	**nominal**	**real**
2024	2.9%	0.1%	**7.8%**	**5.2%**	3.9%	4.6%	7.1%	4.1%	8.1%	4.3%
2023	**9.3%**	3.6%	5.3%	1.7%	7.9%	8.4%	5.8%	1.6%	2.3%	0.1%
2022	**12.6%**	6.7%	**12.8%**	5.3%	15.8%	13.6%	9.2%	8.8%	11.3%	6.4%
2021	5.3%	2.9%	**16.0%**	10.9%	24.5%	19.2%	5.3%	5.5%	13.4%	9.8%
2020	**-2.9%**	**-4.9%**	9.6%	8.2%	18.7%	18.1%	**-0.2%**	**-1.1%**	1.3%	**-0.2%**
2019	5.5%	3.6%	9.7%	7.9%	23.7%	22.1%	1.5%	0.8%	0.7%	1.3%
2018	5.2%	3.5%	10.0%	7.5%	28.5%	24.2%	3.5%	3.6%	3.1%	1.4%
2017	5.7%	4.4%	7.8%	5.9%	25.3%	20.3%	4.7%	4.7%	5.5%	4.7%
2016	3.0%	2.0%	4.6%	3.6%	17.6%	15.9%	**-2.6%**	**-3.0%**	0.5%	**-0.4%**
2015	7.1%	5.6%	8.7%	7.7%	22.5%	22.4%	5.1%	2.9%	8.5%	5.4%
2014	2.9%	1.6%	7.4%	5.6%	26.2%	24.9%	3.6%	0.9%	5.5%	4.2%
CAGR	**4.8%**	**2.5%**	**8.3%**	**5.8%**	**16.8%**	**15.1%**	**3.5%**	**2.5%**	**4.9%**	**2.9%**

Notes: The base year for the inflation adjustment is 2020 (GDP deflator in 2020 = 100) except for the US (2017) and South Korea (2015). Note that China recorded deflation (negative inflation rate) in 2023 and 2024.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

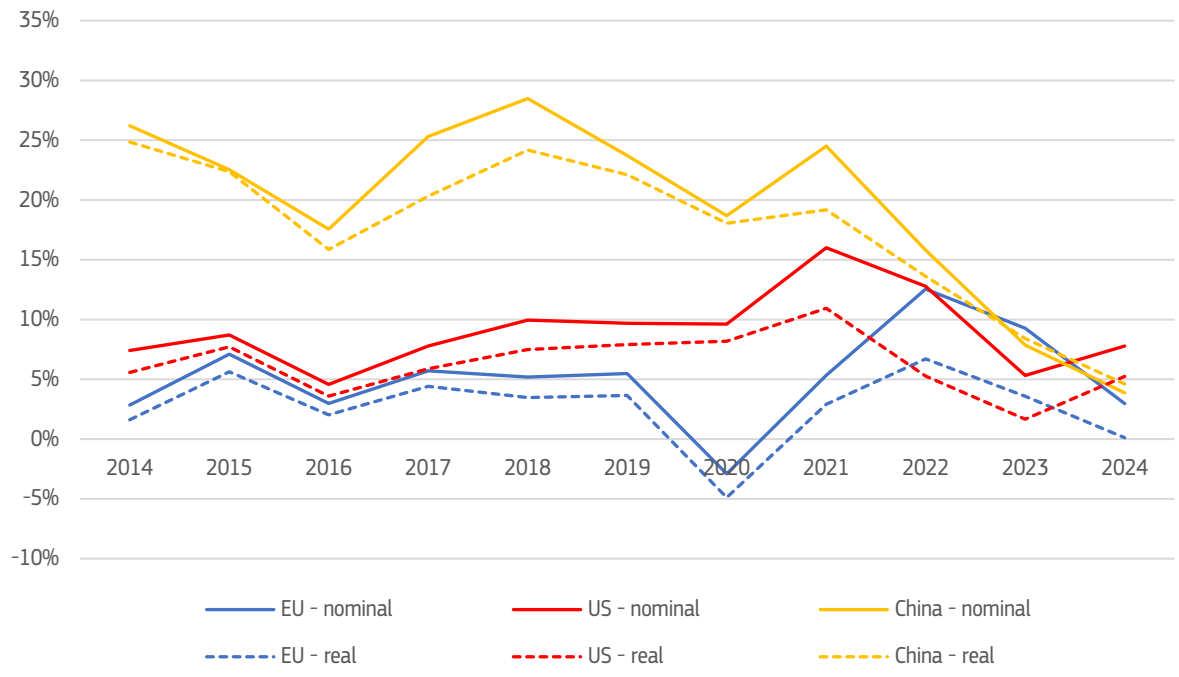
[15] We calculate the growth rates by comparing, e.g. all EU companies in 2024 with all EU companies in 2023. When we instead calculate the growth rates only for the firms included in both years, we get the following result (inflation-adjusted values in brackets): total (n=1 906) 6.8% (4.5%), EU (n=284) 3.9% (1.0%), US (n=660) 8.6% (6.1%), China (n=499) 3.8% (4.5%), Japan (n=183) 6.4% (3.5%), ROW (n=280) 7.9% (4.0%).

The **Japanese Scoreboard companies** continued their **positive development** in 2024 with a nominal increase in R&D investment of 7.1% (4.1% when adjusted for inflation). Although in 2014-2019, their R&D investment increased on average by 2.4% per year only, in the post-COVID-19 period of 2021-2024 their **average annual growth rate almost tripled to 7%.** This indicates that the Japanese companies are now **focusing more on R&D than they did in the past**. In addition, the number of Japanese companies in the Scoreboard increased in 2024, slightly raising the country's share of global R&D by the world's top R&D investors.

ROW companies led R&D investment growth in 2024: the nominal R&D investment growth rate was 8.1% (4.3% when adjusted for inflation), ahead of the US and Japan. The ROW countries driving this growth were South Korea (up 16.1%), Taiwan (up 12.9%) and Australia (up 9.5%), while UK companies increased their R&D at a lower rate (5.6%), and companies headquartered in Switzerland increased by only 1.7% compared to the previous year (after declining by 2.4% in 2023). Canadian companies reduced their R&D by 1.3%.

Figure 16 sets out the nominal and real R&D investment growth rates since 2014 for the EU, the US and China. Comparing the EU with the US shows that up until 2017, US companies increased their R&D investment by only a slightly higher rate than the EU companies, but between 2018 and 2022, US companies' R&D investment expanded at double-digit rates each year. The contrast between the EU and the US was particularly pronounced during the COVID-19 pandemic. Only in 2022 and 2023 was the EU was on a par/above the US in terms of R&D investment growth, before the familiar pattern returned in 2024. This development is reflected in the CAGR in corporate R&D investment between 2014 and 2024: **8.3% for the US vs. 4.8% in the EU** (5.8% and 2.4% when adjusted for inflation). **The US not only has more than twice as many companies in the Scoreboard as the EU, it is on average also increasing its investment at almost twice the speed as the EU companies.**

Figure 16. Nominal vs real R&D investment growth EU, US and China, top 2 000 companies, 2014-2024

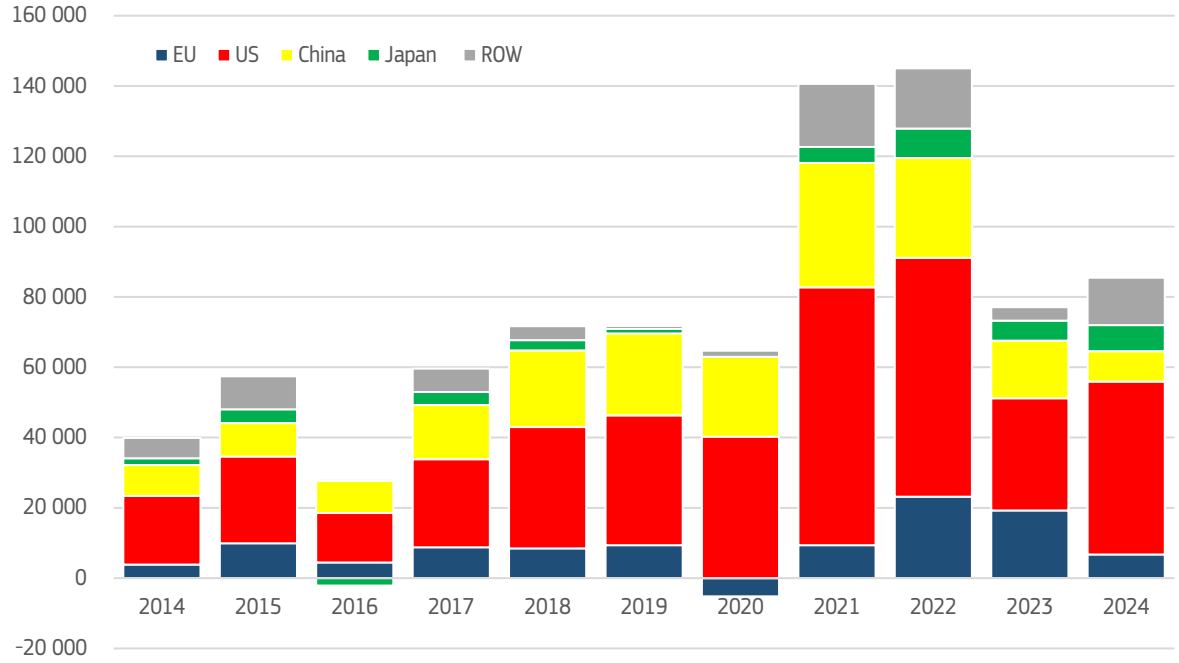


Notes: The base year for the inflation adjustment is 2020 (GDP deflator in 2020 = 100) except for the US (2017). Note that China recorded deflation (negative inflation rate) in 2023 and 2024.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Figure 17 breaks down the absolute nominal growth in R&D investment since 2014 by the main regions/countries. In 2024, **total additions** to R&D investment amounted to **EUR 85.8 billion**, of which **57.3% (EUR 49.1 billion) came from US companies**. In relative terms the US contribution was higher than in the past three years (at 41.2% in 2023, 46.8% in 2022, and 52.1% in 2021). The second largest additions came from ROW companies with EUR 13.9 billion, followed by Japan with EUR 7.4 billion, and China with EUR 8.6 billion (47% less than in 2023), with the EU last and adding only EUR 6.6 billion in 2024. While the contribution of the ROW companies increased over fourfold compared with 2023, **the contribution of EU companies fell by 65% to its lowest level since 2016** (except for 2020). Japanese companies added EUR 2 billion more to R&D than in the previous year. The biggest surprise, however, is China. While being traditionally the driving force in global R&D investment growth together with the US, Chinese companies increased their R&D investment in 2024 by the smallest absolute amount since 2013. For the moment, the Chinese companies have lost their momentum as a driving force of global R&D investment growth.

Figure 17. R&D investment growth decomposition by regions, top 2 000 companies, 2014-2024



Notes: The vertical axis displays the change in absolute R&D investment by the 2 000 companies (in EUR million).
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Overall, **65.4% of companies reported an increase in R&D investment in 2024** compared with the previous year, 8 percentage points below the average share of 73.6% since 2014. This additional R&D totalled to EUR 125 billion, somewhat lower than in 2023, and substantially below the additions in 2022 (EUR 172 billion) and 2021 (EUR 167 billion). Nevertheless, the addition in 2024 was the fourth highest on record, while cuts in R&D (calculated as the sum of negative changes in R&D) increased to EUR 32 billion (the second largest loss since 2020 when cuts amounted to EUR 38.5 billion). As in the previous year, the country with the highest share of companies reporting an increase in R&D in 2024 was **Japan with 76.6% of the companies** (2023: 85.2%)**, followed by the EU at 71.8%** (2023: 80.1%), and the ROW countries at 68.3%. The ROW is the only region in which a higher share of companies increased their R&D in 2024 than in 2023 (65.1%). **In the US, only 62.8% of the companies raised their R&D investment** relative to 2023, by far the lowest share on record for the US. Thus, even though US R&D investment grew strongly in aggregate, this growth is based only on a relatively small fraction of

companies. Finally, **in China only 59.2% of the Scoreboard companies increased their R&D** with respect to the previous year–10 percentage points less than in 2023. This implies that the **decrease in R&D investment in China is rather broad-based** and not concentrated in only a few companies. Across time and regions, only Japan in 2020 (39.0%) and the EU in 2020 (51.2%) had lower values than China in 2024, underlining the extent of the decline in Chinese corporate R&D in 2024.

Box 2. Size classes

The Draghi (2024) report puts strong emphasis on innovative firms as key for industrial transformation and competitiveness. These companies are central drivers of economic growth, job creation and technological progress, and many of them are not necessarily large. We therefore look at the top 2 000 companies by size classes based on employment and classify companies with **up to 250 employees as SMEs**, companies with **251 to 750 employees as small mid-caps**, companies with **751 to 3 000 employees as mid-caps** and companies with **more than 3 000 employees as large companies** (European Commission, 2025c, 2025d, European Investment Bank & European Policy Centre, 2024). This classification makes it possible to gain insight in to the extent that smaller firms play a role among the global top R&D investing companies.

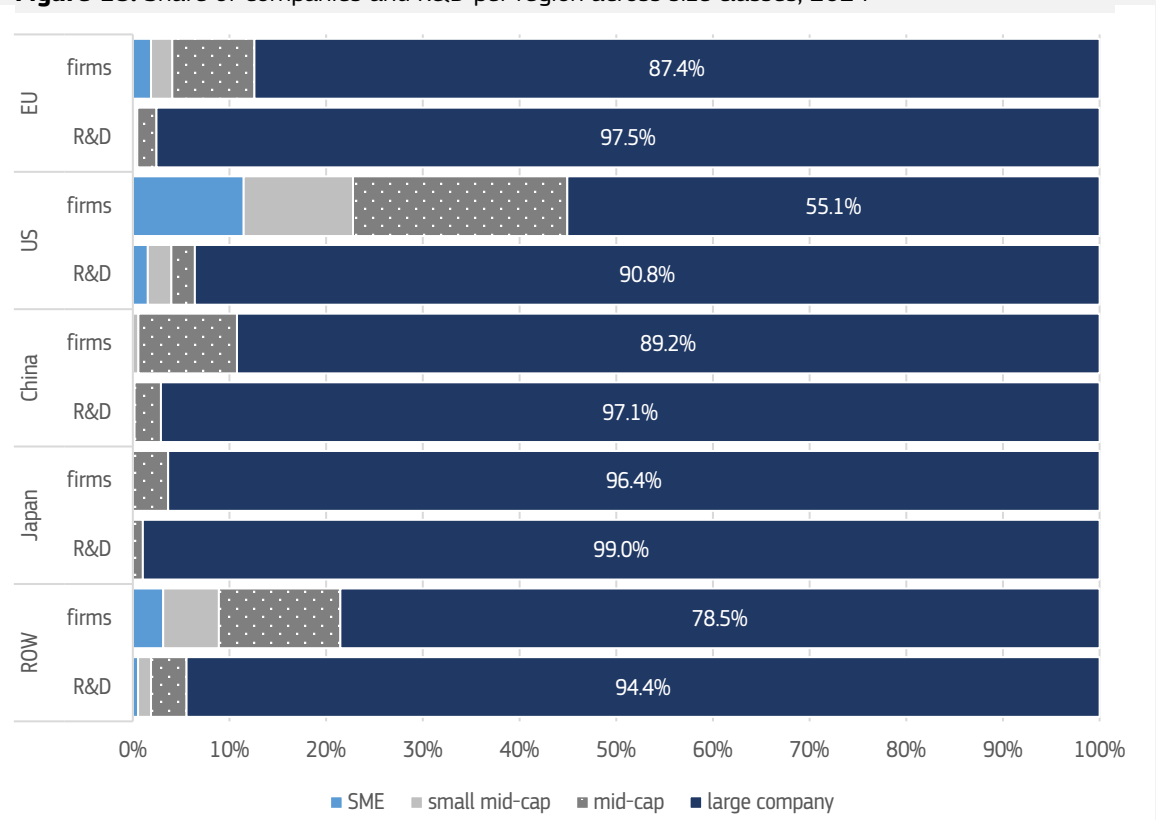
Figure 18 displays the distribution of companies and R&D investment across the 5 regions for 2024. On average, 76.4% of the companies have more than 3 000 employees, but there are stark differences across the regions. In Japan, 96.4% of the companies are classified as large and 89.2% in China, while at the other end **only 55.1% of the US top R&D investors are large companies. In the EU, this share amounts to 87.4% and to 78.5% for the ROW**[16].

In terms of R&D investment, the shares are rather similar across the regions due to the dominance of large companies in the absolute amounts of R&D (see section 2.3). In total, **the 89 SMEs in the top 2 000 companies were responsible for EUR 11.5 billion (0.8%)** of R&D investment, the 97 small mid-caps for EUR 18.9 billion (1.4%), and the 260 mid-cap companies for EUR 52.7 billion (3.8% of the total). These shares have remained stable across time. The compound average growth rates of R&D investment are surprisingly similar across the size classes at 7.0% for SMEs, 7.3% for mid-caps and 7.4% for large companies. However, small mid-caps stand out with average growth rates of R&D investment of 9.5% per year.

Across the regions, we observe that the smaller companies in the US are responsible for above-average shares of R&D investment, followed by the ROW and the EU. **The US has 77 SMEs in the Scoreboard**, **the EU and ROW 6 each**, with none from Japan or China. For small mid-caps, the corresponding figures are 76 for the US, 11 for ROW, 7 for the EU and 3 for China (0 for Japan), and for mid-caps 149 in the US, 27 in the EU, 53 in China, 24 in ROW and 7 in Japan. These data show clearly that **the US has a much larger supply of smaller firms that focus their activities on R&D** compared with the other regions. The EU is behind the US in this respect, on par with the ROW, and ahead of the other regions. In the ROW, the smaller companies come mainly from the UK, Canada, Israel and Australia, and to a lesser extent from Switzerland.

[16] The ROW suffers from systematically missing data due to companies from South Korea and Taiwan that tend to not publish employment figures in their annual reports. However, most of these companies would fall into the category of large companies.

Figure 18. Share of companies and R&D per region across size classes, 2024



Notes: Data refer to the 1 893 companies for which data on employment are available. Size classes are defined according to the EU Competitiveness Compass (European Commission, 2025) communication with SMEs <250 employees, small mid-caps 251-750, mid-caps 751-3 000 and large companies > 3 000 employees.

Source: The 2024 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The health sector hosts most of the smaller companies in the Scoreboard. **88 out of the 89 SMEs and 68 out of the 97 small mid-caps** are in the health sector. In contrast, the mid-cap companies are more active in the ICT sectors, with 63 in ICT hardware and 89 in ICT software, and 62 mid-caps in the health sector.

This classification by size classes will be applied in greater detail in Chapter 4 of this report on the sample of the top 800 companies from the EU based on investment in R&D.

2.5. Business key performance indicators

In addition to information on companies' R&D investment, we also collect information on key performance indicators (KPIs): net sales, operating profit (profit), capital expenditure (capex), market capitalisation, and employment.[17] **Table 9** displays these KPIs and their growth rates (relative to 2023) across the five regions, and adds R&D-specific performance indicators such as R&D intensity

[17] Data on employment are missing for 99 companies from the ROW because companies from South Korea or Taiwan typically do not report employment headcount in their annual reports. Data on market capitalisation are missing for 71 EU companies, 24 companies from the ROW and 16 for China.

(R&D investment divided by net sales), R&D investment per employee (in EUR), profitability (operating profits divided by net sales) and capital intensity (capital expenditure divided by net sales) for 2024. As a **novelty in 2024** we introduce the **ratio of R&D to capex** to assess the significance of **investments in innovation vs investments in physical capital**. Regional development is compared with the figures for the full sample (column 'Total').

Table 9. Business KPIs, top 2 000 companies, 2024

	EU	US	China	Japan	ROW	Total
Companies	318	674	525	192	291	2 000
R&D investment, EUR bn	233.7	680.8	233.2	112.4	186.0	1 446.2
One-year change	2.9%	7.8%	3.9%	7.1%	8.1%	6.3%
Net sales, EUR bn	5 305	7 964	5 836	2 707	4 853	26 666
One-year change	0.4%	5.9%	2.4%	5.6%	2.7%	3.4%
R&D intensity	4.4%	8.5%	4.0%	4.2%	3.8%	5.4%
Operating profits, EUR bn	584.3	1 272.1	388.8	231.5	798.2	3 274
One-year change	-1.3%	16.9%	2.2%	11.1%	6.4%	8.5%
Profitability, %	11.0%	16.1%	6.7%	8.6%	16.5%	12.3%
Capex, EUR bn	373.1	581.8	411.9	172.2	387.2	1 926
One-year change	3.7%	20.5%	-2.2%	9.8%	5.2%	7.7%
Capital intensity	7.0%	8.5%	4.0%	6.4%	8.0%	7.2%
R&D to Capex	62.6%	115.5%	56.6%	65.3%	47.8%	75.5%
Employment, million	13.9	13.8	15.5	7.6	6.3	57.2
One-year change	0.1%	-1.1%	2.5%	0.1%	-3.2%	0.1%
R&D per employee, EUR	16 852	48 784	14 938	14 717	19 718	24 064
Market capitalisation, EUR bn	5 835	33 261	4 121	2 772	8 318	54 308
One-year change	4.6%	22.3%	11.6%	-7.9%	17.0%	13.6%

Notes: Capex stands for capital expenditures. R&D intensity is defined as R&D investment as a share of net sales, profitability is defined as profits as a share of net sales, and capital intensity as capex as a share of net sales. Measured in nominal values.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

After the strong and broad market expansion in 2021 and 2022, the aggregate picture deteriorated in 2023, but improved in 2024. **Net sales increased by 3.4%** for the entire sample, while operating **profits increased by 8.5%** after last year's decrease by 10.5%, and **employment remain at last year's level**. Companies **increased their capex by 7.7%** in 2024 at a somewhat higher rate as in the previous year, and **market capitalisation rose by 13.6%**, driven by the US companies that account for over 60% of the total market capitalisation of the 1 874 Scoreboard companies listed on stock exchanges. These aggregate figures are the result of a rather mixed development across regions and sectors, which will be elaborated in the following paragraphs and sections (for a more detailed picture on the sectoral level see Sections 3.5 and 3.7).

2.5.1. Net sales & R&D intensity

Total net sales increased by 3.4% to EUR 26 666 billion in 2024, with the greatest increases in the US (up 5.9%), followed by Japan (up 5.6%). Sales growth in the companies from China and the ROW was more moderate at 2.4% and 2.7%, while the **sales of the EU companies stagnated** with a small increase of 0.4% only. The US companies account for 29.9% of total sales, China for 21.9%, the EU for 19.9%, the ROW for 18.2%, and Japan for 10.2%. The regional distribution of sales is more balanced than the distribution of R&D investment. 43 companies did not generate any sales–38 of these are in the health sector, in particular biotech, and in most cases from the US. In

2014, there were only 6 companies without sales in the Scoreboard: this number peaked in 2022 at 56 and has decreased again since then.

In **Japan**, sales by companies in the **health sector** (up 12.2%) and 'Others' (up 13.8%) drove aggregate sales growth, while **in the US the ICT software sector and the health sector** accounted for the largest contributions to the increase in sales (up 11.4% and 9.2% respectively). In the **EU, automotive sales decreased** by 4.1% compared with 2023, while sales in the **health and aerospace & defence sectors grew strongly** (up 6.9% and 11.9% respectively). In China, sales by automotive companies and in ICT hardware increased strongly (up 11.6% and 7.5% respectively), while the construction & materials sector (the largest sector in China in terms of sales accounting for approximately 20%) as well as the industrials sector saw sales contract by 3.7% and 2.1%. In the **ROW countries**, the **ICT hardware producers** recovered from the 2023 sales drop and recorded a large increase by 15.8%; aerospace & defence sales grew by 15.4%, while sales of the energy companies fell by 4.4%.

The **three largest sectors in terms of sales** are **energy** (15.5% of the total), **automotive** (14.8%) and **ICT hardware** (14.6%). Total energy sales fell by 1.8% in 2024 (after a strong decrease of 18.2% in 2023) due to a drop in China (down 2.6%), the ROW (down 4.4%) and Japan (down 0.8%), while this sector's sales increased moderately in the US (1%) and the EU (0.6%). In the automotive sector, after three years of double-digit growth, sales growth stagnated in 2024 with a small increase of only 1.1%. The regional picture was quite heterogeneous, with the strongest increase for the Chinese companies (up 11.6%) and Japan (up 4.1%), while EU automotive sales fell by 4.1% and stagnated in the US (0.8%) and the ROW (0.7%). Sales of ICT hardware rose by 8.8% in 2024, after a small decrease in 2023. Sales of the EU companies in this sector fell by 2%, while all other regions recorded increases: up 15.8% in ROW, 8.8% in the US, 7.5% in China and 5.6% in Japan.

As in previous years, the stronger increase in R&D investment relative to sales caused a moderate rise in **R&D intensity** among the global top 2 000 companies from 5.2% in 2023 to **5.4% in 2024, the highest value in the Scoreboard so far**. The R&D intensity of the ROW and US companies increased by 0.2 percentage points, and by 0.1 percentage point for the EU, China, and Japan. The R&D intensity of US companies is around twice as high as that of the other regions.

2.5.2. Operating profits and operating profitability

Total operating profits increased by 8.5% to EUR 3 274 billion in 2024, driven by **the strong increase in US companies'** profits (up 16.9%). The largest share of profits was earned by US companies with 38.8% of the total, followed by ROW (24.4%), the EU (17.8%), China (11.9%) and Japan (7.1%). The disproportional share of ROW relates mainly to the relatively large number of energy companies (primarily in oil and gas). Of the 2 000 companies in the Scoreboard, 497 generated losses, a decrease compared with the past 2 years. Most loss-making companies are in the health sector (208), followed by ICT software (104). 276 US companies made losses, 121 from China, 53 in the ROW countries, 40 in the EU, but only 7 companies in Japan.

The US ICT service companies increased their profits by over 34.3% (to EUR 448 billion), and the US ICT hardware companies by 17.5% (to EUR 316 billion). The profits of companies headquartered in the **EU fell by 1.3%** due to a **sharp drop by the automotive companies** (down 29.1% year-on-year), while all other sectors in the EU (apart from chemicals, ICT software and industrials) recorded increases in profits, in particular aerospace & defence (44%) and health (9.8%). The profits of the **Chinese companies grew** by 2.2% after strong decrease in 2023 (down 6.6%). This positive

development was driven by ICT software (up 20.6%), automotive (up 16%) and health (up 5.7%), while ICT hardware recorded a decrease in profits of 10.2%, and construction & materials by 7%. The **Japanese companies continued to increase profits strongly** (up 11.1% in 2024) thanks to broad-based profit growth across many sectors, and in particular due to the ICT software sector (up 53%), the health sector (up 42%), and ICT hardware (up 15.6%). However, automotive profits fell by 14.9% in 2024 after their record increase of 58% in 2023. In the ROW, profit growth was driven by a **doubling of profits in the ICT hardware sector** (up 104.6%, led by SK Hynix which turned a loss in 2023 into over EUR 15 billion profit), and a strong increase in ICT software companies' profits (up 37.9%), while the energy sector profits fell by 14.2%.

The **three largest sectors globally in terms of profits in 2024 were ICT software (18.9%), energy (18.6%) and ICT hardware (16.6%)**. The profits of the ICT software sector increased by 29.4%, after an increase of 35.2% in the previous year. Total profits of the energy companies fell by 9.1% (after the strong decrease by 35.9% in 2023), driven by the large oil and gas producers from ROW (down 14.2%). In the ICT hardware sector, aggregate profits rose by 22.9%, after a decrease of 13.1% in the previous year.

Overall, **profitability increased** compared to 2023 from 11.8% to 12.3%, mainly driven by the US. The **profitability of the US companies amounted to 16.1%**–an increase by 1.5 percentage points compared to 2023–and the highest level for the US so far. The **profitability of EU companies fell slightly** by 0.2 percentage points to **11%,** and for the **Japanese companies it rose to 8.6%.** The profitability of the Japanese companies increased by 1.2% percentage points over two years to its highest level so far. **In the ROW, profitability is determined to a large extent by the energy sector**. After the sharp drop in 2023 from 21.7% to 15.9%, the ROW countries' profitability increased again in 2024 to 16.5% thanks to the ICT hardware sector. At 6.7%, profitability of the **Chinese companies** stabilised after decreases in recent years but it continued to **trail in the profitability ranking.**

2.5.3. Capital expenditure (capex), capex intensity and R&D-to-capex

The relationship between R&D and capex provides valuable insight into how companies balance long-term innovation investment versus capital investment to enhance current production capabilities or infrastructure. Different industries have inherently different needs, and thus, their R&D-to-capex ratios can vary widely. For example, technology and pharmaceutical companies often have higher R&D investment relative to capex, while industrials, energy or chemical companies have higher capex due to the need for physical infrastructure. This section analyses trends in total capex, capex intensity (capex as a share of net sales), and R&D-to-capex ratios among all Scoreboard companies to assess the shifts between tangible and intangible investment priorities (Haskel & Westlake, 2017; Hirschey et al., 2012).

Total capex increased by 7.7% to EUR 1 926 billion in 2024, **driven by the US companies** (which raised their capex by 20.5%) **and Japanese companies** (up 9.8%), and to a lesser extent the ROW countries (up 5.2%) and the EU (up 3.7%). In contrast, **Chinese firms reduced their capex** by 2.2%–the first decrease since 2016. In the past, the EU, US, China and ROW invested rather similar amounts in capex, but in 2024 the US made a leap ahead to 29.9% of total capex with the largest capex increase on record, increasing by EUR 98 billion.

The biggest **US capex investments** came from the **ICT software companies**; in their quest to develop the most advanced AI they **increased their capex by 50.6%** in 2024 to EUR 279.7 billion.

The ICT software sector was responsible for 48.1% of US capex in 2024, up from 38.5% in 2023. Capex by US ICT hardware producers fell by 6.9% to EUR 75.6 billion (after minus 0.5% in 2023)–their surge in capex in 2021 and 2022 preceded that of the software companies. In total, the two ICT sectors were responsible for 61.1% of the capex of the US Scoreboard companies. As in the past two years, capex growth in the **EU** was driven by the **energy sector,** which contributed EUR 111 billion (29.8% of EU capex) and increased by 17.8%, followed by the automotive sector with EUR 69.4 billion (up 8.1%, 18.6% of EU capex). The EU's industrials, health and aerospace & defence sectors also continued to increase capex in 2024, while **ICT hardware and ICT software companies in the EU both recorded strong declines**. In **China**, capex growth in 2024 was negative in all sectors except from ICT software, energy and aerospace & defence, with **large decreases in automotive**, health, chemicals, construction & materials, and industrials. After three years of strong expansion, the capex of Chinese automotive companies fell by 8.3% in 2024. The **ICT software sector increased capex by 18.3%** (to 13.7% of Chinese capex). The pattern in China resembles that in the US, where a capex increase by the ICT software companies followed that of the ICT hardware sector (ICT hardware reduced capex the second consecutive year after massive increases in 2020-2022). In **Japan,** the ICT software sector continued to significantly raise capex (up 11.1% in 2024, after 9.7% in 2023), as did the industrials sector and companies in the 'Others' sector (with companies like Sony or Panasonic). In addition, Japan's automotive sector, responsible for 31.2% of total capex, continued the expansion, albeit at a slower pace (5.6% in 2024, after 27.3% in 2023). Japan's ICT hardware sector increased capex by 6.7%, after two years of double-digit growth. In the **ROW** group, the energy companies and ICT hardware companies accounted for 29% and 27% of capex. This constitutes an ongoing decrease in the energy sector's share of capex (which was at 42% in 2014), while the ICT hardware sector's share increased. In 2024, the ROW's energy sector increased capex by 6.2%, ICT hardware by 9.7%, and automotive by 13.5%.

The strong increase in capex while sales growth remained somewhat more subdued led to an **increase in capex intensity** from 6.9% in 2023 to 7.2% in 2024. With the large capex increase by the ICT software sector, **US capex intensity rose from 6.4% to 7.3%.** The US has traditionally been a country with lower capex intensity, but the recent investments by its ICT sectors moved it to second position behind the ROW in 2024. The reverse holds for **China** where capex intensity decreased to 7.1% in 2024 from 7.4% in 2023. The **EU companies'** capex intensity increased from 6.8% to 7.0%–the highest value for the EU so far. Capex intensity **continued to rise in Japan,** rising from 6.1% to 6.4%, and in the ROW countries it increased from 7.8% to 8%. The sectors with the highest capex intensity globally are ICT software (12.1%), followed by energy (9.7%), chemicals (9%) and ICT hardware (7.7%).

In this Scoreboard we **newly introduced** the ratio of **R&D to capex** as a KPI in order to judge the **relevance of investments in innovation vs investments in capital goods**. For the Scoreboard companies together, this ratio stands at **75.6%**, but this figure hides important heterogeneities across sectors and countries/regions. **The US leads** this KPI **at 115.5%,** meaning that the US companies invested on average 15% more in R&D than they did in capital goods. On the other end of the distribution stand the **ROW countries at 47.8%,** suggesting that capital goods are more significant for these companies' business models than investments in R&D (sections 3.5 and 3.7 show that this cannot be explained by sectoral patterns alone as there are substantial differences within sectors across regions). In between those poles are the **EU (62.5%)**, Japan (65.3%) and China (56.6%).

The R&D-to-capex ratio stood at 52.6% in 2014; the US companies had the highest value in 2014 with 86.6%, followed by Japan with 55%, and the EU with 51.1%, while China and the ROW had the strongest capex orientation with R&D-to-capex ratios of 31.6% and 27.5%. The increase across all regions indicates that over time, more and more companies focus more and more on R&D, but only in the US R&D investment plays a more important role than capex.

The sectors with the highest R&D-to-capex ratio were health with approximately 3 times more R&D investment than capex, followed by aerospace & defence at approximately 110%, the two ICT sectors with around 100% each, and automotive at approximately 82%. At the other end of the spectrum are the chemicals sector (26%) and the energy sector, which naturally has the lowest ratio of R&D to capex at 6.5%.

2.5.4. Employment and R&D per employee

Employment stagnated with a 0.08% increased and stood at 57.2 million employees. The Chinese companies expanded the most with an increase of 2.5%, followed by Japan and the EU with 0.13% and 0.12%, while in the US and the ROW, the companies reduced employment by 1.1% and 3.2%, respectively. It is important to note that many large companies in South Korea (e.g. Samsung Electronics) and Taiwan (e.g. Delta Electronics) **do not disclose their employment**, leading to a substantial underestimation of employment for this region and the Scoreboard overall.[18]

The US companies, while growing in all other indicators, reduced their employment by 1.1% in 2024, after minus 0.2% in the previous year. The 1.4% increase in **China** constituted the **lowest employment growth** of the Chinese Scoreboard companies **so far**. In **Japan**, five consecutive years of employment reductions ended in 2024 with a small **increase in headcount by 0.13%** thanks to the new companies entering the ranking. In the **ROW companies employment decreased by 1.5%**, after a drop of 13.5% in 2023 (this drop resulted from changes in disclosure by some large companies and some large companies leaving the ranking).

In the top 2 000, the ICT hardware and automotive sectors account for the largest shares of employment with 16.6% and 16.4% respectively, and the companies in the 'Others' sector account for 14.8%. In the EU and Japan, the automotive sector employs 23.4% and 24.1% of the total. In the US ICT software accounts for 26% of employment, while in China and the ROW, ICT hardware companies employ the largest shares at 19.5% and 16.1% respectively. **In the US, the two ICT sectors together account for 42.5% of employment, while in the EU it is a mere 13.7%**.

In 2024, the automotive sector increased employment by 2.5%, driving the overall increase. ICT hardware companies raised employment by 0.6%, while ICT services reduced employment by 2.3%, following a decline of 7.5% in 2023. After the large additions in employees by ICT software companies during the COVID-19 pandemic, these companies continue to reduce their employment count. The sectors grouped in 'Others' decreased employment be 1.5%, the third consecutive year with decreases in these sectors.

R&D investment per employee across all Scoreboard companies stood at EUR 24 064 on average in 2024, corresponding to an increase of EUR 1 329 compared to the previous year. Overall,

[18] The data on employment are complete for Japan, the EU is missing data from one company, the US two, and China five, but missing for 100 ROW companies.

the **increase in R&D per employee continued, albeit more slowly than in the three years before**. While a Scoreboard company spent an average of EUR 11 977 on R&D per employee in 2014, this figure more than doubled over the past 10 years (adjusted for inflation, it increased from EUR 12 177 to EUR 20 459), mainly due to the increase in R&D investment, but also due to reductions in employment.

US companies led on this indicator with EUR 48 784 per person employed[19], an increase of EUR 4 036 compared to the previous year, the largest year-on-year increase besides 2021. Since 2019 (before the COVID-19 pandemic) the average R&D investment per employee in a US Scoreboard company increased by almost EUR 16 000. By contrast, **EU companies invested only EUR 16 852** on R&D per employee in 2024, EUR 455 more than in 2023 (EUR 9 477 in 2014). **The ROW companies come second** in this statistic, but at a large distance to the US, with **EUR 19 718**, an increase of EUR 1 488 compared to 2023. The ROW figure is mainly driven by UK and Swiss health companies, but also by those ICT hardware companies in South Korea and Taiwan that publish data on employment. **China and Japan** are just behind the EU at the lower end of the distribution **with R&D investment per employee of EUR 14 938** (up EUR 184) **and EUR 14 717** (up EUR 953) respectively.

The leading sectors are health with R&D investment of EUR 63 943 per employee (an increase of EUR 3 761 compared to 2023) and ICT services with EUR 49 914 on average per employee, up EUR 4 707 compared to 2023. The ICT hardware sector invested on average EUR 33 555 per employee (around EUR 2 500 more than in the previous year), and the automotive sector EUR 20 951 (EUR 437 more than in 2023).

2.5.5. Market capitalisation

After the drop in 2022 and the strong recovery in 2023 (up by 19.7%), the market capitalisation of the 1 874 publicly listed Scoreboard companies **went up by 13.6% to EUR 54 308 billion** in 2024. The **market capitalisation** of the Scoreboard companies **increased by 83% between 2019 and 2024**[20]. As in 2023, the **growth of the Scoreboard companies' market capitalisation exceeded the growth of global aggregate market capitalisation** in 2024, which was around 8.7% (Sifma, 2025).

The listed **US companies are responsible for 61.2% of the total Scoreboard market capitalisation,** up from 56.9% in 2023. The ROW companies share was 15.3% and that from the EU 10.8%, while the Chinese firms accounted for 7.6% and those from Japan for the remaining 5.1%. In terms of sectors, the ICT hardware and ICT software sectors had the largest shares of total market capitalisation with 25.5% each, followed by the health sector with 12.5%, while the automotive sector traditionally has a lower share with 6.0% of the total. Across all countries, the ICT software companies' market capitalisation grew by 27%, that of the ICT hardware sector by

[19] In the 2024 edition of the Scoreboard this value was close to EUR 49 000. However, the inclusion of Amazon with more than 1.6 million employees lowered the average R&D investment per employee in US companies.

[20] Data on market capitalisation are lacking for 126 companies that are either not publicly listed or where data is simply missing (71 for the EU, 25 for the ROW, 16 for China, 13 for the US and 2 for Japan). Prominent examples of Scoreboard companies that are not listed on the stock market are Huawei in China, Robert Bosch and Boehringer Sohn in the EU, or Synamedia and Revolut in the ROW group.

26.4%, and that of the automotive sector by 10.4%, while health sector market capitalisation remained unchanged to 2023 (up 0.4%).

The market capitalisation of the **US companies increased by 22.3% in 2024**, driven by the large tech companies. Apple had the largest market capitalisation of all Scoreboard companies at EUR 3 164 billion (up 18.5%). The top 10 Scoreboard companies in terms of market capitalisation contain seven US ICT companies plus Tesla (automotive), and the only non-US companies are Saudi Arabian Oil Company (Aramco) and Taiwan Semiconductor (TSMC). In the US, the market capitalisation of the automotive companies increased by 36.6% in 2024, that of the ICT hardware companies by 32.1%, and that of the software companies by 28.3%. The **market capitalisation of the US automotive sector is over five times higher than that of the EU's automotive sector**, even though the sector is much smaller in all other variables (apart from capex).

The market capitalisation of the ROW companies also increased strongly in 2024 (up 17%), followed by China with 11.6% year-on-year growth. The EU companies lagged behind with an increase of only 4.6%, while in Japan the market capitalisation of the Scoreboard companies decreased by 7.9%. In the ROW, the sector with the most significant growth was ICT hardware with an increase of 28.7%, followed by ICT software (up 22.2%), while the health sector fell by 15.4% and the energy sector by 14.8%. In **China**, the growth in market capitalisation was driven by the **automotive sector** (up 24.3%), the ICT hardware companies (up 23.5%) and those in ICT software (up 20%). After two years of decreases in market capitalisation (down 17.3% in 2022 and 1.3% in 2023), the Chinese companies were able to catch up considerably in 2024, even though all other indicators showed a slow-down in the Chinese economy. **In the EU**, the market capitalisation of the **automotive sector fell by 11.6% in 2024** and is now **only slightly greater than the market capitalisation of the Chinese automotive** companies. On the positive side, the EU financial companies increased their market capitalisation by 20.2%, those in ICT hardware by 10.3%, and in ICT software by 37%. In Japan, the decrease in 2024 followed a strong increase by 40.2% in 2023. The downward adjustment was driven by the automotive companies with minus 27.3%, chemicals with minus 19.2% and ICT hardware with minus 12.7%, while the companies in the 'Others' sector recorded an increase by 18.9%.

2.6. Subsidiary structure of the Scoreboard firms

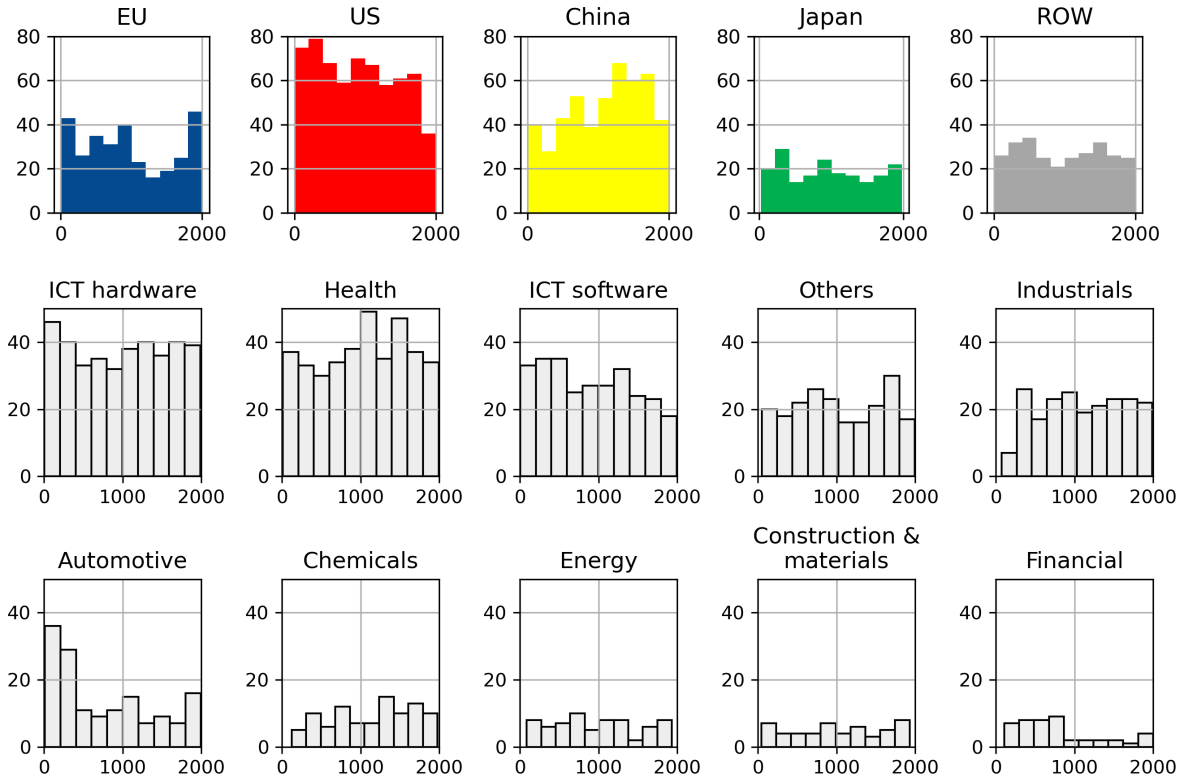
This section focuses on the subsidiaries of Scoreboard companies, particularly on the number of subsidiaries by region, country and sector, and on some comparisons across relevant groups. It should be noted that these groups are not always homogeneous in terms of the number and size of the Scoreboard companies they contain. This variance in the size and number of companies in each of these groups is important in putting into perspective the description of the landscape of Scoreboard subsidiaries that we present below.

Figure 19 provides some context for the analysis by showing how Scoreboard companies belonging to a region or a sector are distributed across the R&D ranking. The top row of **Figure 19** shows that every region has companies that are distributed across the R&D ranking. The US and China, with 636 and 488 companies with subsidiary information available, have more companies than all the other regions combined, although they concentrate in different parts of the ranking. China (40 companies in the top 200 and 66 in the top 400 spots of the ranking) has a comparable number of top-ranked companies to the EU (41 in the first 200 positions of the ranking and 68 in the first 400), but it places many more in the bottom half of the ranking. On the other hand, the US has by

far the largest presence at the top of the ranking (75 companies among the top 200 and 154 among the top 400) and maintains a stable presence throughout.

The two bottom rows of **Figure 19** refer to the 10 sectors containing the largest number of companies. It shows that a few sectors (particularly ICT and health) are much more represented than the others and have a relatively higher number of companies at the top as well as at the bottom of the ranking. At the same time, the automotive sector comprises fewer companies, which concentrate more toward the top of the ranking and could, therefore, have a comparable number of subsidiaries to more represented sectors.

Figure 19. Distribution of Scoreboard companies across regions and sectors, 2024.



Notes: Data refers to the 1 893 companies for which data on subsidiaries are available. Each bin covers 200 positions in the ranking. The top left panel shows that there are slightly over 40 EU-based companies in the first 200 positions of the ranking and almost 30 between rank 201 and 400. Similarly, the second panel in the top row shows that US-based Scoreboard companies account for over 70 of the top 200 companies. In general, the height bars occupying the same position in the top row of plots sum to 200. The same is true for the bars relating to sectors.

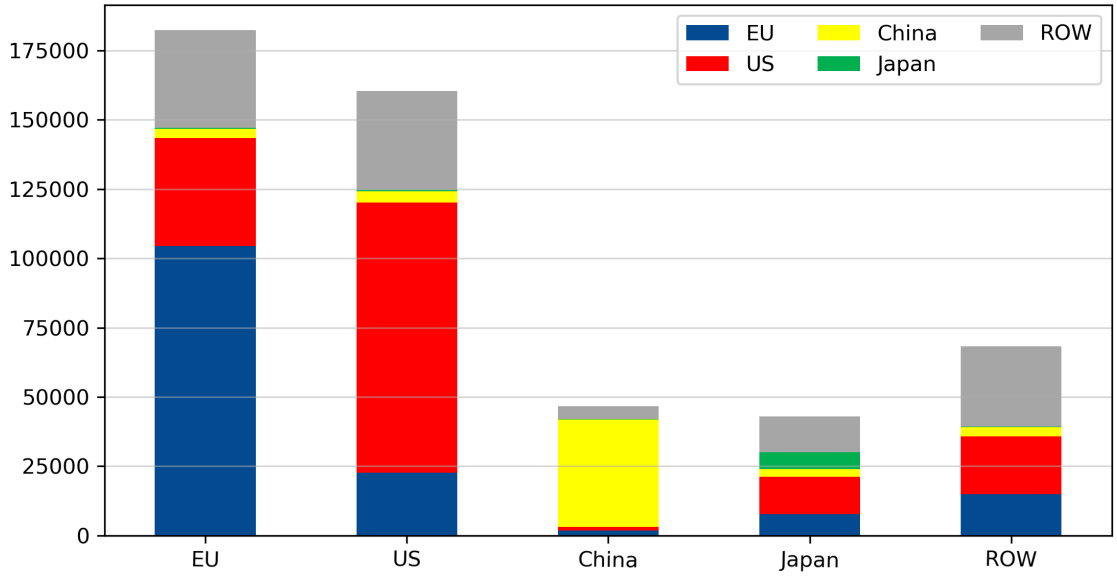
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The top 2 000 companies **control just over 570 000 subsidiaries, of which 501 000 are classified as active corporate subsidiaries**. The headquarters of the companies with subsidiary information in this year's ranking are distributed across 42 countries, and their corporate subsidiaries are in 204 countries and territories. Overall, the number of corporate subsidiaries covered in this year's Scoreboard is lower than last year (501 000 versus 552 000, -10%[21]), even

[21] In this edition, we use a new data collection and subsidiary identification process compared to the past Scoreboard edition. Consequently, the number of subsidiaries of the 2024 Scoreboard companies we reported last year

though their geographical distribution has remained qualitatively similar. This suggests that the industrial structure of the top R&D investors has continued following the same balanced path of expansion even after the post-COVID-19 recovery.

Figure 20. Geographical distribution of subsidiaries by country/region of the mother company, 2024.



Notes: Data refers to the 1 490 companies for which data on subsidiaries are available.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Figure 20 shows the regional distribution of the subsidiaries of the Scoreboard companies. Like in the 2024 edition of the Scoreboard, **EU-based companies own the most subsidiaries** (36%) followed by US-based companies (32%). Japanese companies own 8.6% of subsidiaries, slightly fewer than in the past edition, while China recovered from last year when it had 6% of total subsidiaries to 9.3%, which is very close to the value in the 2023 Scoreboard.

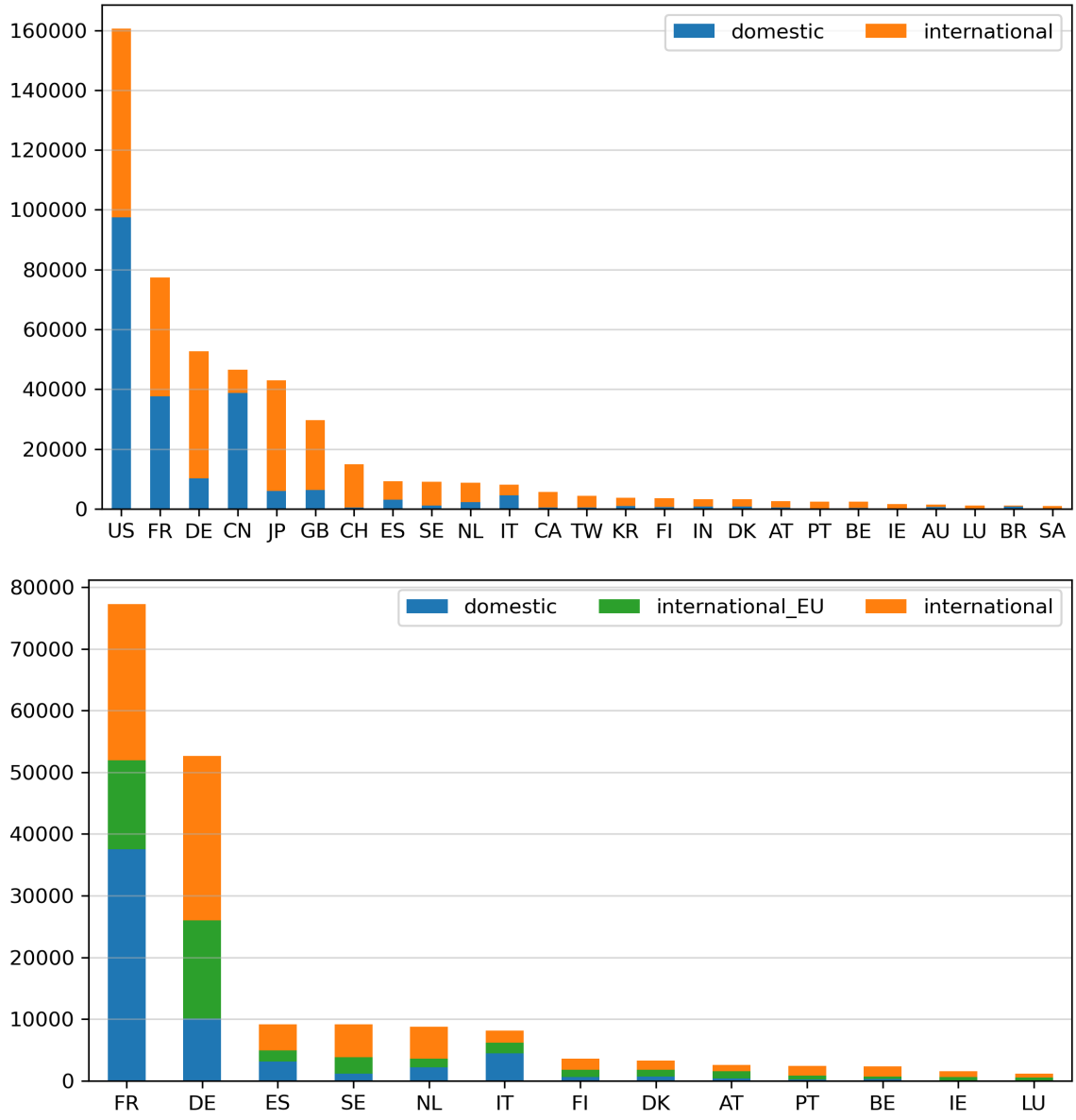
Like in the 2024 Scoreboard, **most of the subsidiaries of companies headquartered in the EU are located in the EU (57%), followed by the US (21%) and the ROW (19%).** Similarly, over half of the subsidiaries of companies headquartered in the US are in the US (61%), 22% in the ROW and 14% in the EU. More than 8 out of 10 subsidiaries owned by Chinese companies are in China (83%), while **Japanese companies remain the most international**, with only 14% of their subsidiaries located domestically.

Figure 21 shows that, despite the large number of countries hosting at least one Scoreboard entity, corporate subsidiaries are quite concentrated geographically. In fact, **around 99% of all the subsidiaries are in the top 25 countries** (75% in the top 5, and 90% in the top 10). This is a noticeable increase compared with the last edition, in which the top 20 countries hosted 90% of all subsidiaries. In line with the distribution of headquarters, the country in which most subsidiaries are located is the US, which accounts for 32% of the total, followed by France (16%), Germany (11%),

(380 000) using the old identification method does not match the number we report here using the new one. We chose to recompute to make the comparison more meaningful. Note that the regional distribution of the 2024 subsidiaries is qualitatively similar regardless of the method used to reconstruct the ownership structure of the companies.

China and Japan (both around 9%). The top 5 countries in terms of the number of hosted subsidiaries were the same in 2024 as in 2023 and almost in the same order; the only change is China (formerly 4th) overtaking Japan.

Figure 21. National and international subsidiaries of the top 2 000 companies by location, 2024.



Notes: the data refer to the 1 893 companies for which subsidiary data are available and to top countries (i.e. countries hosting Scoreboard companies that collectively own at least 1 000 subsidiaries). Top: national and international subsidiaries by country of the mother company for the top 25 countries; domestic subsidiaries are in the same country as the mother company. Bottom: focus on the top 13 EU countries; international subsidiaries are divided into within-EU (located in a different EU country than the Scoreboard company to which they belong) and extra-EU (a different non-EU country).

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

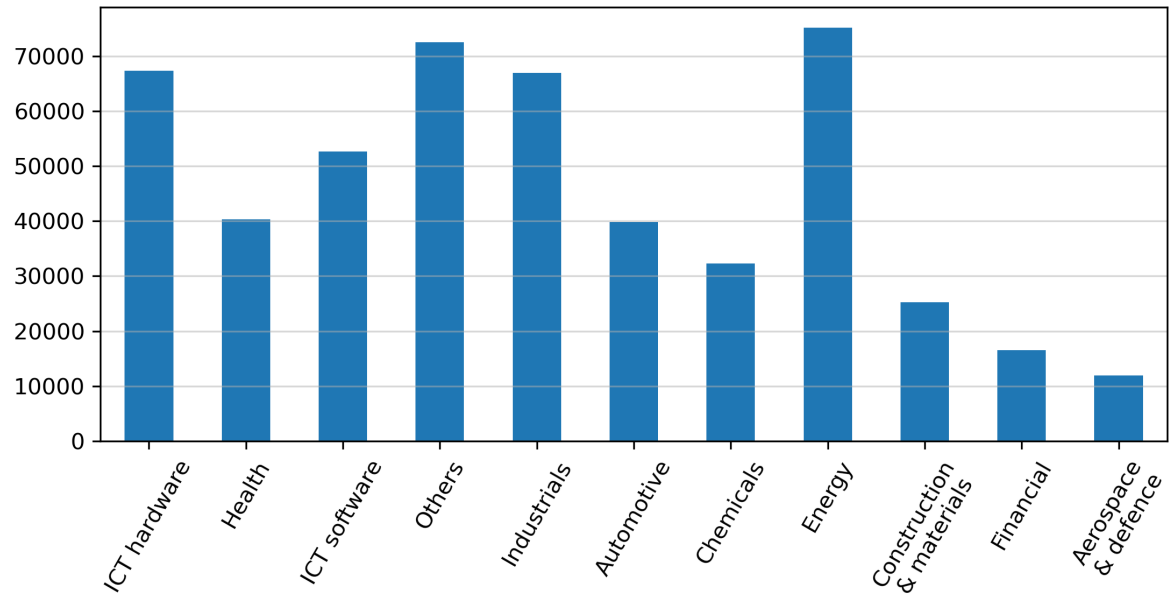
Figure 21 also distinguishes between subsidiaries located in a different country to that in which the corporate headquarters are located (i.e. international subsidiaries, represented by the orange bars in the top chart) and subsidiaries located in the same country as the parent company (i.e. national subsidiaries; blue bars). Like in the past, except for the US and China, where there is a continued clear prevalence of national subsidiaries, most countries host more international than

national subsidiaries (e.g. the ratio of international to national is 6:1 in Japan, 4:1 in Germany, and 1.1:1 in France).

The bottom panel of **Figure 21** focuses on the subsidiaries of EU-based Scoreboard companies and distinguishes between national subsidiaries (blue), international subsidiaries located in the EU (green) and international subsidiaries located outside of the EU (orange). The panel shows that in the EU subsidiaries also tend to concentrate in a few countries. However, using an extended definition of domestic subsidiaries that includes national and within-EU subsidiaries, the prevalence of international subsidiaries becomes much more subtle. For instance, according to this extended definition, France, Spain, Italy, Denmark, and Austria primarily host domestic subsidiaries, while in Germany the ratio of international to domestic subsidiaries is 1:1. This is in line with the prevalence of EU-based subsidiaries belonging to EU-based Scoreboard companies shown in **Figure 20**.

Finally, **Figure 22** looks at the composition of the Scoreboard from a sectoral viewpoint. The graph groups subsidiaries by the sector to which the mother company belongs and orders sectors along the x-axis in descending order based on the number of mother companies they contain. In line with last year's edition of the Scoreboard, companies operating in ICT-related sectors recorded the largest number of subsidiaries (over 65 000 for ICT hardware and over 50 000 for ICT software).

Figure 22. Number of subsidiaries of the top 2 000 by sector of the mother company, 2024.



Notes: Data refer to the 1 490 companies for which data on subsidiaries are available. The sectors are ordered from left to right in descending order based on the number of Scoreboard mother companies (e.g. health has the second largest number of companies, but they have on average fewer subsidiaries per company than e.g. ICT services or Industrials).

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

2.7. Key points

— **Global R&D investment:** The top 2 000 companies invested a total of EUR 1 446.2 billion in R&D in 2024, representing an absolute increase of EUR 85.8 billion compared to 2023 (6.3% growth rate). This is below the compound average annual growth rate since 2014 (7.5%).

— **Regional R&D investment growth:** The ROW had the highest growth rate (8.1%) followed by the US (7.8%) and Japan (7.1%), while R&D investment growth was moderate in the EU (2.9%) and China (3.9%). For China, this is the lowest growth rate on record. The EU's overall development was driven by the stagnation in R&D investment by several large EU automotive companies.

— **Top R&D investors:** The top 50 R&D investors invested EUR 633 billion in 2024, accounting for 44.1% of the total Scoreboard R&D investment. US-based companies led the ranking, with Volkswagen remaining the only EU company in the top 10.

— **Global R&D share of top 50 companies:** The Scoreboard companies account for approximately 90% of global corporate R&D (BES-R&D), and in conjunction with the share of the top 50 companies this implies that 50 companies control close to 40% of total global corporate R&D investment.

— **Concentration of R&D investment:** Since 2018, the concentration of R&D investment among a few US ICT companies has increased significantly, with the top 5 firms' doubling their R&D share to 15% by 2024. This trend indicates that US tech giants are increasingly dominating innovation, potentially affecting global innovation diffusion.

— **Profits at the top:** The top ranked companies are also the most profitable ones. The top 5 companies lead both in terms of magnitude and increase of their operating profit rate. This may indicate that the top R&D investors, and especially the top 5, are becoming more efficient, but it could also point towards increasing monopoly power.

— **Established companies dominate the top ranks:** None of the top 50 are younger than 10 years, and only two are under 20 years old. The higher the ranking, the fewer young companies appear.

— **Younger firms drive growth:** In 2024, the average age of the top 2 000 Scoreboard companies is 45 years. The top 10 contributors to R&D investment growth are relatively younger, averaging 36 years, while the top 10 companies with the largest divestments are much older, averaging 104 years.

— **R&D intensity:** R&D intensity (R&D as a share of net sales) increased to 5.4% in 2024, the highest value in the Scoreboard so far. The US companies led with an average R&D intensity of 8.4%, followed by the EU companies with 4.4% and companies from Japan with 4.2%.

— **Profits and profitability:** Operating profits increased by 8.5% in 2024, mainly due to the strong increase in the US (up 16.9%), in particular the US ICT software sector (up 33.8%), while EU profits decreased due to the drop in the automotive sector (down 29%). Profitability rose to 12.3%, with the ROW leading at 16.5%, followed by the US at 16.1%, the EU at 11%, Japan 8.6% and China 6.7%.

— **Capital expenditure:** Total capital expenditure (capex) increased by 7.7%, driven by the US ICT software companies (up 50.5%), while in the EU the energy companies increased strongly (up 23%). In contrast, Chinese companies recorded a decrease in capex (down 2.2%). In the EU, most capex comes from the energy companies, while in the US it is the ICT sectors. In light of the twin green and digital transition the US is focusing more and more on the digital side, while the EU is tilting to the green energy side.

— **R&D-to-capex:** The newly introduced KPI makes it possible to assess the significance of investments into R&D relative to capital goods. This ratio has increased strongly over time and stood at 75.5% in 2024 (52.6% in 2014). The US leads this KPI on 115%, while it is only 62.6% for the EU, reflecting the US's stronger R&D focus.

— **Employment:** Aggregate employment did not increase in 2024. EU and Japanese companies expanded their workforce marginally by 0.1% and Chinese by 2.5%, while the US and ROW

companies reduced their employment (by 1.1% and 3.2%). In the US Scoreboard companies, the ICT sectors account for over 42% of employment, in the EU it is a mere 13%.

— **R&D per employee:** The US companies invested on average EUR 48 784 on R&D per employee, significantly more than the EU (EUR 16 852) and all other countries. The sectors with the highest R&D investment per employee were health and ICT services, while ICT hardware and automotive companies invested much less in R&D per employee.

— **Market capitalisation:** Market capitalisation increased by 13.6% to EUR 54 308 billion, with US companies accounting for 61.3% of the total (56.8% in 2023). The strong growth was driven by the ICT companies from the US. In contrast, the market capitalisation of the EU companies rose by 4.6% only. The market capitalisation of the US automotive sector is now over five times larger than that of the EU, which is itself only slightly ahead of the Chinese automotive companies.

— **Subsidiaries:** The top 2 000 companies control close to 510 000 subsidiaries, with EU-based companies owning the most subsidiaries globally (37% of the total). Over 90% of subsidiaries are located in the top 10 countries (75% just in the top 5). The country where most subsidiaries are located is the US (31% of the total), followed by France (15%), Germany (11%), Japan and China (both around 9%).

— **Company size distribution:** Large companies (over 3 000 employees) made up 76.4% of the Scoreboard companies and accounted for 94% of total R&D investment. SMEs represent 4.7% (89 firms), small mid-caps 5.1% (97 firms), and mid-caps 13.7% (260 firms). The share of large companies is lower in the US (55.1%) than in the EU (87.4%). The US hosts a much larger number of SMEs and small mid-caps (77 and 76) compared to the EU (6 and 7).

3. R&D investment by sector

Large and multinational companies often operate in multiple domains, making it difficult to assign them to one single industrial sector. Therefore, since its first edition, the Scoreboard has assigned companies to their main sector according to the taxonomies provided by the Industry Classification Benchmark (ICB) and its predecessors. The main sector is usually the one indicated by the companies in their annual reports. For ease of presentation, we aggregate the ICB 3-digit categories into 10 broader categories and move the remaining sectors into the residual category 'Others'. Section 3.1 of this report describes the characteristics of these 11 sector groups and looks at the composition of R&D investment across the sectors in 2024. Section 3.2 investigates the distribution of companies across sectors and geographical regions in order to shed more light on regional specialisation patterns, while Section 3.3. presents the growth rates of R&D investment across sectors, regions and time. Section 3.4 describes the recent evolution in the top 4 sectors, and Section 3.5 takes a deep dive into the KPIs for these sectors. Section 3.6 and Section 3.7 repeat the analysis for the sectors outside the top 4, and Section 3.8 concludes with key points.

3.1. Overview of sectors

Table 10 shows the breakdown of the 2 000 companies by ICB 3-digit sector and shows the number of companies and the sector's share. It also shows each sector's R&D investment and its share of the total Scoreboard R&D, its R&D intensity (R&D investment divided by net sales), and the average R&D investment per company.

Table 10. R&D by ICB 3 sector classification, 2024

ICB3 sector	Sector classification (ICB4)	Companies, share	2024 R&D (EUR bn), share	R&D intensity	R&D per company (EUR million)
Aerospace & defence	Aerospace; Defence	37 (39) 1.9%	24.2 1.7%	4.2%	655.2
Automotive	Automobiles & parts; Tyres; Commercial vehicles & trucks	153 (155) 7.7%	196.4 13.6%	5.0%	1 283.9
Chemicals	Chemicals; Specialty chemicals; Specialty retailers	98 (95) 4.9%	26.0 1.8%	2.3%	265.4
Construction & materials	Heavy construction; Construction & materials; Building materials & fixtures	59 (56) 3.0%	33.6 2.3%	2.3%	570.3
Energy	Exploration & production; Renewable energy equipment; Oil & gas producers; Electricity; Oil equipment, services & distribution; Alternative energy; Alternative fuels; Conventional electricity; Gas, water & multiutilities; Gas distribution; Integrated oil & gas	69 (63) 3.5%	26.9 1.9%	0.6%	391.2
Financial	Banks; Specialty finance; Financial services; Real estate investment & services; Investment services; Real estate holding & development; Consumer finance; Full line insurance	48 (51) 2.4%	25.1 1.7%	3.3%	507.3
Health	Pharmaceuticals; Biotechnology; Medical equipment; Healthcare equipment & services; Healthcare providers	411 (427) 20.6%	287.0 19.9%	13.4%	698.4
ICT hardware	Computer hardware; Telecommunications equipment; Electronic equipment, Semiconductors; Electrical component & equipment; Electronic office equipment	397 (385) 19.9%	318.5 22.0%	8.2%	802.4
ICT software	Computer Services; Software; Telecommunication services	289 (298) 14.5%	359.4 24.9%	10.9%	1 247.8
Industrials	General industrials; Iron & steel; Diversified industrials; Industrial machinery; Transportation services; Mining; Coal; Industrial metals & mining;	220 (218) 11.0%	61.2 4.2%	2.6%	278.5

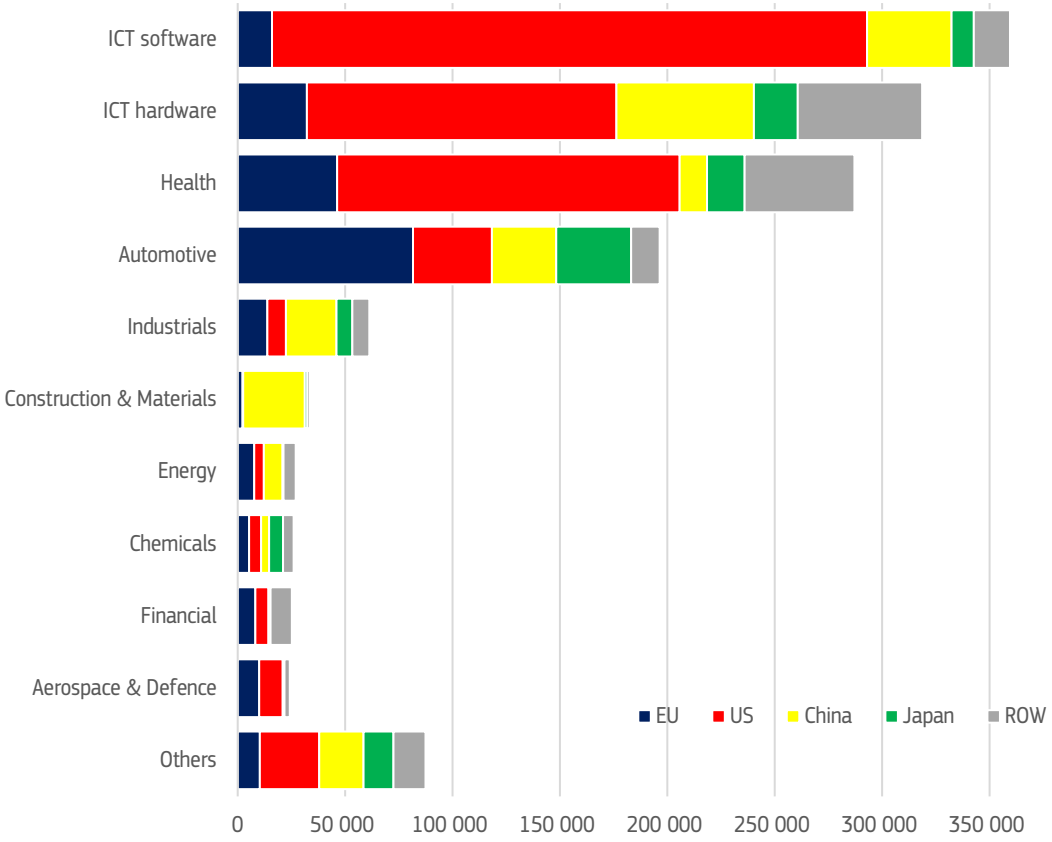
	Containers & packaging; Nonferrous metals; Industrial transportation; General mining; Aluminium; Gold mining; Platinum & precious Metals; Industrial suppliers;				
Others*	Leisure goods; General retailers; Food & drug retailers; Food producers; Household goods & home construction; Travel & leisure; Media; Personal goods; Support services; Beverages; Tobacco; Forestry & paper	219 (212) 10.9%	87.4 6.0%	2.8%	399.0
Total		**2 000**	**1 446.2**	**5.4%**	**723.1**

Notes: *Sectors listed under 'Others' are presented at ICB 3-digit level. Figures in brackets represent the number of companies in 2023. R&D intensity is defined as R&D investment divided by net sales per sector, R&D investment per company is the average per sector.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

Figure 23 shows the distribution of the R&D investment of the 2 000 companies in 2024 by sector and region. Note that after including Amazon in the sample in 2024, the **ICT software sector became the largest R&D-investing sector** with 24.9% of the total Scoreboard R&D investment and 14.4% of the companies (until 2019 the ICT hardware companies had held the largest share of Scoreboard R&D). The strong growth of the leading companies was displayed in **Figure 14** in Section 2.3. In 2024, the average R&D investment per company in the ICT software and service sector exceeded EUR 1.2 billion, matching the automotive sector.

Figure 23. R&D investment by sector and country/region, 2024



Notes: R&D investment in EUR million.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

Corporates headquartered in the US made the biggest contribution to the three sectors with the most R&D investment, with a particularly high degree of dominance **in ICT software.** In this sector,

the **US companies were responsible for 77.1%** of total R&D investment and 53.1% of the companies, while China ranked second with 11% of R&D but 21.5% of the companies. The other regions played only a minor role in this sector: ROW companies were ahead of the EU and Japan with 4.7%, 4.4%, and 2.9% of R&D, and 14.2%, 8.7% and 2.4% of the companies, respectively.

In the **ICT hardware** sector–the second largest sector with 22.0% of the Scoreboard total R&D investment and 19.9% of the companies–**the US dominance was less pronounced with 45.3%** of the sector's R&D and 29% of the companies. In ICT hardware, companies from China and the ROW (mainly Taiwan and South Korea) ranked second and third with 20.1% and 18.2% of the total R&D (and 32.5% and 18.6% of the companies). The **EU companies** were only fourth and **quite far behind with 10.1% of R&D and 9% of the companies**, and Japanese companies contributed the remaining 6.4% of R&D (but 10.8% of the companies).

In the **health sector**, which accounted for 19.9% of R&D, **US-based companies dominated as well with 55.5%** of the sector's R&D and 55% of the companies, followed by the ROW with 17.8% of R&D and 11.2% of the companies (mainly Switzerland and the UK), the EU (16.1% of R&D and 13.9% of the companies), Japan (6.1% of R&D and 5.3% of the companies) and China (4.4% of R&D but 14.6% of the companies).

The fourth-largest sector was **automotive,** which accounted for 13.6% of R&D and 7.7% of the companies. The automotive sector is the **EU's stronghold with 41.6% of the sector's total investment** and of 21.6% the companies. The US, Japan and China followed with R&D investment shares of 18.7%, 17.7%, and 15.3%, and with 20.9%, 17% and 28.1% of the companies, respectively. The ROW countries held lower shares in automotive R&D with 6.8% of R&D but 12.4% of the sector's companies (mainly in South Korea).

The **top 4 sectors**–ICT software and services, ICT hardware, health and automotive–together **accounted for 80.3% of the total R&D investment** and **62.5% of the companies** in 2024. In terms of R&D this represents a 0.9 percentage points increase, and a 0.7 percentage points decline in the share of companies compared to the previous year. These numbers complement the findings presented in Section 2.3 on the **increasing concentration of R&D in fewer and fewer companies and sectors**.

Table 11 and **Table 12** present a summary of the Scoreboard R&D investment data for the five regions/countries and 11 sectors. **Table 11** shows the number of companies, their nominal R&D investment in EUR billion for 2024, the change in the number of companies and the growth rate of R&D investment for each region and sector. **Table 12** summarises the distribution of R&D investment across the sectors for each region in 2024. Together, these two tables provide readers with an accessible overview of the regional and sectoral R&D landscape.

Table 11. Overview of number of companies and R&D investment per sector and region, 2024

	EU		US		China		Japan		ROW		Total	
	n	R&D	n	R&D	n	R&D	n	R&D	n	R&D	n	R&D
Aerospace & Defence	11 (-1)	10.0 (4.8%)	14 (1-)	10.9 (6.5%)	5 (0)	0.8 (-4.2%)	0 (0)		7 (0)	2.4 (-3.4%)	37 (-2)	24.2 (4.3%)
Automotive	33 (-1)	81.6 (0.8%)	32 (-3)	36.7 (-1.7%)	43 (3)	29.9 (11.9%)	26 (0)	34.8 (12.3%)	19 (-1)	13.3 (12.6%)	153 (-2)	196.4 (4.5%)
Chemicals	13 (0)	5.2 (-6.8%)	19 (0)	5.6 (1.4%)	25 (2)	3.7 (0.2%)	27 (1)	6.4 (-0.6%)	14 (0)	4.9 (2.1%)	98 (3)	26.0 (-0.9%)
Construction & Materials	9 (2)	2.2 (18.2%)	3 (1)	0.3 (43.6%)	33 (0)	28.7 (-2.5%)	8 (0)	1.2 (5.5%)	6 (0)	1.2 (5.0%)	59 (3)	33.6 (-0.6%)

Energy	25	7.7	10	4.4	19	8.7	3	0.4	12	5.6	69	26.9
	(5)	(19.8%)	(0)	(6.0%)	(0)	(3.8%)	(0)	(-14.2%)	(1)	(2.8%)	(6)	(7.7%)
Financial	17	8.2	12	6.1	7	0.9	0		12	9.8	48	25.1
	(0)	(1.3%)	(-1)	(-0.3%)	(-1)	(-19.2%)	(0)		(-1)	(-0.7%)	(-3)	(-0.9%)
Health	57	46.3	226	159.4	60	12.6	22	17.5	46	51.1	411	287.0
	(0)	(13.0%)	(-17)	(7.1%)	(0)	(0.1%)	(2)	(9.1%)	(-1)	(5.9%)	(-16)	(7.6%)
ICT hardware	36	32.2	115	144.1	129	63.9	43	20.4	74	57.8	397	318.5
	(4)	(0.3%)	(-1)	(9.1%)	(3)	(6.8%)	(2)	(6.2%)	(4)	(16.5%)	(12)	(8.7%)
ICT software	26	15.9	153	276.9	62	39.3	7	10.3	41	16.8	289	359.4
	(-1)	(-8.9%)	(-9)	(10.5%)	(-2)	(1.9%)	(0)	(1.0%)	(2)	(2.7%)	(-10)	(7.8%)
Industrials	51	13.8	30	8.6	85	23.5	28	7.3	26	7.9	220	61.2
	(3)	(5.2%)	(0)	(-9.2%)	(-2)	(1.1%)	(2)	(6.9%)	(-1)	(5.6%)	(2)	(1.6%)
Others	40	10.3	60	27.6	57	20.6	28	13.9	34	14.9	219	87.4
	(-1)	(-2.7%)	(0)	(2.1%)	(4)	(5.8%)	(2)	(3.2%)	(2)	(2.8%)	(7)	(2.6%)
Total	318	233.7	674	680.8	525	233.2	192	112.4	291	186.0	2000	1446.2
	(10)	(2.9%)	(-31)	(7.8%)	(7)	(3.9%)	(9)	(7.1%)	(5)	(8.1%)		(6.3%)

Notes: n refers to the number of companies, and the relates figures in brackets are the change in the number of companies per region and sector. For the R&D columns the number in brackets are the percentage growth of nominal R&D per sector and region in 2024. The 'Total' row represents the same information for the respective region across all sectors. R&D investment is expressed in EUR billion.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

Table 12. Distribution of R&D investment per sector and region in %, 2024

	EU	US	China	Japan	ROW	Total
Aerospace & Defence	4.3%	1.6%	0.4%	0.0%	1.3%	1.7%
Automotive	34.9%	5.4%	12.8%	31.0%	7.1%	13.6%
Chemicals	2.3%	0.8%	1.6%	5.8%	2.6%	1.8%
Construction & Materials	1.0%	0.04%	12.3%	1.0%	0.7%	2.3%
Energy	3.3%	0.7%	3.8%	0.4%	3.0%	1.9%
Financial	3.5%	0.9%	0.4%	0.0%	5.3%	1.7%
Health	19.8%	23.4%	5.4%	15.6%	27.5%	19.8%
ICT hardware	13.8%	21.2%	27.4%	18.2%	31.1%	22.0%
ICT software	6.8%	40.7%	16.9%	9.2%	9.0%	24.9%
Industrials	5.9%	1.3%	10.1%	6.5%	4.3%	4.2%
Others	4.4%	4.1%	8.9%	12.4%	8.0%	6.0%
Total (EUR billion)	233.7 (100%)	680.8 (100%)	233.2 (100%)	112.4 (100%)	186.0 (100%)	1 446.2 (100%)
Regional share	16.2%	47.1%	16.1%	7.1%	8.1%	(100%)

Notes: % refers to the row total. The shares in the column 'Total' represent the sector's share in the total Scoreboard R&D investment. The row 'Total' displays the region's R&D investment in EUR billion, and the percentage share to the region's share in total R&D investment.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

3.2. Distribution of companies across sectors and regions

Table 13 gives the number and share of companies per sector across the five countries/regions; each cell contains the number and share of firms in the respective regional total in 2024. The column 'Total' gives each sector's share in the top 2 000, and the row 'Total' indicates each country's/ region's number and share of Scoreboard companies. Comparing the shares (numbers) of companies for each region with the regional total (column total) shows in which sectors a region has a larger share than its overall share of firms (marked in bold). This can be interpreted as a **regional specialisation**.

In this **relative specialisation pattern**, the **EU is over-represented in six of the 11 sectors.** However, these six sectors are of **lower R&D intensity** (see **Table 10**), and in fact, EU firms are significantly **under-represented in the top 3 R&D-investing sectors:** ICT hardware, ICT software,

and health. In terms of numbers, the EU has the second-most aerospace & defence companies and automotive companies, and the largest number of companies in the energy and financial sector.

The **US specialises in two out of the four top R&D sectors**, ICT software and health, with 53.1% and 55% of the Scoreboard companies in these sectors being US companies. The US share in health and software companies also remained remarkably stable over time, even though these sectors are characterised by M&A activities, but also many bankruptcies and new companies entering the ranking. In addition, the US leads in aerospace & defence in terms of the number of companies.

China and Japan have a similar specialisation pattern: both countries have an over-proportionate number of companies in sectors with low R&D intensity such as construction & materials or chemicals. In construction & materials, Chinese companies represent almost 56% of the Scoreboard companies in this sector. At the same time, **China has established a strong basis in ICT hardware,** with 32.5% of the sector's companies, and in industrials. In Japan the leading sectors are chemicals and automotive, but also the country's share of companies in industrials or ICT hardware exceeds its global share of Scoreboard companies.

Table 13. Distribution of firms across sectors and regions, number (share per region in brackets), 2024

	EU	US	China	Japan	ROW	Total
Aerospace & defence	**11 (29.7%)**	**14 (37.8%)**	5 (13.5%)	0	**7 (18.9%)**	37 (1.9%)
Automotive	**33 (21.6%)**	32 (20.9%)	**43 (28.1%)**	**26 (17.0%)**	19 (12.4%)	153 (7.7%)
Chemicals	13 (13.3%)	19 (19.4%)	25 (25.5%)	**27 (27.6%)**	14 (14.3%)	98 (4.9%)
Construction & materials	9 (15.3%)	3 (5.1%)	**33 (55.9%)**	**8 (13.6%)**	6 (10.2%)	59 (3.0%)
Energy	**25 (36.2%)**	10 (14.5%)	**19 (27.5%)**	3 (4.4%)	**12 (17.4%)**	69 (3.5%)
Financial	**17 (35.4%)**	12 (24.5%)	7 (14.3%)	0	**12 (25.0%)**	49 (2.5%)
Health	57 (13.9%)	**226 (55.0%)**	60 (14.6%)	22 (5.4%)	46 (11.2%)	411 (20.5%)
ICT hardware	36 (9.1%)	115 (29.0%)	**129 (32.5%)**	**43 (10.8%)**	**74 (18.6%)**	397 (19.9%)
ICT software	26 (9.0%)	**153 (53.1%)**	62 (21.5%)	7 (2.4%)	41 (14.2%)	288 (14.4%)
Industrials	**51 (25.8%)**	30 (13.6%)	**85 (38.6%)**	**28 (12.7%)**	26 (11.8%)	220 (11.0%)
Others	**40 (23.2%)**	60 (27.4%)	57 (26.0%)	**28 (12.8%)**	**34 (15.1%)**	219 (11.0%)
Total	318 (16.0%)	674 (33.7%)	525 (26.3%)	192 (9.6%)	291 (14.5%)	2 000 (100%)

Notes: % refer to the row total. Figures in bold indicate that the sector has a higher share than the region's overall share of the number of firms in 2024. Share figures in the 'Total' column represent the sector's share in the total Scoreboard.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

The countries grouped under **ROW** include major R&D locations such as the UK, Switzerland, South Korea and Taiwan, and other emerging innovation locations such as Mexico, Brazil or Vietnam. This diverse group of countries has a high share of **ICT hardware companies** due to the presence of major semiconductor manufacturers, and electric and electronic equipment producers, especially in Taiwan and South Korea. The ROW has the highest share of companies in the **financial sector**, with large British banks dominating the group. Likewise, the aerospace & defence sector is well represented with major companies from the UK, Canada and Brazil. **The largest oil and gas producers** (energy sector) are also in the ROW group, mainly located in Saudi Arabia and the UK. Finally, the health sector contains large and **research-intensive pharmaceutical companies** headquartered in Switzerland and the UK, but the share of health companies remains below the overall share of the ROW group. Notably, the number (and share) of **ICT software companies is on an increasing trend**, mainly due to companies headquartered in Canada and Israel, but also in Australia.

However, having a large share of the number of companies does not automatically correspond to a high share in R&D investment, as can be seen when combining the insights to be taken from **Table 13** and **Figure 23**. While China has the largest number of companies in the automotive sector, China's aggregate R&D investment amounted to 15.3% of the automotive total and was still partly considerably lower than that of the other regions, except for ROW (see Section 3.4). Similarly, China had a large share of ICT hardware companies, but the share of R&D was much lower than its share of companies.

3.3. Growth rates across sectors and regions

Table 14 shows R&D investment growth (in %) relative to the previous year since 2014 for each of the 11 sectors, both in nominal values and in inflation-adjusted growth rates (in brackets), as well as the compound annual growth rate (CAGR) per sector during this period. Overall, R&D investment grew in 2024 by 6.2% (3.9% when adjusted for inflation), corresponding to a total increase of EUR 84 billion (EUR 46 billion). The nominal growth rate in 2024 was below the top 2 000 companies' CAGR of 7.5% since 2014 (inflation adjusted 5.4%).

Table 14. Nominal and inflation-adjusted growth rates of R&D investment per sector in %, 2014-2024

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	CAGR
Aerospace & defence	2.3 (0.8)	0.2 (-0.8)	2.5 (1.2)	-5.0 (-6.3)	3.9 (2.2)	-1.0 (-2.3)	-11.2 (-12.9)	1.4 (-1.8)	12.7 (7.0)	5.3 (1.2)	4.3 (1.7)	1.0 (-1.1)
Automotive	9.7 (7.9)	7.2 (5.8)	4.1 (3.3)	7.5 (6.0)	7.5 (5.9)	2.9 (1.5)	-5.2 (-6.6)	8.5 (5.5)	13.4 (8.6)	12.0 (7.7)	4.5 (2.3)	5.6 (3.6)
Chemicals	1.2 (-0.2)	1.2 (1.0)	-0.8 (-1.5)	4.8 (3.1)	-0.6 (-2.0)	-5.5 (-6.3)	-2.7 (-4.4)	14.5 (11.9)	6.5 (2.7)	3.1 (-0.1)	-0.9 (-2.9)	1.7 (0.0)
Construction & materials	8.8 (8.0)	15.0 (14.9)	15.4 (13.8)	18.9 (15.5)	16.1 (12.9)	22.2 (20.7)	25.7 (25.0)	17.9 (13.2)	15.0 (12.6)	9.3 (9.3)	-0.6 (-0.4)	13.8 (12.3)
Energy	4.8 (3.2)	53.1 (36.5)	-14.7 (-16.3)	-14.7 (-13.0)	-2.3 (-3.7)	-12.1 (-5.0)	3.5 (3.0)	25.8 (12.9)	15.2 (8.3)	-5.6 (-0.9)	7.7 (6.1)	3.5 (1.7)
Financial	4.1 (3.2)	6.7 (6.9)	-12.7 (-13.6)	5.1 (2.8)	3.6 (1.6)	10.5 (8.9)	4.5 (2.3)	19.3 (15.1)	12.7 (6.4)	-2.3 (-6.4)	-0.9 (-3.7)	3.9 (1.9)
Health	6.0 (4.7)	8.8 (8.1)	6.7 (5.9)	6.7 (5.4)	6.9 (4.9)	6.2 (4.8)	9.6 (7.9)	15.2 (11.5)	6.2 (0.6)	3.9 (0.4)	7.6 (5.1)	7.0 (4.9)
ICT hardware	5.7 (4.1)	6.1 (4.8)	1.2 (0.2)	11.2 (9.1)	7.1 (4.8)	7.9 (6.3)	5.1 (3.9)	10.4 (6.8)	14.2 (9.3)	6.7 (3.7)	8.8 (6.3)	7.1 (5.0)
ICT software	13.2 (11.4)	16.1 (15.0)	11.0 (9.9)	18.5 (16.5)	20.4 (17.7)	20.5 (18.5)	18.5 (17.0)	19.8 (14.8)	18.5 (11.5)	6.2 (2.9)	7.8 (5.5)	14.1 (11.6)
Industrials	-1.4 (-2.9)	-1.7 (-2.9)	2.0 (1.2)	3.1 (1.5)	9.0 (7.2)	8.2 (7.2)	-1.1 (-2.6)	11.8 (8.3)	11.5 (7.5)	3.6 (1.6)	1.6 (0.2)	4.3 (2.6)
Others	5.3 (3.9)	6.6 (5.4)	5.5 (4.7)	2.2 (0.5)	8.7 (7.0)	8.4 (7.0)	1.2 (-0.3)	14.3 (10.9)	9.1 (4.8)	5.6 (2.2)	2.6 (0.8)	5.8 (3.8)
Total	**6.5 (5.0)**	**8.8 (7.3)**	**3.7 (2.8)**	**8.1 (6.5)**	**9.0 (6.9)**	**8.3 (7.0)**	**6.3 (4.8)**	**14.1 (10.1)**	**12.7 (7.3)**	**6.0 (2.9)**	**6.3 (4.0)**	**7.5 (5.4)**

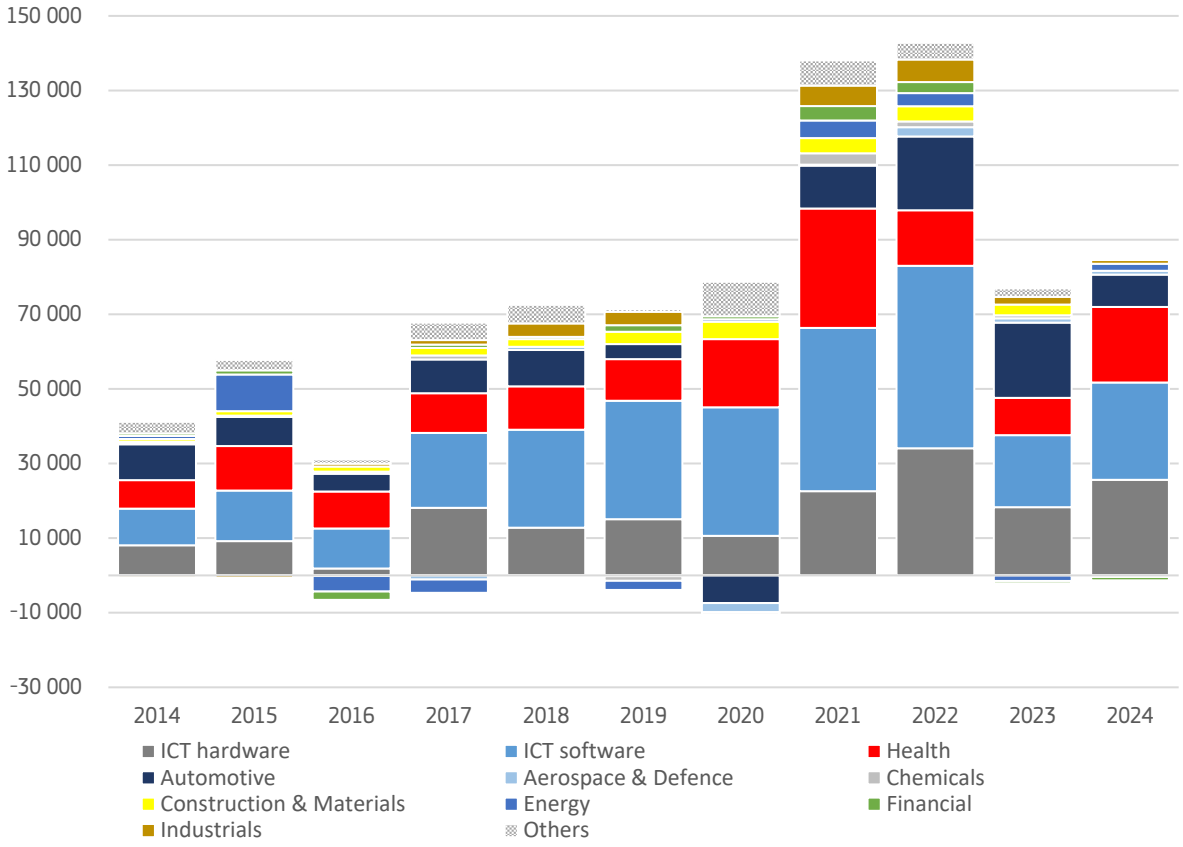
Notes: Due to the low number of firms in some sectors growth rates can change considerably due, e.g. to a firm's entry/exit. Inflation-adjusted values are given in brackets. CAGR refers to the compound annual growth rate over 2014-2024.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

In 2024, the **highest growth rate** was achieved by the companies in the **ICT hardware sector (8.8%),** followed by ICT software with a 7.8% increase and health with 7.6%. The growth rate of the **ICT software sector remained for the second consecutive year far below the sector's CAGR of 14.1%,** while health and ICT hardware grew at a faster rate than in the previous 10 years on average. **Growth in the automotive sector**, which was above average in 2022 and 2023, **fell to 4.4%** in 2024, below the CAGR of 5.6%.

Figure 24 shows the contribution of each sector to the annual nominal increase in total R&D investment in absolute terms. As regards the contribution to the net change in R&D investment in 2024, the **ICT software sector added the most** with an **additional EUR 26.1 billion** to EUR 359.5 billion. This corresponds to 30% of the total increase of the 2 000 companies combined. The second largest sector contribution to the increase in R&D investment comes from the **ICT hardware** sector with EUR 25.6 billion (29.8% of the net increase), **followed by health** with an additional EUR 20.2 billion spent on R&D in 2024 (23.7% of the change). After two years of a more moderate contribution the health sector again **increased significantly** and added more R&D in 2024 than in 2020 (in nominal terms). The **automotive sector** increased its R&D investment by EUR 8.6 billion (10.2% of the total increase), which is **less than half of its 2023 contribution**. As shown in **Table** and discussed in more detail below, the slowdown was driven by automotive companies from the US and the EU, while other countries' automotive sectors R&D investment grew strongly.

Figure 24. Annual change in R&D investment by sector in EUR million - Sectoral breakdown, 2014-2024



Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

Since 2014, the **two ICT sectors have been responsible on average for 55% of total R&D investment growth** in the Scoreboard. After a decrease in the contribution of these two sectors in 2023, it climbed to **60.5% in 2024**, the highest value since 2020.

Among the sectors that are smaller in terms of R&D, the **energy sector** had the highest net contribution with EUR 1.9 billion or 2.3% of the total change. The aerospace & defence companies also increased their R&D faster than the sector's long-run average and added EUR 1 billion to R&D investment.

To summarise the development in 2024 by sector and by region, **Table 15** presents the growth rates of R&D investment (inflation-adjusted values in brackets) for the sector-region-pairs.

In 2024, **three sectors experienced negative growth** rates of R&D investment (both in nominal and inflation-adjusted values), after two sectors in 2023 and none in 2022 and 2021. In 2020, four out of 11 sectors were negative (five when adjusted for inflation).

In the EU, **three sectors had negative nominal growth,** or six after adjustment for inflation. At the same time, in **six sectors the EU companies increased their R&D by more than the sectoral average,** indicating a rather heterogeneous development. While **health sector growth was the highest among all regions**, growth for the other three of the top 4 sectors was below average and the **ICT software sector contracted significantly**. Both the automotive and ICT hardware sectors reduced R&D investment in 2024 when adjusted for inflation.

Table 15. Nominal R&D investment growth rates by sector and region in %, top 2 000 (deflated in brackets), 2024

	EU	US	China	Japan	ROW	Total
Aerospace & defence	4.8 (2.5)	6.5 (4.0)	-4.2 (-3.6)		-3.4 (-8.2)	4.3 (1.7)
Automotive	0.8 (-2.1)	-1.7 (-4.1)	11.9 (12.7)	12.3 (9.2)	12.6 (6.8)	4.5 (2.3)
Chemicals	-6.8 (-9.8)	1.4 (-1.0)	0.2 (0.9)	-0.6 (-3.4)	2.1 (0.5)	-0.9 (-2.9)
Construction & materials	18.2 (15.2)	43.6 (40.2)	-2.5 (-1.8)	5.5 (2.5)	5.0 (2.2)	-0.6 (-0.4)
Energy	19.8 (16.7)	6.0 (3.5)	3.8 (4.6)	-14.2 (-16.6)	2.8 (-0.1)	7.7 (6.1)
Financial	1.3 (-1.8)	-0.3 (-2.7)	-19.2 (-18.6)		-0.7 (-3.8)	-0.9 (-3.7)
Health	13.0 (10.1)	7.1 (4.6)	0.1 (0.8)	9.1 (6.0)	5.9 (3.0)	7.6 (5.1)
ICT hardware	0.3 (-2.7)	9.1 (6.6)	6.8 (7.6)	6.2 (3.2)	16.5 (10.9)	8.8 (6.3)
ICT software	-8.9 (-11.5)	10.5 (7.9)	1.9 (2.6)	1.0 (-1.8)	2.7 (0.5)	7.8 (5.4)
Industrials	5.2 (1.9)	-9.2 (-11.3)	1.1 (1.8)	6.9 (4.0)	5.6 (1.7)	1.6 (0.2)
Others	-2.7 (-5.5)	2.1 (-0.3)	5.8 (6.6)	3.2 (0.3)	2.8 (-0.8)	2.6 (0.8)
Total	2.9 (0.1)	7.8 (5.2)	3.9 (4.6)	7.1 (4.1)	8.1 (4.3)	6.3 (4.0)

Notes: The table reports nominal R&D investment growth rates, inflation adjusted growth rates are in brackets. Figures in the 'Total' column represent the sector's R&D investment growth across all regions, and the 'Total' row the region's R&D investment growth. There are no Japanese companies with the main sector classification in aerospace & defence or financials in the Scoreboard.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

As the EU, also the **US had three sectors with negative R&D investment growth** (in nominal terms, and 5 sectors in inflation-adjusted terms), and in five out of 11 sectors growth was above the global average (or less negative). In two out of the top 4 sectors, the US had above-average growth rates (the two ICT sectors), the health sector increased slightly below the sector average, and automotive R&D decreased compared to 2023.

China had a difficult year in 2024 and recorded its lowest R&D investment growth rate so far. The (relatively) weak development of the economy, with lower consumer spending and **falling prices** (deflation), continued in 2024 and caused real R&D investment growth to exceed the nominal values. In **three out of 11 sectors (nominal) R&D investment growth was negative**. The automotive sector, however, increased strongly, but at a lower rate than in the years before (22-28% in 2021-2023). In only three sectors did the Chinese companies increase R&D faster than the global average.

Japan continued its strong performance in 2024, with **six out of nine sectors having above-average (or less negative) growth**, and only two sectors being negative (three in inflation-adjusted values). The **automotive sector expanded strongly,** and also the ICT hardware

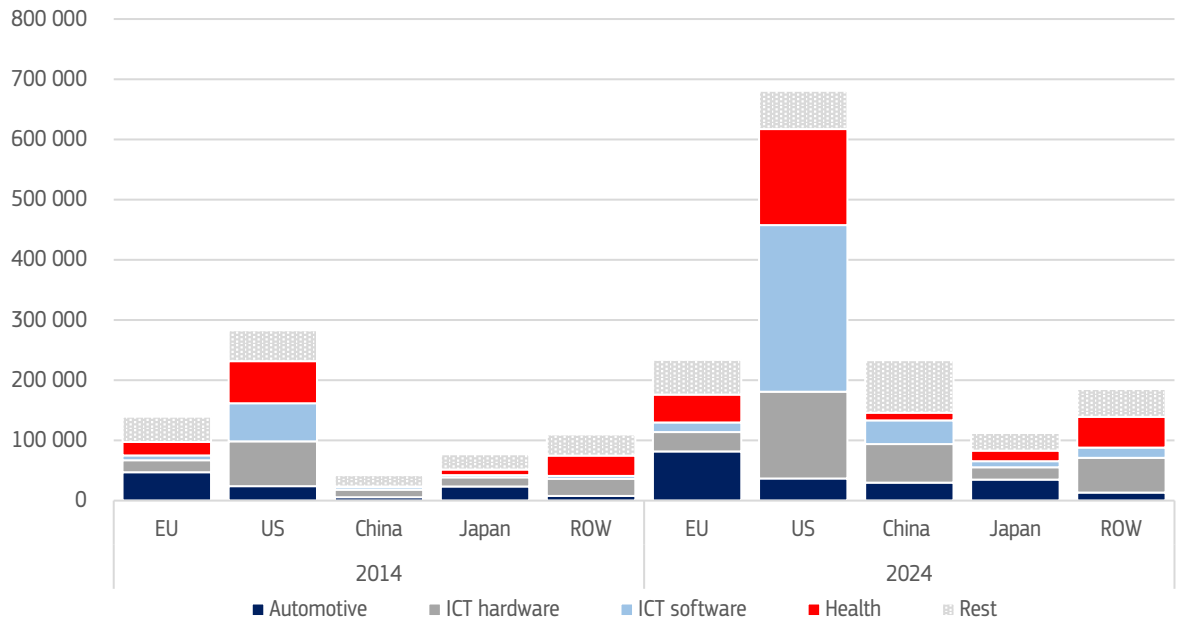
sector's R&D increased, but at a lower rate than the global average. In contrast, the ICT software sector and in particular the health sector developed sluggishly.

Finally, in the **ROW group only two sectors had negative nominal growth (four in inflation adjusted terms),** and in seven sectors R&D investment increased more than the average. The ROW companies in **automotive and ICT hardware** had the best performance and achieved the **highest growth rates** of all countries/regions in these sectors. In contrast, health and ICT software R&D investment increased, but only below the global average.

3.4. The top 4 R&D-investing sectors in the longer term – 2014-2024

As discussed above (Section 2.3) and shown in **Table 10,** the distribution of firms and R&D across the sectors is highly concentrated and this **concentration continued to increase**: **80.3% of R&D investment** in 2024 (EUR 1 161 billion) was realised by 62.5% of the firms (1 249 firms) **in 4 key sectors**, namely ICT software (and services), ICT hardware, health, and automotive[22]. Companies in these sectors develop technologies that are considered critical for competitiveness[23] and the EU's economic security agenda[24]. Moreover, the EU Competitiveness Compass puts emphasis on technologies such as AI, quantum computing, or biotechnology (European Commission, 2025).

Figure 25. R&D top sectors – R&D investment across regions 2014 and 2024



Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

[22] For the 20th anniversary of the Scoreboard, we described these 4 sectors in great detail, including a presentation of the most relevant firms in each sector. In this year's report, we update the development without going into the details of the subsectors. We refer the interested reader to the 2023 Scoreboard for a deeper analysis.

[23] According to the Draghi (2024) report, technologies play a crucial role in addressing the innovation gaps with the US and China. Technologies such as AI or 5G/6G are expected to increase productivity across sectors and make the Green Deal a business opportunity, and emerging technologies provide opportunities for future EU leadership.

[24] The European economic security agenda is a strategy to ensure EU capabilities and prevent vulnerabilities in strategic technologies (advanced semiconductors, artificial intelligence, quantum technologies, and biotechnologies).

The distribution of R&D investment across regions and the top 4 sectors in 2014 and 2024 is summarised in **Figure 25**. The figure clearly shows the **large and growing lead of US companies** in total R&D, and the outstanding contribution of the two ICT sectors. Over that decade, the US companies massively increased their R&D investment, and the **Chinese companies became globally significant R&D players**, while the remaining regions–including the EU–developed at a much slower pace. To illustrate this, the US Scoreboard companies invested more in R&D in 2014 than the EU companies in 2024 (EU 2024: EUR 233.7 billion, US 2014: EUR 282.9 billion).

Between 2014 and 2024, the US lead over the other regions/countries increased dramatically. In 2014, **the EU companies' R&D investment amounted to 49.3% of that of their US counterparts, but to only 34.3% in 2024**. China, in contrast, increased its R&D investment from 14.9% to 34.2% of that of the US, while the shares of the ROW companies and Japan fell (from 38.8% to 27.2%, and 27.2% to 16.5% respectively).

As illustrated in more detail in **Figure 24,** the main sectors driving the growth in R&D in 2024 were ICT software, ICT hardware and, to a somewhat lesser extent, health. Since 2014, **the ICT software sector has contributed between 24% and 58% to the total annual increase in R&D,** and the health sector and ICT hardware on average 20% each. While the automotive sector has played a major role in the aggregate, it has added less to global dynamics with its average contribution of 12% to the annual total increase in R&D.

Concentration in the top 4 sectors increased in the period of analysis in terms of R&D but decreased in terms of the number of companies (see also Section 2.3). **Table 16** shows the change in the shares of the top 4 sectors across the 5 regions/countries between 2014 and 2024. While in 2014, 56.5% of the companies in the ranking came from one of these 4 sectors, this figure increased by 6 percentage points to 62.5% in 2024, and the R&D share grew from 73.5% in 2014 to 80.3% in 2024 (up 6.8 percentage points). The share of R&D increased by more than the share of companies of these 4 sectors. However, developments across regions and sectors differ.

Table 16. Top 4 sectors - Share of companies and R&D per region, 2014 and 2024

	Share of companies			Share of R&D		
	2014	**2024**	**PP change**	**2014**	**2024**	**PP change**
EU	42.1%	47.8%	+5.7	68.6%	75.4%	+6.8
US	71.2%	78.0%	+6.9	81.9%	90.6%	+8.7
China	52.3%	56.0%	+3.7	55.5%	62.6%	+7.1
Japan	47.4%	51.0%	+3.6	67.1%	73.9%	+6.8
ROW	54.5%	61.9%	+7.4	68.0%	74.8%	+6.7
Total	56.5%	62.5%	+6.0	73.5%	80.3%	+6.8

Notes: PP stands for percentage points.
Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

The EU has the lowest concentration in terms of the share of companies with only 47.8% in the top 4 sectors in 2024, while in the **US the company share is 78%**. In terms of R&D, in each region the share of R&D exceeded the share of firms since these four sectors are the most R&D intensive. The **EU's R&D share of 75.4%** is significantly higher than the share of firms, and **in the US the 4 sectors even unite 90.6% of the total US R&D** represented in the Scoreboard. In China, the R&D share of the top 4 sectors is the lowest with 62.6%, and in Japan and the ROW the

values are 73.9% and 74.8%, respectively. Below we explore the sectoral and regional dynamics behind the aggregate results.

Table 17 provides details on the R&D investment in each of the 4 top sectors and the regions for 2014 and 2024. The column 'Total' gives the total per region and year, and the row 'Total' the R&D investment for each sector and year. In addition, the growth rates indicate by how much R&D changed over the period for each sector and region, as well as for the regions and sectors in total. The largest R&D investment and the highest change is marked in bold for every row.

Over the past decade, **total R&D investment has increased by 121%**, driven by the **ICT software sector,** which spent 325% more on R&D in 2024 than in 2014. While the ICT software sector was the smallest of the top 4 sectors in 2014, it became the leading sector in 2020 when it overtook ICT hardware. ICT hardware and health companies increased their R&D investment by 111.9% and 110.6%, automotive by 81.5% and the remaining sectors by 64.9%.

Table 17. Top 4 sectors - R&D investment across regions, 2014 and 2024, in EUR million

Region	Year	ICT software	ICT hardware	Health	Automotive	Rest	Total
EU	2014	8 070	20 059	22 332	**47 063**	42 014	139 538
	2024	15 993	32 217	46 322	**81 624**	57 576	233 732
	Growth	98.2%	60.6%	107.4%	73.4%	37.0%	67.5%
US	2014	63 186	**74 459**	70 020	24 131	51 186	282 981
	2024	**276 938**	144 071	159 430	36 719	63 656	680 814
	Growth	338.3%	93.5%	127.7%	52.2%	24.4%	140.6%
China	2014	4 469	12 381	995	5 696	**18 852**	42 393
	2024	39 347	63 970	12 679	29 962	**87 274**	233 232
	Growth	780.5%	416.7%	1 174.4%	426.0%	362.9%	450.2%
Japan	2014	3 872	15 173	9 114	23 434	**25 292**	76 884
	2024	10 349	20 438	17 514	**34 833**	29 289	112 423
	Growth	167.3%	34.7%	92.2%	48.6%	15.8%	46.2%
ROW	2014	4 842	28 230	33 839	7 927	**35 153**	109 992
	2024	16 833	**57 867**	51 097	13 296	46 933	186 026
	Growth	247.7%	105.0%	51.0%	67.7%	32.2%	69.1%
Total	2014	84 438	150 303	136 300	108 250	**172 497**	651 788
	2024	**359 460**	318 563	287 041	196 433	284 729	1 446 227
	Growth	325.7%	111.9%	110.6%	81.5%	64.9%	121.9%

Notes: Growth is the percentage change in R&D investment in 2024 vs 2014. Bold: highest value in each row.
Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

In the EU, automotive continues to be the largest sector, and its **R&D investment has increased by 73.4% since 2014.** The **ICT software** sector has doubled its R&D investment since 2014–but this constitutes the **lowest increase of all regions,** and the EU software sector remains the second smallest after Japan with only **little weight in the EU's aggregate R&D**. EU health sector companies increased their R&D investment at the same speed as the sector globally, but the total of EUR 46.3 billion corresponds to less than one third of that of the US companies.

In the US, ICT hardware companies invested the most in R&D in 2014, while in 2024, the **ICT software sector** was the largest contributor to the aggregate, with ICT software now having almost twice the R&D investment of the ICT hardware sector. The US ICT software R&D investment increased by 338% within a decade and led global corporate R&D investment by a large margin. With their **EUR 276 billion** in 2024, the **US software companies have invested about 17 times more than the EU companies** from this sector, while in 2014 this was only 7.8. US health companies have also increased their investments faster than the sector in total. The **US automotive** sector plays a minor role and has developed more moderately, but its R&D investment in 2024 continued to **exceed that of the Japanese companies** from this sector. Automotive is

the only sector where the EU companies increased their lead over the US–the EU automotive R&D was twice that of the US in 2014, and by 2024 it was 2.2 times more. Overall, **the US exhibits greater dynamism** than the EU, Japan and ROW, as shown by the increase in the number of firms, R&D investment growth, and changing sectoral composition. However, at the same time the increasing concentration of R&D investment in fewer and fewer sectors and companies can also pose risks (Section 2.3).

The R&D investment of Chinese Scoreboard companies has increased by 450% since 2014, and number of companies has almost doubled. As set out in **Table 13,** Chinese R&D-investing companies are less concentrated in the top sectors, meaning that the remaining sectors ('rest') are responsible for the largest share of R&D investment. **Chinese R&D increased considerably faster than in the other countries** across all sectors, due to both improved coverage in the Scoreboard (with more firms reporting according to global standards) and faster R&D investment growth. While in 2014, the EU companies were investing more in R&D in all sectors than the Chinese, by 2024 the EU was ahead only in automotive and health–at least in terms of R&D investment.

The **Japanese Scoreboard companies** are **more diversified** than those of other countries and regions, as shown by the relatively large R&D investment of the sectors outside the top 4. While these sectors (summarised as 'rest') had the highest R&D investment in 2014, R&D investment has grown slower than in the other sectors, meaning that in 2024 automotive constituted the largest sector. However, Japanese automotive companies increased their R&D at the lowest rate among all regions. The ICT software sector, in contrast, performed strongly and increased its R&D investment by 167%, and thereby narrowed the gap to the EU (from 47% of EU R&D investment in this sector to 65%). In total, however, while in 2014 R&D investment by Japanese companies was at 55% of the R&D investment of EU companies, by 2024 this share had fallen to 48%.

The ROW countries increased their R&D investment by 69%, at about the same speed as the EU but below the global increase over the period 2014-2024. In 2014, the largest contributors were the companies outside the top 4 sectors, but in 2024 the **ICT hardware** sector was leading (with a doubling of R&D investment). The ICT software companies also recorded the largest relative increase and overtook the EU in this sector, while in 2014 the EU's ICT software R&D investment was twice that of the ROW. The relative positions of the EU and the ROW remained unchanged between 2014 and 2024, with the ROW R&D investment amounting to around 79% of that of the EU companies.

3.5. Sector KPI for the top 4 in the longer term – 2014-2024

This section dives deeper into the sectors by introducing KPIs for the top 4 R&D-investing sectors and by considering their evolution by country/region and over time. Section 3.7 repeats this exercise for the remaining sectors.

ICT software

The ICT software and services sector led in terms of R&D investment and accounted for 24.9% of total R&D investment in 2024. No single sector has ever concentrated such a high share of total R&D in the Scoreboard. This sector comprises companies that develop software and provide computer services and telecommunication services. In 2024 the ICT software and service companies invested EUR 359.4 billion in R&D (EUR 295.6 billion when adjusted for inflation). This sector is the fastest growing with a **CAGR of R&D investment of 14.1% per year** since 2014

(11.6% when adjusted for inflation), and R&D investment in 2024 was 4.4 times higher than that of 2014. The growth of this sector's R&D ranged between 18.5% and 20.5% in the years 2017 to 2022 but fell in the past 2 years to 6.1% and 7.8%. The rapid growth almost doubled the sector's share of total Scoreboard R&D, and the number of companies increased from 239 (12%) to 289 (14.5%).

Table 18. ICT software KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	26	8 070	31 067	218 604	25 100	14.2%	3.7%	31.6%	9 759
	2024	26	15 993	50 289	312 789	29 407	16.1%	5.1%	54.4%	20 093
	growth		98.2%	61.9%	43.1%	17.2%				
US	2014	**128**	**63 186**	**102 217**	**639 868**	**54 614**	16.0%	9.9%	**114.0%**	**38 601**
	2024	**153**	**276 938**	**449 686**	**2 060 547**	**279 768**	**21.9%**	**13.4%**	99.0%	**77 289**
	growth		338.3%	339.9%	222.0%	412.3%				
China	2014	33	4 469	7 597	42 385	2 694	**17.9%**	**10.5%**	162.1%	15 441
	2024	62	39 347	75 657	554 962	55 551	13.6%	7.1%	70.8%	24 922
	growth		780.5%	895.9%	1 209.3%	1 961.9%				
Japan	2014	7	3 872	15 036	170 164	19 024	8.8%	2.3%	20.4%	6 700
	2024	7	10 349	27 145	177 600	20 545	15.4%	5.8%	50.4%	16 079
	growth		167.3%	81.7%	4.4%	8.0%				
ROW	2014	45	4 842	23 779	182 765	24 974	13.0%	2.6%	19.2%	5 333
	2024	41	16 833	25 441	185 683	14 244	13.7%	9.1%	**118.2%**	21 622
	growth		247.7%	7.0%	1.6%	-43.0%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2024 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

In no other sector is the **regional concentration** more pronounced: **77% of total R&D investment came from US companies.** Even though their level of R&D investment was already very high in 2014, the US companies increased it at a very high rate. Over the past decade, **only China has been able to establish a significant own ICT software sector**, while the R&D investment of the EU, Japanese and ROW companies remained marginal on the global scale. The number of companies increased in the US and China, remained unchanged in the EU and Japan and decreased in the ROW.

The **US companies** earned over **72% of the sector's profits** in 2024 (up from 56.9% in 2014), and their profitability rose to 21.9%. The profitability of the sector's companies increased in all regions apart from China, with the US and Japanese companies achieving the largest increases, followed by the EU. The profitability of the ICT software sector was 18.9%, the highest of the top 4 sectors.

In 2024, the **sales of US companies** exceeded EUR 2.06 trillion–**62.6% of the sector's total** sales. In addition, the **US companies** had the **highest R&D intensity (13.4%)**, followed by the ROW (9.1%) and China (7.1%), while the Japanese and EU companies were at the lower end (5.8% and 5.1%, respectively). In all regions except China the R&D intensity has increased over the last decade, with the biggest increase recorded for the ROW companies.

The US companies were responsible for by far the largest share of capex with 70% of the sector's total (43% in 2014). In 2024, the US companies spent **EUR 250 billion more on capex than the**

EU companies–investments aimed at ensuring their lead in AI and that are missing in the EU. The capex of the Chinese companies also increased strongly, and was 90% higher than that of the EU companies. However, the EU companies were ahead of Japan and the ROW companies in terms of capex both in 2014 and 2024.

The strong capex growth of the US ICT software companies in 2024, as well as compared to a decade ago, resulted in a reduction in the **R&D-to-capex ratio** from 114% in 2014 to 99% in 2024. This also illustrates these companies' current **strategic moves,** with their **large investments into data centres, energy supply, etc. for AI**. **The same trend is observed for China** and bears witness of the competition between these two countries for the global lead in AI. In contrast, we observe the opposite trend in the other regions/countries. Overall, the R&D-to-capex ratio in the ICT software sector increased from 65.8% in 2014 to 111.2% in 2023, but in 2024 it declined to 89.9% due to the large capex made by the US and Chinese companies. The increasing role of R&D relative to capex can also be seen also in the ROW countries. **In Japan and the EU,** however, the ICT software companies invested more in capex than in R&D, and the R&D-to-capex ratio shows that **R&D has always been (much) less important for the ICT software companies than capex in these regions.**

In all countries and regions, the R&D investment per employee has increased significantly over the past decade. In the **US, the mean R&D investment per employee reached EUR 77 289** in 2024, doubling the 2014 value; companies from China were second, both in 2014 and 2024, followed by the ROW, the EU and Japan.

ICT hardware

The ICT hardware sector comprises firms producing computer hardware, semiconductors, telecommunications equipment, and electronic and electric equipment (including electronic office equipment). At 22.0%, it is the **second-largest sector** in the Scoreboard for R&D investment. The number of ICT hardware companies in the Scoreboard decreased somewhat from 415 in 2014 to 397 in 2024, and the R&D investment share decreased by 1 percentage point. Overall, the sector **increased its R&D investment by 7.1% on average per year** (5% when adjusted for inflation) at **half the rate of ICT software.** Total R&D investment by ICT hardware companies amounted to EUR 318.5 billion in 2024 (EUR 273.3 billion when adjusted for inflation). **Table** presents selected KPIs for the sector by country/region and describes their evolution between 2014 and 2024. The highest value for each KPI and year is marked in bold.

The ICT hardware companies with the largest R&D investment were headquartered in the **US,** and were responsible for **45.2% of the sector's total R&D investment**. In 2024, the US led in every indicator apart from capex, the R&D-to-capex ratio, and R&D intensity. The **Chinese companies are second** in terms of R&D investment, overtaking the EU, Japan and even the ROW within the last decade. While in 2014, most of the ICT hardware companies were from the US, in 2024 the Chinese companies were the most numerous. In all regions except China the number of firms has fallen in the last decade.

The distribution of profits is even more concentrated than that in R&D, with **the US companies earning 57.8% of the ICT hardware sector's profits**. The EU companies in contrast earned only 7.5% of the sector's profits, less than all other regions. Since 2014, the distribution of profits across the regions has changed only marginally, with China's share increasing by 3 percentage points at the expense of Japan. **With 14.1%, the profitability of the sector is high** and has increased by 3 percentage points compared to 2014. The **US led in profitability** by a large margin **ahead of**

the EU, followed by the ROW and Japan, while the profitability of the Chinese companies was lower and has decreased since 2014.

Table 19. ICT hardware KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	43	20 059	17 508	215 950	7 322	8.1%	**9.3%**	**272.5%**	16 907
	2024	36	32 217	40 948	298 826	16 747	13.7%	**10.8%**	**192.4%**	29 040
	growth		60.6%	133.9%	38.4%	128.7%				
US	2014	**156**	**74 459**	**141 367**	**824 593**	**46 292**	**17.1%**	8.9%	157.6%	**31 170**
	2024	115	**144 071**	**316 417**	**1 399 146**	75 604	**22.6%**	10.3%	190.6%	**62 981**
	growth		93.5%	123.8%	69.7%	63.3%				
China	2014	55	12 381	15 961	262 599	20 240	6.1%	4.7%	59.5%	5 722
	2024	**129**	63 970	43 613	854 724	75 248	5.1%	7.5%	85.0%	21 194
	growth		416.7%	173.3%	225.5%	271.8%				
Japan	2014	58	15 173	25 213	322 021	15 728	7.8%	4.7%	96.3%	7 151
	2024	43	20 438	42 275	412 384	24 235	10.3%	5.0%	84.3%	9 828
	growth		34.7%	67.7%	28.1%	54.1%				
ROW	2014	103	28 230	51 191	608 326	39 618	8.4%	4.6%	69.3%	21 416
	2024	74	57 867	103 806	924 463	**106 107**	11.2%	6.3%	54.5%	19 112
	growth		93.5%	102.8%	52.0%	167.8%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

In 2024, the US ICT hardware companies recorded close to **EUR 1.4 trillion in net sales** (36% of the total)–this share remained stable since 2014. The ROW companies ranked second in terms of sales, ahead of China and Japan, with **the EU in last place**. The growth rate of EU ICT hardware sales was the second lowest after Japan. In contrast, the **EU companies** had the **highest R&D intensity** in 2014 and in 2024. However, the average **R&D investment per employee in the EU is less than half that of the US companies** and it **increased by less than in the US or in China.** In the ROW, R&D investment per employee decreased due to Hon Hai Technology Group (Taiwan) starting to publish employment data and thus enters in the calculations of R&D investment per employee in 2024 (the company is the largest ICT hardware producer in the world in terms of employment with 620 000 employees). The **Japanese companies** are mostly active in the electronic and electrical equipment subsector and were **less R&D intensive** than their counterparts in other regions. In 2024, the Japanese companies had the lowest R&D spending per employee, reaching only about half the level of the second lowest (ROW), as well as the lowest increase in the past decade.

The ROW companies had the **largest capex** in 2024, while in 2014 the US companies were ahead. The foundries in the major producer countries, South Korea and Taiwan, are of the utmost global relevance in the manufacturing of semiconductors, which is extremely capital intensive. The capex of the Chinese companies increased strongly and was on a par with that of the US companies in 2024. The Japanese and EU companies had the lowest capex investments in 2024 and also in 2014.

Overall, the R&D-to-capex ratio of the ICT hardware sector was about the same level both in 2014 and 2024 at 113% and 107%, with a low in 2022 (80.7%) when the sector stepped up its capex significantly. In terms of the **R&D-to-capex ratio, the EU companies are ahead of the US** with

192%, meaning that the average EU company invested 92% more in research and innovation than in capital goods. In contrast, in all other regions capex exceeded the investment in R&D. This indicates **different (regional) specialisation patterns**, with the EU and US companies being more on the technology development side, and the Asian and ROW companies more on the producer side. Still, the increase in R&D-to-capex in China also indicates that the Chinese companies' focus on R&D is growing.

Health

The health sector constitutes the largest sector in the Scoreboard in terms of the number of firms and the **third largest in terms of R&D.** The share of health companies increased from 16.6% in 2014 to 21.9% in 2022 and stood at 20.6% in 2024, while its R&D share decreased by 1 percentage point to 19.9% between 2014 and 2024. R&D investment in 2024 amounted to EUR 287 billion and grew by 7% on average per year (4.9% when adjusted for inflation). The growing number of firms in combination with a somewhat lower R&D share is the result of **many younger and smaller but R&D-intensive firms**–mostly **operating in the biotech sector and located in the US**–entering the Scoreboard in recent years.

Table 20. Health KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	53	22 332	33 669	205 762	10 227	16.4%	10.9%	216.2%	23 219
	2024	57	46 322	48 457	333 192	23 302	14.6%	13.8%	198.8%	40 779
	growth		107.4%	43.9%	61.9%	127.9%				
US	2014	**162**	**70 020**	**102 862**	**648 335**	**20 463**	16.1%	10.6%	337.1%	**58 745**
	2024	**226**	**159 430**	**100 358**	**1 204 956**	**38 948**	9.0%	12.7%	**404.8%**	**95 925**
	growth		127.7%	-2.4%	85.9%	90.3%				
China	2014	17	995	3 893	47 174	1 979	8.3%	2.1%	48.5%	4 420
	2024	60	12 679	14 434	187 707	8 918	7.7%	6.8%	142.2%	17 795
	growth		1 174.4%	270.8%	297.9%	350.6%				
Japan	2014	32	9 114	7 241	74 752	2 485	9.7%	12.2%	**366.8%**	33 964
	2024	22	17 514	16 093	115 161	5 232	14.0%	15.2%	334.8%	58 392
	growth		92.2%	122.3%	54.1%	110.6%				
ROW	2014	41	33 839	46 656	229 701	11 544	**20.3%**	**14.7%**	288.7%	52 737
	2024	46	51 097	53 724	300 879	13 480	**18.0%**	**16.9%**	377.4%	73 156
	growth		51.0%	15.1%	31.0%	16.8%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2024 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

As can be seen in **Table 20**, the **US led this sector's** R&D investment by a large margin both in 2014 and 2024. The **US hosted 55% of the firms** in 2024 and accounted for **55.5% of the sector's R&D**. While R&D investment increased in all regions, the increase in the US was more dynamic and took place on a larger scale. **EU companies continued to rank third**, closely behind ROW companies, and were able to **reduce the gap** between 2014 and 2024 by increasing R&D at twice the ROW rate. The number of companies from the EU and the ROW increased between 2014 and 2024, the number of Chinese companies more than tripled, but the Japanese figure fell by around one third.

Operating profits in 2014 and 2024 were **highest for the US companies** and were also at about the same level, while in all other regions profits increased more strongly. The ROW companies earned the second-largest profits ahead of the EU, but the **EU companies caught up significantly**. Chinese profits also increased considerably, but they still remained slightly behind Japan. **Profitability fell in the EU, the US and ROW**, remained stable in China and increased significantly for the Japanese companies. The reason for the lower profitability is the **increasing number of companies in the early stages of the life cycle with high R&D investments** in product development **but little or no sales and profits**: 67% of the US and 38.3% of the ROW health companies recorded losses in 2024, up from 53.4% and 10% in 2014, respectively. In addition, these firms often have low employment levels, leading to (very) high R&D per employee. This development is–to a lesser extent–also visible in the EU and China, with 5.7% and 5.9% of the companies not earning profits in 2014, but 29% and 33.3% in 2024. Japan is the exception here with all health companies reporting profits, both in 2014 and in 2024.

The **highest sales** in 2024 were recorded by the **US companies**, which were almost four times higher than those of the EU companies in second place and which increased by 85% compared to 2014. The EU companies' sales increased faster than those of the ROW countries, meaning that the EU's health sector sales exceeded those of the ROW in 2024. The **R&D intensity increased in all regions/countries** between 2014 and 2024 and **remained highest for the ROW companies, followed by Japan and the EU**, ahead of the US. The R&D intensity of the Chinese health sector tripled but remained at a much lower level than that of its global competitors.

In terms of **capex, the US firms led** in 2014 and 2024, followed by the EU, ROW, Chinese and Japanese companies. The **capex of the EU companies increased faster than in all other countries** except from China, narrowing the gap to the US and with more investment than the ROW. Relating R&D to capex for the health sector shows that the companies in **this sector on average invest a much more in R&D than in capital goods**. The R&D-to-capex ratio for the sector increased from 288% in 2014 to 317.8% in 2024. This trend is also caused by the large number of young, research-focused firms discussed above–not only do they not yet generate sales or profits, they also have very low capex. In the US, a health company invested on average four times more in R&D than in capex in 2024; the ROW and the Japanese companies have ratios well above 300% too. In China, the sector developed from a capex-focus in 2014 to an R&D-focus in 2024. The EU and the Japanese companies are the only ones where this ratio declined over time due to the strong capex growth.

R&D investment per employee was highest in the US in 2024, but the US lead over the other countries was smaller than in the two ICT sectors. The **US companies** spent on average **EUR 95 925** on R&D per employee, followed by ROW companies with EUR 73 156 and Japan with EUR 58 392. The **EU companies** came fourth: with **EUR 40 779** they were quite a distance behind the other countries/regions but they **increased by relatively more** (up by 75%) than the other regions except China. The Chinese health companies have increased R&D per employee over fourfold since 2014 but remain far behind even the EU companies.

Automotive

The automotive sector comprises firms in the automobiles and parts, commercial vehicles and trucks, and tyres subsectors. Accounting for 13.6% of R&D investment and 7.7% of the companies in 2024, it is the fourth-largest sector in the Scoreboard in terms of R&D, but has a lower R&D intensity than the three other top sectors. Since 2014, the number of automotive companies has

fallen from 171 to 153, and the share of R&D investment declined from 16.6% in 2014 to 13.0% in 2021, before increasing again to 13.6% in 2024. The automotive sector is the only of the top 4 in which the **EU led in terms of R&D investment in 2024,** accounting for **41.6% of the sector's total**, compared to 18.7% for the US, 17.7% for Japan, 15.3% for China and 6.8% for the ROW. The R&D shares of the EU, the US and Japan decreased at the expense of an increasing share of the Chinese firms. While the number of companies in Japan and the ROW has dropped since 2014, the number of companies in the EU and the US has remained almost unchanged, and the number of companies in China has increased considerably, as has their R&D investment.

Table 21. Automotive KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	35	**47 063**	**53 147**	**870 122**	**48 113**	6.1%	**5.4%**	**95.7%**	16 373
	2024	33	**81 624**	**83 797**	**1 332 328**	**69 499**	6.3%	**6.1%**	**117.4%**	25 212
	growth		73.4%	57.7%	53.1%	44.4%				
US	2014	35	24 131	28 451	577 534	33 351	4.9%	4.2%	71.2%	**17 726**
	2024	32	36 719	59 958	796 914	63 259	7.6%	4.6%	58.0%	**26 288**
	growth		52.2%	110.7%	38.0%	89.7%				
China	2014	31	5 696	8 656	208 214	8 493	4.2%	2.7%	65.7%	5 065
	2024	**43**	29 962	13 885	542 806	34 008	2.6%	5.5%	88.1%	12 431
	growth		426.0%	60.4%	160.7%	300.4%				
Japan	2014	**41**	23 434	44 716	572 315	43 687	**7.8%**	4.1%	53.6%	12 234
	2024	26	34 833	61 828	871 189	53 799	7.1%	4.0%	64.7%	18 953
	growth		48.6%	38.3%	52.2%	23.1%				
ROW	2014	29	7 927	17 410	237 767	11 946	7.3%	3.3%	64.0%	10 823
	2024	19	13 296	33 485	400 016	17 017	**8.4%**	3.3%	78.1%	15 851
	growth		67.7%	92.3%	68.2%	42.5%				

Notes: n...number of companies, emp...employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

As shown in **Table 21,** the **EU companies led automotive R&D by a large margin** in 2014 and in 2024. As with the US ICT companies, the EU automotive companies were starting from a high level yet still significantly increased their R&D investment. In 2014, the second most important region for automotive R&D was the US, slightly ahead of Japan; the US maintained this small lead also in 2024 2024. China caught up significantly and invested only somewhat less in R&D than the US or Japan.

Operating profits in 2024 were highest for the EU companies with EUR 84 billion, followed by Japan and the US. Compared to 2014, the EU companies expanded their lead in profits over the other regions in 2024, but the US companies recorded the highest growth rate in profits. The **highest profitability in 2024 was recorded by the ROW** companies, followed by Japan and the US, while **the EU companies' profitability fell slightly.** The US companies recorded the largest increase in profitability over the last decade, followed by the ROW companies, while the increase was smaller for the EU, and profitability fell for Japan, and strongly for China. This is due to the highly competitive environment in China where in particular EV companies aim to increase their (domestic as well as global) market shares with aggressive pricing.

In terms of sales, **no other EU sector achieved higher sales than the automotive** companies in 2024. With **EUR 1.33 trillion,** it is the only EU sector with sales exceeding EUR 1 trillion (while in the US this holds for the two ICT sectors and health). The Japanese companies ranked second in terms of sales in 2024, whereas in 2014 the US companies were still ahead of Japan. The Chinese automotive companies increased their sales by 160% and were ahead of the ROW in 2024.

In view of this enormous sales volume, it is interesting to note that the **EU companies** also **led in terms of R&D intensity**. However, **R&D intensity is far below the other three top R&D sectors** in the Scoreboard. The Chinese automotive companies more than doubled their R&D intensity and ranked second in 2024 with 5.5%, overtaking the US, Japan and the ROW. In terms of R&D intensity, companies in every region apart from Japan and the ROW saw an increase.

In **capex the EU lead** was smaller than for the other indicators. In 2014, the Japanese companies ranked second, but in 2024 the US automotive companies were second behind the EU companies. Behind the **Chinese companies and their massive growth in capex**–most probably related to the build-up of EV production capacities–US companies recorded the highest capex growth.

Relating capex to R&D investment shows that the **EU companies have a stronger focus on R&D than their competitors**, and their R&D focus increased between 2014 and 2024. In all other regions and countries, the capex of the automotive companies exceeded their R&D investments, both in 2014 and 2024, and in the US the ratio even decreased. In China, Japan and the ROW, in contrast, the relevance of R&D compared to capex increased for the automotive sector. Overall, the R&D-to-capex ratio of the automotive sector increased from 73.1% in 2014 to 82.7% in 2024.

Even though the EU companies invest more in R&D than in capex, the US companies had the highest **R&D investment per employee.** In both regions this indicator developed similarly over time, with the US maintaining the gap of around EUR 1 000 more per employee. Even though total R&D investment by EU companies increased faster than in the US, it did not translate into higher investments per employee. As mentioned earlier, the **Japanese companies have always been less R&D intensive**, which can also be seen by their R&D-per-employee figure, which is below that of the EU and US in both years. Moreover, the Japanese automotive companies increased their R&D per employee by less than their EU and US counterparts. Looking at the Chinese and ROW companies, we can see that, as of 2024, the ROW was still ahead of China, but the gap is closing.

3.6. R&D in the sectors outside the top 4 in the longer term–2014-2024

The remaining six sectors (plus the residual category 'Others', see **Table 10** in Section 3.1 for details) comprised 37.6% of the Scoreboard companies (751) and 19.7% of R&D investment in 2024. Their share of firms has declined by 6 percentage points since 2014, and the share of R&D by somewhat more (6.8 percentage points).

China is the only region in which the number of firms in these sectors has increased in the past decade, from 124 to 231, but by relatively less than the total number of Chinese companies. In all other regions/countries the number of companies in these sectors has fallen, and the company-share of the top 4 sectors has increased. However, by 2024 **the EU was the only region with a higher share of companies outside the top 4 sectors**, while Japan now had 51% of the companies in the top 4 sectors (see Section 3.2 and **Table 13**).

The pattern of R&D investment development has been as follows: the share of R&D in the sectors outside the top 4 has declined in every country/region. It is the highest in China with 37.4% and the

lowest in the US with 9.3%, 24.7% for the EU-headquartered companies, 25% for the ROW companies and 26% for Japanese companies.

Table 22 summarises R&D investment per sector in 2014 and 2024 and the growth rate over this period. The column 'Total' gives the sector total, and the row 'Total' at the bottom indicates the regional total for the sectors outside the top 4. The highest values per sector are marked in bold.

Table 22. Outside the top 4 sectors - R&D across regions, 2014 and 2024, in EUR million

Region	Year	EU	US	China	Japan	ROW	Total
Aerospace & defence	2014	8 476	**8 523**	155		4 509	21 662
	2024	10 008	**10 932**	851		2 451	24 243
	Growth	18.1%	28.3%	450.8%		-45.6%	11.9%
Chemicals	2014	4 406	**7 983**	305	5 217	3 770	21 681
	2024	5 285	5 639	3 727	**6 470**	4 892	26 014
	Growth	19.9%	-29.4%	1 122.3%	24.0%	29.8%	20.0%
Construction & materials	2014	1 353	306	**4 964**	829	687	8 139
	2024	2 251	300	**28 688**	1 167	1 241	33 647
	Growth	66.3%	-2.0%	477.9%	40.8%	80.7%	313.4%
Energy	2014	4 540	**5 715**	3 342	738	4 166	18 502
	2024	7 703	4 437	**8 760**	431	5 658	26 990
	Growth	69.7%	-22.4%	162.1%	-41.5%	35.8%	45.9%
Financial	2014	**7 444**	2 776	511		5 768	16 499
	2024	8 191	6 154	982		**9 846**	25 173
	Growth	10.0%	121.7%	92.3%		70.7%	52.6%
Industrials	2014	9 193	**10 901**	5 395	7 422	5 859	38 769
	2024	13 805	8 617	**23 579**	7 328	7 931	61 259
	Growth	50.2%	-21.0%	337.0%	-1.3%	35.4%	58.0%
Others	2014	6 601	**14 982**	4 181	11 087	10 394	47 245
	2024	10 333	**27 575**	20 686	13 893	14 914	87 402
	Growth	56.5%	84.1%	394.8%	25.3%	43.5%	85.0%
Total	2014	42 014	**51 186**	18 852	25 292	35 153	172 497
	2024	57 739	63 655	**87 274**	29 289	46 933	284 729
	Growth	37.0%	24.4%	362.9%	15.8%	32.2%	65.1%

Notes: Growth is the R&D investment percentage change between 2014 and 2024. There were no Japanese companies in the sectors aerospace & defence and financials in 2014 and 2024.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

In 2024, the **aerospace & defence** sector had the lowest R&D of the sectors presented in **Table 22,** and it also had the lowest increase relative to 2014. The **US and the EU companies were head-to-head**, while China remained far behind; the ROW lost 10 companies and half of the R&D investment compared to 2014. However, the aerospace & defence sector has some peculiarities due to the fact that often large R&D projects are financed by the public sector, making the sector only partly comparable to others. There is also a substantial number of defence companies, especially from the US, that does not disclose R&D. The reported **figures for this sector constitute a lower bound** and should therefore be read with caution.

The **R&D investment of the chemicals sector increased 20%** over the past decade. In 2014, the US firms had the highest R&D investment in this sector, but their investment has fallen by 29.4% since then. This decrease relates to the (M&A-related) fall in the number of US chemicals companies in the Scoreboard. In contrast, the chemicals companies in the other countries and regions increased R&D, with the Japanese companies leading the sector in 2024. The **EU companies increased R&D** at a somewhat lower rate as the Japanese companies, and their R&D investment remained slightly below that of their US counterparts, but ahead of the ROW and China.

Construction & materials was **dominated by Chinese state-owned companies** throughout the period, and they were responsible for 79% of the Chinese R&D in this sector in 2024. The

Chinese companies invested **85.3% of the sector total** and the sector amounted to 12.8% of total R&D investment by the Chinese Scoreboard companies (this share is 0.04% for the US and 1% for the EU). This shows the important role of **infrastructure development in China and abroad**, with the largest R&D-investing companies in this sector being railway and power construction corporates. R&D investment in the construction & materials sector increased in all regions apart from the US. Both in 2014 and 2024, the EU companies were responsible for the second-largest R&D investments behind China.

In the **energy sector**, total R&D increased by 46% between 2014 and 2024, mainly due to large **increases by Chinese companies.** The **EU energy companies stepped up their R&D** by more than the overall average, but R&D decreased in the US. While in 2014, EU, US, Chinese and ROW companies were within a small range in terms of R&D investment, in 2024 **China had a clear lead** in energy R&D, ahead of the EU. In the US and Japan, however, R&D investment in 2024 was lower than a decade ago, and the R&D investment of the ROW companies increased at a lower rate than in the EU or China. Accounting for 28.5% of the sector's R&D in 2024, **EU companies were second** to China at 32.5%, with the EU's share rising and China's decreasing. The leading companies in China, the US and the ROW were oil and gas producers, while **the leading EU energy companies were in electricity and alternative energy**.

In the **financial sector** the ROW countries were in the lead in 2024, mainly because of the **UK** (with seven out of 11 companies). The sector's R&D investment has increased by 52.6% since 2014, with the strongest increase in the US, China and the ROW. The EU companies also increased their R&D investment in this sector and invest almost as much as the ROW companies. The sector shows signs of transformation with **new entrants from the crypto sphere and trading platforms**, such as Coinbase or Robinhood (both US).

Industrials is the **largest sector** of those outside the top 4. R&D investment by companies in this sector increased by 58% between 2014 and 2024, even though the number of companies fell in all regions/countries except for China where it increased. In 2014, the US companies led this sector, slightly ahead of the EU, but by 2024 Chinese companies were leading by a large margin, with the EU companies in second place. The **EU industrials companies increased their R&D investment by 50.2%** in the last decade, driving the sector's total growth together with China. In 2024, 22.5% of the sector's R&D came from EU companies and 38.5% from Chinese companies.

The sectors included in 'Others' accounted for 6% of R&D in 2024, down from 7.3% in 2014, and the share of companies decreased from 12.8% to 11%. Nevertheless, R&D investment increased strongly in all regions. The **US continues to lead in these sectors**, followed by China, Japan and the ROW, with the lowest R&D coming from EU companies. This group contains a heterogeneous mix of companies: in the US, the most important in terms of R&D are Netflix, Maplebear and Airbnb; in the EU L'Oréal and LVMH; in Japan Sony and Panasonic; in the ROW Nestlé and Unilever; and in China Meituan and Midea Group.

Overall, the sectors outside the top 4 **increased R&D investment by 65%**, **far below the 142% growth realised in the top 4 sectors between 2014 and 2024.** After the Chinese companies, the EU companies were those with the highest increase in R&D investment in these sectors, driven in particular by the industrials and the energy sector.

3.7. Sector KPIs outside the top 4 in the longer term–2014-2024

As with the top 4 sectors the most important KPIs for the sectors outside the top 4 are presented below. We focus on the countries and briefly compare the changes between 2014 and 2024.

Aerospace & defence

The aerospace & defence sector is characterised by a close **competition between the EU and the US companies**, with the US companies leading in some indicators, while in others the EU companies are ahead. The US still has the largest number of companies, and the highest R&D and sales, **the EU companies led in profits** (due to five consecutive years of large losses from Boeing, while Airbus earned significant profits), capex, R&D intensity as well as R&D investment per employee. Profitability, however, was highest in the ROW countries in 2024. Overall, the number of firms decreased from 52 to 37, and with this R&D too (in particular in the ROW).

Table 23. Aerospace & defence KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	14	8 476	9 678	125 017	4 688	7.7%	**6.7%**	**176.5%**	**19 918**
	2024	11	10 008	**16 349**	174 817	**8 550**	9.4%	**5.7%**	117.1%	**19 452**
	growth		18.1%	68.9%	39.8%	82.4%				
US	2014	**18**	**8 523**	**30 428**	**263 417**	**6 521**	**11.6%**	3.2%	130.7%	10 880
	2024	**14**	**10 932**	12 819	**294 546**	8 343	4.5%	3.6%	**131.0%**	15 566
	growth		28.3%	-57.9%	11.8%	11.8%				
China	2014	3	155	401	5 937	398	6.8%	2.6%	38.8%	2 273
	2024	5	851	902	20 920	1 223	4.3%	4.1%	69.6%	7 590
	growth		450.8%	124.6%	252.4%	207.3%				
ROW	2014	17	4 509	4 668	80 841	4 051	5.8%	5.6%	108.6%	13 084
	2024	7	2 451	10 226	86 841	3 002	**11.8%**	2.8%	81.7%	8 477
	growth		-45.6%	119.1%	7.4%	-25.9%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

The new indicator, R&D-to-capex, shows that across all countries, the aerospace & defence companies increased their capex relative to R&D in the recent years. Only in China and, to a lesser extent, in the US did R&D investment increase more relative to capex. Overall, **the sector is the only one outside the top 4 R&D investing sectors where the R&D-to-capex ratio exceeds 100**, although it decreased between 2014 and 2024 from 138.4% to 115%.

Chemicals

The chemicals sector shows a rather heterogeneous pattern across regions/countries and over time. In terms of R&D, US companies invested the most in 2014, followed by Japan, but **in 2024, the Japanese companies invested the most, with the EU companies ranking second**. In the US, the R&D investment of the sector was lower in 2024 than in 2014 due to the fall in the number of companies, but also due to lower investments by several large companies.

In profits and sales, the US sector total in 2024 was also lower than a decade ago, with the **ROW companies taking the lead** for both indicators in 2024. The driving force for this is the Indian company Reliance Industries that was responsible for around one third of the entire ROW profits

and sales, but it invested only EUR 170 million in R&D. Japanese chemicals companies have the highest R&D intensity, and the highest R&D-to-capex. Overall, the ratio of R&D to capex for the entire sector decreased from 37.5% to 26% and was the second lowest after the energy sector.

Table 24. Chemicals KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	15	4 406	14 178	174 346	12 701	8.1%	2.5%	34.7%	11 738
	2024	13	5 285	11 861	180 338	14 750	6.6%	2.9%	35.8%	14 261
	growth		19.9%	-16.3%	3.4%	16.1%				
US	2014	31	**7 983**	**34 750**	**284 930**	**18 243**	**12.2%**	2.8%	43.4%	**17 177**
	2024	19	5 639	19 840	230 027	18 346	8.6%	2.5%	30.7%	**15 508**
	growth		-29.4%	-42.9%	-19.3%	0.6%				
China	2014	6	305	1 548	15 346	1 847	10.1%	2.0%	14.3%	6 546
	2024	25	3 727	10 141	173 149	17 985	5.9%	2.2%	20.7%	10 976
	growth		1 122.3%	555.0%	1 028.3%	873.9%				
Japan	2014	**34**	5 217	8 056	143 748	7 190	5.6%	**3.6%**	**72.6%**	12 836
	2024	**27**	**6 470**	13 544	181 070	14 455	7.5%	**3.6%**	**44.8%**	14 512
	growth		24.0%	68.1%	26.0%	101.0%				
ROW	2014	20	3 770	23 700	193 776	17 340	**12.2%**	1.9%	21.5%	13 715
	2024	14	4 892	**32 410**	**350 748**	**34 439**	**9.2%**	1.4%	14.2%	4 128
	growth		29.8%	36.8%	81.0%	98.6%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

Table 24 shows that R&D investment per employee increased in all regions apart from the US and the ROW, but the US companies still invest the most per employee. The dramatic drop in the ROW relates to a doubling in employment by ROW chemical companies due to Reliance Industries–with 400 000 employees in 2024 it is the largest company in this sector, ahead of BASF with 111 800 employees. Overall, this volatile pattern of the ROW results from the sample's composition: the ROW chemicals sector comprises a very heterogeneous set of companies, from rather small and specialised companies (five companies with headquarters in Switzerland) to very large companies in India and South Korea.

Although the number of chemicals companies decreased in all regions between 2014 and 2024 apart from China, the Scoreboard still contains more chemicals companies from Japan than China. Over the past decade, the sector has been **marked by M&A and restructuring activities**: big R&D investors spun off their speciality chemicals activities, such as Solvay (Belgium) at the end of 2023 (Syensqo) or Dow in 2019 (Corteva).

Construction & materials

The construction & materials sector is dominated by Chinese state-owned companies–they led in R&D, operating profit, sales and capex in 2014 and 2024. In 2024 they also led in R&D intensity, R&D-to-capex and R&D investment per employee. According to the latter metric, they invested twice as much as those from the second highest ranked region, the ROW.

The **Chinese companies recorded sales of EUR 1 074 billion in 2024, over three times more than all the other regions' companies combined**, but profits remained lower, which results in relatively low profitability. The leading Chinese companies in this sector (in terms of R&D

investment) are in general construction, railway construction, communications and energy/power infrastructure; nine out of the 10 largest companies in this sector are Chinese, seven of them owned by the Chinese government, and one company comes from the EU (Saint-Gobin).

The strong increase in the sector's R&D investment, driven by the Chinese companies, led to a rise of the **R&D-to-capex ratio** of the entire sector from 28% in 2014 to 69.3% in 2024, which is **higher than in industrials, and not much lower than automotive**.

Table 25. Construction & materials KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	13	1 353	15 124	204 192	8 149	7.4%	0.7%	15.6%	1 365
	2024	9	2 251	18 523	181 220	8 535	10.2%	1.2%	26.4%	3 617
	growth		66.3%	22.5%	-11.3%	4.7%				
US	2014	4	306	1 664	16 984	770	**9.8%**	**1.8%**	39.8%	**6 483**
	2024	3	300	3 064	20 784	915	**14.7%**	1.4%	32.8%	5 768
	growth		-2.0%	84.1%	22.4%	18.8%				
China	2014	**19**	**4 964**	**20 464**	**390 355**	**14 495**	5.2%	1.3%	34.2%	3 674
	2024	**33**	**28 688**	**49 965**	**1 074 120**	**34 529**	4.7%	**2.7%**	**83.1%**	**14 197**
	growth		477.9%	144.2%	175.2%	138.2%				
Japan	2014	11	829	3 379	69 687	1 666	4.8%	1.2%	**49.8%**	3 881
	2024	8	1 167	3 931	81 339	1 992	4.8%	1.4%	58.6%	6 044
	growth		40.8%	16.3%	16.7%	19.6%				
ROW	2014	10	687	5 963	67 251	3 566	8.9%	1.0%	19.3%	2 996
	2024	6	1 241	6 074	71 518	2 579	8.5%	1.7%	48.1%	7 323
	growth		80.7%	1.9%	6.3%	-27.7%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2024 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

Energy

The energy sector stands out for its high sales, profit and capex (and capital intensity). In 2024 the sector was responsible for **18.6% of profits, 15.5% of sales and 20.9% of capex, but only for 1.9% of the R&D investment**. While sales and profits of the sector vary a lot across the years depending on (fossil) energy prices, the capex share has always been the highest of all sectors. In 2014, the sector was responsible for 34.2% of total capex, but with the rise of the capex of ICT hardware, and later ICT software companies, the energy sector's share decreased, even if total capex remained at the same level.

Table 26 shows that ROW companies dominated the sector (especially through large companies from Saudi Arabia and the UK) in terms of sales, capex, and profits, but the highest R&D investment comes from the Chinese companies. **The EU had the largest number of companies and was second in terms of R&D investment, profits and capex**. The R&D intensity and R&D-to-capex ratio of the sector are the lowest in the Scoreboard, as is R&D investment per employee, even though it increased considerably over time and in all regions. The strong increase in ROW R&D per employee is related to a decrease in employment from 1.3 million to 411 000 due the Russian companies Gazprom and Rosneft leaving the ranking in 2015 and 2017 respectively.

In terms of R&D, Chinese companies were investing the most in 2024, while in 2014 the US companies had been in the lead. In 2024, the companies from the US and Japan invested less in R&D than in 2014. The R&D intensity of the sector was very low due to the enormous sales relative to R&D, and also the R&D-to-capex ratio. However, the R&D-to-capex ratio increased by over 50% from 4% in 2014 to 6.5% in 2024, showing that the sector is getting somewhat more R&D-focused.

Table 26. Energy KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	**24**	4 540	50 243	889 900	84 408	5.6%	0.5%	5.4%	3 819
	2024	**25**	7 703	105 745	940 874	111 059	11.2%	0.8%	6.9%	6 732
	growth		69.7%	110.5%	5.7%	31.6%				
US	2014	15	**5 715**	79 944	781 586	98 364	**10.2%**	**0.7%**	**5.7%**	**9 789**
	2024	10	4 437	104 183	674 052	57 066	15.5%	0.7%	**7.8%**	11 021
	growth		-22.4%	30.3%	-13.8%	-42.0%				
China	2014	10	3 342	48 124	757 689	72 687	6.4%	0.4%	4.6%	2 891
	2024	19	**8 760**	84 159	1 014 170	**113 921**	8.3%	**0.9%**	7.7%	7 833
	growth		162.1%	74.9%	33.9%	56.7%				
Japan	2014	12	738	2 173	254 601	17 202	0.9%	0.3%	4.3%	2 909
	2024	3	431	4 348	179 491	7 376	2.4%	0.2%	5.8%	5 010
	growth		-41.5%	100.1%	-29.5%	-57.1%				
ROW	2014	19	4 166	**87 466**	**1 576 374**	**144 631**	5.5%	0.3%	2.9%	2 931
	2024	12	5 658	**312 125**	**1 334 943**	112 521	**23.4%**	0.4%	4.4%	**12 265**
	growth		35.8%	256.9%	-15.3%	-22.2%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2024 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

The **leading companies in China and the ROW are oil and gas producers** (including the large state-owned corporations from Saudi Arabia, China and Brazil), **while the leading EU energy companies are in alternative energy and electricity** (also with several state-owned companies). In the US, the sector's companies are a mix of large traditional energy companies and smaller, younger companies in renewable energy and electricity.

The profits of the oil- and gas-producing companies from the ROW by far exceeded those of all the other regions, resulting in the ROW companies having the highest profitability in 2024 (and over four times higher than in 2014). These companies' profits increased by more than 250% compared to 2014, while at the same time sales were 15% lower. One single company, Saudi Arabian Oil (which earned the highest profits of all Scoreboard companies in 2024), was responsible for EUR 200 billion of the ROW's total profits of EUR 312 billion (however, in 2022, the profits of Saudi Arabian Oil amounted to EUR 294 billion, the highest profit ever recorded by a Scoreboard company, followed by Petrobras with EUR 288 billion).

Financial

Table 27 shows that the EU had the largest number of financial companies in the Scoreboard in 2024, followed by the US and the ROW. In 2014, the EU companies had the highest R&D investment in this sector, but by 2024 the ROW companies were ahead thanks to large investments by UK banks. In terms of R&D intensity and R&D investment per employee, the US companies were

in the lead in both 2014 and 2024. The high R&D investment per employee is driven by fintechs and crypto platforms and is also related to the small sample size.

In sales and capex, **the EU companies earned and invested substantially more than their competitors**. As in 2014, the high capex investment in the EU relates to one Spanish bank, Banco Santander, that is responsible for half of the EU's capex in this sector. The sector is also characterised by an **increase in the R&D-to-capex ratio**, which has doubled within the last decade from 38.4% to 76.6%.

Table 27. Financial KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	**25**	**7 444**	43 659	**406 671**	**23 933**	10.7%	1.8%	28.5%	4 685
	2024	**17**	8 191	85 981	**325 952**	**16 779**	26.4%	2.5%	48.8%	8 219
	growth		10.0%	96.9%	-19.8%	-29.9%				
US	2014	10	2 776	9 891	35 173	1 696	**28.1%**	**7.9%**	**163.7%**	**30 722**
	2024	12	6 154	29 792	95 408	1 772	30.3%	**6.5%**	**286.5%**	**53 065**
	growth		121.7%	201.2%	171.3%	4.5%				
China	2014	1	511	9 677	21 902	985	44.2%	2.3%	51.8%	6 797
	2024	7	982	-760	53 116	1 280	-1.4%	1.8%	76.7%	4 424
	growth		92.3%	-107.9%	142.5%	30.0%				
ROW	2014	21	5 768	**60 419**	263 968	14 505	22.9%	2.2%	39.1%	5 636
	2024	12	**9 846**	**109 402**	260 263	12 571	**42.0%**	3.8%	78.3%	14 224
	growth		70.7%	81.1%	-1.4%%	-13.3%				

Notes: n -number of companies, emp. -employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

As in 2014, the ROW financial companies earned the highest profits, followed by the EU and the US. In China, four out of the seven companies made losses, with the result that the profits of the entire sector were negative in 2024**. Traditionally, the financial sector is the sector with the highest profitability** across all sectors observed in the Scoreboard, and at **29.8%** in 2024 it reached its highest value so far. The ROW and US companies had the highest profitability and, apart for China, profitability increased in all regions/countries between 2014 and 2024.

Industrials

The industrials sector collects rather heterogeneous companies, from industrial engineering, industrial machinery, industrial transportation, to mining. In 2014, the EU had the highest number of companies in this sector. Since then, the number of companies had decreased in the EU, the US, ROW and Japan, while Chinese companies entered the Scoreboard and became the most numerous. This is also reflected in aggregate **R&D investment**, where **the lead passed from the US to China. Chinese firms also had the highest R&D intensity and R&D investment per employee in 2024** (the US was leading in 2014). Additionally, of the four Chinese companies in the top 10 R&D investors in this sector, three are state-owned.

In terms of profits, the ROW companies led in 2014 by a small margin ahead of the US companies, but in 2024 the US companies earned the largest profits. The US companies' profitability exceeded that of the ROW companies in both years. Overall, profitability increased in all regions/countries apart from the ROW.

The Chinese companies had the highest sales in 2024, while in 2014 the ROW companies were leading. The highest capex came from the ROW companies, both in 2014 and 2024. The industrials sector has a rather low overall R&D-to-capex ratio, **highlighting the important role of capital goods in this sector**; nevertheless, the role of R&D in this sector has also become more important over time as shown by an increase in this ratio from 33.1% to 40.8%. The US companies have the strongest R&D focus, ahead of China, the EU and Japan, while the values for the ROW companies were much lower, both in 2014 and in 2024. Regarding R&D per employee, the Chinese companies recorded the highest increase over time and were ahead of the US in 2024.

Table 28. Industrials KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	**67**	9 193	22 973	432 095	16 808	5.3%	1.8%	54.1%	4 833
	2024	51	13 805	30 295	471 585	28 671	6.5%	2.5%	48.1%	8 538
	growth		50.2%	31.9%	9.1%	70.6%				
US	2014	46	**10 901**	45 694	396 332	16 940	**11.5%**	**2.8%**	**63.2%**	**8 103**
	2024	30	8 617	**53 804**	337 976	10 794	**15.9%**	2.5%	**79.8%**	9 782
	growth		-21.0%	17.7%	-14.7%	-36.3%				
China	2014	57	5 395	17 987	286 407	20 614	6.3%	1.9%	25.9%	4 247
	2024	**85**	**23 579**	48 375	**757 640**	45 542	6.4%	**3.1%**	51.8%	**10 581**
	growth		337.0%	168.9%	164.5%	120.9%				
Japan	2014	50	7 422	20 959	317 672	15 204	6.6%	2.3%	48.8%	5 987
	2024	28	7 328	22 744	310 840	17 422	7.3%	2.4%	42.1%	7 101
	growth		-1.3%	8.5%	-2.2%	14.6%				
ROW	2014	42	5 859	**47 440**	**446 500**	**46 313**	10.6%	1.3%	12.5%	4 449
	2024	26	7 931	45 665	449 064	**47 686**	10.4%	1.8%	16.6%	7 756
	growth		35.4%	-1.6%	0.6%	3.0%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

Others

The sectors collected under 'Others' cover a wide spectrum, from retailers to media, gaming, travel, beverages and tobacco, but also business support services, if not covered in other sectors. **The US led this sector by the number of companies, R&D investment, profits, and sales in both 2014 and 2024**. The US companies that determined the US lead in this sector are Proctor & Gamble and Philip Morris, but also Netflix, Airbnb and Ebay.

By contrast, the EU companies were fourth in terms of R&D in 2014 and last in 2024. This is also reflected in the low R&D intensity and R&D investment per employee of the EU companies shown in **Table .** In no other region did R&D per employee increase less between 2014 and 2024 than in the EU. The Japanese companies had the highest R&D intensity in 2024 and the highest R&D investment per employee thanks to companies such as Sony and Sankyo.

EU companies invested the most in capex in 2024 and in 2014 and recorded the second highest sales volume in 2024. A driving force behind the large capex investment in the EU is the German railway provider Deutsche Bahn, while in sales large food and drug retailers and luxury goods producers such as LVMH and Christian Dior were ahead. These companies earned the largest profits in 2024, but these profits were offset by the losses of other EU companies.

The R&D-to-capex ratio of the companies in these sectors increased from 47.9% in 2014 to 59.3% in 2024. This ratio increased in all regions apart from Japan and the EU, with the EU value being by far the lowest among all regions/countries. The US also led in this indicator and recorded the highest increase over time–it is the only country where R&D investment exceeded capex.

Table 29. Others KPIs, 2014 and 2024, across regions

	Year	n	R&D	Operating profit	Sales	Capex	Profit-ability	R&D intensity	R&D-to-capex	R&D per emp.
EU	2014	58	6 601	49 441	545 126	**26 153**	9.1%	1.2%	24.0%	2 755
	2024	40	10 333	92 883	753 223	**45 814**	12.3%	1.4%	22.6%	4 481
	growth		56.5%	87.9%	38.2%	75.2%				
US	2014	**71**	**14 982**	**94 238**	**664 714**	21 603	**14.2%**	2.2%	**68.0%**	7 314
	2024	**60**	**27 576**	**122 296**	**849 721**	27 064	**14.4%**	3.2%	**101.9%**	11 730
	growth		84.1%	29.8%	27.8%	25.3%				
China	2014	28	4 181	12 752	98 259	7 032	13.0%	**4.3%**	59.5%	3 737
	2024	57	20 686	48 464	603 454	23 788	8.0%	3.4%	87.0%	11 172
	growth		394.8%	280.1%	514.1%	238.3%				
Japan	2014	46	11 087	24 315	339 589	17 324	6.6%	3.3%	63.1%	**8 338**
	2024	28	13 893	39 379	378 338	27 177	7.3%	**3.7%**	51.1%	**13 607**
	growth		25.3%	72.9%	11.4%	56.9%				
ROW	2014	53	10 394	51 068	533 586	24 541	10.6%	1.9%	41.6%	3 744
	2024	34	14 914	64 867	488 810	23 526	10.4%	3.1%	63.4%	10 853
	growth		43.5%	27.0%	-8.4%	-4.1%				

Notes: n…number of companies, emp…employee. R&D investment, operating profit, sales and capex (capital expenditure) are expressed in EUR million. Profitability and R&D intensity are computed by dividing profit and R&D by net sales. R&D per employee is expressed in EUR. All ratios are calculated as the sample mean. Growth refers to the growth rate between 2014 and 2024. Bold: highest figure per indicator and year.

Source: The 2024 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

3.8. Key points

- **Top 4 sectors:** The top 4 sectors in terms of R&D investment are ICT software, ICT hardware, health, and automotive, and **they accounted for 80.3% of total corporate R&D investment** as measured in the Scoreboard. These sectors develop technologies that are considered critical for competitiveness and the EU's economic security agenda.
- **Regional specialisation:** The analysis highlights regional specialisation patterns, with the EU being over-represented in seven of the 11 sectors, but under-represented in the top three R&D sectors. The US is specialised in two out of the four top R&D sectors, namely ICT software and health. **The EU's Scoreboard companies are more diverse** regarding the sectoral pattern than those from other regions/countries.
- **US dominates the ICT software sector:** The ICT software sector is the fastest-growing sector, with a CAGR of 14.1% per year since 2014–the sector's R&D investment has increased by 325% within a decade. The **US dominates the sector, with 77% of total R&D** coming from US companies, and they invested on average EUR 77 000 on R&D per employee. In 2024, the software companies in the **US and China strongly increased their capex to secure their lead in AI.**
- **US leads in the ICT hardware sector**: The US has the largest R&D investment in the ICT hardware sector, with 45.2% of the sector's total R&D, and leads in every other indicator apart from capex. ROW companies had the largest capex in 2024, driven by the foundries in the major semiconductor-producing countries South Korea and Taiwan.

— **Health sector R&D:** The health sector has the largest number of firms, with 411 companies in 2024. The US has been leading the health sector's R&D efforts by a large margin both in 2014 and in 2024. In 2024, **the US hosted 55% of the firms, and 55.5% of the R&D**, but the ROW companies lead in R&D intensity (16.9%) and profitability. The health sector has many younger and smaller but R&D-intensive firms, mostly operating in the biotech sector and located in the US.

— **EU leads in automotive:** The EU leads in automotive R&D investment, **accounting for 41.5%** of the sector total in 2024. The EU's automotive sector has seen significant growth since 2014, but **the development in 2024 was rather modest**. The EU automotive companies have the **highest R&D intensity and the highest R&D-to-capex ratio** with 6.1% and 117%, indicating a stronger R&D focus than their global competitors.

— **Aerospace & defence:** The EU companies have the highest R&D intensity, but the US companies lead in terms of R&D investment by a small margin ahead of the EU. **It is the only sector outside the top 4 where R&D investment exceeds capex.** However, the sector faces some peculiarities due to often large R&D projects financed by the public sector that is excluded from the Scoreboard. In addition, many large defence companies do not disclose R&D. Therefore, the sector's R&D data presented in the Scoreboard constitute a lower bound.

— **Chemicals sector:** The chemicals sector shows a heterogeneous pattern across regions and time, with Japanese companies investing the most in R&D and having the highest R&D intensity. The EU companies have increased their R&D investment in this sector and were second to Japanese companies in 2024.

— **Construction & materials:** The construction & materials sector is dominated by Chinese state-owned companies, which led in R&D, operating profit, sales, and profitability. Over time, the construction & materials sector became more R&D focused, as shown by the increase in the R&D-to-capex ratio from 28% to 69%.

— **Energy sector:** The energy sector is characterised by high sales, profits, and capex, with Chinese companies investing the most in R&D and the EU companies following closely behind. The large fossil energy companies from ROW realised the largest sales and profits. The leading companies in China and ROW are oil and gas producers, while **the leading EU energy companies are in alternative energy and electricity**. In the EU, energy companies continued to substantially raise their R&D investment.

— **Financial sector:** The financial sector traditionally has the highest profitability. Profitability was highest for ROW companies (42%) in 2024, with a significant increase compared to 2014. The ROW companies led in R&D in 2024, ahead of the EU. In the recent years, **R&D-intensive fintechs entered the Scoreboard**, such as trading or crypto platforms.

— **Industrials:** The industrials sector is the largest sector outside the top 4, with Chinese companies leading in R&D investment, R&D intensity, and R&D investment per employee. The sector's R&D investment increased by 55% since 2014, driven by the Chinese companies. The industrials sector has a relatively low R&D-to-capex ratio, highlighting the important role of capital goods in this sector; nevertheless, R&D became more important over time, as shown by an increase in this ratio from 33.1% to 40.8%.

— **'Others':** The 'Others' sectors, which includes companies from various industries, has seen significant growth in R&D investment. In 2024, the US companies led in R&D investment, but the Japanese companies had the highest R&D intensity and R&D investment per employee. The sector includes companies from industries such as consumer goods, retail, and media, but also travelling, food, and beverages.

4. A closer look at the EU

This chapter provides a more detailed analysis of corporate R&D investment across EU countries, based on data for the 800 companies headquartered in the EU with the highest R&D investment (the EU 800). There are 318 companies with headquarters in the EU in the global top 2 000 ('core group'). In 2024, each company in the core group invested more than EUR 63.1 million in R&D, averaging EUR 737 million per company. In the same year, the emerging group of additional 482 companies headquartered in the EU invested more than EUR 5.5 million but less than EUR 67.1 million on R&D (on average EUR 24.2 million per company).

This year we introduce two important novelties: (1) the perspective of the European Innovation Scoreboard (EIS) and (2) new analysis by size classes, taking into account a new, differentiated approach, as proposed in the new Competitiveness Compass. Both approaches will be explained in more detail in the relevant sections (4.2 and 4.5). The EIS perspective aims at improving the understanding of how Scoreboard firms are embedded in national innovation systems, and which national innovations result in which types of Scoreboard companies. The analyses along four size classes highlight the different dynamics of companies of different sizes.

This chapter is structured as follows: Section 4.1 gives a country overview and explains major developments in and between the two EU samples—the EU core and EU emerging group. Section 4.2 looks at the EIS groups and presents related statistics. Section 4.3 presents a sectoral overview with a special focus on the four R&D key sectors in the EIS groups. Section 4.4 gives an overview over KPIs for the EIS groups, before Section 4.5 turns to the size classes, Section 4.6 zooms into the KPIs for the companies along the size classes, and the chapter concludes with a summary of key points in Section 4.7.

4.1. Top 800 EU R&D investors–overview

Figure 26 presents the geographical distribution of the EU 800 companies by headquarters location. The EU 800 companies are located in 20 Member States[25] and together invested EUR 245.5 billion in R&D in 2024. Of this, EUR 233.7 billion was invested by the 318 core companies, and EUR 11.6 billion by the 482 companies from the emerging (5% of the total R&D investment by the EU 800). **Nominal R&D investment by the EU 800 increased by 2.1%** compared with the previous year **but decreased by 0.7% when adjusted for inflation**.

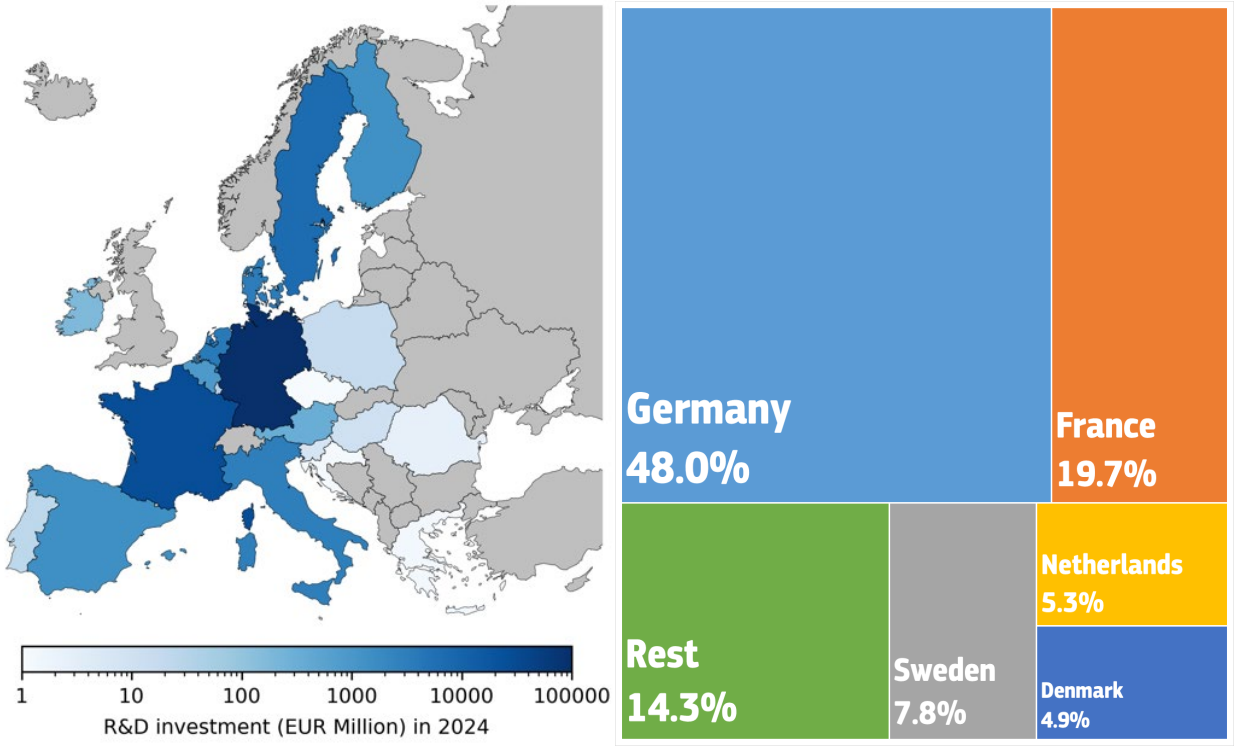
Due to the **reclassification of headquarter countries** (see Annex 4 for a detailed description), the EU 800 lost 29 companies to non-EU countries. Most of these were allocated to the US (22 companies with a total R&D investment of EUR 9.4 billion[26]), with the remaining ones allocated to the UK (5), Switzerland (1) and Russia (1). The country affected most was to the Netherlands, which lost 23 companies in the EU 800 ranking and R&D investments of EUR 18.3 billion. Nevertheless, of this amount, only a relatively small amount of EUR 2.1 billion left the EU, and the remaining EUR 16 billion were reallocated to other EU countries, primarily France (EUR 11.2 billion) and Italy (EUR 3.6 billion). The second largest readjustment concerns Ireland, which had 19 companies

[25] In course of re-assigning headquarter countries one company each was moved from the UK to Croatia and from the Netherlands to Romania. See Annex 4 for details.

[26] The calculations were performed with the R&D investment data for 2023.

reallocated, accounting for EUR 9.3 billion in R&D investment, of which the largest part went to the US (18 companies and EUR 9.2 billion of R&D investment). Luxembourg is the country with the third largest adjustment, losing EUR 1.8 billion in R&D investment and 10 companies. However, most of the R&D and the companies stay in the EU, with only two companies going to the UK and one to the US. France is the country which gained most from the country reclassification, with an increase in R&D investment of EUR 11.1 billion, followed by Italy, with an increase of EUR 3.8 billion. Another country which benefitted from the reclassification was Germany, which gained 15 companies. In contrast to other countries, this concerned mostly smaller companies that registered their headquarter in the Netherlands (10 companies) or Luxembourg (3) and Belgium (2). Many of these companies have their physical location in the respective border regions of Germany. With the new allocation, France's share of R&D investment grew considerably to almost 20%, while the Netherland's share fell from 12.5% to 5.3%. Italy almost doubled its share of total R&D investment to 4.2%, while the share of Ireland fell from 4.4% to 0.6% (all values are for 2023). Overall, the changes in headquarter countries brought the country aggregates calculated with the Scoreboard data closer to the values reported by the OECD (BERD data).

Figure 26. EU 800 Map, Treemap of top 5 countries



Notes: Map: Colour darkness proportional to R&D investment in 2023 by companies headquartered in the country.
Treemap: Top 5 countries representing 85.7% of R&D in the EU 800 sample, the remaining 15 countries are responsible for 14.3% of the total.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Table 30 presents the distribution of the EU 800 companies' headquarters and R&D across 20 EU Member States. Together, the **top 3 countries** in terms of R&D investment in the EU 800 sample–Germany, France and Sweden–are home to **59.4% of the companies and 75.5% of R&D investment**. Compared to past editions of the Scoreboard, the figures for the Netherlands, Ireland and Luxembourg are substantially lower due to the refined allocation of company headquarters to the country of R&D operations. Some Member States are not represented in the Scoreboard as they have no consolidated headquarters located on their territory. They nevertheless host R&D-active firms, but these are excluded because for one of the following reasons: their R&D spending falls

below the EUR 5.5 million threshold, they are affiliates or subsidiaries of Scoreboard companies headquartered in other countries, or they do not provide sufficient information on R&D investment.

Table 30. EU Member States in the EU 800 sample, 2024

	Companies (core/emerging)	R&D (EUR m)	Share of companies	Share of R&D
Germany	248 (109/139)	117 862.6	31.0%	48.02%
France	119 (53/66)	48 281.3	14.9%	19.67%
Sweden	108 (26/82)	19 263.2	13.5%	7.85%
Netherlands	41 (24/17)	12 998.7	5.1%	5.30%
Denmark	56 (23/33)	11 999.6	7.0%	4.89%
Italy	42 (21/21)	11 108.8	5.3%	4.52%
Spain	26 (13/13)	6 687.9	3.3%	2.72%
Finland	41 (12/29)	6 493.6	5.1%	2.65%
Belgium	33 (11/22)	4 711.2	4.1%	1.92%
Austria	36 (10/26)	2 446.3	4.5%	1.00%
Ireland	18 (8/10)	1 652.6	2.3%	0.67%
Luxembourg	8 (2/6)	533.3	1.0%	0.22%
Portugal	8 (2/6)	420.8	1.0%	0.17%
Poland	4 (1/3)	328.3	0.5%	0.13%
Hungary	1 (1/0)	241.3	0.1%	0.10%
Slovenia	1 (1/0)	184.9	0.1%	0.08%
Romania	1 (1/0)	93.8	0.1%	0.04%
Greece	6 (0/6)	58.2	0.8%	0.02%
Croatia	1 (0/1)	56.1	0.1%	0.02%
Czechia	2 (0/2)	49.0	0.3%	0.02%
Total	800 (318/482)	245 460.6	100.0%	100.0%

Notes: 'Core' refers to the 318 companies in the global top 2 000, 'emerging' refers to the additional 482 companies that form the EU 800. Data presented in decreasing order of R&D.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The annual R&D investment growth rates for the core and emerging EU samples (nominal and inflation-adjusted) varied significantly in 2024, pointing to the **difficult economic environment, especially for smaller R&D investing companies**. It is important to note that the EU emerging group consists of smaller EU companies investing in R&D sampled as a 'residual' category. It also includes companies that exited the EU core group, which causes more volatility in the growth rates of the emerging group throughout the observation period.

The companies in the **EU core sample increased R&D investment by 2.9%** (0.1% when adjusted for inflation), but the **EU emerging sample companies decreased R&D investment by 11.8%** (minus 14.2% when adjusted for inflation). In total, R&D investment by the EU core companies increased by EUR 6.7 billion in 2024, while the EU emerging companies recorded a decrease of EUR 1.6 billion. Over the 10-year period since 2014, the CAGR for the EU core companies amounted to 4.8% (2.5% when adjusted for inflation), and for the EU emerging companies to 5.8% (3.5% adjusted for inflation).

Overall, in 2024, **65.9% of all EU 800 companies reported an increase in R&D investment** compared to the previous year, **a decrease by 6.4 percentage points compared to 2023,** and the lowest value since 2020. The results differ between the EU core and EU emerging samples: for the core group, 71.7% reported a year-on-year increase in R&D investment, compared to 80.1% in the previous year and to the average of 72.9% since 2014. In the emerging-group companies, only 62% recorded an increase in R&D investment in 2024 compared to the previous year, down from 67.5% in 2023 and below the average of 66.2% in the past decade. Also in this group, the 2024

value constitutes the lowest share of companies with positive R&D investment growth since 2020. The difference between the groups also relates to how the sample is collected; for example, an EU core company which reduces R&D investment and drops out of the global top 2 000 ranking will enter the emerging group ranking in a high spot. Nevertheless, it also confirms that R&D investment by smaller EU companies appears to be more volatile. Section 4.6 provides more details on the number of companies with positive and negative development on a country level in **Table 39**.

4.2. EU 800 in an EIS perspective

This section analyses the EU 800 companies from an EIS perspective. The EIS, which takes a geographical approach, provides a comparative assessment of the research and innovation performance of EU Member States, other European countries, and global competitors (European Commission, 2025e). By grouping the Scoreboard companies into three EIS country clusters depending on their innovation performance–innovation leader, strong innovator, and moderate innovator–we can gain understanding of how Scoreboard firms are embedded in national innovation systems. In particular, we gain additional insights into the role large private R&D investors play in driving national EIS performance, and which national innovation systems generate which types of Scoreboard companies. This approach completements the EIS indicators with information on the top companies in each group, their sectors of activity, and performance over time.

To allocate the Scoreboard companies to the EIS country groups, we looked at each EIS report since 2013 and counted the times a country appears in each of the EIS clusters–innovation leader, strong innovator, moderate innovator and emerging innovator. **Table 31** shows the EIS groups and the corresponding EU countries. Overall, the EIS groups have remained very stable over time, with only eight countries having moved between the EIS groups since 2013[27]. As the Scoreboard includes only a few companies from emerging innovator countries, we integrated these into the group of moderate innovators.

Table 31. EIS groups and the EU Scoreboard countries, EU 800 sample, 2014-2024

EIS Group	EU Countries with Scoreboard companies (2014-2024)
Innovation leader	Denmark, Finland, Netherlands, Sweden
Strong innovator	Austria, Belgium, Estonia, France, Germany, Ireland, Luxembourg
Moderate innovators	Croatia, Cyprus, Czechia, Greece, Hungary, Italy, Malta, Poland, Portugal, Romania*, Slovenia, Spain

Notes: *emerging innovator country (reclassified)

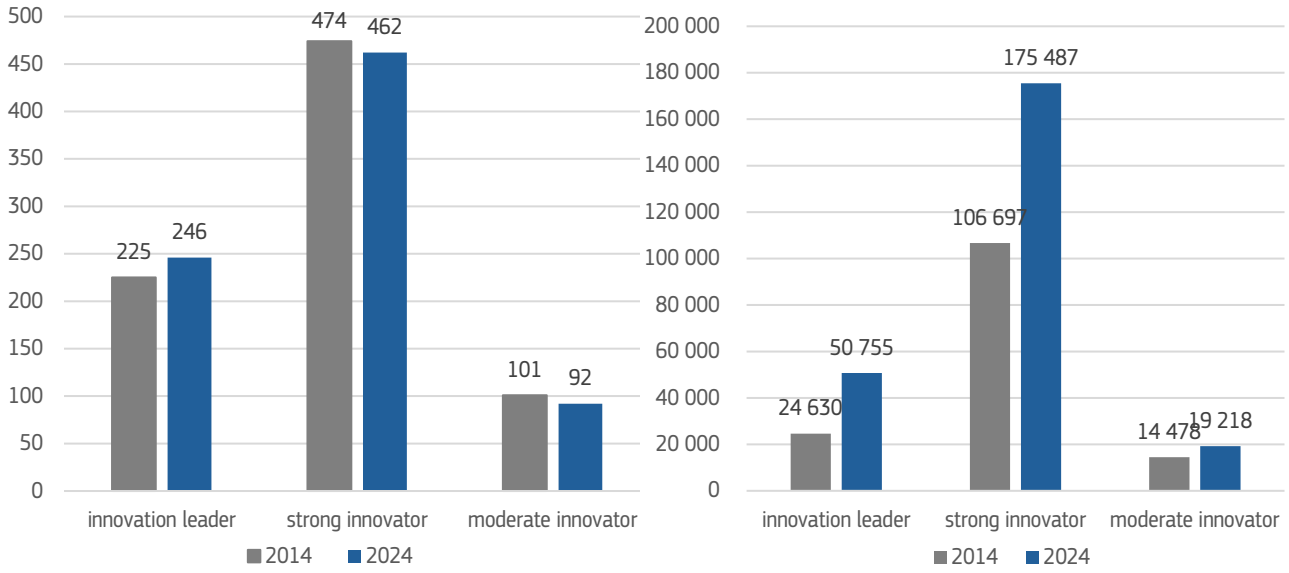
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Figure 27 shows the number of Scoreboard companies and their R&D investment across the EIS groups in 2014 and 2024 (compare to **Table 30**). Most Scoreboard companies and the greatest share of R&D comes from companies headquartered in strong innovator countries, as this group includes the largest EU economies Germany and France. However, **over the past decade, we**

[27] Belgium (3 times innovation leader, 10 times strong innovator), Croatia (4 times emerging innovator, 8 times moderate innovator), Estonia (6 times moderate innovator, 7 times strong innovator), Germany (5 times innovation leader, 8 times strong innovator), Luxembourg (2 times innovation leader, 11 times strong innovator), the Netherlands (9 times innovation leader, 4 times strong innovator), Portugal (1 time strong innovator, 12 times moderate innovator) and Slovenia (6 times strong innovator, 7 times moderate innovator).

observe that the share of the innovation leader companies has been increasing at the expense of the other two groups. The strong innovators' share of companies amounted to 59.3% in 2014 and decreased slightly to 57.8% in 2024, with the corresponding R&D shares of 73.2% in 2014 and 71.5% in 2024. The second largest group are the innovation leader countries; their share of companies increased from 28.1% to 30.8%, and their R&D share rose from 16.9% to 20.7%. The smallest group is that of the moderate innovators. Since 2014, their share of companies decreased from 12.6% to 11.5%, and the share of R&D decreased from 9.9% down to 7.8% (note that until 2013 when Fiat, the largest R&D investing company in this group with EUR 3.6 billion, was still an independent company with headquarters in Italy, the moderate innovator countries' R&D share amounted to 12.7%).

Figure 27. Number of firms (left panel) and R&D investment (right panel) by EIS group, 2014 vs 2024



Notes: R&D investment in EUR million

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

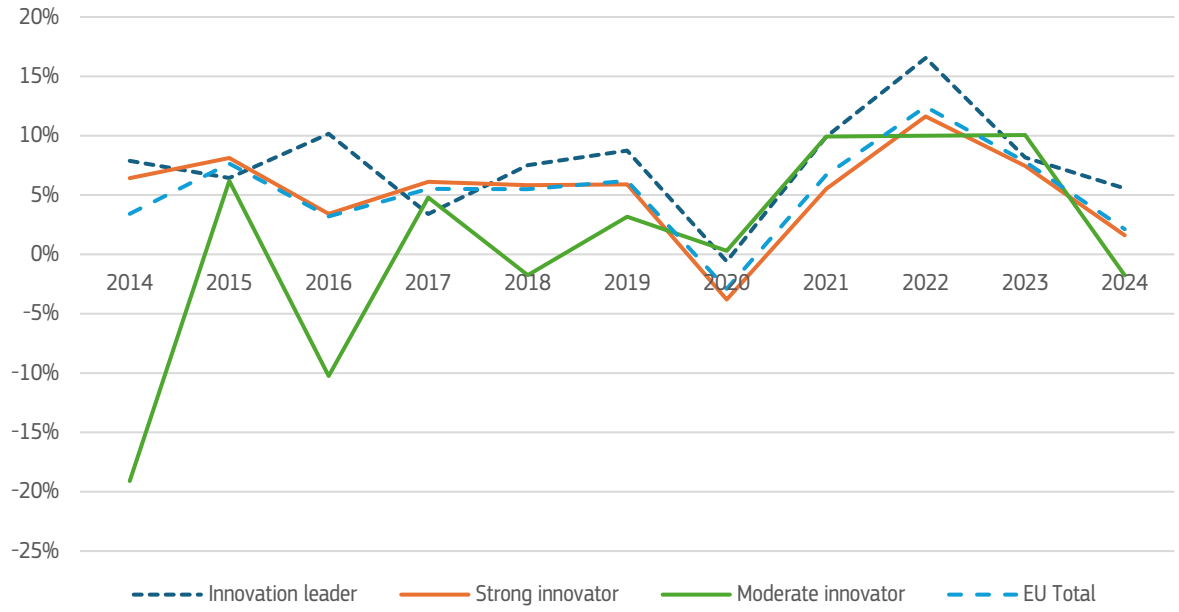
The innovation leader countries have the largest share of smaller R&D investing companies (65.4%) that are outside of the global top 2 000 Scoreboard companies, and these emerging group companies have a larger proportion of R&D investment in the innovation leader group's total (7.2%). The strong and moderate innovator countries have lower shares of smaller R&D investing companies (58.2% and 56.5% respectively) with lower shares of R&D investment (3.9% and 6.5%, respectively). In strong innovator countries in particular, the R&D share of the emerging companies is below the long-term average of around 5% due to the presence of the largest EU companies in terms of R&D investment.

On average, a Scoreboard company from an innovation leader country invested EUR 206 million on R&D in 2024, for companies from strong innovator countries that number was EUR 379 million, and for those from emerging innovator countries EUR 209 million. The **average R&D invested per firm has increased in all three groups** since 2014, with the strongest increase (88%) in the innovation leader countries. Strong and emerging innovators saw increases by 69% and 46% respectively. The average R&D investment of EU companies in the global top 2 000 (EU core) increased by more than that of smaller R&D investors outside the top 2 000 (EU emerging): in the former group, the company average rose from EUR 374 million in 2014 to EUR 733 million in 2024 (up 96%), while in the latter group the average increased by 67%, from EUR 14.7 million to

EUR 24.2 million. In the EU core sample, the companies in the innovation leader countries recorded larger increases in average R&D investment (139%), while in the emerging EU sample, the average investment increased most for the companies from the strong innovator countries (76%). This suggests that, similar to what is observed for the global sample, **companies that had a strong R&D focus in the past increased their R&D investment at higher rates**.

Figure 28 shows the growth rates of R&D investment for the three groups and for the EU 800 in total. While the growth trajectory of the strong innovators is naturally very close to that of the total, the innovation leaders had higher growth rates in most of the years. The group of moderate innovators experienced most volatility, as it oscillated between positive and negative growth over time. This volatility can be explained by the smaller number of companies in this group, which means that developments affecting a few large firms have an outsized impact on the total. The sharp reduction in R&D investment in 2014 was a result of the acquisition of Fiat (automotive) in the course of the formation of Stellantis; the drop in 2016 was due to another large Italian company moving headquarters to the Netherlands and stopping disclosure of its R&D figures.

Figure 28. EIS groups and EU total R&D investment growth rate, 2014-2024



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

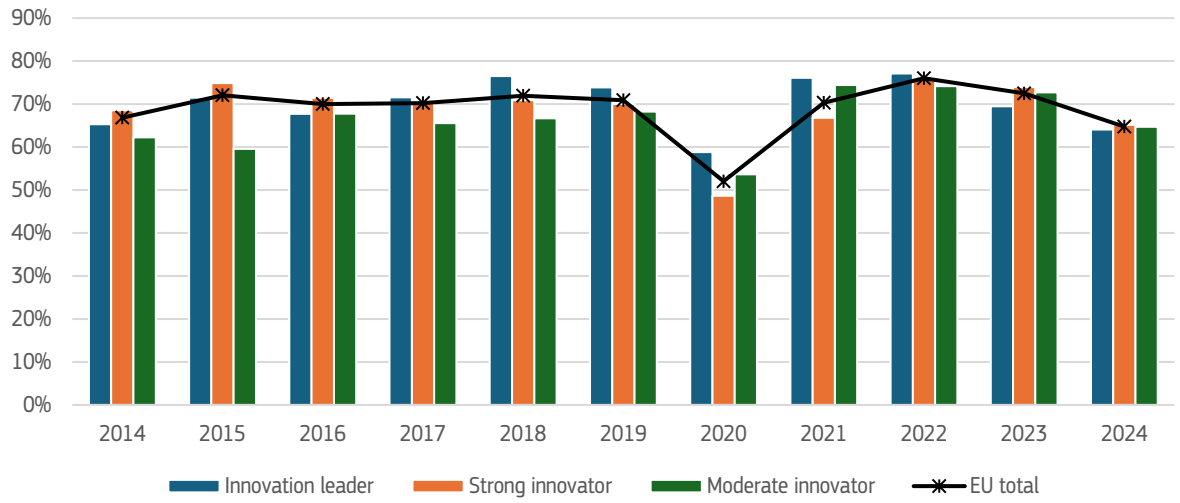
In 2024, at 5.6%, nominal R&D investment growth of Scoreboard firms was strongest for those headquartered in the innovation leader countries; the strong innovators increased their nominal R&D by 1.6%, and the companies in the moderate innovator group registered a decrease of 1.8%. Adjusted for inflation, the corresponding growth rates in 2024 were 2.6% for innovation leaders, minus 1.2% for strong innovators and minus 4.4% for moderate innovators. For the EU 800, inflation-adjusted total R&D investment fell by 0.7%.[28]

[28] Inflation rates are calculated using the GDP deflator from the World Bank and amounted to 3.2% in 2024 (down from 5.7% and 5.9% in 2022 and 2023), with 3.1% in the innovation leader countries, 3.4% in the strong innovator countries, and 3.6% in moderate innovator countries. In 2014-2020, the inflation rate was on average 1.5%.

Over the 10-year period, the **innovation leader countries registered a CAGR of R&D investment of 6.8%.** That rate was **4.6% for the strong innovators** and **2.5% for** the **moderate innovators.** The total EU 800 R&D investment increased by 4.9% on average per year between 2014 and 2024. In inflation-adjusted terms, the CAGR for the innovation leader countries amounted to 4.3%, for the strong innovator countries to 2.3%, and for the companies in moderate innovator countries to only 0.6% (and to 2.5% for the EU 800).

As mentioned, the growth rates can be affected by developments related to only a few, but large, companies. To get a better idea of the breath of R&D investment growth, we therefore also looked at the share of companies with positive R&D investment growth. As **Figure 29** makes clear, 2024 has been the most difficult year for EU companies since the COVID-19 pandemic in 2020. The share of companies that increased their R&D investment compared to the previous year stood at 64.8%, the second lowest since 2020, when it stood at 52%. The difficult economic conditions in 2024 affected all EIS groups similarly. The figure also shows that the companies in the strong innovator countries were hit more broadly by COVID-19, and it took them longer to recover.

Figure 29. EIS groups: share of companies with positive R&D investment growth, 2014-2024



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Over the longer period, the **innovation leader companies had a higher share of companies with positive year-on-year R&D investment growth:** on average 70.4% of companies increased their R&D each year. The corresponding values for the strong innovators are 68.9% and 66%. The innovation leaders not only increased their R&D investment faster than the other groups, but the growth was on average also somewhat broader, with more firms recording positive growth.

4.3. Sectoral distribution and development in the EU 800 and the EIS groups

EU 800 core and emerging companies

The sectoral distribution of the extended EU sample resembles that of the EU companies in the top 2 000: the top 4 sectors account for a somewhat smaller proportion of R&D (73.9% compared to 75.3%) and companies (46.5% against 47.3%). Compared to the top 2 000, the EU has more large companies, especially from the automotive sector, that are responsible for a considerable share of aggregate R&D investment. The **share of companies from the ICT software and service**

sector is lower and amounted **to only 9.8% in 2024**, a decrease compared to the previous year and the **lowest value on record**; the shares of health and ICT hardware companies are close to the global sample. In terms of R&D, the differences are more striking: in 2024, **the EU 800 ICT software companies were responsible for only 7% of R&D**, almost one percentage point below last year's share, while this sector led in global R&D with 24.9% of the total. **With 13.6% compared to 22% in the top 2 000 ICT hardware also accounts for a significantly lower share** of R&D among the EU 800. Only the health sector's share, with 19.7%, is close to the corresponding share in top 2 000 companies (19.9%). In contrast, **automotive** is responsible for a much bigger share among the EU 800: **33.5%, 20 percentage points higher than in the top 2 000**, where it accounts for 13.6%. **Table 32** summarises the sectoral distribution of companies and R&D investment for the EU 800 sample in 2024.

Table 32. Number of companies and R&D investment by sector in the EU 800, 2024

	Countries	Companies	Share of companies	Core group	Emerging group	SMEs	R&D investment	Share R&D
Automotive	9	54	6.8%	33	21	0	82 290	33.5%
Health	14	149	18.6%	57	92	64	48 392	19.7%
ICT hardware	11	91	11.4%	36	55	7	33 434	13.6%
ICT software	13	78	9.8%	26	52	9	17 165	7.0%
Industrials	12	127	15.9%	51	76	1	15 987	6.5%
Others	15	132	16.5%	40	92	7	12 654	5.1%
Aerospace & defence	7	17	2.1%	11	6	0	10 194	4.2%
Financials	12	51	6.4%	17	34	1	8 978	3.7%
Energy	14	38	4.8%	25	13	0	8 019	3.3%
Chemicals	8	33	4.1%	13	20	2	5 706	2.3%
Construction & materials	11	30	3.8%	9	21	1	2 635	1.1%
Total	20	800	100%	318	481	92	245 460	100%

Notes: 'Core' refers to the 318 companies in the global top 2 000, 'emerging' refers to the additional 482 companies that form the EU 800. Countries refers to the number of EU countries with companies in a specific sector. R&D expressed in EUR million. SMEs defined as firms with less than 250 employees.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Table 33 summarises the number of companies and R&D investment for the EU core and EU emerging companies by sector, and shows the change in the number of companies in 2024 compared to 2023 and the growth rate of R&D investment.

In 2024, R&D investment growth in the EU emerging sample was negative in eight out of the 11 sectors, and in three sectors in the EU core sample. These developments result from genuine changes in R&D investment in companies but also from companies moving between these two groups when their R&D investment increases/decreases sufficiently to make them cross the R&D investment threshold separating the top 2 000 companies from the rest. The next paragraphs therefore briefly discuss the sectors where movements between the groups significantly affected the growth rates.

In the **energy sector**, **six companies increased their R&D strongly** and moved from the EU emerging sample to the EU core sample, while one company decreased its R&D investment significantly and moved from the core to the emerging sample. This contributed to the significant increase in energy sector R&D investment in the core group (up 18.2%) and the strongly decrease in the EU emerging sample (down 49.5%). Similarly, in the **construction & materials** sector, two

companies moved from the emerging to the EU core group, and several smaller companies newly joined the EU emerging sample. The EU core R&D investment in this sector increased by 18.2%, and decreased by 23.6% in the EU emerging sample.

Table 33. EU 800 core and emerging groups, number of companies, R&D investment and growth rates by sector, 2024

	EU core				EU emerging			
	n	change	R&D	R&D growth	n	change	R&D	R&D growth
Aerospace & defence	11	-1	10 007	4.8%	6	0	187	27.0%
Automotive	33	-1	81 624	0.8%	21	2	665	5.9%
Chemicals	13	0	5 284	-6.8%	20	1	421	-5.2%
Construction & materials	9	2	2 251	18.2%	21	0	384	-23.6%
Energy	25	5	7 703	19.8%	13	-3	316	-49.5%
Financial	17	0	8 190	1.3%	34	3	787	-10.4%
Health	57	0	46 321	13.0%	92	-11	2 070	-13.1%
ICT hardware	36	4	32 216	0.3%	55	1	1 218	-18.7%
ICT software	26	-1	15 992	-8.9%	52	-5	1 172	-18.8%
Industrials	51	3	13 804	5.2%	76	-5	2 183	-12.6%
Others	40	-1	10 333	-2.7%	92	7	2 321	3.5%
Total	318	10	233 731	2.9%	482	-10	11 728	-11.8%

Notes: 'Core' refers to the 318 companies in the global top 2 000, 'emerging' refers to the additional 482 companies that form the EU 800. n refers to the number of companies and 'change' to the change in the number of companies per sectors between 2023 and 2024. R&D expressed in EUR million.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The R&D investment in the **chemicals sector** decreased in both samples, the EU core and emerging groups (by 6.8% and 5.2%), mostly, as mentioned above, due to the completion of the restructuring of the Belgian company Solvay (see Sections 2.2.2 and 3.7). After the spin-off of Sysensqo, Solvay moved to the EU emerging sample in 2024, while Sysensqo entered the EU core sample in 2023. Otherwise, the changes in the chemical companies' R&D investment in 2024 were rather small.

In the **ICT software sector, the R&D investment decreased strongly** in both groups (by 8.9% in the core group, and by 18.8% in the emerging group). One reason for the strong decrease is the **acquisition of seven companies by companies outside the EU** affecting both the EU core and EU emerging groups. However, the drop in R&D investment in the EU core group was mainly driven by lower R&D investments by SAP (down by EUR 965 million) and Telecom Italia (down by EUR 506 million).

The **ICT hardware** sector also saw a **negative development** with R&D investment **in the EU emerging sample** in 2024 being 18.7% lower than in 2023, while the R&D investment in the EU core group increased by only 0.3%. Three companies from the EU emerging group moved up into the EU core group, and two companies from the EU core group were acquired (one by a US company, the other by a German company). This explains in part the strong decline in the EU emerging sample. However, in the EU core sample, the large ICT hardware companies such as ASML, NXP Semiconductors, Nokia, Siemens, and STMicroelectronics increased their R&D investment less than in previous years or even reduced it.

In the **industrials** sector, the R&D investment increased by 5.2% in the EU core sample but decreased by over 12% in the EU emerging sample. This was driven by a somewhat heterogeneous development, with five companies moving up into the EU core sample and smaller companies filling up the ranks of the EU emerging group. However, many of the larger companies in the sector increased their R&D investment in 2024 only by small amounts.

EU 800 in the EIS perspective

The **sectoral distribution** of the EU 800 by EIS groups is displayed in **Table 34**. The **innovation leader** countries have the largest share of companies in the **health sector,** with 24.1% of the firms and 21% of R&D, but the largest share of R&D investment (33.2%) comes from the companies in the **ICT hardware sector** (13.8% of the companies). The ICT hardware companies which spent most on R&D are Ericsson (EUR 4.5 billion), Nokia (EUR 4.4 billion) and ASML Holding (EUR 3.9 billion), but the largest R&D investing company is Novo Nordisk (health), with EUR 5.1 billion spent on R&D in 2024. The **ICT software sector and the automotive sector are smaller** in the innovation leader countries compared to the strong and moderate innovator groups, both in terms of R&D and company share. In total, there are 10 companies with R&D investment exceeding EUR 1 billion in 2024 in the four innovation leader countries; four of them are in ICT hardware, two each in health and automotive, and one each in industrials and ICT software.

Table 34. Sectoral distribution - Number of firms and R&D investment by EIS groups, 2024

	Innovation leader				Strong innovator				Moderate innovator			
	firms	share	R&D	share	firms	share	R&D	share	firms	share	R&D	share
Aerospace & defence	2	0.8%	275	0.5%	13	2.8%	7 457	4.3%	2	2.2%	2 463	12.8%
Automotive	6	2.4%	5 507	10.9%	40	8.5%	74 281	42.3%	8	8.7%	2 501	13.0%
Chemicals	6	2.4%	766	1.5%	27	5.9%	4 941	2.8%	0	0.0%	0	0.0%
Construction & materials	6	2.4%	660	1.3%	18	3.9%	1 519	0.9%	6	6.5%	456	2.4%
Energy	7	2.8%	1 234	2.4%	19	4.1%	5 560	3.2%	12	13.0%	1 226	6.4%
Financial	22	8.9%	1 586	3.1%	23	5.2%	4 030	2.3%	6	6.5%	3 463	17.5%
Health	59	24.0%	10 456	20.6%	74	16.1%	35 477	20.2%	16	17.4%	2 460	12.8%
ICT hardware	34	13.8%	16 872	33.2%	50	10.8%	14 496	8.3%	7	7.6%	2 066	10.8%
ICT software	22	8.9%	2 865	5.6%	45	9.8%	11 016	6.3%	11	12.0%	3 285	17.1%
Industrials	38	15.4%	6 789	13.4%	78	16.9%	8 503	4.8%	11	12.0%	696	3.6%
Others	44	17.9%	3 746	7.4%	75	16.1%	8 205	4.7%	13	14.1%	703	3.7%
Total	246	30.8%	50 755	20.7%	462	57.6%	175 487	71.5%	92	11.6%	19 218	7.8%

Notes: R&D expressed in EUR million.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

In the **strong innovator** countries, the **automotive sector dominates** in R&D investment with 42.3% of this group's R&D and 8.5% of the companies: five from the top six companies in this group come from the automotive sector, and four are from Germany. The health sector is second with 20.2% of R&D investment and 16.0% of the companies, followed by ICT hardware with 8.3% of R&D and 10.8% of the companies. Like for innovation leaders, in this group of countries the **ICT software sector's share remains far below the global average,** with 6.3% of the group's R&D investment and 9.7% of the companies. In 2024, 33 companies from this group invested over EUR 1 billion in R&D. Volkswagen was the leading R&D investing company with EUR 20.9 billion in 2024–more than all the companies from the moderate innovators group together–ahead of the other large automotive companies Mercedes-Benz, BMW and Robert Bosch. 12 of these 33 companies are in automotive, seven in health (with the largest being Sanofi and Bayer), three each in ICT hardware, ICT software and aerospace & defence (the largest are Siemens, SAP and Airbus), two in energy and one each in chemicals, financial and others.

In the **moderate innovator countries**, most companies belong to the **health sector** (17.4%), and account for 12.8% of this group's R&D investment. The largest share of R&D investment, however,

comes from companies in the **financial sector** (17.5%) with Banco Santander from Spain being the largest (EUR 2.1 billion), followed by ICT services (17.1%), where the largest R&D investing company in this sector is Amadeus from Spain with EUR 1.3 billion. However, it is important to note that many large companies in the ICT service sector are national telecommunication providers and only a few companies are in software development and computer services. The moderate innovator countries have more companies in the automotive sector than the innovation leader group, but their R&D investment was less than half that of the companies in the innovation leader group. In total, the moderate innovator countries have five companies that invested more than EUR 1 bn in R&D in 2024, with the largest being the Italian defence company Leonardo (EUR 2.4 billion), followed by Banco Santander (financial), STMicroelectronics (ICT hardware), Amadeus (ICT software) and Ferrari (automotive).

Developments in the sectors in 2024 and over the longer term

The growth rates of R&D investment in nominal and inflation adjusted terms for each sector since 2014 are presented in **Table 35**. Below we briefly discuss each sector's most recent developments.

The **aerospace & defence** sector experienced higher rates of R&D investment growth since 2022: following the Russian invasion of Ukraine, the aerospace & defence sector companies have **strongly increased their R&D investment**. The sector's total R&D investment increased from EUR 8.2 billion in 2021 to over EUR 10 billion in 2024, and, after several years of decline its share of EU 800 R&D rose again to 4.2%. In 2024, 70.6% of the companies of this sector increased R&D investment, which is above the sector's long-run average of 62.4% and above the EU average.

After its strong performance in 2022 and 2023 when its R&D investment increased by EUR 17.5 billion, **in 2024, the automotive sector was characterised by stagnation**. The automotive companies invested only 0.8% more in R&D than in the previous year, with heterogeneous development across companies: a large increase by BMW contrasts with large reductions by Volkswagen and Stellantis, while the remaining large EU automotive companies maintained their R&D investment levels. The share of the sector in the EU 800 R&D decreased somewhat to 33.5%. 63% of the companies reported an increase in R&D compared to 2023, a substantially smaller percentage than in the previous year (73.6%) and below the long-run average of 69.3%.

The **chemicals** sector registered a large (6.7%) decrease in R&D investment, the second largest decrease since 2020. Only 57.6% of the companies reported an increase in R&D in 2024, while the sector's share was on average 64.5%. The largest decrease came from the Belgian company Solvay, due a divestment that became effective in 2024. The chemicals sector's **R&D share among the EU 800 continued to decline**, reaching 2.3%, its lowest value so far.

For the third consecutive year, the **construction & materials** sector had a very positive development and **raised R&D investment by 9.4%**, the third largest rate of increase after the energy and health sectors. 73.3% of the companies reported growing R&D investment compared to the previous year– 7 percentage points above the sector's long-term average. All the big companies such as Acciona in Spain, Assa Abloy in Sweden, Saint-Gobin in France, Heidelberg Materials in Germany or Wienerberger in Austria increased their R&D investments.

Table 35. EU 800 nominal and inflation adjusted growth rates of R&D investment per sector in %, 2014-2024

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	CAGR
Aerospace & defence	-0.9 (-1.5)	-2.0 (-3.0)	-8.7 (-9.4)	-2.2 (-2.9)	4.0 (2.8)	10.2 (8.9)	-7.9 (-10.3)	4.0 (2.5)	11.7 (7.8)	5.8 (0.3)	5.1 (2.8)	1.6 (-0.2)
Automotive	9.7 (8.1)	9.5 (7.8)	7.9 (6.7)	7.2 (5.8)	6.6 (4.8)	4.8 (2.9)	-6.9 (-8.8)	2.5 (0.1)	13.8 (7.9)	12.0 (5.7)	0.8 (-2.1)	5.1 (2.7)
Chemicals	-1.8 (-3.2)	11.3 (9.7)	-0.5 (-1.6)	0.8 (-0.6)	5.8 (3.8)	3.3 (1.3)	-6.8 (-8.5)	4.9 (2.2)	4.8 (-1.0)	7.2 (1.2)	-6.7 (-9.6)	2.1 (-0.4))
Construction & materials	0.8 (-0.0)	-2.9 (-4.0)	3.1 (2.3)	2.8 (1.7)	1.9 (0.3)	3.9 (2.1)	0.3 (-1.8)	2.3 (0.5)	10.1 (5.1)	13.9 (8.0)	9.4 (6.5)	3.9 (1.8)
Energy	6.6 (5.7)	-11.4 (-12.4)	-7.7 (-8.2)	6.6 (5.7)	1.7 (0.4)	7.1 (5.7)	25.8 (22.8)	7.8 (5.6)	6.3 (1.0)	7.3 (3.0)	13.6 (10.8)	4.8 (2.7)
Financial	10.8 (10.0)	5.8 (4.6)	-15.6 (-16.1)	-0.8 (-2.0)	0.1 (-1.3)	-3.6 (-5.3)	1.6 (0.0)	12.6 (10.1)	10.8 (5.0)	3.7 (-1.3)	0.1 (-2.9)	1.1 (-1.0)
Health	4.9 (3.5)	9.8 (8.4)	7.6 (6.6)	6.8 (5.5)	3.7 (2.2)	8.8 (7.0)	0.9 (-1.3)	12.3 (9.7)	11.7 (5.5)	3.2 (-1.0)	11.5 (8.8)	6.9 (4.6)
ICT hardware	-3.0 (-4.1)	4.8 (3.2)	0.7 (-0.2)	5.1 (3.8)	10.3 (8.2)	5.3 (3.2)	-4.8 (-6.6)	9.6 (7.0)	13.4 (7.4)	6.4 (0.5)	-0.6 (-3.5)	4.4 (2.0)
ICT software	3.2 (2.2)	17.0 (15.6)	3.4 (2.5)	12.5 (11.3)	1.0 (-0.4)	13.1 (11.3)	8.3 (6.2)	5.3 (3.0)	13.7 (9.0)	6.4 (0.2)	-9.7 (-12.3)	6.2 (3.9)
Industrials	-6.7 (-7.7)	5.6 (4.2)	4.1 (3.2)	0.5 (-0.9)	3.9 (1.8)	8.6 (6.5)	-5.3 (-7.2)	6.4 (3.7)	11.1 (4.9)	9.6 (3.8)	2.4 (-0.8)	4.2 (1.7)
Others	-3.8 (-4.9)	14.1 (12.2)	4.0 (3.0)	4.7 (3.5)	7.4 (5.6)	3.8 (1.9)	-6.6 (-8.4)	8.0 (5.6)	13.9 (8.1)	6.3 (0.9)	-1.7 (-4.4)	4.7 (2.4)
Total	**3.4 (2.2)**	**7.6 (6.1)**	**3.2 (2.2)**	**5.5 (4.2)**	**5.5 (3.8)**	**6.2 (4.3)**	**-2.9 (-4.9)**	**6.7 (4.2)**	**12.4 (6.6)**	**7.8 (2.2)**	**2.1 (-0.7)**	**4.9 (2.5)**

Notes: Due to the low number of firms in some sectors growth rates can change considerably due to e.g. firm entry/exit. Inflation-adjusted values are given in brackets. CAGR refers to the compound annual growth rate over 2014-2024.
Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I.

In the **energy sector**, the transition towards green and renewable energy continues. In 2024, the energy companies spent 13.6% more on R&D than in the previous year, which makes the energy sector **the fastest growing sector in the EU 800 in 2024.** 71.1% of the companies in the sector reported an increase in R&D investment–10 percentage points higher than the sector's long-term average. The share of the energy companies in total EU R&D rose to 3.3%, its highest share since 2014. As in the previous years, the largest increases in R&D came from the electricity companies, led by Electricité de France, which doubled its R&D investment within one year, to EUR 1.8 billion. The **EU has only a few fossil fuel firms in the Scoreboard.** Out of the 38 energy companies, only six are oil and gas producers, and another three are mainly in oil equipment, services and distribution, while 14 are electricity companies and seven are in alternative energies (including nuclear and hydrogen). The remaining companies are in gas, water and multiutilities. **66% of R&D investment by EU energy companies** (2023: 59%) comes from companies in **electricity and alternative forms of energy**, and only 19% from oil and gas companies (plus equipment).

In the **financial sector,** R&D investment **stagnated**, bringing its share in total R&D down to 3.7%. Only 54.9% of the companies reported positive R&D investment growth in 2024, the lowest share across all sectors.

The **health sector recorded a strong increase** in 2024, with an R&D investment growth rate of 11.5%, the second highest after the energy sector, raising the sector's share in the EU 800 to 19.7%, the highest so far. With 69% of the companies reporting an increase in their R&D investment relative to the previous year, the sector's performance is only slightly below the long-term average of 70.2%. The large increase was driven mainly by the leading EU companies in this

sector: Germany's Bayer, Biontech, and Boehringer Sohn, Denmark's Genmab and Novo Nordisk, and France's Sanofi.

In the **ICT hardware sector R&D investment fell** by 0.6%, and its share in EU 800 R&D decreased from 14% to 13.6%, even though the number of firms increased from 86 to 91. 67% of the companies had positive R&D investment growth in 2024, 5 percentage points below the long-term average. Companies such as Schneider Electric, ASML and Infineon continued to raise their R&D investment, but at a slower pace than in the previous year. However, in aggregate these increases were offset by lower levels of R&D investment by other companies such as AMS-Osram, NXP Semiconductors and STMicroelectronics.

The **ICT software sector had a difficult year**, with the R&D investment of the EU companies **falling by 9.7%**, the largest decline of all sectors. The increased spending by companies such as Amadeus was offset by large declines in others, such as SAP or Telecom Italia, while the levels of investment of other major EU companies such as Spotify or Ubisoft did not increase. Moreover, the number of companies decreased from 84 to 78. Only 55.1% of the companies reported an increase relative to 2023, the second lowest share after the financial sector and over 12 percentage points below the long-term average of 72.8%. The **EU ICT software sector's total R&D investment was only EUR 17.2 billion**, which is **only a quarter** of that of the Scoreboard leader **Amazon, with EUR 65 billion** in 2024 alone. The developments in the ICT software and services sector continue to be of concern, as it constitutes the main factor in the structural R&D intensity gap between the EU and the US and China; **the size of this gap is only set to increase as the technological frontier continues to advance rapidly.**

In the **industrials** sector, R&D investment increased by 2.4% compared to 2023, while the number of companies decreased by two to 127. With 70.5% (10-year average of 69.3%) of the companies reporting an increase in R&D investment compared to the previous year, **the positive results in this sector were more broadly spread across companies** than in most of the other sectors. The largest absolute increase was recorded by the Swedish company Sandvik (up EUR 121 million), followed by the Polish company Inpost (up EUR 94 million), while the sector's largest company in terms of R&D investment, Philips, decreased its R&D investment by EUR 132 million).

The companies in the residual group '**Others**' **decreased their R&D investment by 1.7%** in 2024, after three years of strong growth. The share of companies that increased their R&D investment relative to the previous year stood at 67.4%, somewhat below the long-term average of 68.8%. The largest R&D investor in this group, L'Oréal (the only one with R&D investment exceeding EUR 1 billion), raised its R&D investment by EUR 77 million, followed by Lego with an increase of EUR 70 million.

4.4. Business performance indicators for the EIS groups

Like for the sample of the global top 2 000 R&D investing companies (Section 2.5), **Table 36** presents key performance indicators for the three EIS groups in 2024, and for the EU 800 as a whole. Nominal R&D investment growth was strongest in the innovation leaders group (5.6%), while the strong innovators increased their R&D only marginally (1.6%) and the companies in the moderate innovator group registered a decrease (down 1.8%). Adjusted for inflation, the corresponding R&D investment growth rates were 2.6% for innovation leaders, minus 1.2% for strong innovators and minus 4.4% for moderate innovators (not shown in the table).

Sales growth was negative in 2024, with the overall drop **driven by a decline of 4.2% among the strong innovators.** The innovation leaders' sales remained slightly under the level of 2023, and those of the moderate innovators increased moderately. The reason for this overall drop were falling sales for the large companies in the automotive and energy sector but also in industrials and chemicals. In 2024, the automotive sector was responsible for 21.0% of the sales of the EU 800, the energy sector for 16.9%, and the industrials sector for 12.4%. Year-over-year, sales in these three sectors decreased by 4.5%, 11.5% and 4.8%, respectively.

Table 36. Business key performance indicators for the EIS groups, 2024

	Innovation leader	Strong innovator	Moderate innovator	EU 800
Companies	246	462	92	800
R&D investment, EUR bn	50 755	175 487	19 218	245 460
One-year change	5.6%	1.6%	-1.8%	2.1%
Net sales, EUR bn	958 924	4 733 706	793 073	6 485 704
One-year change	-0.1%	-4.2%	1.2%	-3.0%
R&D intensity	5.3%	3.7%	2.4%	3.8%
Operating profits, EUR bn	118 016	436 654	123 448	678 158
One-year change	12.5%	-7.6%	5.8%	-2.3%
Profitability, %	12.3%	9.2%	15.6%	10.5%
Capex, EUR bn	51 660	311 009	73 591	436 261
One-year change	5.5%	2.1%	-2.1%	1.8%
Capital intensity	5.4%	6.6%	9.3%	6.7%
R&D to capex	98.2%	56.4%	26.1%	56.3%
Employment	2 721 162	13 151 856	1 956 902	17 829 920
One-year change	-1.6%	-2.1%	0.8%	-1.7%
R&D per employee, EUR	18 652	13 343	9 821	13 766
Market capitalisation, EUR bn	1 640 119	4 195 138	938 947	6 774 204
One-year change	3.1%	0.6%	13.6%	2.8%

Notes: Capex stands for capital expenditure. R&D intensity is defined as R&D investment as a share of net sales, profitability is defined as profits as a share of net sales, and capital intensity as capex as a share of net sales. Measured in nominal values.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

R&D intensity, defined as R&D investment over net sales, **was on average 3.8% and increased** by 0.2 percentage points compared to 2023. The increase reflects a small rise in R&D investment combined with a decrease in sales. The R&D intensity of the companies in **innovation leader** countries was the highest, at **5.3%**, and recorded the highest increase compared to 2014 (3.7%). The strong innovators follow with 3.7% (up from 2.9%), and the companies in the moderate innovator countries had the lowest R&D intensity, with only 2.4%, and recorded the smallest increase (up from 1.8% in 2014). This relates to the sectoral composition of the EIS groups, with the innovation leader countries having more companies in sectors with a higher R&D intensity–mainly health (see **Table 34**).

Profits decreased by 2.3% for the EU 800, but the data show a **very heterogeneous** picture across the three EIS groups. Companies in **innovation leader countries recorded a strong increase** in profits of 12.5%, and the **companies in moderate innovator countries** also recorded an increase (5.8%). In contrast, **the companies in strong innovator countries saw their profits fall by 7.6%.** Due to the large weight of this group in the profit distribution (64.4% of profits in the EU 800 are attributed to the 462 companies in the strong innovator countries), this translates to a loss for the entire EU 800. However, the large decrease in profits is partially explained by the record profits the companies in the strong innovator countries earned in 2023 (EUR 472 billion). **The fall in profits was particularly strong in the automotive sector,** with minus 28.8% (after an increase of 18.7% in 2023), and in the **industrials** sector where profits fell

by 13.2% in 2024, and by 13.6% in 2023. From 2014 to 2023, the automotive sector was responsible for on average 15.8% of the EU 800 companies' profits, but in 2024 this share decreased to 12.6%, and that of the industrials sector at 7.9%. In contrast, the **profits of the health sector grew by 12.6%, and those in aerospace & defence by an impressive 50.9%;** these two sectors accounted for 19.7% and 4.2% of the total EU 800 profits.

Profitability was highest in the moderate innovator countries, at 15.6%, due to the large share of companies in the financial and energy sectors, **followed by the innovation leaders** with 12.3%, and for the strong innovators 9.2%. Total profitability increased by 0.1 percentage points compared to 2023, to 10.5%, the second highest value after 2021 when it stood at 10.8%. Compared to the previous year, **the innovation leader companies recorded the strongest increase in profitability** (up by 1.3 percentage points), and those in the moderate innovator countries grew by 0.7 percentage points, while the strong innovators recorded a decrease (down 0.4 percentage points). As in the global sample, the financial companies had the highest profitability (23.8%), followed by ICT software (14.3%) and health (14.1%), while the **automotive sector and chemicals had the lowest profitability,** with 6.3% and 6.2%. Thus, the sectoral weights across the countries and EIS groups determines the total profitability.

After two years of growth, **employment decreased** by 1.7%, to 17.8 million employees, with the decrease due mainly to a decline in employment in the **strong innovator countries (down 2.1%)** and in the innovation leaders (down -1.6%), while the companies from the moderate innovator group raised their employment (up 0.8%). The strong innovator group accounted for 73.8% of total EU 800 employment, followed by the innovation leaders with 15.2% and the moderate innovators with 11%. The sectors with the highest employment shares are automotive, 'others' and industrials, with 18.8%, 18% and 17%. Employment decreased by 1% in the automotive sector and fell by 4.8% in 'others' and industrials. However, employment increased in construction & materials (4%), energy (3.3%) and financial (2.3%), i.e. sectors that are less R&D intensive. The **strongest increase** came from the companies in **aerospace & defence, with plus 7%,** the fourth consecutive year of strong employment growth in this sector. Since 2020, the sector's employment increased by over 85 000 workers to its highest level so far.

The drop in employment and the simultaneous small increase in R&D investment led to a small rise in R&D investment per employee, to EUR 13 766 (up EUR 520) for the EU 800. This value is **lower than the R&D investment per employee of the Chinese or Japanese Scoreboard companies** due to the large number of companies with high employee count: the 482 companies from the EU emerging sample add only 4.7% to total EU 800 R&D investment, but 23% to employment. The companies from **innovation leader** countries spent most on R&D per employee **(EUR 18 652)** and increased R&D investment per employee the most (up EUR 1 260). The strong innovator group spent EUR 13 343 per employee, an increase of EUR 491 compared to 2023, and the moderate innovators R&D investment per employee fell by EUR 258 to EUR 9 821. The sectors with the highest R&D investment per employee are health (EUR 40 112), ICT hardware (EUR 28 182) and automotive (EUR 24 516), while **the EU's ICT software sector companies invested only EUR 12 328 per employee.**

The **capex** of the EU 800 companies **increased by 1.8%** in 2024 driven by the strong innovator countries and the innovation leaders, while the moderate innovator companies reduced their capex. The 462 companies in the strong innovator group were responsible for 71.3% of total capex, the moderate innovators for 16.9%, and the innovation leader companies for the remaining 11.8%. In 2024, capex developments across sectors were uneven. The energy sector, which accounted for

29.8% of capex, raised its investment by 12.2% to EUR 130 billion; in the automotive sector, responsible for 16.3% of the total, capex increased by 7.3% to EUR 71 billion. The strongest growth came from aerospace & defence and health, with plus 17.4% and 13.3%, but their capex shares were only 2.1% and 5.6%. All the remaining sectors **reduced their capex**, in particular **ICT hardware (down 16.4%) and ICT software (down 11.3%).** The **EU ICT sectors' capex development stands in stark contrast to what we observe in the US and China, where these sectors invested heavily in capital goods**.

The **capital intensity** of the EU 800 increased by 0.3 percentage points to 6.7%. The **moderate innovator countries led** for this indicator, while the **innovation leaders had the lowest ratio**. However, the capex intensity increased by 0.3 percentage points in the innovation leader countries and by 0.4 percentage points for the strong innovators, and fell by 0.3 percentage points for the moderate innovators. The lower importance of capex in the **innovation leader** countries translates into the **highest R&D-to-capex ratio of 98%**: these companies invest almost as much in R&D as in capex, and they are the only ones getting close to the US for this indicator (115%). In contrast, **the companies in the strong and moderate innovator countries are more capital intensive**. Again, this is **determined by the groups' sectoral composition**, with a larger share of health companies in the innovation leader group, and a larger share of financial, energy and construction companies in the moderate innovators group. Since 2014, the R&D-to-capex ratio has increased from 89.6% to 98% in the innovation leader group, from 49.1% to 56.4% in the strong innovator group and from 23% to 26.1% in the moderate innovator group. **The R&D-to-capex ratio for the moderate innovator group in 2024 was lower than the corresponding value in China in 2014** (27.5%). This indicates that the role of R&D investment for the business models of these companies is less important and did not increase over time.

Market capitalisation in the EU 800 increased by 2.8%, but growth was uneven across the EIS groups. The **strong innovator companies** accounted for 61.9% of the EU 800 total, a lower share than for the other indicators, and it **increased by only 0.6%.** The innovation leader group companies were responsible for 24.2% of the total and recorded an increase of 3.1%, while the **strongest increase** was recorded in the **moderate innovator group** (13.6%, or 13.8% of the EU 800 total). Interestingly, the ICT software sector recorded the largest increase, 32.7%, even though their results stagnated or declined for all other indicators. The companies in aerospace & defence, health, energy and automotive also saw their market capitalisation increase (by 17.4%, 13.3%, 12.2% and 7%), while the ICT hardware companies experienced a significant decrease (down 16.4%). 566 out of the EU 800 companies were publicly listed in 2024.

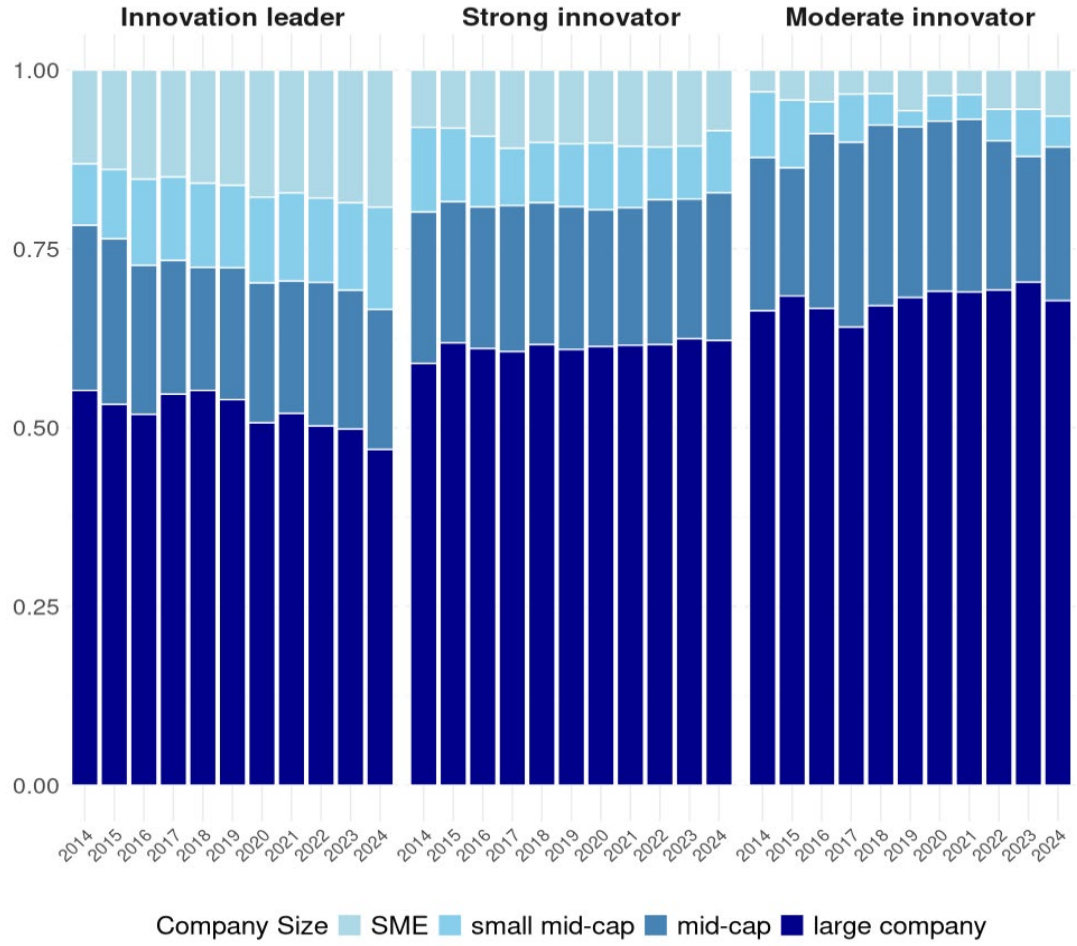
4.5. The EU 800 across size classes and EIS groups

The Draghi (2024) report emphasised the key role of innovative firms for industrial transformation and future competitiveness. Innovative firms are central drivers of economic growth, job creation and technological progress, and many innovative companies are not necessarily large (see innovative firm dashboard[29]). Despite their important role, these firms often face barriers to growth and thus are targeted by specific policy measures (European Investment Bank & European Policy

[29] https://iri.jrc.ec.europa.eu/innovative-firms

Centre, 2024). Moreover, the Commission's recommendation for the EU single market introduced the new size class of small mid-cap companies with a view to providing proportionate regulation tailored to companies' size with the aim of supporting firm growth.

Figure 30. Size classes and EIS groups, 2014-2024



Notes: Size classes based on employment only. Data on employment was missing for at most 4% of the companies in a given year.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

In this section we look at the EU 800 by size classes and EIS groups. We use employment to determine size and classify companies with up to 250 employees as SMEs, companies with 251 to 750 employees as small mid-caps, 751 to 3 000 employees as mid-caps and those with more than 3 000 employees as large companies (European Commission, 2025c, 2025d, European Investment Bank & European Policy Centre, 2024). **Figure 30** below shows the distribution of the EU 800 companies across these four size classes and by EIS group for the 2014 to 2024.

In 2024, **58.1% of the EU 800 companies were large companies** with more than 3 000 employees, 20.4% were mid-caps, 9.9% small mid-caps and the remaining 11.5% SMEs. The size class distribution of the extended EU sample thus resembles that of the US presented in **Figure 18**, but with lower absolute R&D investment. Between 2014 and 2024, the share of SMEs increased by 2.8 percentage points from 69 to 92 companies, while the share of small mid-caps and mid-caps decreased by 0.7 and 1.3 percentage points, and the share of large companies remained stable at 58%. These aggregate figures hide interesting differences between EIS groups, as displayed in **Figure 30** and summarised in **Table 37**.

The **innovation leader** countries have the **highest share of smaller companies** among the EU 800 R&D investing companies, and this share has been increasing over time. Between 2014 and 2024, the **number of SMEs increased** from 29 to 47, and their share rose from 13.1% of the companies in 2014 to **19.6% in 2024**. The number of small mid-caps also increased (from 19 to 35), but these companies accounted for a smaller share, namely 8.6% in 2014 and 14.3% in 2024. In total, the share of companies with less than 750 employees in the innovation leader group **increased from 21.7% to 33.5%** between 2014 and 2024. The share of **mid-caps decreased** from 23.1% to 21.5% over the same period, and the **share of large companies fell** from 55.2% to 46.2%, the lowest across the three EIS groups.

Table 37. Number of firms and R&D investment in 2014 and 2024 across size classes and EIS groups

	Innovation leaders		Strong innovators		Moderate innovators		Total	
	2014	2024	2014	2024	2014	2024	2014	2014
SME								
n	29	47	37	39	3	6	69	92
share	13.1%	19.2%	8.0%	8.5%	3.1%	6.5%	8.8%	11.5%
R&D	418	946	507	1 038	64	63	989	2 048
share	1.7%	1.9%	0.5%	0.6%	0.4%	0.3%	0.7%	0.8%
small mid cap								
n	19	35	55	40	9	4	83	79
share	8.6%	14.3%	11.9%	8.7%	9.2%	4.3%	10.6%	9.9%
R&D	514	1 115	715	799	266	203	1 496	2 116
share	2.1%	2.2%	0.7%	0.5%	1.8%	1.1%	1.0%	0.9%
mid cap								
n	51	48	98	96	21	19	170	163
share	23.1%	14.3%	21.2%	20.8%	21.4%	20.7%	21.7%	20.4%
R&D	1 500	3 078	2158	4041	1063	637	4 721	7 746
share	6.1%	6.1%	2.0%	2.3%	7.4%	3.3%	3.3%	3.2%
large company								
n	122	115	273	286	65	63	460	464
share	55.2%	46.9%	59.0%	62.2%	66.3%	67.7%	58.8%	58.1%
R&D	21 998	45 605	103 040	169 469	13 030	18 315	138 067	233 389
share	90.0%	89.9%	96.8%	96.7%	90.3%	95.2%	95.0%	95.1%

Notes: Size classes based on employment only. Data on employment was missing for 18 companies in 2014 and for two companies in 2024. R&D is expressed in EUR million. n…number of companies

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Compared to the innovation leaders, the **strong and moderate innovator countries** have higher shares of **large companies** in the EU 800 sample: in the strong innovator group, 59% of the companies in 2014 were large companies, and in the moderate innovator group 66.3%. Of the remaining companies, around 21% were mid-caps in both groups, 11.9% and 9.2% respectively were small mid-caps and 8% and 3.1% were SMEs. By 2024, the share of large companies increased in both groups, to 62.2% for the strong innovators and 67.7% for the moderate innovators. The shares of mid-cap companies remained almost unchanged at 20.7% and 21.5%, while the shares of small mid-caps decreased to 8.7% and 4.3%. Finally, the number of SMEs in strong innovator countries increased from 37 to 39, and from 3 to 6 in the moderate innovator group. It is interesting to note that the class of small mid-caps appears to be squeezed in the moderate and the strong innovator groups, while the share of SMEs increased in each EIS group, even though the numbers of SMEs remains low, in particular for the moderate innovators.

These first insights support the conclusion that the **framework conditions** in EIS innovation leader countries are more conducive **to generating and growing small and R&D-intensive companies**. Moreover, while the distribution across size groups changed less in the strong and moderate innovator countries and rather tended towards larger companies, in the innovation leader

countries, the share of small companies increased at a higher rate, pointing to **higher entrepreneurial dynamics** in these countries.

Large companies accounted for the largest share of R&D investment with 95.1% of the EU 800 total in 2024. The mid-caps added another 3.2%, small mid-caps 0.9% and the remaining 0.8% came from SMEs. This distribution has remained largely stable over time. When we compare this to the distribution of R&D across the four size classes in the US, we find that the EU SME share is only about half that of the US; for small mid-caps it is only a third, and for mid-caps it stands at 60%, while the share of large companies in the EU is 5 percentage points higher than in the US. Even more striking is the fact that **small mid-caps** in the EU, even though they are up to three times the size of SMEs, **do not have a proportionately larger share of R&D**.

Looking at shares in R&D by EIS groups, we find that the **in the innovation leader countries**, the large companies contribute a smaller share to total R&D (90%), while **the shares of the smaller companies in R&D are higher** with 6% for mid-caps, and 2% for SMEs and small mid-caps. In the strong innovator countries, the large companies accounted for close to 97% of R&D investment and in the moderate innovator countries for 95% (the increase in the R&D share of large companies in moderate innovator countries reported in **Table 37** relates to Ferrari, which moved from the mid-cap class to that of large companies).

In 2024, six out of the 92 SMEs, seven of the 79 small mid-caps and 27 of the 163 mid-cap companies are also in the global top 2 000 ranking. Only among the large companies are there more companies in the global top 2 000 than in the extended EU sample (278 out of 464). All the EU SMEs in the top 2 000 ranking are in the health sector (pharmaceuticals and biotech), as are four of the seven small mid-caps

As in previous years, **most SMEs are in the health sector** (64 out of 92, or 69.6%), followed by ICT software with nine SMEs. **85.1% of the R&D investment** of the SMEs comes from the health sector, but only 3.9% from ICT software. In contrast, most **small mid-caps are in ICT hardware** (22 out of 79), followed by ICT software (18) and health (15). However, 33.2% of the R&D investment of the small mid-caps came from the health sector, 25.9% from ICT software and 16.2% from ICT hardware. This indicates that there exist small R&D investing companies in these critical ICT sectors, but these companies need to scale up in order to grow and compete with international competitors.

The largest number of SMEs comes from **Sweden,** with 28.3%, followed by **France,** with 27.3%, and **Denmark,** with 10.1%, while Germany comes only fifth, with 7.1%. Czechia, Greece, Hungary, Luxembourg, Malta, Portugal and Slovenia do not have any SMEs in the EU 800. French SMEs account for the biggest R&D investment share at 34% of the total, followed by Sweden at 21.3% and the Netherlands at 16.6%.

Comparing the EU core group SMEs with those from the other world regions/countries shows that the EU has the second highest number of SMEs behind the US, but by a very large margin. In the Scoreboard **there are 77 US companies with fewer than 250 employees, and they invested EUR 10.2 billion in R&D in 2024**. The US SMEs' total R&D investment amounted to 87.5% of the total R&D investment by all companies in the EU emerging group in 2024. The EU and the ROW come second with six SMEs each and a total R&D investment of EUR 529 million for the EU SMEs and EUR 668 million for the ROW. There was no SMEs from China or Japan in the 2024 Scoreboard. All SMEs in the top 2 000 are in the health sector, most of them in biotechnology.

4.5.1. KPIs per size class

To gain a better understanding of the R&D intensive EU companies across the different size classes, we analyse business KPIs and R&D-related KPIs across the four size classes. As for the top 2 000 companies in Section 2.5, **Table 38** displays the KPIs (expressed in EUR million) and their growth rates (relative to 2023) across the size classes and adds R&D-specific performance indicators such as R&D intensity, R&D investment per employee (in EUR), profitability, capital intensity, and the newly introduced ratio of R&D to capex in 2024.

Table 38. Business KPI across size classes, EU 800, 2024

	SMEs	Small mid-caps	Mid-caps	Large companies	Total
Companies	92	79	163	464	800
R&D investment, EUR mn	2 048	2 116	7 756	233 389	245 460
One-year change	-13.8%	-9.1%	1.5%	2.4%	2.1%
Net sales, EUR mn	3 324	12 444	112 796	6 357 023	6 485 704
One-year change	-8.1%	8.5%	39.6%	-8.6%	-3.0%
R&D intensity	47.8%	17.0%	6.9%	3.7%	3.8%
Operating profits, EUR mn	-2 179	164	9 357	670 973	678 158
One-year change	-13%	4 252.5%	104.9%	-3.0%	-2.3%
Profitability, %	-47.7%	1.3%	8.3%	10.6%	10.5%
Capex, EUR mn	144	580	5 340	430 195	436 261
One-year change	6.0%	8.8%	27.3%	1.5%	1.8%
Capital intensity	4.0%	4.7%	4.7%	6.8%	6.7%
R&D to capex	1 305%	363%	145.2%	54.3%	56.3%
Employment	9 842	37 945	274 480	17 507 652	17 829 920
One-year change	-8.6%	3.0%	6.9%	-1.9%	-1.7%
R&D per employee, EUR	208 084	55 773	28 257	13 331	13 766
Market capitalisation, EUR mn	22 234	30 747	194 729	6 526 064	6 774 204
One-year change	-4.8%	23.7%	12.9%	2.5%	2.8%

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The R&D investment of SMEs and small mid-caps decreased in 2024 relative to the previous year, while mid-caps and large companies increased their R&D investment. One reason for the negative growth rates in the two smaller size classes is that several companies increased their employment and moved to higher size classes; examples are Babble (ICT software) from Germany, which moved from small mid-cap to mid-cap, Invisio Communications (ICT hardware) from Sweden and Merus (health) from Netherlands, which moved from SME to small mid-cap. These **examples of companies just crossing thresholds and moving up the size classes support the Commission's recommendations** of using more granular size classes to proportionately adapt regulations these companies' sizes. Compared to 2023, the number of SMEs decreased by seven, while the number of small mid-caps and mid-caps increased by nine each.

Net sales increased for small mid-caps and mid-caps, while SMEs and large companies recorded a reduction in sales. While the drop experienced by the SMEs is driven by companies moving across size classes, the large companies' drop in sales relates to the sectoral developments described above (Section 4.4), with falling sales in energy, automotive, industrials, and the 'others' sector.

R&D intensity decreases with company size. SMEs' R&D intensity is almost three times higher than that of small mid-caps, while the difference between mid-caps and large companies is smaller, but still substantial. Given that in the three smaller size classes R&D investment decreased more than net sales, while net sales increased, the R&D intensity fell compared to the previous

year, and it increased only in the large companies, due to the fall in sales, while R&D investment increased moderately.

In total, profits decreased by 2.3% due to the decrease in the large companies' profits by 3%. In contrast, the profits of small mid-caps and mid-caps experienced strong growth, partially due to the movement of companies between the size classes. The aggregate profits of the SMEs were negative and decreased compared to 2023. **Of the 92 SMEs, only 21 reported profits in 2024,** and out of the 79 small mid-caps only 46 did. In contrast, 134 of the 163 mid-caps and 420 of the 464 large companies earned profits in 2024. These findings **are consistent with the observations for small R&D-intensive companies in the US** and other countries, which are often in their **early stages of development**, with high R&D investment but only little or no sales and profits.

Profitability increases with company size: the large companies recorded the highest profitability, while this indicator was negative for the SMEs and very low for the small mid-caps. Interestingly, in the past three years, the profitability of the large companies exceeded that of the mid-caps, while until 2021 the reverse was true, with the mid-caps' profitability being well above that of the large companies (11.5% vs 8% on average in 2014-2021). The mid-caps had more companies in health and in the two ICT sectors as well as 'others', sectors with a higher profitability than the sectors responsible for most of the profits of the large companies; however, the strong increase in profitability of the financial companies and the energy sector raised the aggregate profitability of the large EU companies.

Capex increased in all size classes. The mid-cap companies in particular stepped up their capex. The capex intensity was lowest for the SMEs, and highest for the large companies. The interesting figure here is the ratio of R&D investment to capex: in total, **the EU SMEs invested 13 times more in R&D than in capex**, for the small mid-caps this ratio stands at 363% and for the mid-caps at 145%. Only in large companies was capex more important than R&D. This supports conclusion made above that there exists a substantial number of smaller EU companies which exhibit a strong focus on R&D investment. The R&D-to-capex ratio of SMEs has been very volatile across the years due to the small sample size and the sample composition, but the 10-year average stood at 984%. In small mid-caps, there has been a downward trend of R&D-to-capex in recent years, with the 10-year average standing at 460%. In contrast, the **mid-cap companies are on an upward trend**: in the period 2014-2020, the ratio of R**&D investment to capex was 72.8% but increased to 147%** in the period 2021-2024. For the large companies, in turn, this ratio remained lower: between 2014 and 2020, it increased from 45.6% to 58.1%, but has decreased somewhat since then. Nevertheless, it is almost 10 percentage points higher than a decade ago.

Employment decreased in the EU 800, driven by falling employment numbers at **large companies**, which are responsible for **over 98% of the total employment** of the sample. Employment numbers for SMEs fell by 8.6%, as a result of the larger SMEs moving up into the class of small mid-caps, as described above. In turn, the number of employees in the small mid-caps and mid-caps increased.

The important indicator here is R&D investment per employee and it shows the expected heterogeneities across the size classes. **SMEs have by far the highest R&D investment per employee, with over EUR 200 000 per employee,** followed by **small mid-caps with EUR 55 773 per employee**, and the mid-caps with EUR 28 294 per employee, while the value for the large companies is less than half of this, with only EUR 13 331. This shows that the smaller EU

companies are comparable to leading companies worldwide, but the low aggregate value for the EU is a result of large companies with high numbers of employees but relatively low R&D investment.

The R&D-to-capex ratio and the R&D investment per employee support the conclusion on the small and R&D-intensive companies in the EU. These results for these indicators for EU companies are similar to those for small companies in the US, the innovation leader in many fields. This underscores the need for **policies that help small R&D-intensive companies to scale up**.

The last KPI is market capitalisation, 96% of which is concentrated in the large companies. Nevertheless, **a larger share of SMEs is publicly listed than in all other size classes**: 78.3% of the SMEs vs 59.5% of small mid-caps, 66.3% of mid-caps and 73.7% of the large companies are listed on stock exchanges. Small mid-caps and mid-caps experienced strong growth in market capitalisation, while large companies recorded only moderate growth, and that of the SMEs fell. There is no indication that this decrease was related to companies moving between the size classes.

4.6. EU 800 country focus

Table 39 looks at the EU countries with Scoreboard companies in 2024, showing the growth rates of R&D investment with respect to the previous year (in nominal and in inflation-adjusted terms) and the share of companies with an increase in R&D in the core and emerging groups. Given the large variation in company size and R&D investment in the EU sample, decisions by individual companies can determine the overall trend for a country. By looking at the share of firms with growing/decreasing R&D investment we can draw a wider inference about the development of R&D investment in a country. The table shows the growth rates, the number of companies in the core and emerging groups, and for each group the share of companies with positive growth. The last row, 'Total', contains the aggregate development.

In 2024, total R&D investment by EU companies increased by 2.1% (but decreased by 0.7% when adjusted for inflation). R&D investment by EU companies increased in nominal terms in 14 out of 20 countries with Scoreboard company headquarters. However, the **ongoing high inflation pressure** in many European countries drove inflation-adjusted growth rates down, so that only 11 countries recorded real increases in corporate R&D. Notably, the results for **Germany, Luxembourg and the Netherlands turn negative** when inflation is taken into account.

Overall, 228 of the core group companies raised their R&D in 2024 compared to the previous year (71.6%), but only 299 (62%) of the emerging group companies did so. This lower share in the emerging has two explanations. Firstly, if a company in the core group reduced its R&D investment, it may have moved into the group of emerging companies. Secondly, companies investing less in R&D might regard R&D as less central to their business activities and therefore may be more likely to reduce R&D during an economic slowdown, or their R&D might vary more from project to project.

Aggregate growth rates in R&D may hide country-level differences: for example, in Belgium, total R&D investment in 2024 was lower than in 2023, even though more than half of the companies in both groups increased their R&D investment. In contrast, in Denmark total R&D increased considerably with above-average shares of companies in the emerging group increasing their R&D. In Poland, the strong increase was entirely driven by one company from the core group, while no company in the emerging group increased its R&D investment in 2024.

The countries with the highest shares of companies with positive growth (excluding the countries with less than two companies) in the core group are Ireland, Spain, Germany, Finland and France (in decreasing order), while in the emerging group the share of companies with positive growth is

highest in Ireland, Spain, the Netherlands, Luxembourg and Austria. Conversely, the countries with the lowest shares of companies with positive growth in the core group are Austria, Belgium, Italy and Denmark. In the emerging group, the Netherlands, Poland, Greece and Italy have the lowest shares of companies with positive growth.

Table 39. EU 800 companies with positive/negative R&D growth 2024, per country, EU core and EU emerging

	R&D growth	R&D growth deflated	Companies core	Share positive growth	Companies emerging	Share positive growth
Austria	-10.2%	-12.9%	10	50.0%	26	73.1%
Belgium	-1.0%	-2.8%	11	54.5%	22	54.5%
Croatia	-4.5%	-9.5%	0	0.0%	1	0.0%
Czechia	21.1%	16.4%	0	0.0%	2	100.0%
Denmark	13.1%	11.1%	23	69.6%	33	69.7%
Finland	2.7%	0.9%	12	75.0%	29	51.7%
France	2.7%	0.3%	53	73.6%	66	57.6%
Germany	1.4%	-1.6%	109	75.2%	139	62.3%
Greece	-9.3%	-12.0%	0	0.0%	6	50.0%
Hungary	26.7%	18.0%	1	100.0%	0	0.0%
Ireland	9.7%	6.2%	8	87.5%	10	90.0%
Italy	-4.1%	-6.1%	21	66.7%	21	61.9%
Luxembourg	0.2%	-4.7%	2	50.0%	6	76.5%
Netherlands	2.5%	-2.6%	24	70.8%	17	76.5%
Poland	33.6%	29.0%	1	100.0%	3	0.0%
Portugal	-23.5%	-26.7%	2	0.0%	6	16.7%
Romania	21.5%	11.7%	1	100.0%	0	0.0%
Slovenia	3.5%	0.4%	1	100.0%	0	0.0%
Spain	3.1%	0.1%	13	76.9%	13	84.6%
Sweden	4.3%	1.5%	26	69.2%	82	61.0%
Total	**2.1%**	**-0.7%**	**318**	**71.8%**	**482**	**61.7%**

Notes: 'Core' refers to the 318 companies in the global top 2 000, 'emerging' refers to the additional 482 companies that form the EU 800. Countries are listed in alphabetical order.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The **development of R&D investment at country level** is often determined by a **few large companies**. In the following paragraphs we investigate the cases where a few companies drive the overall development, or where the core and emerging group followed very different trajectories.[30]

In **Austria**, even though several companies increased R&D, the growth rate in 2024 was negative and among the lowest among the EU 800 countries. Out of 36 companies, 11 show negative R&D growth rates between 2023 and 2024. The company with the highest negative growth rate is an automotive group focussing on high-tech components (Pierer Industrie)[31]. R&D investment in Austria is less concentrated than in other EU countries, and the largest company (in terms of R&D) accounted for 19.5% of Austria's R&D in the Scoreboard. Overall, the top 5 companies for nominal R&D investment (AMS-Osram, Wisetech Global Limited, Voestalpine, OMV and AT&S) accounted for 55.5% of Austria's overall R&D and had an average growth rate of R&D of 0.8% in 2024.

[30] Note that countries with less than two companies are not considered here.

[31] The company underwent a major restructuring, which led to a significant reduction in R&D investment.

In **Belgium**, 55% of R&D investment in the Scoreboard related to two companies in the health sector, UCB and Argenx, which increased R&D by an average of 19.2% in 2024. However, some companies in the health, chemical and automotive sectors saw reduced investment in R&D. Solvay, which was the second largest Belgian R&D investor in 2023, reduced its R&D by 92% due to the completion of the spin-off of its speciality chemicals segment (Syensqo). Overall, this caused a slight negative development in Belgium.

In **Denmark**, there was an increase in total R&D compared to 2023 and companies in both the core and emerging groups increased their R&D investment. These positive results come from several health and financial companies that increased their R&D considerably. As for 2023, the largest contributor to the country's overall R&D investment was Novo Nordisk–the company increased R&D by 34% in 2023 and by another 29.4% in 2024. Novo Nordisk is by far the largest Danish company in the Scoreboard (42.5% of Danish Scoreboard R&D), and the largest contributor to the R&D growth in Denmark

In **Finland**, the largest Finnish company, Nokia, accounts for 67% of the overall nominal R&D investment of Scoreboard companies headquartered in Finland. The aggregate trend was driven by Nokia's 2.6% increase in R&D with respect to 2023. The number of companies that saw a decrease in R&D was just 16 out 41, which further contributed to the increase in the overall R&D.

In **France,** the largest increases were recorded by companies in the health and energy sectors. Companies with a significant share of the overall R&D investment by headquarters in France, such as Sanofi and Electricité de France, saw rapid growth in R&D (9.9% and 83.3% respectively, with an aggregated share of R&D of nearly 20% in 2024). Also, companies in the aerospace & defence sector increased their investment in R&D: the top three French companies in this sector based on share of R&D investment (responsible for 13% of overall R&D by French Scoreboard companies)–namely Airbus, Thales and Safran–increased R&D investment by 9% on average. On the contrary, the automotive sector reduced R&D investment by 1.7% on average, with Stellantis (down 8.4%), Forvia (down 1.5%) and Valeo (down 5.6%) decreasing their investment in R&D compared to 2023 and, among the top 5, Renault (up 3.3%) and Michelin (up 4%) increasing R&D investment.

Developments in **Germany** were mixed. The largest company in terms of R&D investment in the most representative sector (automotive), namely Volkswagen, which comprises the 18% of the overall R&D performed by German Scoreboard companies, decreased its R&D investment by 3.6%. Similarly, Mercedes-Benz (with 8.2% of overall R&D) reduced its R&D investment by 2.8%. On the contrary, other automotive companies increased their R&D investment: BMW (up 17%) and Robert Bosch (up 5%). The German health sector significantly increased R&D investment, with Bayer by 22.6%, Boehringer Sohn by 14.2%, and Biontech by 26.7%. The R&D investment of the largest ICT software and services company in Germany, SAP, fell sharply by 15.4%, and the largest ICT hardware producer, Siemens, kept R&D investment levels flat (up 0.03%). The largest chemicals company, BASF, reduced R&D investment by 3%.

In **Greece**, R&D investment growth was negative due to the strong reduction in R&D in the construction & materials sector. On the other hand, battery producer Sunlight increased R&D strongly (up 55%), as did gaming solutions supplier and operator Intralot (up 98%).

In **Ireland**, R&D investment growth was positive thanks to substantial increases in investments by companies in the financial sector. Notably, Bank of Ireland and Allied Irish Banks, the two largest contributors to the overall R&D investment of Scoreboard companies registered in Ireland (totalling 35% of the overall R&D in 2024), raised R&D investment on average by 20.5% in 2024. The only

decreases in R&D investment were recorded by two companies in the health sector: Prothena (down 32.3%) and Iterum Therapeutics (down 73.8%).

Italy's nominal R&D investment fell by 4.1% in 2024 (minus 6.1% deflated), even if many companies expanded R&D (66.7% of the core companies, and 61.9% of the emerging companies). Among the top 5 companies for R&D investment in 2024 (accounting for 61.7% of overall R&D investment), Leonardo (up 11.6%), Ferrari (up 8.8%) and Chiesi (up 15.0%) saw an increase compared to 2023, while STMicroelectronics (down 4.2%) and Iveco (down 9.7%) experienced a decline. The contraction in total R&D investment is therefore explained by the last two companies and a sharp decline for other two large players–one telecom (down 47.6%) and one major bank (down 15.3%)–offsetting solid gains in aerospace & defence and the health sector.

Eight firms invested EUR 530 million in R&D in **Luxembourg**, of which half increased their R&D investment compared to 2023. The top company is Arcelor Mittal, one of the largest steel-producing companies in the world, which experienced a decline in R&D investment (down 3.4%). The slightly positive nominal increase in total R&D investment is explained by the increase of the energy company Tenaris (up 23.7%) and that of emerging companies in the industrial sector.

The **Netherlands** had a positive nominal R&D investment growth rate in 2024. Companies in the ICT hardware and ICT software sectors were large contributors to the positive performance: ASML Holding (up 5.8%), ASM International (up 14.5%), Elastic (up 7.4%), TomTom (up 2.5%). The drag on R&D investment came mostly from companies in the industrial, health and chemical sectors. Notably, Philips decreased R&D investment by 6.9% in 2024.

Poland had one of the highest R&D investment growth rates in 2024, contributing to the Scoreboard with four companies. This is due to Inpost (up 64.7%), a company specialised in parcel locker services, which accounts for 73% of the overall R&D investment by Scoreboard companies headquartered in Poland. Two of the three emerging companies in Poland are from ICT software and services (CD Projekt and Asseco), but they reduced their R&D by 8.7% on average.

Portugal had the strongest decline in R&D among other EU 800 Scoreboard countries in 2024. Although the contraction was widespread, with seven out of eight companies decreasing the R&D investment compared to 2023, the decline was mostly driven by top energy companies: Energias de Portugal (down 32.6%) and Galp Energia (down 22.2%). Caixa General de Depositos (down 35.0%) and Outsystems (down 15.3%) also performed poorly.

The companies from **Spain** raised their R&D investment by 3.1%. Companies in both the core and emerging group contributed to this increase. The top 5 companies for R&D investment in 2024 accounted for 73.6% of total R&D, and they experienced a mixed development: Banco Santander (down 4.2%), Amadeus (up 19.5%), Telefonica (down 17.6%), Grifols (up 11.2%) and Iberdrola (down 4.9%). Strong growth from companies with lower levels of R&D investment and mostly from emerging companies contributed to the overall positive result. Notably, two emerging companies, CAF in automotive and Sener in aerospace & defence, increased their R&D investment by 23% and 74% respectively.

Sweden showed above-average R&D investment growth. 108 companies invested EUR 19.3 billion; with companies in both core and emerging groups contributing to the good performance. A mix of companies in automotive and ICT (hardware and software) in the top part of the R&D distribution grew on average by 4.8%: Ericsson (up 3.9%), Volvo (up 11.5%), Geely Sweden Holdings (up 5.3%), Spotify (down 3.3%), Hexagon (up 7.8%). These account for 62.1% of Swedish R&D investment in the EU 800 sample.

4.7. Key points

- **R&D investment growth:** The EU 800 companies invested EUR 245.4 billion in R&D in 2024, an increase of 2.1% in nominal terms, but a decrease of 0.7% in real terms, with the core group increasing its R&D investment by 3% in nominal terms and 0.1% in real terms. The EU emerging group, comprising smaller R&D investing companies, experienced a decrease in R&D investment in 2024, with a negative growth rate of 11.8% in nominal terms (down 14.2% in real terms).
- **Fewer firms with positive growth**: 65.9% of the EU 800 companies reported an increase in R&D in 2024, a decrease by 7 percentage points compared to 2023, and the lowest value since 2020. The development in the core group was more positive with 71.7% reporting a year-on-year increase in R&D investment, but only 62% of the emerging sample companies.
- **Regional concentration in the EU:** The top three countries in terms of R&D investment in the EU 800 sample are Germany, France, and Sweden. They represented 59.3% of the companies and 75.5% of total R&D investment, with Germany accounting for 48%.
- **Sectoral distribution:** The automotive sector accounts for the largest share of R&D investment, with 33.5% of the total R&D investment, followed by the health sector (19.9%), ICT hardware (13.6%), and ICT software (7%). Most of the EU 800 companies are outside the 4 top sectors, indicating a broader sectoral base and less concentration than in other regions.
- **Large companies with lower R&D:** The EU emerging sample has a large number of companies with high employment. The 482 companies in this sample add only 5% to total EU 800 R&D investment, but 23% to employment.
- **Automotive slows down:** After the strong contributions in 2022 and 2023, automotive R&D investment increased by only 1.1% in 2024, with a heterogeneous development across companies. A large increase in R&D investment by BMW contrasts large reductions by Volkswagen and Stellantis, while the remaining large EU automotive companies maintained their R&D investment levels.
- **The health sector drives R&D investment growth:** The EU 800 health companies recorded strong R&D investment growth of 11.6%, lifting the sector's share in the EU 800 from 18.2% to 19.7%, the highest so far. The large increase was driven mainly by the leading EU companies: Germany's Bayer, Biontech, and Boehringer Sohn, Denmark's Genmab and Novo Nordisk, and France's Sanofi.
- **Investment gap in ICT software worsens:** The EU is a long way behind the US in the ICT software and services sector, with the EU investment of EUR 17 billion in this sector being only a quarter of that of the leading company, Amazon. The sector's R&D investment fell by 9.7% in 2024, and the number of companies fell from 84 to 78. The developments in this sector continue to be of concern as the technological frontier advances rapidly.
- **Electricity and renewable energy companies**: The positive trend in the energy sector continues, R&D and capex increasing significantly (by 13.6% and 12.2%). In contrast to the global energy sector, the **EU has only a few firms in fossil fuel in the Scoreboard**, while most are electricity or alternative energy companies (including nuclear). **66% of R&D by the EU energy companies** comes from companies in **electricity and alternative energies**, and only 19% from the oil and gas companies.
- **Large variations in R&D investment per employee:** on average, R&D investment per employee was EUR 13 766 for the EU 800, less **than the values of the Chinese or Japanese Scoreboard companies** due to the many large companies in the EU emerging sample. The companies from innovation leader countries spent most on R&D per employee (EUR 18 652), the strong innovator group spent EUR 13 343 per employee, and the moderate innovators EUR 9 821 per employee.

— **Small companies are very R&D intensive:** SMEs have by far the highest R&D investment per employee, with over EUR 200 000 per employee, followed by small mid-caps with EUR 55 773, and the mid-caps with EUR 28 257, while the value for the large companies is less than half of this with only EUR 13 331. This shows that the smaller EU companies are comparable to their leading counterparts worldwide. The sectors with the highest R&D investment per employee are health (EUR 40 112), ICT hardware (EUR 28 182) and automotive (EUR 24 495), while **the EU's ICT software sector companies invested only EUR 12 385 per employee.**

— **Better entrepreneurship dynamics in innovation leader countries:** Evaluating the Scoreboard companies in terms of the European Innovation Scoreboard shows that the **framework conditions** in EIS innovation leader countries are more conducive **to generating and growing small and R&D-intensive companies**. Moreover, in the innovation leader countries, the share of small companies increased more, pointing to **higher entrepreneurial dynamics** in these countries.

5. Internationalisation of R&D – analysis of R&D investment flow data

This chapter analyses the trends and dynamics in the internationalisation of R&D by multinational enterprises (MNEs) using the US Bureau of Economic Analysis (BEA) from an EU perspective over the period 2013-2022. We first contextualise R&D internationalisation and discuss its importance for EU top R&D investors. In Section 5.2 we describe the data used for this analysis and explain why we choose US data from all available sources. We then analyse the US BEA data describing inbound and outbound R&D investment flows by region and sector. We complement this analysis with a box that presents the new release of the biennial joint JRC-OECD Cor&Dip database of patents matched to the Scoreboard companies listed in the 2023 edition of the report. This complementary analysis allows us to compare international R&D flows between MNEs, with the Scoreboard companies' geographical distribution of patents by their subsidiaries.

5.1. The importance of R&D internationalisation in the EU

The internationalisation of R&D is the **cross-border allocation of company-funded R&D budgets** across multiple locations and partners. Companies accomplish this through various complementary modes (Dushnitsky & Lenox, 2006; Kuemmerle, 1999): (i) foreign direct investment in R&D–new laboratories and R&D performed by foreign affiliates; (ii) cross-border contract R&D with external contractors; (iii) collaborative arrangements such as international R&D alliances, joint ventures and consortia; (iv) market-mediated access to knowledge via technology licensing and data-sharing agreements; and (v) corporate transactions that shift control or accelerate capability building, in particular cross-border mergers and acquisitions and corporate venture capital.

Until the 1980s, R&D internationalisation was relatively uncommon as companies tended to centralise R&D in their home country. Since then, **it has become a key driver of globalization**, **with multinationals increasingly conducting R&D abroad** (OECD, 2008; Sommer, 2021). However, since the financial crisis in 2008/2009, the internationalisation of R&D has started to slow. Although the absolute amount of foreign R&D continued to increase globally, there was a decline in the relative amount of foreign R&D (i.e. measured as the share of total R&D budgets). In 2019, international R&D accounted for 21% of total (global) business R&D, down from 26% in 2013 (Dachs et al., 2024).

Historically, R&D internationalisation was more prevalent between the US and Europe, but in recent years, emerging economies like China and India have attracted a larger share of R&D investment, especially in sectors like ICT services (Dachs & Zahradnik, 2022).

Several factors influence MNEs' decisions on where to locate their R&D (for an overview see: Hall, 2011; Thursby & Thursby, 2006). These decisions can be related to factors such as: (i) a desire to improve innovation performance (i.e. knowledge-seeking motives like proximity to qualified people or collaborators); (ii) a desire to be close to customers; (iii) market size; (iv) taking advantage of the wage differentials of R&D workers in different parts of the world; (v) advances in ICT that facilitate collaborations across multiple locations; and (vi) financial considerations such as taxes or government incentives. At the same time, companies increasingly rely on external knowledge sources, particularly through M&A and R&D alliances (Papanastassiou et al., 2020). Recent evidence by Martinez Cillero et al. (2025) has shown that: (i) leading R&D investors have been relying more and more on M&A in the past decade; (ii) that M&A increases companies' market power; and that

(iii) M&A does not necessarily complement the internal R&D investment. Taken together, these considerations reveal that M&A is powerful mechanism for the internationalisation of R&D, which can bring benefits to companies and countries, but that should also be monitored attentively to avoid stifling competition.

The internationalisation of R&D has also been a focus of strong interest from policy makers in the EU. The EU's traditional open stance toward the internationalisation of R&D has been increasingly threatened by recent geopolitical developments that eventually resulted in the EU's policy shift to consider the need for open **strategic autonomy and technological sovereignty** (Domnick et al., 2023). In this evolving landscape, a report (European Commission et al., 2017) developed a detailed analysis of the R&D inflows into the EU and the economic impact of these inflows in the period up to 2013. The study shows that 66% of total inward R&D from non-EU countries to the EU in 2013 came from the US, pointing to the leading role of US MNEs in global corporate R&D. In 11 out of 20 EU countries, the US was the largest or second largest source of R&D inflows between 2007 and 2013.

At the EU member state level, 52% of business R&D originated from companies in other EU countries, increasing to 61% when considering the European Research Area (ERA). Central European and new EU member states primarily received R&D inflows from other EU/ERA countries, while countries like the Netherlands, Italy, and the UK saw significant inflows from non-EU/non-ERA countries, predominantly the US. The diversification of R&D inflow origins and the decline in the number of EU countries among the top investors in R&D in the EU between 2003 and 2013 indicate that R&D internationalisation has shifted from regional to global integration (Dachs & Zahradnik, 2022; European Commission et al., 2017).

Even though R&D internationalisation has become increasingly important for companies, various sources show that **companies continue to spend the largest share of their R&D in the country in which they are headquartered**. Surveying the EU's top R&D-investing companies from the EU Industrial R&D Investment Scoreboard, Tuebke et al. (2016) report that on average, 27% of the R&D investment in 2015 went to countries outside the EU (EU-28), with the US being the largest recipient of EU investment in R&D followed by Canada and China. Furthermore, they found that companies with greater R&D intensity are more international. The most international EU companies are in the pharmaceutical and biotech sectors, with around 40% of their R&D investment going to the US and Canada (the focus on the US and Canada is partly to meet health regulations for product approval). In 2022, the survey showed that on average, 20% of the R&D investment of the surveyed EU companies went to locations outside the EU-27 in 2021. The US remained the largest recipient of EU R&D investment R&D, especially for companies in the health and ICT sectors, followed by the UK for EU health companies and India for EU ICT companies (Nindl, 2022).

Since large EU R&D investors are crucial for developing strategic technologies and reducing global dependencies, updating the most recent evidence on R&D internationalisation is essential, particularly for Scoreboard companies that account for most global R&D and operate in various countries and regions. Such an update is even more relevant in the light of current global policy reversals (e.g. in tariffs or the funding of sustainable technologies). However, the annual reports of these Scoreboard companies from which the data are collected usually do not contain sufficient information to make it possible to break down R&D investment by region. The Scoreboard provides aggregate data by company and allocates the entire investment to the country in which the

company is headquartered.[32] In the absence of company-level R&D flow data, here we rely on the most recent country-level data on international R&D flows to analyse recent developments.

5.2. Data on international R&D flows

Detailed data on international R&D flows between countries is generally scarce and often relies on **estimates** of R&D investments made by MNEs (Belitz & Lejpras, 2021). The **US Bureau of Economic Analysis (BEA) offers the most comprehensive and longest time series of data on MNE** activities, which is utilised in this analysis (Bureau of Economic Analysis, 2025). This data includes information on the activities of US MNE affiliates abroad and R&D investments into US affiliates by foreign MNEs, aggregated by year, country, and sector according to the North American Industry Classification System (NAICS), covering both inflows and outflows.

Other sources, such as the Foreign-controlled Statistics (FATS) from Eurostat, collect data on R&D investments by foreign companies in EU affiliates, focusing on R&D inflows (Eurostat, 2024). However, these data have limited coverage of R&D outflows and are not ideally suited for our analysis. Eurostat's data pertain to the territorial concept of R&D (BERD), which reflects the amount of R&D performed within a country, regardless of ownership. In contrast, the Scoreboard allocates R&D to the headquarters country. To understand how much, for instance, German companies spend on R&D domestically versus abroad, outflow data are essential but currently unavailable from Eurostat. Similarly, the OECD collects data on MNE activities through its Activities of Multinational Enterprises (AMNE) database, which also has limited coverage of R&D outflows (OECD, 2024).

Given the lack of comprehensive outflow data from other sources and considering the US's significant share in global R&D, we rely on BEA data to analyse R&D flows between MNE affiliates across countries, particularly concerning the EU. A significant limitation is that the data only contain information on affiliates with a majority holding. **Because BEA activity data exclude minority stakes, they miss corporate venture capital (CVC) and joint ventures**. Evidence from Gavigan et al. (2024) or Grassano et al. (2022) shows that: (i) US corporations account for most of global CVC, and US startups attract most of this CVC, with EU Scoreboard companies directing about 80% of their CVC to US startups (2013–2020); and (ii) in the automotive sector, most CVC by leading EU companies also goes to US startups.

Since 2009, the BEA has provided data on R&D investments by US MNEs abroad and foreign MNEs in the US, reported in US dollars by country of destination (outflows) and origin (inflows). The latest data covers US investments abroad up to 2023 and foreign investments into the US up to 2022. Aggregate inflow data are available by NAICS sector, while outflow data are at a higher level of sectoral aggregation and cover fewer countries. For analysis purposes, data were converted to euros using the 2023 end-of-year exchange rate. Our focus is on R&D flows between the US and EU, both inward and outward.

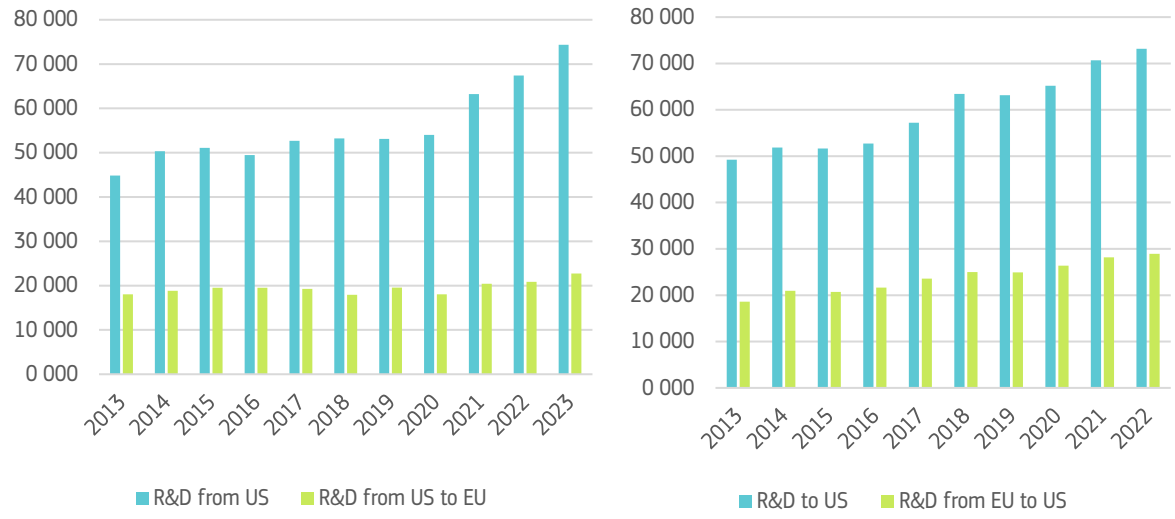
[32] Note that in the Scoreboard, we adjusted the country classification for companies with legal headquarters in tax havens or other countries to the country of operational headquarters, see Annex 4.

5.3. Overview of R&D investment flows

As highlighted above, US MNEs are responsible for most outward R&D investments and receive the most inward investment in R&D worldwide. In 2022, the last year for which data on both, inflows and outflows are available, US MNEs spent EUR 67 billion on R&D outside the US (outflows), and non-US companies spent EUR 73 billion in US-based subsidiaries' R&D (inflows). Outflows from the US increased between 2013 and 2022 by 65% and inflows to the US increased by 48% over the same period. Total R&D investment by US companies (domestic investment plus outflows) increased by 91% from EUR 265 billion to EUR 472 billion (BEA data) between 2013 and 2022. Thus, the US shares of foreign R&D decreased in both dimensions–outflows from the US fell from 16.9% to 14.3%, and inflows to the US fell from 18.5% to 15.5%.[33] These recent developments support the findings of Iverson et al. (2016) and Dachs et al. (2024) that domestic R&D typically grows faster than R&D abroad, pointing to an overall decrease in R&D internationalisation in the US.

The **EU countries have** traditionally received the largest share of US R&D investment, but this share has been decreasing steadily. Between 2013 and 2023 flows of investment in R&D from the US to the EU increased by 25% (from EUR 18 billion to EUR 22 billion). However, the **share of US flows of investment in R&D directed to the EU decreased from 40.3% to 30.6% in the same period**. MNEs from the EU are also the largest R&D investors in the US. The R&D investments of EU-based companies in their US affiliates increased by 55% from EUR 19 billion in 2013 to EUR 29 billion (in 2022), resulting in an **increase in the EU's share of total R&D inflows to the US from 37.8% to 39.6%.** In total, the combined bilateral R&D flows between US and EU MNE affiliates increased from EUR 36 billion in 2013 to EUR 50 billion in 2022.

Figure 31. R&D flows from and to the US and EU in million EUR, 2013-2023/2022



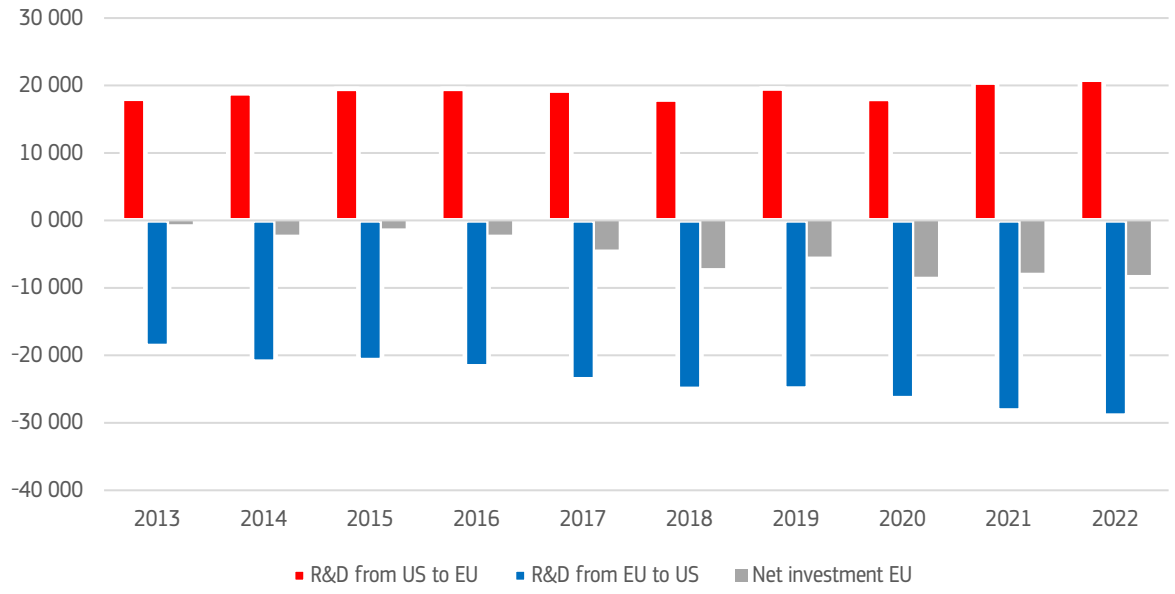
Notes: Left panel: R&D outflows from US, right panel: R&D inflows to the US. R&D investment in million euro at 2023 end-of-year exchange rates. BEA data were retrieved from https://www.bea.gov/data/intl-trade-investment/activities-us-affiliates-foreign-mnes on August 26, 2025.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

[33] In 2023, US MNEs spent EUR 74 billion in R&D abroad, an increase of 10.4% compared to the previous year. This causes the share of foreign R&D in the US total to increase to 14.6%.

Combining the panels of **Figure 31** as done in **Figure 32** shows that **the EU has a significant deficit in terms of R&D flows with the US**. In 2013, EU companies invested EUR 500 million more in their US affiliates than US companies invested in the EU, but by 2022 this gap had increased to over EUR 8 billion. Overall, **the US is a net recipient of R&D investment from abroad**, with the surplus varying over the years and ranging between EUR 635 million in 2015 to over EUR 12 billion in 2020, with the largest share of this surplus investment coming from EU companies.[34] The EU's R&D investment deficit with the US measured by the value of the bilateral flows between these two regions increased from an average of 3% in 2013-2015 to 17% in 2020-2022.

Figure 32. R&D investment flows US-EU and net R&D investment, 2013-2022



Note: R&D investment in million euro at 2023 end-of-year exchange rates. R&D outflows from the US were transformed with a negative sign for better visualisation. BEA data were retrieved from https://www.bea.gov/data/intl-trade-investment/activities-us-affiliates-foreign-mnes on August 26, 2025.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

When comparing R&D flows between the EU and the US to their respective R&D investments in the Scoreboard, interesting insights emerge. In 2022, US Scoreboard companies invested EUR 530 billion in R&D, while EU Scoreboard companies invested EUR 202 billion. In 2013, US R&D investment was 74% higher than that of the EU-27 combined, and by 2022, this difference grew to 161% due to an increase in the number of US companies in the Scoreboard and faster R&D investment growth. The share of US corporate R&D going to the EU averaged 5.8% from 2013 to 2022, declining from 7.4% in 2013 to 3.9% in 2022. Conversely, the share of EU R&D going to the US rose from 13.3% to 14.3% over the same period. Thus, **the US is over three times more important for EU companies in terms of R&D investment than the EU is for US companies.**

[34] Note that without the EU, the US would register a net inflow of R&D in the years 2013 and 2016-2020, but a net outflow in the years 2014-2015, and 2021 and 2022.

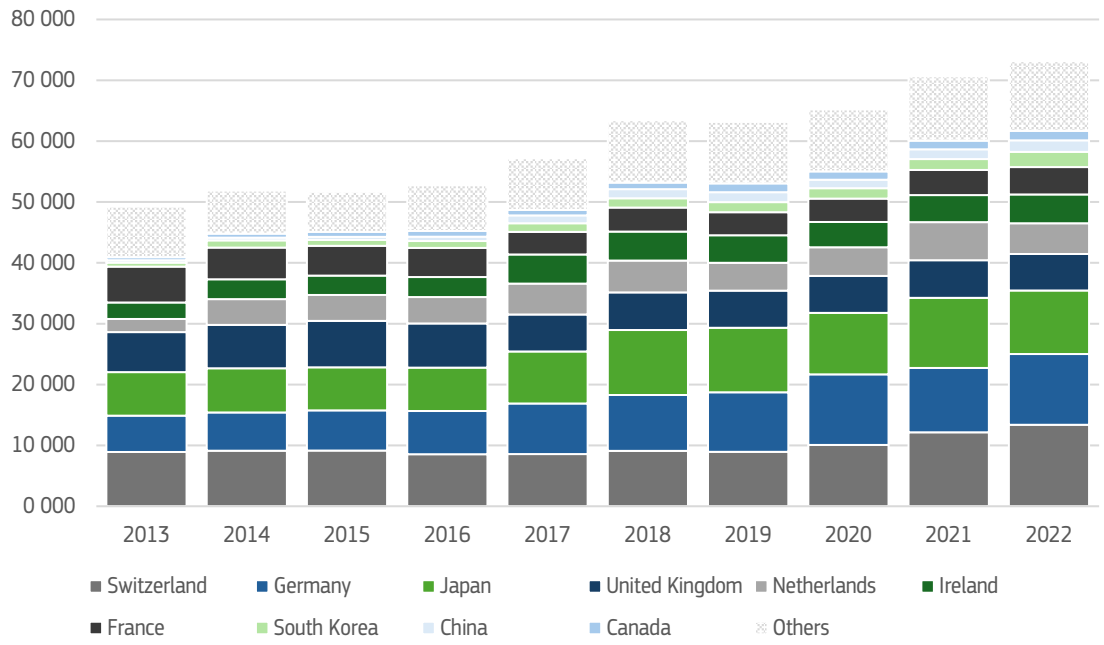
Box 3 reinforces the evidence on state of the bilateral flows of R&D between the EU and the US by focusing on the patenting activities of Scoreboard companies. **Figure 38** shows that if we reallocate the patents from the country of the mother company to the country of the subsidiaries that filed them, we observe more patents filed in the US by EU companies (33 000) than patents filed in the EU by US companies (25 000)

5.4. Top 10 countries for R&D inflows and outflows

R&D inflows

As described above, the largest flows of R&D investment by non-US companies in their US subsidiaries comes from the EU–40% of the total inflows originate from EU-based MNEs. **Another 28% of R&D flows by non-US companies in US subsidiaries** were invested by non-EU European companies, **mostly from Switzerland and the UK**. While the EU's share in US R&D investment remained rather constant since 2013, the non-EU European share decreased from 31.5% to 26% mainly due to the stagnation of investments coming from the UK. The most significant non-European country investing in US-based R&D is **Japan**, with Japanese MNEs being **responsible for about 15% of total R&D inflows to the US** between 2013 and 2022. The role of China has increased strongly since 2013 but remains marginal, accounting for only 2.6% of total foreign inflows of R&D to US subsidiaries between 2013 and 2022. **Figure 33** below shows the top 10 countries in terms of R&D investment flows to the US; together these top 10 countries are responsible for 85% of the total inflow of non-US-based funding to US-based R&D.

Figure 33. Top 10 countries investing R&D in US subsidiaries (inflows)



Notes: R&D investment in million euro at 2023 end-of-year exchange rates. The 10 countries are selected based on their contribution to R&D inflows in 2022. These 10 countries accounted for approximately 85% of total non-US-sourced spending on R&D in US affiliates in 2022. Data were retrieved from https://www.bea.gov/data/intl-trade-investment/activities-us-affiliates-foreign-mnes on August 26, 2025.

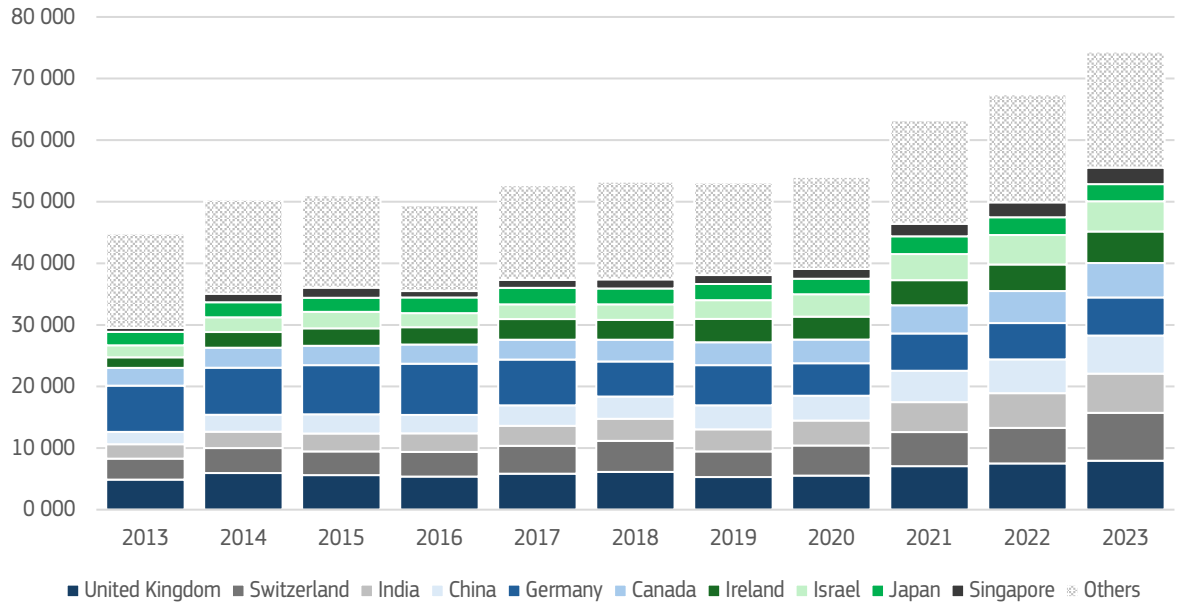
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The top 3 countries are **Switzerland (17% of total inflows), Japan (15%) and Germany (14%)**. While the Swiss and Japanese investment shares changed only very little, **Germany's share** of total investment in US affiliates **grew from 12% in 2013 to close to 16% in 2022**. The **UK** was a significant R&D investor in the US, but its **role has diminished** over this period. Overall, the R&D investment of UK MNEs in their US affiliates in 2022 was at the same level as in 2013 (around EUR 6 billion), resulting in a marginalisation of its share from 13.3% of total non-US-sourced R&D investment in the US to only 8.2%. An even stronger trend is observed for France, with the share of R&D investment in US affiliates more than halving over this period from 13.3% to 6.2%. The UK and France are the only top 10 countries whose MNEs invested less in R&D in their US affiliates in 2022 than they did in 2013.

R&D outflows

Looking in the opposite direction at the **top 10 countries receiving R&D investments** from US companies shows that these countries collectively accounted for 75% of the R&D flows in 2023 from the US to subsidiaries abroad, an increase from 65.8% in 2013. The list includes **two EU Member States** (Germany and Ireland), **four Asian countries** (India, China, Japan, and Singapore), as well as Switzerland, the UK, Israel, and Canada. Overall, US R&D investment outflows to foreign subsidiaries are less concentrated than the inflows from foreign companies to US-based subsidiaries.

Figure 34. Top 10 countries investing R&D in US subsidiaries (inflows)



Notes: R&D investment in million euro at 2023 end-of-year exchange rates. The 10 countries are selected based on their contribution in 2022 in order to match with the inflow data. The selected countries together accounted for approximately 75% of total foreign R&D in US affiliates in 2023. Data were retrieved from https://www.bea.gov/data/intl-trade-investment/activities-us-affiliates-foreign-mnes on August 26, 2025.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The most significant target country for US R&D investment in 2023 was the UK, closely followed by Switzerland, India and China. Germany is at position five, and apart from Ireland it is the only EU country in the top 10 countries for R&D investment by US companies.

An important insight from **Figure 34** is that the **US R&D investments into German subsidiaries declined** from over EUR 7 billion in 2013 to EUR 6.1 billion in 2023. In 2013, Germany was the largest recipient of US R&D inflows by a margin of almost EUR 3 billion ahead of the second largest recipient (the UK). But by 2023 Germany was receiving around EUR 1.8 billion less in US-sourced R&D investment than the UK and Switzerland, and receiving a similar amount to India and China. In 2013, Germany attracted 16.8% of US R&D investment outside the US, but only 8.3% in 2023. In contrast, **Ireland received increasingly large R&D investments from the US** in this period–up from EUR 1.7 billion in 2013 to over EUR 5 billion in 2023 (accounting for the lion's share of total BERD of EUR 6.9 billion in Ireland in 2023).

Switzerland has been very successful in attracting US R&D investments. In the period under consideration, the volume of US-sourced R&D investment in the country increased from EUR 3.4 billion in 2013 to EUR 7.8 billion in 2023, and Switzerland's share in US R&D outflows increased from 7.6% to 10.4% between 2013 and 2023. This continued growth in US-sourced R&D investment is due to the **large presence of US ICT and pharma R&D centres in Switzerland**, such as the largest Google development hub outside the US (Worldcrunch, 2014) and the 'Health Valley' in western Switzerland (GGBA, 2025).

US investment in UK affiliates grew by 62% between 2013 and 2023, and stood at EUR 7.9 billion in 2023, and the UK's share of US-sourced R&D investment outside the US remained stable in 2023 at close to 11%.

Looking outside the EU, **the percentage of US-sourced R&D investment outside the US received by other European countries increased slightly** from 19.4% to 22.2% between 2013 and 2023, mainly due to the growth seen in Switzerland.

India and China receive a growing share of US R&D, and both exhibit a similar trend. Each country received approximately EUR 2 billion in R&D investment from the US in 2013. In 2023, China received EUR 6.1 billion (an increase of 208%) and India EUR 6.3 billion (and increase of 173%) in R&D investment by US companies in their affiliates. Another striking development is the strong growth of US-sourced R&D investment in subsidiaries in **Israel**. The sums flowing into Israeli subsidiaries of US companies grew by 150% since 2013 and amounted to EUR 4.9 billion in 2023.

Country balance of R&D inflows and outflows

In total, **US companies invested EUR 539 billion in R&D in affiliates abroad** between 2013 and 2022. The **US in turn received R&D investments** into US-based affiliates of non-US companies of **EUR 598 billion** over the same time, resulting in net inflows to the US of close to EUR 60 billion.

Figure 35 shows the sum of the inflows and outflows for the top 10 countries from both perspectives to describe their balance in terms of R&D investment with the US in 2013-2022. This amounts to a total of 15 countries, as the top sources of investment in US-based R&D were not necessarily the countries receiving most US R&D investment. A negative value suggests that the country spent more on R&D investment in the US than the US spent on R&D investment in the respective country, and a positive value represents a net inflow from the US to the country (the US spent more in that country than the country spent in the US). We first discuss each net recipient, before we turn to the net investors.

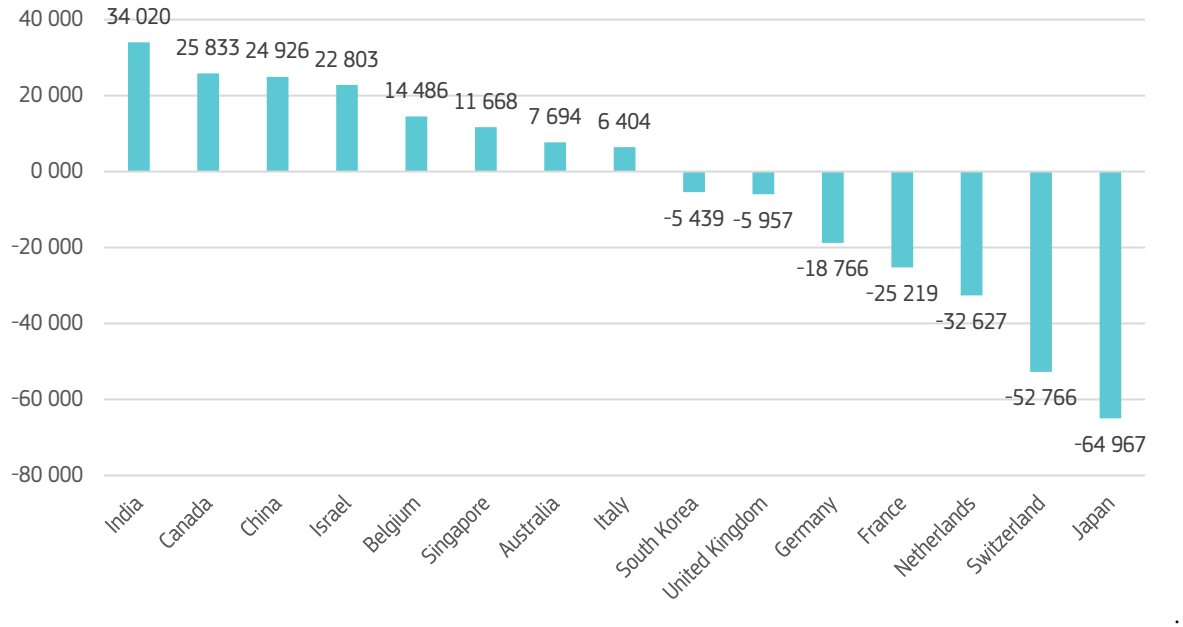
The **largest net inflow of R&D from the US** is recorded by **Indian subsidiaries of US MNEs**, followed by Canada, China and Israel. The US companies spent in total EUR 35 billion on R&D investment in Indian subsidiaries, while Indian MNEs invested only EUR 1.8 billion in their US-based affiliates over this time. **Inflows of US-sourced investment to India exceed outflows from India to the US by a factor 19.** The EU country that benefited the most from US R&D investments was **Belgium** with a net inflow of EUR 14 billion.

Canada is an important location for US MNEs, and subsidiaries in Canada received EUR 36 billion from US-sourced R&D investment in 2013-2022. However, Canadian MNEs only invested EUR 10 billion in the US, leading to substantial net inflow of R&D investment from the US into Canada.

In addition, the **China-based** subsidiaries of US MNEs received R&D investment of EUR 36 billion, while Chinese companies in turn spent EUR 11 billion in US-based subsidiaries between 2013 and 2022. This resulted in a similar balance to that seen with Canada, **a net inflow to China of around EUR 25 billion.**

Between 2013 and 2022, the R&D investment by US affiliates in **Israel** amounted to EUR 29 billion, while Israeli companies spent only EUR 7.1 billion in their US affiliates during the same period, resulting in a **net gain for R&D in Israel of EUR 22.8 billion.**

Figure 35. Total R&D net investment for the top inflow and outflow countries, 2013-2022



Notes: R&D investment in million euro at 2023 end-of-year exchange rates. Top countries in terms of inflows and outflows of US R&D. Positive values suggest net inflows from the US, while negative values suggest that the country invested more in US-based affiliates than it received. Data were retrieved from https://www.bea.gov/data/intl-trade-investment/activities-us-affiliates-foreign-mnes on August 26, 2025.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Belgium, Singapore, Australia, Italy, and South Korea are countries with overall lower total investment flows. As a result, the differences between their inflows and outflows are smaller. These countries received between EUR 17 billion (for Belgium) and EUR 8 billion (Italy) in R&D investment

by US MNEs between 2013 and 2022, and invested between EUR 1.7 billion (Australia) and EUR 14 billion (South Korea) in their subsidiaries in the US during the same period.

Taking into consideration the aggregated flows over the period 2013 to 2022, Japan is the country that made the largest net R&D investment into the US. Over the last decade, in each year **Japanese companies invested 3 to 4 times more into their subsidiaries in the US than vice versa**. In sum, Japanese companies spent over EUR 90 billion on R&D in their US subsidiaries but US companies only spent EUR 25 billion in their affiliates in Japan over the same period, resulting in a net inflow of almost EUR 65 billion into the US.

The second largest net contributor to US-based R&D is Switzerland. In terms of flows to the US, **Swiss companies spent the largest amount in R&D investment in their US-based affiliates–in total EUR 98 billion between 2013 and 2022**. In turn, US companies spent only EUR 45 billion in Swiss-based affiliates, resulting in a net inflow to the US of EUR 52.7 billion during this period.

Germany turned from a net recipient of US-sourced R&D investment to a net contributor to US-based R&D over this period. The balance over the period 2013-2022 amounts to a net outflow from Germany to US-based affiliates of EUR 18 billion. German companies now rank third in terms of both receiving R&D investment by US companies (EUR 68 billion) and in investing in US-based affiliates (EUR 87 billion).

The **Netherlands** received only EUR 12 billion from US companies, but Dutch companies invested over EUR 45 billion into US affiliates in 2013-2022, resulting in a net outflow to the US during this period of EUR 33 billion. Just like Japanese companies, **Dutch MNEs spent 3 to 4 times more in the US** than vice versa. One potential driver behind this result might relate to the headquarter decisions taken by companies such as Stellantis or Airbus, which are registered in the Netherlands but have (almost) no activities there. Nevertheless, the R&D inflows to and outflows from these companies are still allocated to the Netherlands.

The UK was one of the countries to receive the most inward R&D investment from the US. Over the period 2013-2022, US companies invested EUR 59 billion in R&D in their UK-based subsidiaries, and UK companies spent around EUR 65 billion in their US-based affiliates, resulting in a small deficit for UK companies.

Box 3. JRC-OECD COR&DIP database (2025 edition)

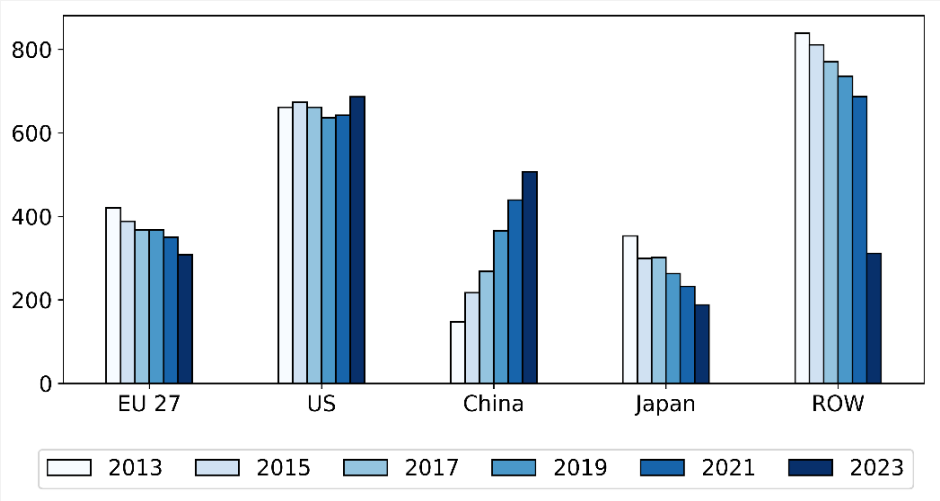
The Scoreboard data is the cornerstone of a longstanding collaboration between the JRC and the OECD Directorate for Science, Technology and Innovation (STI), who jointly produce the EC-JRC-OECD COR&DIP database (COR&DIP). The database, which has been published biennially since 2015, records the patents and trademarks of the top 2 000 corporate R&D investors worldwide.

This year's release of the COR&DIP database covers the R&D investors ranked in the 2023 edition of the EU Industrial R&D Investment Scoreboard. The patent data comes from the Worldwide Patent Statistical Database (PATSTAT Global, Spring 2025) of the European Patent Office (EPO), while the trademark data is sourced from the United States Patent and Trademark Office (USPTO) and the European Union Intellectual Property Office (EUIPO).

This box focuses on the COR&DIP patent data consisting of the IP5 patent families* filed by the Scoreboard companies directly or through the subsidiaries they owned as of 2022. The Scoreboard entities are matched to the patent applicants recorded in Patstat based on common geographical location and name similarity through a series of string-matching algorithms (Amoroso et al., 2021).

Figure 36 shows how the regional composition of the patenting Scoreboard companies has changed over the years. The number of US-based companies has remained stable around 33% of the total throughout all the editions of the COR&DIP database. In contrast, EU- and Japan-based companies have declined steadily (from 21% to 15% and from 18% to 9%, respectively), while Chinese companies have risen 3.5-fold to 25%.

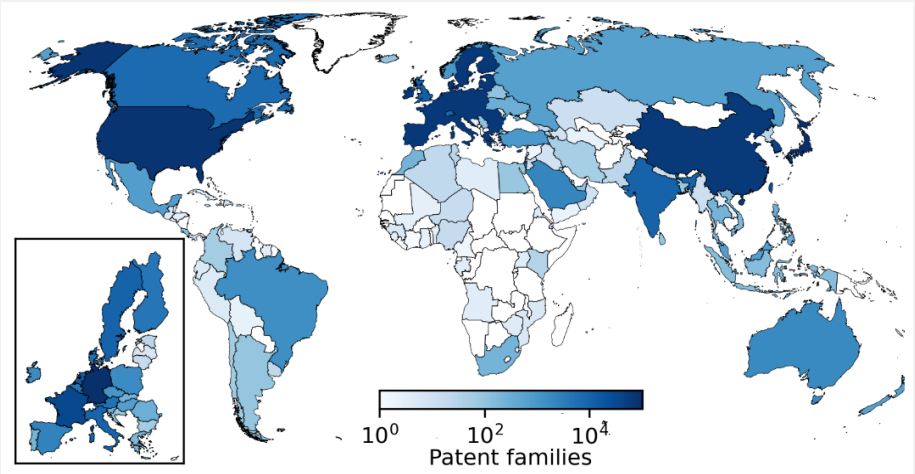
Figure 36. Regional distribution of patenting Scoreboard companies by edition of the report.



Notes: Data refers to the top 2 000 companies from the 2013-2023 Scoreboard editions, for which patenting data is available.
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The map in **Figure 37** shows the geographical distribution of patents filed by the Scoreboard companies included in the 2025 release of COR&DIP based on the country of the inventors. The world map, in which the EU is grouped into a single region for ease of comparison, shows that Japanese inventors file the highest number of patents (100 000) followed by US-based inventors (84 000), EU-based inventors (70 000) and China (62 000). The inset focuses on the EU and shows that German inventors file by far the most patents within the EU (34 000). The top 5 is completed by France (12 000), the Netherlands (5 300), Sweden (3 700), and Italy (3 600).

Figure 37. Geographical distribution of patent inventors linked to the patent filings of Scoreboard company.

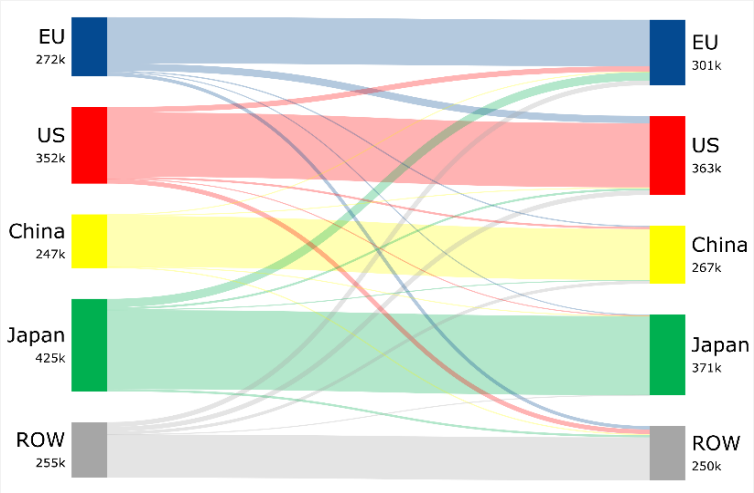


Notes: Data refers to the top 2 000 companies ranked in the 2023 Scoreboard edition for which patenting data is available.
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Figure 38 compares regional distribution of patents we obtain by assigning patents to the headquarter country of the Scoreboard companies with the subsidiary matched to the patent applicant. All regions file

most of their patents through subsidiaries located in the same region as the mother company. Moreover, with the exception of Japan, all major regions are net receivers of patents, after accounting for the flow of patents they file through foreign subsidiaries and the patents that foreign mother companies file on their soil through their affiliates. The largest flows of patents involve Japanese companies filing around 39 000 patents in the EU, EU companies filing patents in the US (33 000) and US companies filing in the EU (25 000). China is neither a strong source nor a strong recipient of patent flows from other regions.

Figure 38. Geographical distribution of patents: headquarters VS subsidiaries.



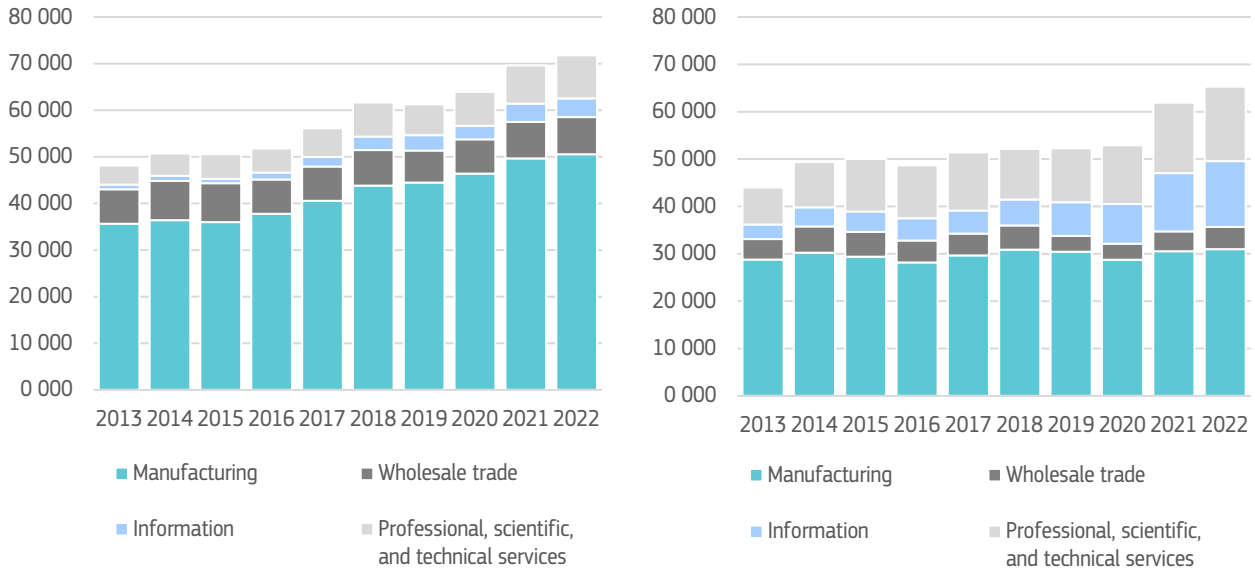
Notes: Data refers to the top 2000 companies ranked in the 2023 Scoreboard edition for which patenting data is available.
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

* A patent family is a collection of patent applications. IP5 families include applications filed at the five top IP offices (IP5) in the world, namely: CNIPA (Chinese National Intellectual Property Administration), EPO, JPO (Japan Patent Office), KIPO (Korean Intellectual Property Office), and USPTO. We adopt a definition of IP5 patent families that encompasses families filed at multiple patent offices, at least one of which belongs to the IP5. This definition excludes single filings by construction. For more details about possible definitions of IP45 families, see Dernis et al. (2015).

5.5. Sectoral flows

The sectoral data across countries provided by the BEA has information on R&D investments by sector (NAICS). The data cover investment by MNE headquartered in Canada, France, Germany, Netherlands, Switzerland, the UK and Japan. The data on investments outside the US by US MNEs have a broader country coverage. The sector classification relates to the sector of the affiliate. However, the disaggregation level of sectors and the country coverage vary between inflows and outflows, and the coverage is lower for the outflows. For this reason, we only briefly discuss the main trends observed since 2013 for the main sectoral aggregates.

Figure 39. R&D inflows to the US (left panel) and outflows from the US (right panel) by sector, 2013-2022



Notes: R&D investment in million Euro at 2023 end-of-year exchange rates. Data was retrieved from https://www.bea.gov/data/intl-trade-investment/activities-us-affiliates-foreign-mnes on August 26, 2025.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Inflows of R&D investment by non-US MNEs to their US-based affiliates mostly go to the manufacturing sector. The share of manufacturing in total R&D flows into US-based subsidiaries was 69.1% in 2022, only 2 percentage points lower than its level in 2013. In contrast, R&D investments into US-based subsidiaries in the information sector increased from 2% of total inflows to the US to 5.5% between 2013 and 2022, and that in professional, scientific, and technical services from 8.3% to 12.6%.

Within the manufacturing sector, the largest R&D investment in the US by non-US-based companies went into US-based subsidiaries in the pharmaceutical sector, with EUR 23 billion invested in 2022 (EUR 17 billion in 2013). This was followed by transport equipment with EUR 8 billion invested by non-US-based companies in US-based affiliates in 2022 (up from EUR 5.4 billion in 2013) and computers and electronic parts with EUR 7.2 billion (up from EUR 4.4 billion in 2013).

For the **outflows** of US-based R&D investment to subsidiaries outside the US, **the sectoral pattern changed** considerably over the past decade. The **manufacturing** sector contributed the most to the R&D investment outside the US of US-based MNEs, but the **share of this manufacturing R&D investment decreased by almost 20 percentage points** between 2013 and 2022 and stood at 45.9% (with a total volume of EUR 30 billion which remained unchanged in the period under consideration). Within the manufacturing sector itself, the relative weightings shifted during this period away from chemicals and motor vehicles and towards computers and electronic products, in particular semiconductors.

In turn, the **R&D investment by US-based MNEs in the service sectors outside the US increased strongly, and in 2022 accounted for 44%** of R&D outflows from US MNEs to non-US-based affiliates. US affiliates, based outside the US, in professional, scientific, and technical services received EUR 17.2 billion in 2022. The share of total R&D investment made by the US-based professional, scientific, and technical services sector into affiliates based outside the US was volatile over the period from 2013-2022, with an average of 21%, and in 2022 it amounted to 23% of the total US R&D outflows. The strongest increase in R&D investment outflows from the US

over this period was in the **information sector**, where outflows from the US were 4.5 times larger in 2022 than in 2013, accounting for 20.6% (EUR 13.9 billion) of the total US outward R&D investment.

This development implies that countries that are more specialised in manufacturing sectors are receiving increasingly lower shares of US MNE R&D investment relative to those more specialised in the service sectors.

5.6. Key points

- **More R&D conducted in affiliates companies abroad:** While in the past, companies centralised R&D in their home countries, since the 1980s there has been a significant **shift towards conducting R&D abroad**. The financial crisis of 2008/2009 slowed the growth rate of R&D internationalisation, but the absolute amount of foreign R&D continued to rise.
- **Drivers of R&D internationalisation:** The availability of skilled personnel, low-cost human capital, market size, technological advancements and incentives are important determinants. Mergers and acquisitions are also pivotal in facilitating R&D internationalisation.
- **US and EU R&D dynamics:** From 2013 to 2022, US R&D investment outside the US increased by 65%, with the EU receiving the largest share of this extra-US investment in 2022 (30.6%). However, the EU's share has decreased over time, from over 40% in 2013.
- **New R&D locations: Emerging countries** like China and India **are increasingly attracting international R&D** activities. Despite their growth, these emerging economies still host less R&D by US-owned firms than the EU/Europe.
- **US and EU balance of R&D flows:** The **EU is experiencing a growing deficit in R&D flows with the US**. In 2013, EU-based companies invested EUR 500 million more in their US affiliates than US-based companies did in EU affiliates. By 2022, this investment gap widened significantly, reaching over EUR 8 billion.
- **EU companies R&D conduct relatively more R&D in the US than vice versa:** The share of **US corporate R&D going to EU affiliates amounted on average to 5.8% of the US R&D investment** as measured in the Scoreboard (7.4% in 2013, 3.9% in 2022). **The share of EU Scoreboard companies' R&D investment going to US affiliates stood at 14.3%** on average and increased from 13.3% to 14.3% of total R&D investment of the EU Scoreboard companies.
- **R&D investment in the information and service sectors on the rise:** The manufacturing sector remains the primary recipient of R&D flows into the US, though its share has slightly decreased in favour of information and services sectors from 2013 to 2022. For **US R&D outflows, there was a notable shift from manufacturing toward services**, especially in professional, scientific, and technical fields. This shift has led to increased US R&D investments in countries like India and Israel, while traditional manufacturing hubs like Germany are receiving less US R&D investment.

6. Patenting trends in key green technologies

In 2015, to tackle climate change and its negative impacts, world leaders adopted the Paris Agreement which sets long-term goals to guide all nations to reduce global greenhouse gas emissions. As a legally binding international treaty, the agreement marked the beginning of a shift towards a net-zero emissions world. This provided a **powerful, long-term market signal for a systemic change in innovation agendas** to enable global transition to low carbon technologies. In the European Union (EU), the European Green Deal (COM (2019) 640 final) was launched by President von der Leyen in 2019, with the goal of making the EU the first climate-neutral continent by 2050. The deal set out a plan to transform the EU's economy, energy, transport and industries for a more sustainable future.

Since the 2019 edition, in line with the EU policy agenda, the Scoreboard has reported progress on patenting in climate change mitigation technologies (CCMTs)–also referred to as green technologies. Dedicated chapters in previous editions have reported on CCMTs with relevance to energy-intensive industries (EIIs), circularity and clean transport (see Grassano et al., 2021, 2022, and Nindl et al. 2023). This year's chapter provides an update on patenting trends in CCMTs along with these three technology areas. In addition, building on a recent publication on patent-driven innovation insights for the green and digital (twin) transition (Ince and Georgakaki, 2025), it also reports on twin technologies.

Decarbonisation constitutes one of the three pillars of the Competitiveness Compass (European Commission, 2025). As a key component of the Competitiveness Compass, the Clean Industrial Deal (COM(2025) 85 final) was launched in February 2025, to continue delivering on the European Green Deal.

The Clean Industrial Deal places particular focus in **EIIs** and proposes measures to boost every stage of EU production in key EIIs, such as steel, metals and chemicals. These industries face high costs, unfair global competition and complex regulations, and urgently need support to decarbonise and switch to clean energy.

Another key element of the Clean Industrial Deal is **circularity**. The EU depends on imports for the supply of critical raw materials, and technologies enabling circularity are of high importance to ensure secure and continuous access to such materials. Following on from the First Circular Economy Action Plan in 2015 (COM(2015) 614 final), the EU has adopted several policies on the circular economy as part of the European Green Deal. The New Circular Economy Action Plan (COM(2020)98) was adopted in 2020, and a Circular Economy Act is planned for 2026.

In the **transport** sector, recent years have seen rapid technological changes, posing significant challenges for the automotive industry, which is facing fierce price competition on EVs, particularly from China. The EU launched the Automotive Action Plan in March 2025 (COM(2025) 95 final), introducing key changes and measures to find a balance between the push for zero-emission vehicles and the industry's competitiveness challenges.

According to the Draghi (2024) report, EU companies have been leading the green transition, while lagging behind in the digital transition. Despite this contrast, the report highlights an opportunity for EU companies to lead in the **twin transition** as the world goes through another digital revolution: artificial intelligence. The Clean Industrial Deal calls for a boost in digitalisation to overcome structural inefficiencies in the EU's energy system, highlighting green digitalisation among the major horizontal enablers of the green transition.

The US has taken a clear lead in the AI revolution and is therefore well placed to create next-generation clean technologies driven by AI. However, after providing extensive support to clean-tech development through the Inflation Reduction Act of 2022, the US administration has now reversed its position with disruptive effects.

China leads in clean-tech manufacturing, thanks to the Made in China 2025 strategy launched in 2015. The continuation of substantial subsidy schemes has been questioned by analysts, however, as the growing government debt may be slowing down economic growth. This Scoreboard edition reports a slowdown in R&D growth in China for 2024. However, patenting trends show that innovation in China's clean-tech industry has come a long way from where it stood in 2015. With a shift in focus from domestic to international protection, the industry may already be mature enough to compete globally without government support.

In this chapter, Section 1 provides an update on global trends; Section 2 presents further insights on the patenting activity of EU Member States; Section 3 provides an update on the Scoreboard companies; and Section 4 provides a summary of the key points.

Box 4. Patenting trends: Methodology

We apply the methodology developed by the JRC to derive indicators on global inventions in clean energy technologies (Mountraki, Georgakaki, Ince and Primavera, 2025). This approach provides an analysis consistent with the monitoring of Research Innovation and Competitiveness for the Energy Union Governance, one of the pillars of the European Green Deal (European Commission, 2019), and the annual progress reports on competitiveness of clean energy technologies produced within this context (European Commission, 2025f). In addition, it is in line with, and thus connects, the R&D Investment Scoreboard with the work of the Strategic Energy Technology Plan (Mountraki et al., 2025) and the Clean Energy Technologies Observatory on related technologies (European Commission, 2025g). Patent data are retrieved from PATSTAT 2024 Autumn Edition. Data are partial for 2021 and very limited from 2022 onwards. Therefore, the analysis relies on 2020 data to report on absolute values or growth rates. For cumulative values or shares, such as the specialisation index, we include 2021 data where it does not introduce bias.

As data are not as complete from 2022 onwards; the analysis reports 2021 figures as the most recent available.

The analysis is restricted to Climate Change Mitigation Technologies (CCMTs) (CPC, 2025). CCMTs–referred to as green technologies in the context of this study–are identified through the Y02 scheme of the Cooperative Patent Classification (CPC). The selection of CCMTs relevant to **energy-intensive industries** (EIIs), is done through sub-categories of the Y02P section of the CPC scheme (Grassano et al., 2021). The selection of CCMTs relevant to **circular technologies** is made using relevant codes mainly from the Y02A and Y02W sections, focusing on reuse and recycling aspects of inventive activities (Grassano et al., 2022). Y02T subclasses enable the definition of clean **transport** technologies under CCMTs (Nindl et al., 2023). The selection of **twin (green and digital) technologies** consists of the Y02D and Y04S sections combined with Y02A, Y02B and Y02T sub-classes that contain digital elements (Ince and Georgakaki, 2025).

We use patent families as a proxy for inventions. Patent families include all documents relevant to a distinct invention, including applications to multiple jurisdictions and following regional, national and international routes. Statistics are produced for applicants (as the owners of the patent and, thus, directly financing R&D activities) considering applicants that are companies, universities and government non-profit organisations. In the case of multiple documents per invention, and when more than one applicant or technology code is associated with an application, fractional counting is used to proportion effort between applicants or technological areas, thus preventing multiple counting. An invention is termed international (also known as high-value) when it contains patent applications to more than one office, as this entails

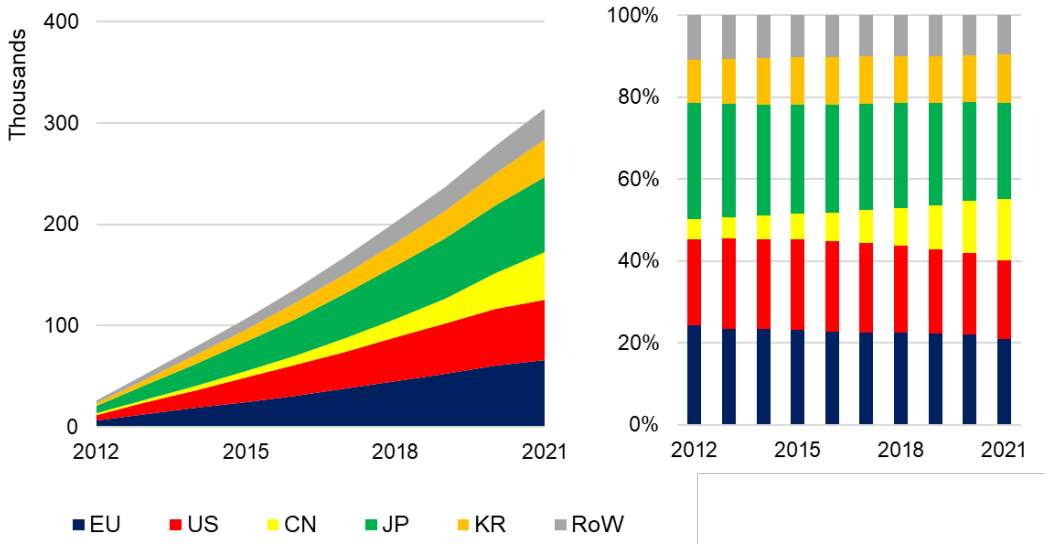
longer processes and higher costs and thus indicates a higher expectation of the prospects in international markets (Dechezleprêtre et al. 2011, 2015).

Fractional counting is also used to quantify international collaborations in patenting activity. Co-inventions are calculated based on a matrix of all combinations among co-applicants, for inventions that have been produced by at least two entities resident in two different countries. Shares of co-inventions in the same country are not considered.

6.1. The EU within global trends

In the period 2012-2021, the global share of international green inventions constituted around 12% of all international patenting activity. At the end of the period 2012-2021, Japan and the EU continued to lead in cumulative international green inventions followed by the US, both in absolute terms (**Figure 40** left) and as a share of international green patenting worldwide (24% and 21% respectively, **Figure 40** right). Shares of international green patenting have remained relatively stable within each portfolio for major economies, except for China. In the period 2012-2021, China's international green patent filings grew steadily every year, leading to an ever-growing share of worldwide international green patenting, starting from 5% and reaching 15% of the total.

Figure 40. International green inventions, cumulative trends by major economies in absolute numbers (left) and as a global share (right).



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

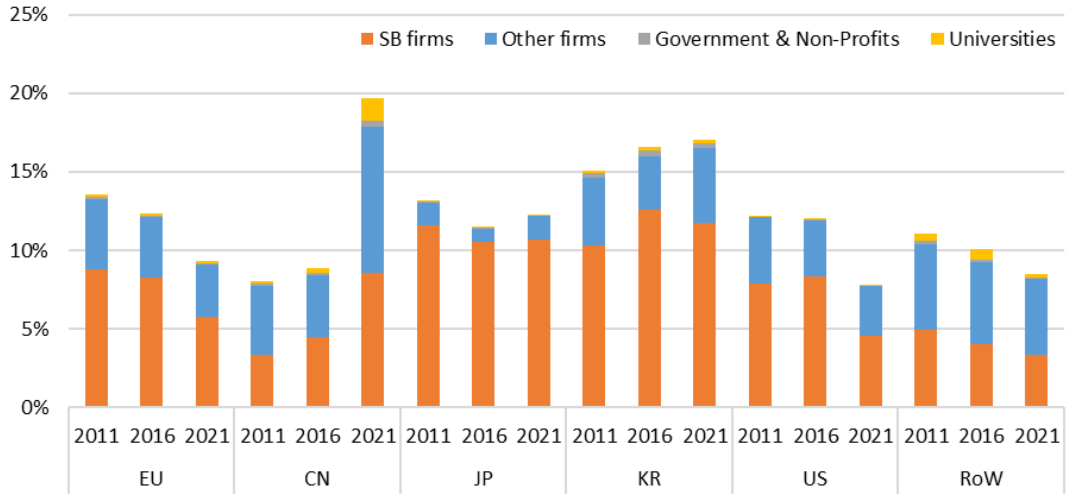
Figure 41 shows the annual share of green inventions in the international patent portfolio of each major economy. In the period 2011-2021, **South Korea and the EU had the highest green share**, on average, in their overall international patent portfolio, with 15% and 13%, respectively. However, the share declined in the EU and the US towards the end of the period, while remaining stable in Japan and increasing in South Korea and China. Since 2016, China's international patent portfolio has become steadily greener, reaching a share of around 20% of all its international fillings in 2021.

The share of Scoreboard companies in international green inventions continued its decline, reaching 60% in 2021 compared to 68% in 2019, as reported in the 2023 edition of the Scoreboard. In the EU, US and China, the contribution to green inventions was diverse, with many applicants from

outside the Scoreboard, whereas in Japan and South Korea, green inventions continued to come mainly from Scoreboard companies.

In **China**, **the contribution from universities** to international green inventions **is increasing**. In 2021, it reached 15%, notably higher than in other major economies. This may be due to the **state-led innovation policy**, 'Made in China 2025', which was launched in 2015, and differed from the market-led innovation policies of other major economies. It placed the **emphasis on key technologies**, boosted their public funding and aligned the innovation agenda of state-owned universities and the private sector.

Figure 41. International green inventions, as share of overall portfolio by applicant



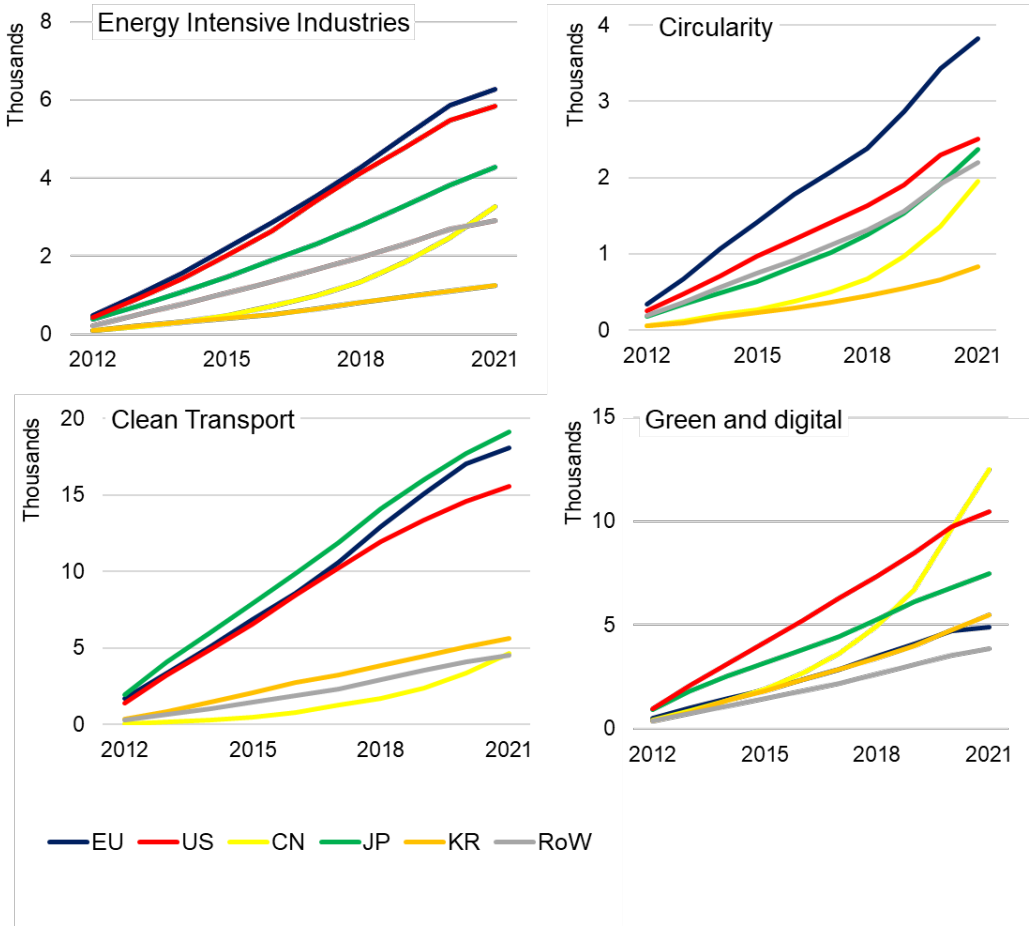
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

Figure 41 shows the cumulative figures for international patenting in key technologies. The position of the EU is stable, as reported in previous editions of the Scoreboard, and the annual growth rates of EU inventions across technological domains remain comparable, at around 18-19%. still leads in green patent filings for Energy Intensive Industries very closely followed by the US, both in cumulative and annual filings.

In 2020, the EU:

- still leads in green patent filings for energy-intensive industries, very closely followed by the US, in both cumulative and annual filings;
- has a clear and increasing lead in inventions for circularity in cumulative terms and still leads in annual filings, albeit with a smaller margin;
- is just behind the leader, Japan, in cumulative numbers for clean transport, and leads in annual filings; and
- is not gaining ground in green and digital inventions, where EU output seems to be stagnating.

Figure 42. Cumulative international green inventions for major economies



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

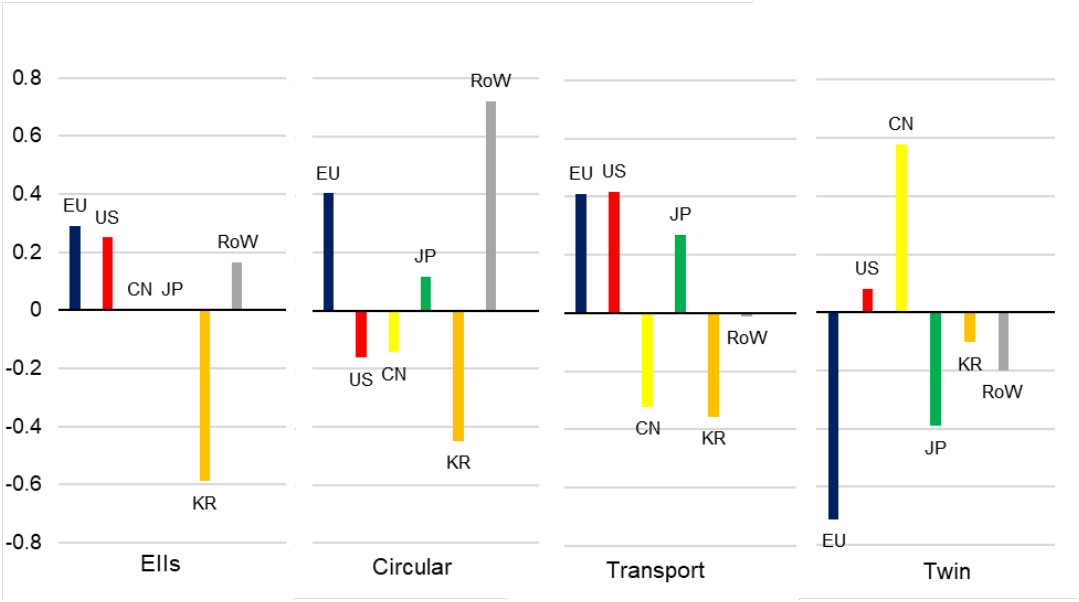
The **EU policy framework on circularity**, and continuous policy action, have provided a **strong incentive for innovation and a first mover advantage for the EU**. The EU continued to lead in circular inventions with the highest annual growth levels, while maintaining a narrow lead in EIIs and a strong position in clean transport.

Nonetheless, the increased prominence of China is also evident in these four technology areas. **China has overtaken the US as leader in green and digital technologies** and is increasing its performance more rapidly than others in the areas of circularity, energy-intensive industries and–to a lesser extent–clean transport. Although the cumulative values remain low, of the four key technology areas, clean transport is where China experienced its highest annual growth rate since 2016 (around 50%). Other notable trends are Japan's increased emphasis on circularity and the US's stagnating performance in clean transport.

In addition to the cumulative trends, the specialisation index assesses the relative technological advantage of each major economy in the four technology areas examined (**Figure 43**). The index is calculated as the share of international inventions in each of the key technologies in a country's international green patent portfolio, compared to the respective global average share. In 2021, consistent with the performance shown in **Figure 42**, **the EU was highly specialised in all key technologies except for the twin green and digital domain**. Although China's international green patenting is rapidly increasing in all four areas, China is only highly specialised in twin green

and digital technology. The US is specialised in international green inventions related to the energy-intensive industries and clean transport, together with the EU (and joined by Japan in clean transport). Unlike the EU and Japan, the US is not specialised in circular inventions but shows some specialisation in the twin domain.

Figure 43 Specialisation index in key technology areas by major economy (2021)

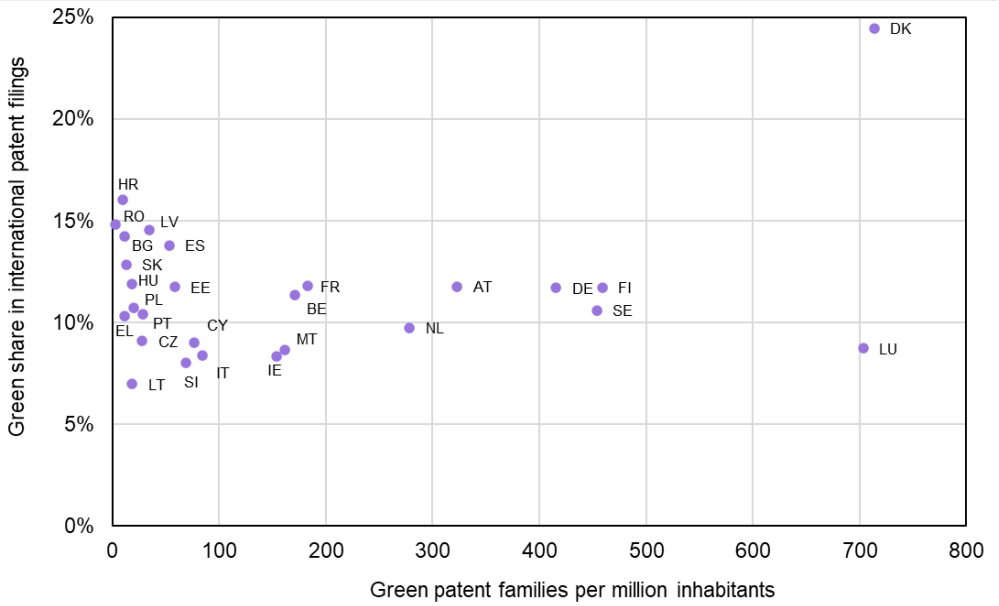


Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

6.2. EU Member States

Figure 44 shows the distribution of green inventions among the EU Member States in terms of the share of overall international patenting activity and the number of international inventions per million inhabitants. Over the period 2012-2021, the three innovation leaders, Denmark, Finland and Sweden, also led in international green inventions per capita. Luxembourg's positioning reflects its international tax rules, which attract many corporations to locate their headquarters there. Denmark has the highest share of green inventions in overall international patenting activity. Strong innovators, Germany and Austria, have more international green patents per capita than the innovation leader, Netherlands. Consistent with the findings in previous Scoreboard editions, the largest strong innovators, Germany and France, continued to have the highest number of international green patent inventions in absolute terms.

Figure 44. The EU Member States' international inventions in green tech (2012-2021)



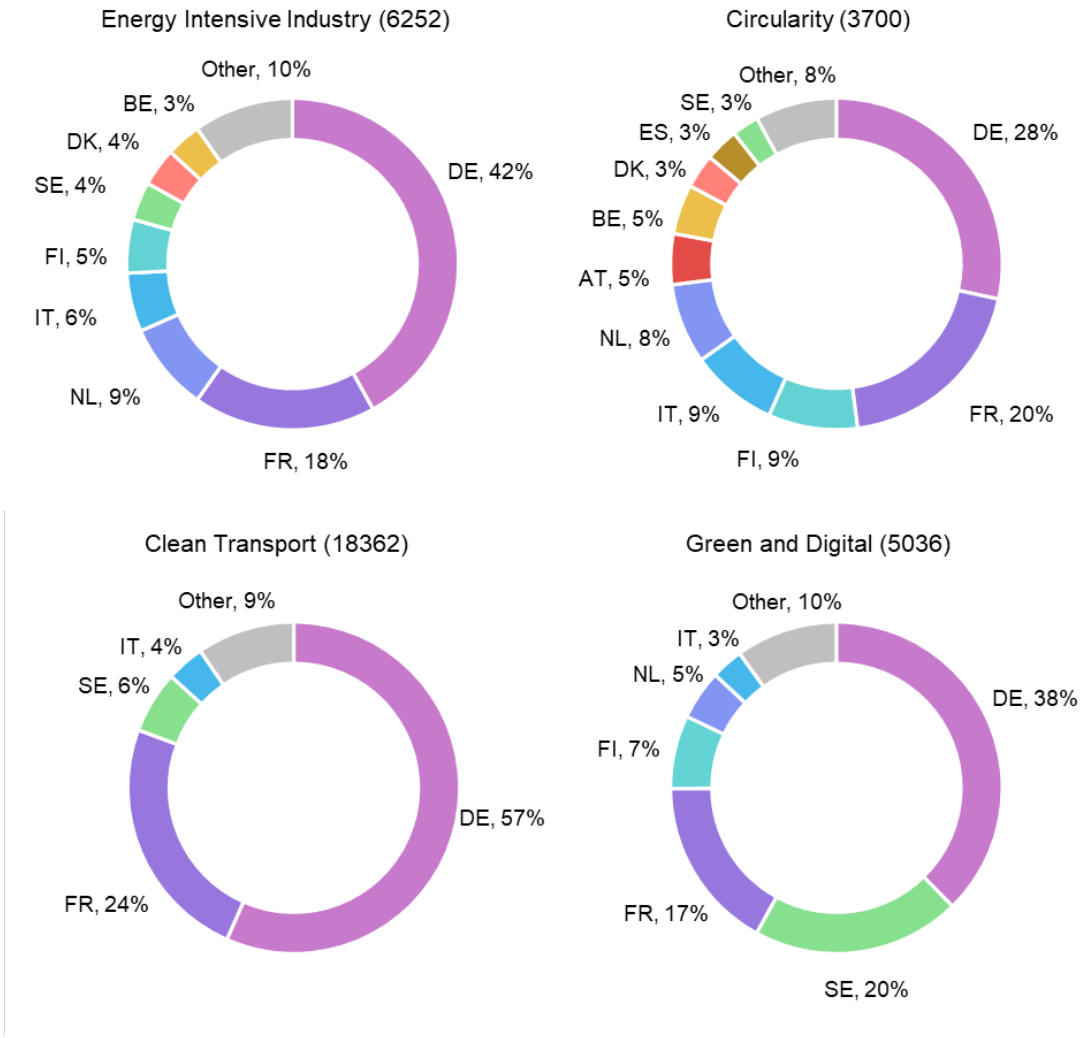
Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

Figure 45 shows the **contribution of EU Member States** to the EU international patent portfolio in key green technology areas. The largest strong innovators, Germany and France, were the two major contributors in all key technology areas except for the twin domain. In the **twin domain, an innovation leader, Sweden, takes second place after Germany**. As shown in Ince and Georgakaki (2025), Sweden, Ireland and Finland perform well, especially in specialisation in the twin domain. Sweden and Finland are innovation leaders with advanced technology industries and ambitions to lead in digital industry, combined with good infrastructure and strategies on greening their digital industries. Ireland is one of the strong innovators in the EU, and its global tech companies, coupled with a **supportive policy environment and a skilled workforce**, are enablers for specialisation[35].

The EU international patent portfolio is most diversified in circular technologies, with 10 Member States contributing 90% of output. Energy-intensive industry follows. The most concentrated technological domain is clean transport, where 90% of international patent filings come from just four EU Member States.

[35] The State of the Digital Decade 2025 report (COM (2025) 290 final), and its country outlooks.

Figure 45. Share of international inventions in key green technologies in the EU (2012-2021)

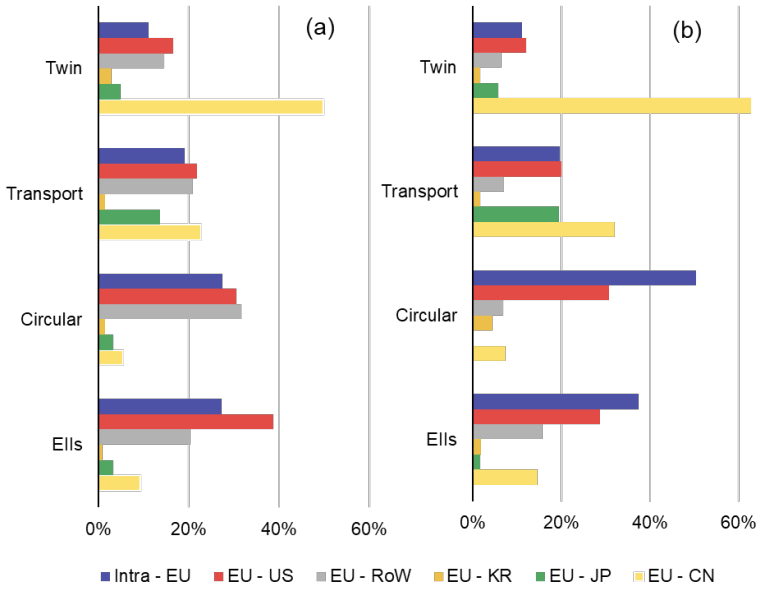


Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

Figure 46 shows the cooperation preferences of EU applicants in the four technology areas. In the period 2019-2021, **EU patent applicants cooperated primarily with the US** in international patenting related to EIIs, followed by intra-EU cooperation. Applicants from among EU Scoreboard companies cooperated more within the EU than with the US. There is also **substantial cooperation with China**, especially by EU Scoreboard applicants. In circular inventions, EU Scoreboard applicants tend to cooperate within the EU, and other EU applicants cooperate more often with external partners from the US and the rest of the world.

In clean transport and twin patenting, however, all types of **EU applicants cooperate primarily with China**. EU-US cooperation is the second highest in both technological domains. However, in the twin domain, cooperation with the US is only about a third of the level of cooperation with China across all EU applicants, and a fifth for EU Scoreboard applicants. Although the share of co-applications in overall patenting remains low, this could be interpreted as a shift in the EU's international cooperation from working with established US and domestic partners to engaging with newly emerging partners from China, which is highly specialised in this domain.

Figure 46. Co-applications for all EU applicants (a) vs EU Scoreboard companies (b) (2019-2021)



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

6.3. Scoreboard Companies

Table 40 shows the distribution of patenting activity in key green technology areas across the Scoreboard sectors in 2019-2021. **ICT hardware continued to lead in the Scoreboard green patenting** activity with a share of 31%, followed by the **automotive** sector with 22%.

Table 40. Share of international inventions in key technologies by ICB industries (2019-2021)

ICB Sectors	EIIs	Circular	Transport	Twin	CCMTs
Aerospace & defence	6%	0%	14%	1%	4%
Automotive	5%	5%	54%	9%	22%
Chemicals	14%	27%	2%	1%	7%
Construction	3%	4%	0%	0%	1%
Energy	12%	9%	1%	1%	4%
Financial	1%	3%	1%	0%	1%
Health	5%	2%	0%	1%	2%
ICT hardware	16%	8%	10%	65%	31%
ICT services	1%	1%	1%	12%	3%
Industrials	33%	32%	16%	3%	18%
Others	3%	8%	2%	7%	6%

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

Compared to the period 2016-2019, which was analysed in the 2023 Scoreboard, ICT producers increased their share in international green patenting by 1 percentage point, while the respective share for the automotive industry decreased by 4 percentage points. **Industrials is the top patenting sector** for international green inventions related to **energy-intensive industries**, followed by ICT hardware, the chemicals sector, and the energy sector. The industrials also lead in

circular inventions, followed by the chemicals sector and the energy industry. Not surprisingly, in clean transport technologies, the automotive sector shows the highest patenting effort while, in twin technologies, the ICT industries have the highest shares.

Table 41 shows the top patenting Scoreboard firms in terms of their international green patent portfolio sizes and shares in the key technology areas examined. Top international patenting firms in green inventions for energy intensive industries and circularity come from more diverse ICB industries than in clean transport and twin technologies. As discussed also in Ince and Georgakaki (2025), the ICT hardware sector is highly active in international patenting related to energy intensive industries. In circularity inventions, the industrials and chemicals sectors are the most prevalent both in terms of their portfolio sizes and green portfolio shares. As in the 2023 Scoreboard, the largest automotive companies continued to lead in the number of international patents in clean transport technologies while two aerospace & defence companies also join the rankings. For twin technologies, not surprisingly, firms from the ICT sectors are highly dominant both in terms of portfolio size and share.

In terms of EU champions on a global scale:

- In the energy-intensive industries, Siemens from Germany is the only EU company in the top 10 in terms of portfolio size, and Linde from Ireland in terms of portfolio share.
- In circularity, BASF is the only EU company in the top 10 in terms of volume of inventions, and UMICORE is the only EU company in the top 10 in terms of portfolio share.
- In clean transport, Volkswagen and Robert Bosch from Germany, along with Safran from France, are the only EU firms in the top 10 in terms of portfolio size. Safran is also in the top 10 in terms of green portfolio share, along with Vitesco Technologies from Germany.
- In twin green and digital, Sweden's Ericsson is among the top patent applicants in terms of portfolio size, while Eon from Germany is among the top 10 firms with the largest portfolio shares.

As discussed above and shown in **Figure 41**, the share of Scoreboard companies in international green inventions has declined in the EU. **Patents are instead being filed by a more diverse range of applicants**, whereas in Japan and South Korea, green inventions continue to come mainly from Scoreboard companies. Along with the rise in prominence of applicants from China, this may explain the scarcity of EU Scoreboard companies in the top 10, even in areas where the EU is in the lead.

The positioning of the EU Scoreboard companies can be further explored by looking at the top 50 international patent applicants in each key green technology. **EU Scoreboard companies lead in EIIs** in terms of the number of companies (16) in the top 50, followed by Japan (13) and US (11). Nonetheless, they have lower patenting levels than their US and Japan counterparts. This is in line with the fact that the share of EU Scoreboard companies in EII-related green patenting (around 56%) remains lower than the average contribution in overall green technologies.

Table 41. Scoreboard firms in the top 10 by volume of inventions and green portfolio share in key technology areas and their ICB industries (2019-2021)

	BY PATENT PORTFOLIO SIZES			BY PATENT PORTFOLIO SHARES		
Rank	Company	Industry	Inventions	Company	Industry	Share
EIIs						
1	HP (US)	ICT hardware	146	SUMITOMO METAL MINING (JP)	Industrials	23%
2	GENERAL ELECTRIC (US)	Industrials	141	EASTMAN CHEMICAL (US)	Chemicals	18%
3	JFE (JP)	Industrials	137	ROYAL DUTCH SHELL (UK)	Energy	17%
4	NIPPON STEEL (JP)	Industrials	101	JFE (JP)	Industrials	15%
5	SAUDI ARABIAN OIL (SA)	Energy	92	**LINDE (IE)**	**Chemicals**	15%
6	RTX (US)	Aerospace	91	EXXON MOBIL (US)	Energy	12%
7	MITSUBISHI HEAVY (JP)	Industrials	87	CHINA PETROLEUM & CHEMICAL	Energy	12%
8	SEIKO EPSON (JP)	ICT hardware	79	NIPPON STEEL (JP)	Industrials	9%
9	**SIEMENS (DE)**	**ICT hardware**	71	KOBE STEEL (JP)	Industrials	9%
10	CHINA PETRO & CHEM (CN)	Energy	64	ENEOS (JP)	Energy	9%
Circular						
1	JFE (JP)	Industrials	115	SUMITOMO METAL MINING (JP)	Industrials	32%
2	EASTMAN CHEMICAL (US)	Chemicals	89	EASTMAN CHEMICAL (US)	Chemicals	30%
3	CONTEMPORARY AMPEREX (CN)	ICT hardware	85	JFE (JP)	Industrials	13%
4	NIPPON STEEL (JP)	Industrials	69	SIKA (CH)	Chemicals	12%
5	SUMITOMO METAL MINING (JP)	Industrials	53	SK HOLDINGS (KR)	Chemicals	8%
6	MAMOURA DIVERSIFIED (AE)	Financial	50	**UMICORE (BE)**	**Industrials**	8%
7	DOW CHEMICAL (US)	Chemicals	50	MAMOURA DIVERSIFIED (AE)	Financial	7%
8	LG CHEM (KR)	Industrials	45	ENEOS (JP)	Energy	7%
9	FORMOSA PLASTICS (TW)	Industrials	39	POSCO (KR)	Industrials	7%
10	**BASF (DE)**	**Chemicals**	37	TOYOBO (JP)	Chemicals	7%
Transport						
1	TOYOTA MOTOR (JP)	Automotive	1211	ROLLS-ROYCE (UK)	Aerospace	40%
2	RTX (US)	Aerospace	751	GREAT WALL MOTOR (CN)	Automotive	36%
3	FORD MOTOR (US)	Automotive	660	FAW CAR (CN)	Automotive	34%
4	HONDA MOTOR (JP)	Automotive	594	**VITESCO TECHNOLOGIES (DE)**	**ICT hardware**	29%
5	**VOLKSWAGEN (DE)**	**Automotive**	580	**SAFRAN (FR)**	**Aerospace**	29%
6	**SAFRAN (FR)**	**Aerospace**	529	CUMMINS (US)	Industrials	27%
7	KIA MOTORS (KR)	Automotive	507	MAZDA MOTOR (JP)	Automotive	25%
8	HYUNDAI MOTOR (KR)	Automotive	506	BORGWARNER (US)	Automotive	23%
9	**ROBERT BOSCH (DE)**	**Automotive**	446	SUZUKI MOTOR (JP)	Automotive	22%
10	ROLLS-ROYCE (UK)	Aerospace	355	CRRC CHINA (CN)	Automotive	22%
Twin						
1	HUAWEI (CN)	ICT hardware	1395	ADVANCED MICRO DEVICES (US)	ICT hardware	17%
2	SAMSUNG ELECTRONICS (KR)	ICT hardware	666	XIAOMI (CN)	ICT hardware	15%
3	ZTE (CN)	ICT hardware	576	NARI TECHNOLOGY (CN)	ICT software	15%
4	QUALCOMM (US)	ICT hardware	563	CICT (CN)	ICT hardware	15%
5	LG ELECTRONICS (KR)	Others	517	INSPUR ELECTRONIC (CN)	ICT software	14%
6	XIAOMI (CN)	ICT hardware	432	ZTE (CN)	ICT hardware	13%
7	SILERGY (CN)	ICT hardware	372	**E.ON (DE)**	**Energy**	11%
8	INTEL (US)	ICT hardware	313	SILERGY (CN)	ICT hardware	10%
9	NTT (JP)	ICT software	282	INVENTEC (TW)	ICT hardware	9%
10	**ERICSSON (SE)**	**ICT hardware**	262	WINBOND (TW)	ICT hardware	8%

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG RTD.

Although the EU leads in patenting in **circular inventions**, EU Scoreboard companies do not focus on this technology area as such. **The share of EU Scoreboard companies in EU circular inventions remain low**, at around 53%. **Japan leads** in patenting levels (more than triple those of the EU Scoreboard companies) and in the number of companies (22) in the top 50, which includes 9 EU and 6 US Scoreboard companies.

In **clean transport**, the EU Scoreboard companies account for 82% of all EU patenting activity in this domain. Japan leads the rankings for the Scoreboard top 50, both in terms of number of companies (15) and international patenting levels. The top 50 includes 14 EU companies, which have the second highest level of international patenting. This is consistent with activity being more concentrated in Scoreboard companies in this technology area, both in Japan and the EU, which also share the lead in filings. The automotive industry leads in all major economies except for China, where ICT producers patent the most.

In **twin** inventions, as for the top 10, **only one in ten companies in the top 50 come from the EU**. EU patenting only constitutes 7% of the top 50 sample, even though EU activity is highly concentrated around the (leading) EU Scoreboard companies, which account for 73% of EU patenting in the domain. Japan leads in the number of companies in the top 50 which include automotive companies along with ICT producers and ICT services. Nonetheless, as in the overall rankings and in the top 10, the 11 Chinese ICT producers and ICT service companies in the top 50 lead in terms of patenting activity.

6.4. Key points

- At the end of the period 2012-2021, Japan and the EU continued to lead in cumulative international green inventions. While China was still behind in terms of cumulative inventions, in terms of annual filings, all indications are that it will already have surpassed other major economies.
- The share of Scoreboard companies in international green inventions continued to decline. While Scoreboard applicants still account for 60% of the international green portfolio, the mix of firms is becoming more diverse.
- In terms of the four key technology areas, the EU:
  - still led in green patent filings for the **energy-intensive industries** and **circularity**, both in cumulative and annual filings;
  - was just below the leader, Japan, in cumulative numbers for **clean transport**, but had more annual filings; and
  - was not gaining ground in **green and digital inventions**, with stagnating output.
- In terms of distribution across Member States, the EU international patent portfolio is most diversified in circularity and most concentrated in clean transport technologies. Germany and France are major contributors in most areas.
- EU Scoreboard companies, mainly from Germany, continued to feature in the top 10 in all key technologies, both in terms of portfolio sizes and green portfolio shares.
- EU activity is spread across a larger number of performers, within and beyond the Scoreboard. In terms of Scoreboard companies in the top 50, the EU leads in EIIs and is second to Japan in clean transport. EU leadership in the circular domain is not reflected through champions in the Scoreboard, but EU activity in the green and digital domain is very much concentrated among Scoreboard companies; the latter is also true for clean transport.

References

Aka, H. (2025). *Tip of the Iceberg: Understanding the Full Depth of Big Tech's Contribution to US Innovation and Competitiveness*. https://itif.org/publications/2025/10/06/tip-of-the-iceberg-understanding-big-techs-contribution-us-innovation-competitiveness/

Akcigit, U., & Ates, S. T. (2021). Ten Facts on Declining Business Dynamism and Lessons from Endogenous Growth Theory. *American Economic Journal: Macroeconomics*, *13*(1), 257–298. https://doi.org/10.1257/mac.20180449

Akcigit, U., & Ates, S. T. (2023). What Happened to US Business Dynamism? *Journal of Political Economy*, *131*(8), 2059–2124. https://doi.org/10.1086/724289

Alphabet (2024), 'Alphabet Inc. Form 10-K', 31 December 2024, https://abc.xyz/assets/77/51/9841ad5c4fbe85b4440c47a4df8d/goog-10-k-2024.pdf

Amazon (2025), Amazon Science website, https://www.amazon.science/, accessed 17 November.2025

Amazon (2025b), Amazon Web Services website, https://aws.amazon.com/, accessed 17 November.2025

Amoroso, S., Aristodemou, L., Criscuolo, C., Dechezleprete, A., Dernis, H., Grassano, N., Moussiegt, L., Napolitano, L., Nawa, D., Squicciarini, M., & Tuebke, A. (2021). *World Corporate Top R&D investors: Paving the way for climate neutrality*. JRC Publications Repository. https://doi.org/10.2760/49552

Astrazeneca (2025), Astrazeneca official website, https://www.astrazeneca.com/r-d.html, accessed 17 November.2025

Autor, D., Dorn, D., Katz, L. F., Patterson, C., & Van Reenen, J. (2020). The Fall of the Labor Share and the Rise of Superstar Firms. *The Quarterly Journal of Economics*, *135*(2), 645–709. https://doi.org/10.1093/qje/qjaa004

Belitz, H., & Lejpras, A. (2021). *R&D Internationalization Strategies of the World's Top Corporate R&D Investors* (DIW Discussion Papers, No. 1942). Deutsches Institut für Wirtschaftsforschung (DIW). https://doi.org/10.2139/ssrn.3834997

Berger, M., Calligaris, S., Greppi, A., & Kirpichev, D. (2025). Acquisitions and their effect on start-up innovation. *OECD Science, Technology and Industry Working Papers*, *2025*(10). https://doi.org/10.1787/b4efd3ab-en

Braguinsky, S., Choi, J., Ding, Y., Jo, K., & Kim, S. (2023). *Mega Firms and Recent Trends in the U.S. Innovation: Empirical Evidence from the U.S. Patent Data*. NBER WORKING PAPER SERIES.

Brenda Goh, Che Pan (2025), 'China's Huawei hypes up chip and computing power plans in fresh challenge to Nvidia', 18 September, 2025, https://www.reuters.com/business/media-telecom/chinas-huawei-hypes-up-chip-computing-power-plans-fresh-challenge-nvidia-2025-09-18/

Broadcom (2025), Broadcom official website, www.broadcom.com, accessed 17 November 2025

Bureau of Economic Analysis (2025), 'Activities of U.S. Multinational Enterprises (MNEs)', August 2025, accessed 28 August 2025, https://www.bea.gov/data/intl-trade-investment/activities-us-multinational-enterprises-mnes

Business Insider (2024), 'Verily has a December deadline to cut important ties with Google, leaked documents show', 18 November 2024, https://www.businessinsider.com/verily-leave-google-alphabet-flywheel-life-sciences-2024-11#:~:text=Verily%2C%20Alphabet's%20life%20sciences%20subsidiary,documents%20reviewed%20by%20Business%20Insider

China Power (2023), 'Are Patents Indicative of Chinese Innovation?', 15 February 2016, updated 16 August 2023, accessed 5 June 2025, https://chinapower.csis.org/patents/

Confraria, H., Grassano, N., Moncada, P. C. P., & Nindl, E. (2024). *The impact of the EU Industrial R&D Investment Scoreboard in Science and Policy*. (JRC139008). JRC Publications Repository. https://publications.jrc.ec.europa.eu/repository/handle/JRC139008

CPC (2025), 'CPC Scheme and Definitions', accessed 17 May 2025, https://www.cooperativepatentclassification.org/cpcSchemeAndDefinitions

Czarnitzki, D., & Confraria, H. (2025). *R&D productivity: Are ideas harder to find or does Europe suffer from a commercialization gap?* (JRC141091). JRC Publications Repository. https://publications.jrc.ec.europa.eu/repository/handle/JRC141091

Dachs, B., & Zahradnik, G. (2022). From few to many: Main trends in the internationalization of business R&D. *Transnational Corporations*, *29*(1), 107–134. https://doi.org/10.18356/2076099x-29-1-4

Dachs, B., Amoroso, S., Castellani, D., Papanastassiou, M., & von Zedtwitz, M. (2024). The internationalisation of R&D: Past, present and future. *International Business Review*, *33*(1), 102191. https://doi.org/10.1016/j.ibusrev.2023.102191

De Loecker, J., Obermeier, T., & Van Reenen, J. (2024). Firms and inequality. *Oxford Open Economics*, *3*, i962–i982. https://doi.org/10.1093/ooec/odad097

De Ridder, M. (2024). Market Power and Innovation in the Intangible Economy. *American Economic Review*, *114*(1), 199–251. https://doi.org/10.1257/aer.20201079

Dechezleprêtre, A., Glachant, M., Haščič, I., Johnstone, N., & Ménière Y. (2011). *Invention and Transfer of Climate Change–Mitigation Technologies: A Global Analysis*, Review of Environmental Economics and Policy, 5 (11), 109–130, https://doi.org/10.1093/reep/req023

Dechezleprêtre, A., Haščič, I, & Johnstone, N (2015). *Invention and International Diffusion of Water Conservation and Availability Technologies: Evidence from Patent Data*, OECD Environment Working Papers, No. 82, OECD Publishing, Paris, https://doi.org/10.1787/5js679fvllhg-en.

Delis, F., Delis, M. D., Laeven, L., & Ongena, S. (2025). Global evidence on profit shifting within firms and across time. *Journal of Accounting and Economics*, *79*(2), 101744. https://doi.org/10.1016/j.jacceco.2024.101744

Dernis, H., Dosso, M., Hervas, S. F., Millot, V., Squicciarini, M., & Vezzani, A. (2015). *World Corporate Top R&D Investors: Innovation and IP bundles*. JRC Publications Repository. https://doi.org/10.2791/64121

Domnick, C., Hervas, S. F., Gavigan, J., Moncada, P. C. P., & Rentocchini, F. (2023). *A resilient, competitive, fair and sustainable EU: Industrial Innovation for Open Strategic Autonomy*. JRC Publications Repository. https://publications.jrc.ec.europa.eu/repository/handle/JRC136221

Draghi, M. (2024). *The future of European competitiveness. Part A: A competitiveness strategy for Europe.* European Commission. https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en

Dushnitsky, G., & Lenox, M. J. (2006). When does corporate venture capital investment create firm value? *Journal of Business Venturing*, *21*(6), 753–772. https://doi.org/10.1016/j.jbusvent.2005.04.012

European Commission (2019), 'Factsheets on the European Green Deal', 11 December 2019, accessed on 7 October 2025, https://commission.europa.eu/publications/factsheets-european-green-deal_en

ECB (2025). *Survey on the Access to Finance of Enterprises in the euro area—Third quarter of 2025*. European Central Bank. https://www.ecb.europa.eu/stats/ecb_surveys/safe/html/ecb.safe202510.en.html

European Commission (2025), 'A competitiveness Compass for the EU', COM(2025) 30 final, 29.01.2025, https://commission.europa.eu/topics/competitiveness/competitiveness-compass_en.

European Commission (2025b): Directorate-General for Economic and Financial Affairs, 'European Economic Forecast (incl. Statistical Annex). Autumn 2025', 17 November 2025, https://doi.org/10.2765/2173364

European Commission (2025c): Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, *Small mid-caps – Helping Europe's growing businesses*, Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2873/4668568

European Commission (2025d), 'Commission recommendation of 21.05.2025 on the definition of small mid-cap enterprises', C(2025) 3500 final, 21.05.2025, https://eur-lex.europa.eu/resource.html?uri=cellar:87780c67-365f-11f0-8a44-01aa75ed71a1.0018.02/DOC_1&format=PDF .

European Commission (2025e): Directorate-General for Research and Innovation, *European Innovation Scoreboard 2025*, Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2777/3239776

European Commission (2025f): Directorate-General for Energy, 'Clean energy competitiveness' 14 September 2025, https://energy.ec.europa.eu/topics/research-and-technology/clean-energy-competitiveness_en

European Commission (2025g): Joint Research Centre, 'Clean Energy Technology Observatory' 14 September 2025, https://setis.ec.europa.eu/publications-and-documents/clean-energy-technology-observatory_en

European Commission. Directorate General for Research and Innovation., NIFU., AIT., IRCRES., & SPRU. (2017). *Internationalisation of business investments in research and development and analysis of their economic impact (BERD Flows): Final report.* Publications Office. https://data.europa.eu/doi/10.2777/888034

European Investment Bank & European Policy Centre. (2024). *Hidden champions, missed opportunities: Mid caps' crucial roles in Europe's economic transition*. European Investment Bank. https://data.europa.eu/doi/10.2867/575876

Eurostat (2024), 'Statistics explained. Category: Globalisation of businesses. Foreign-controlled enterprise statistics FATS', accessed 28 August 2025, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Category:Globalisation_of_businesses

Eurostat (2025), 'National accounts and GDP' June 2025, accessed 2 October 2025, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=National_accounts_and_GDP

Financial Times (2025), 'AI-developed drug will be in trials by year-end, says Google's Hassabis', 21 January, 2025, https://www.ft.com/content/41b51d07-0754-4ffd-a8f9-737e1b1f0c2e

Gavigan, J., Fako, P., & Compano, R. (2024). *Corporate Venture Capital in the Automotive Sector*. JRC Publications Repository. https://publications.jrc.ec.europa.eu/repository/handle/JRC139326

GGBA (2025), 'Key industries: Life Sciences. A tradition of progress', accessed 12 September 2025, https://ggba.swiss/en/key-industries/life-sciences/

Grassano, N., Hernandez Guevara, H., Fako, P., Tuebke, A., Amoroso, S., Georgakaki, A., Napolitano, L., Pasimeni, F., Rentocchini, F., Compaño, R., Fatica, S. & Panzica, R. (2021). *The 2021 EU Industrial R&D Investment Scoreboard*, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2760/559391

Grassano, N., Hernandez, G. H., Fako, P., Nindl, E., Georgakaki, A., Ince, E., Napolitano, L., Rentocchini, F. & Tuebke, A. (2022). *The 2022 EU Industrial R&D Investment Scoreboard*. JRC Publications Repository. https://doi.org/10.2760/485748

Gugler, K., Szücs, F., & Wohak, U. (2025). Start-up acquisitions, venture capital and innovation: A comparative study of Google, Apple, Facebook, Amazon and Microsoft. *International Journal of Industrial Organization*, *99*, 103148. https://doi.org/10.1016/j.ijindorg.2025.103148

Hall, B. H. (2011). The internationalization of R&D. *MERIT Working Papers*, Article 2011–049. https://ideas.repec.org//p/unm/unumer/2011049.html

Haskel, J., & Westlake, S. (2017). *Capitalism without Capital: The Rise of the Intangible Economy*. Princeton University Press. https://press.princeton.edu/books/hardcover/9780691175034/capitalism-without-capital

Hirschey, M., Skiba, H., & Wintoki, M. B. (2012). The size, concentration and evolution of corporate R&D spending in U.S. firms from 1976 to 2010: Evidence and implications. *Journal of Corporate Finance*, *18*(3), 496–518. https://doi.org/10.1016/j.jcorpfin.2012.02.002

Huawei (2025), Huawe official website, www.huawei.com, accessed 17 November.2025

Ince, E. and Georgakaki, A. (2025), *Green and digital patenting of Industrial R&D Investment Scoreboard firms* (JRC142597), European Commission, Petten (the Netherlands), JRC Publications Repository.

International Monetary Fund (2025), 'World Economic Outlook: Global Economy in Flux, Prospects Remain Dim.' Washington, DC. October

Kuemmerle, W. (1999). Foreign direct investment in industrial research in the pharmaceutical and electronics industries—Results from a survey of multinational firms. *Research Policy*, *28*(2), 179–193. https://doi.org/10.1016/S0048-7333(98)00110-3

Martinez Cillero, M., Napolitano, L., Rentocchini, F., Seri, C., & Zaurino, E. (2025). *M&As, Innovation and Superstar Firms* (JRC143362). JRC Publications Repository. https://publications.jrc.ec.europa.eu/repository/handle/JRC143362

Merck (2025), Merck & Co. Inc official website, https://www.merck.com/research, accessed 17 November.2025

Meta (2025), Meta official website, www.meta.com, accessed 17 November.2025

Microsoft (2025), Microsoft official website, www.microsoft.com, accessed 17 November.2025

Mountraki, A., Georgakaki, A., Ince, E. and Primavera (2025), J. R&I data for SETIS and the State of the Energy Union Report, European Commission, JRC135385. http://data.europa.eu/89h/jrc-10115-10001

Nindl, E. (2022). *The 2022 EU Survey on Industrial R&D Investment Trends*. JRC Publications Repository. https://doi.org/10.2760/579174

Nindl, E., Confraria, H., Rentocchini, F., Napolitano, L., Georgakaki, A., Ince, E., Fako, P., Tuebke, A., Gavigan, J., Hernandez, H., Pinero Mira, P., Rueda Cantuche, J., Banacloche Sanchez, S., De Prato, G., & Calza, E. (2023). *The 2023 EU Industrial R&D Investment Scoreboard | IRI*. Publications Office of the European Union. https://iri.jrc.ec.europa.eu/scoreboard/2023-eu-industrial-rd-investment-scoreboard

Nindl, E., Napolitano, L., Confraria, H., Rentocchini, F., Fako, P., Gavigan, J., & Tuebke, A. (2024). *The 2024 EU Industrial R&D Investment Scoreboard*. Publications Office of the European Union. https://doi.org/10.2760/0775231

Nvidia (2025), Nvidia official website, The news items used are follows: Galaxy AI: The Journey of Innovation, The Learning Curve, Part 8: Creating Conversations From Japan to the World, Galaxy AI is Coming to New Galaxy Watch for More Motivational Health, www.nvidia.com, accessed 17 November.2025

OECD (2008). *The Internationalisation of Business R&D* (OECD Publishing). https://www.oecd.org/en/publications/the-internationalisation-of-business-r-d_9789264044050-en.html

OECD (2015). *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development* (The Measurement of Scientific, Technological and Innovation Activities). OECD Publishing. https://www.oecd.org/en/publications/frascati-manual-2015_9789264239012-en.html

OECD (2024), 'Activity of Multinational Enterprises', accessed 11 July 2025, https://www.oecd.org/en/data/datasets/activity-of-multinational-enterprises.html

OECD (2025), 'OECD Economic Outlook, Interim Report September 2025: Finding the Right Balance in Uncertain Times', OECD Publishing, Paris, https://doi.org/10.1787/67b10c01-en.

OECD (2025b). *OECD Financing SMEs and Entrepreneurs Scoreboard: 2025 Highlights* (67; OECD SME and Entrepreneurship Papers). OECD Publishing. https://www.oecd.org/en/publications/oecd-financing-smes-and-entrepreneurs-scoreboard-2025-highlights_64c9063c-en.html

Papanastassiou, M., Pearce, R., & Zanfei, A. (2020). Changing perspectives on the internationalization of R&D and innovation by multinational enterprises: A review of the literature. *Journal of International Business Studies*, *51*(4), 623–664. https://doi.org/10.1057/s41267-019-00258-0

Reuters (2024), 'AI firm Nebius, split from Russia's Yandex, gains in volatile Nasdaq debut', 21 October 2024, accessed 1 September 2025, https://www.reuters.com/technology/artificial-intelligence/investors-expect-volatile-nasdaq-return-ai-firm-split-russias-yandex-2024-10-21/

Rezende, L. de A., Bansi, A. C., Alves, M. F. R., & Galina, S. V. R. (2019). Take your time: Examining when green innovation affects financial performance in multinationals. *Journal of Cleaner Production*, *233*, 993–1003. https://doi.org/10.1016/j.jclepro.2019.06.135

Samsung (2025), Samsung Newsroom at https://news.samsung.com/global/, accessed 17 November.2025

Schwartz, A., Yavorsky, N. D., Osborn, M., & Zhao, S. (2025). *Trends in Large Corporate Bankruptcy and Financial Distress* [Midyear 2025 Update]. Cornerstone Research. https://www.cornerstone.com/insights/collections/trends-in-large-corporate-bankruptcy-and-financial-distress/

Sifma (2025), 'Capital Markets Fact Book', Sifma website, 28 July 2025, accessed 15 October 2025, https://www.sifma.org/resources/research/statistics/fact-book/

Sommer, D. (2021). *Internationalization of Research & Development and Host-Country Patenting* [PhD Thesis, University of Hohenheim]. https://hohpublica.uni-hohenheim.de/handle/123456789/6668

Szücs, F. (2020). Do research subsidies crowd out private R&D of large firms? Evidence from European Framework Programmes. *Research Policy*, *49*(3), 103923. https://doi.org/10.1016/j.respol.2020.103923

Thursby, J., & Thursby, M. (2006). *Here or There?: A Survey of Factors in Multinational R&D Location—Report to the Government-University-Industry Research Roundtable*. National Academies Press. https://doi.org/10.17226/11675

Timothy Prickett Morgan (2025), "Broadcom Lands Shepherding Deal For OpenAI "Titan" XPU", 5 September, 2025, https://www.nextplatform.com/2025/09/05/broadcom-lands-shepherding-deal-for-openai-titan-xpu/

TNO Vector (2024). R&D Top 3, accessed 27 August 2025, https://www.tno.nl/publish/pages/12097/tw_r_d_top_30_poster_a3_2024_def.pdf

Tuebke, A., Hervas, S. F., Grassano, N., & Potters, L. (2016). *The 2016 EU Survey on Industrial R&D Investment Trends*. JRC Publications Repository. https://doi.org/10.2791/66974

World Bank (2025), 'GDP growth (annual %), 2025, accessed 2 October 2025, https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG

Worldcrunch (2014), 'Inside Google's Largest Non-U.S. Office – in Zurich', 15 September 2014, accessed on 12 September 2025, https://worldcrunch.com/business-finance/inside-google039s-largest-non-us-office-in-zurich/

Yashashree Vivarekar (2025), ”Alphabet Q2 2025 Financial Results Analysis – market brief”, August 2025, https://aimresearch.co/market-briefs/alphabet-q2-2025-financial-results-analysis

List of abbreviations and definitions

Abbreviations	Definitions
AI	Artificial intelligence
CAGR	Compound annual growth rate
CVC	Corporate venture capital
DD	Digital Decade
DG RTD	European Commission, Directorate General for Research and Innovation
EV	Electric vehicle
EC	European Commission
ECB	European Central Bank
EIC	European Innovation Council
EIS	European Innovation Scoreboard
ERA	European Research Area
EU	European Union
GAFAM	Big tech companies (Google, now known as Alphabet, Amazon, Facebook, now known as Meta, Apple, and Microsoft)
HE	Horizon Europe
ICT	Information and communication technology
IMF	International Monetary Fund
JRC	European Commission, Joint Research Centre
KPI	Key performance indicator
M&A	Mergers & acquisitions
MFF	Multiannual financial framework (long-term EU budget & Next Generation EU)
MNE	Multinational enterprise
OECD	Organisation for Economic Co-operation and Development
R&D	Research & development
R&D&I	Research, development and innovation
R&I	Research & innovation
ROW	Rest of the world
Scoreboard	EU Industrial R&D Investment Scoreboard
SME	Small and medium-sized enterprise
TT	Technology Transfer
UK	United Kingdom
US	United States of America
VC	Venture Capital
WIPO	World Intellectual Property Organisation

List of boxes

List of figures

List of tables

Annexes

Annex 1. General information on the Scoreboard

Investment in research and innovation is at the core of the EU policy agenda. The Europe 2020 growth strategy includes the Innovation Union flagship initiative[36] with a 3 % headline target for intensity of R&D. R&D investment from the private sector plays also a key role for other relevant European initiatives such as the Industrial Policy[37], Digital Agenda and New Skills for New Jobs flagship initiatives.

The project 'Global Industrial Research & Innovation Analyses' (GLORIA)[38] supports policymakers in these initiatives. The Scoreboard, as part of the GLORIA project, aims to improve the understanding of trends in R&D investment by the private sector. The Scoreboard identifies main industrial players in key industrial sectors, analyse their R&D investment and economic performance and benchmark EU companies against their global competitors.

This report monitors and analyses the company data and provides additional information on the positioning of Scoreboard companies in relation to other key indicators of relevance for industrial innovation policy. The annual publication of the Scoreboard intends to raise awareness of the importance of R&D for businesses and to encourage firms to disclose information about their R&D investments and other intangible assets.

The data for the Scoreboard are taken from companies' publicly available and audited accounts. As in more than 99% of cases these accounts do not include information on the place where R&D is actually performed, the company's whole R&D investment in the Scoreboard is attributed to the country in which it has its registered headquarter. This should be borne in mind when interpreting the level classifications and analyses.

The Scoreboard's approach is, therefore, fundamentally different from that of statistical offices or the OECD when preparing business enterprise expenditure on R&D data, which are specific to a given territory. The R&D financed by business sector in a given territorial unit (BES-R&D) includes R&D performed by all sectors in that territorial unit. **Therefore, the Scoreboard R&D figures are comparable to BES-R&D data only at the global level.**

The Scoreboard data are of interest for those concerned with private sector R&D investments and positioning and benchmarking company commitments and performance (e.g. companies, investors and policymakers). BES-R&D data are primarily used by economists, governments and international organisations interested in the R&D performance of territorial units defined by political boundaries.

---

[36] The Innovation Union flagship initiative aims to strengthen knowledge and innovation as drivers of future growth by refocusing R&D and innovation policies for the main challenges society faces.

[37] The Industrial Policy for the Globalisation Era flagship initiative aims to improve the business environment, notably for small and medium-sized enterprises, and support the development of a strong and sustainable industrial foundation for global competition.

[38] GLORIA builds on the IRIMA project (Industrial Research and Innovation Monitoring and Analysis). See: http://iri.jrc.ec.europa.eu/home /. The activity is undertaken jointly by the Directorate General for Research & Innovation (DG R&I E; see: http://ec.europa.eu/research/index.cfm?lg=en) and the Joint Research Centre, Directorate B. Fair and Sustainable Economy (JRC-Seville; see: https://ec.europa.eu/jrc/en/science-area/innovation-and-growth).

The two approaches are therefore complementary. The methodological approach of the Scoreboard, its scope and limitations are further detailed in Annex 2 below.

Scope and target audience

The Scoreboard is a benchmarking tool which provides up-to-date information on corporate R&D investment and other financial data, with a unique EU-focus. The 2 000 companies listed in this year's Scoreboard account for over 90% of worldwide R&D funded by the business enterprise sector and the Scoreboard data refer to a more recent period than the latest available official statistics. Furthermore, the dataset is extended to cover the top 800 R&D investing companies in the EU.

The data in the Scoreboard, published since 2004, allow long-term trend analyses, for instance, to examine links between R&D and business performance.

The Scoreboard is aimed at three main audiences.

- **Policymakers, government and business organisations** can use R&D investment information as an input to industry and R&D assessment, policy formulation or other R&D-related actions such as R&D tax incentives.
- **Companies** can use the Scoreboard to benchmark their R&D investments and so find where they stand in the EU and in the global industrial R&D landscape. This information could be of value in shaping business or R&D strategy and in considering potential mergers and acquisitions.
- **Researchers, investors, and financial analysts** can use the Scoreboard to assess investment opportunities and risks, as well as analyse investment trends.

The Scoreboard dataset has been made freely accessible to encourage further economic and financial analyses and research by any interested parties. See https://iri.jrc.ec.europa.eu/data

Annex 2. Methodological notes

Data collection process

The data for the 2025 Scoreboard have been collected from companies' annual reports and accounts by Alepro Data Consulting. Potential R&D investing companies were identified using past Scoreboard editions (and the related data set published in 2024), a search in the Orbis flatfile (Bureau van Dijk – A Moody's Analytics Company), direct company contacts, patent filings and scientific publications involving companies. Each firm's annual reports were searched for figures on R&D expenditure, additions to intangible assets, amortisation/ depreciation/impairments, grants, R&D funded by third parties, restructuring costs, R&D expenditure from discontinued operations, engineering costs, net sales, capital expenditures, operating profits and employment. Data on market capitalisation was taken from the Orbis data base directly. The source documents, annual reports and accounts, are public domain documents, allowing independent replication of the Scoreboard. All data is consistent with previous Scoreboard editions.

Main characteristics of the data

The data correspond to companies' latest published accounts, intended to be their 2024 fiscal year accounts, although due to different accounting practices throughout the world, they also include accounts ending on a range of dates between late 2024 and mid-2025. Furthermore, the accounts of some companies are publicly available more promptly than others. Therefore, the current set

represents a heterogeneous set of timed data. However, around 70% of companies closed their accounts in December 2024.

In order to avoid double counting, the consolidated group accounts of the ultimate parent company are used. Companies which are subsidiaries of another company are not listed separately. Where consolidated group accounts of the ultimate parent company are not available, subsidiaries are included.

In the case of a demerger, the full history of the continuing entity is included. The history of the demerged company can only go back as far as the date of the demerger to avoid double counting of figures. In case of an acquisition or merger, pro forma figures for the year of acquisition are used along with pro-forma comparative figures if available.

The R&D investment included in the Scoreboard is calculated as the cash investment which is funded by the companies themselves. It excludes R&D undertaken under contract for customers such as governments or other companies. It also excludes the companies' share of any associated company or joint venture R&D investment when disclosed. However, it includes research contracted out to other companies or public research organisations, such as universities. Where part or all of R&D costs have been capitalised, the additions to the appropriate intangible assets are included to calculate the cash investment and any amortisation eliminated.

More precisely, R&D investment is calculated as the R&D expenditure adjusted for additions to intangible assets, amortisation/depreciation/impairments (subtraction), grants (subtraction), R&D funded by third parties (subtraction), restructuring costs (subtraction), R&D expenditure from discontinued operations (addition), engineering costs (subtraction), and other costs (subtraction). However, if firms do not publish this information, R&D expenditure is taken at face value. Note that ca. only one third of the companies published these data in their annual reports.

Companies are allocated to the country of their registered office. In some cases, this is different from the operational or R&D headquarters. This means that the results are independent of the actual location of the R&D activity.

Companies are assigned to industry sectors according to the NACE Rev. 2[39] and the ICB (Industry Classification Benchmark). In the Scoreboard report we use different levels of sector aggregation, according to the distribution of companies' R&D and depending on the issues to be illustrated.

Limitations

Users of the Scoreboard data should take into account the methodological limitations, especially when performing comparative analyses (see Box A1 below)

The Scoreboard relies on disclosure of R&D investment in published annual reports and accounts. Companies which do not disclose figures for R&D investment or only figures which are not material enough are not included in the Scoreboard. Due to different national accounting standards and disclosure practices, companies of some countries are less likely than others to disclose R&D investment consistently. There is a legal requirement to disclose R&D in company annual reports in some countries.

[39] NACE is the acronyme for "Nomenclature statistique des activités économiques dans la Communauté européenne".

In some countries, R&D costs are often integrated with other operational costs and can therefore not be identified separately. For example, companies from many Southern European countries or the new Member States are under-represented in the Scoreboard, while UK companies could be over-represented. For listed companies, country representation improves with IFRS adoption.

The R&D investment disclosed in some companies' accounts follows the US practice of including engineering costs relating to product improvement. Where these engineering costs have been disclosed separately, they are excluded from the Scoreboard. However, the incidence of non-disclosure is uncertain and the impact of this practice is a possible overstatement of some overseas R&D investment figures in comparison with the EU. Indeed, for US companies, the GAAP accounting standards are always used because they are the official, audited ones, however non-GAAP results may give a more realistic view of true R&D investments.

In implementing the definition of R&D, companies exhibit variability arising from a number of sources: i) different interpretations of the R&D definition; ii) different companies' information systems for measuring the costs associated with R&D; iii) different countries' fiscal treatment of costs. Some companies view a process as an R&D process while other companies may view the same process as an engineering or other process.

Interpretation

There are some fundamental aspects of the Scoreboard which affects the interpretation of the data. The focus on R&D investment as reported in group accounts means that the results do not indicate the location of the R&D activity. The Scoreboard indicates rather the level of R&D funded by companies, not all of which is carried out in the country in which the company is registered. This causes inputs such as R&D and capital expenditure to be related to outputs such as sales or profits only at the group level.

The data used for the Scoreboard differ from data provided by statistical offices, e.g., the R&D expenditures funded by the business enterprise sector and performed by all sectors within a given territorial unit (BES-R&D). The Scoreboard refers to all R&D financed by a particular company from its own funds, regardless of where that R&D activity is performed. In contrast, BES-R&D refers to all R&D activities funded by businesses and performed within a particular territory, regardless of the location of the business's headquarters. Therefore, the Scoreboard R&D figures are directly comparable to BES-R&D data only at the global level, i.e. the aggregate of the 2 000 companies R&D investment can be compared with the global total BES-R&D.

The Scoreboard collects data from audited financial accounts and reports. In contrast, BES-R&D typically takes a stratified sample, covering all large companies and a representative sample of smaller companies. An additional difference concerns the definition of R&D intensity, BES-R&D uses the percentage of value added, while the Scoreboard measures it as the R&D/Sales ratio as value added data is not available at a micro-level

Sudden changes in R&D figures may arise because a change in company accounting standards. For example, the first-time adoption of IFRS[40], may lead to information discontinuities due to the

[40] Since 2005, all listed companies in the EU are required to prepare their consolidated financial statements according to IFRS (International Financial Reporting Standards, see: http://www.iasb.org/).

different treatment of R&D, i.e. R&D capitalisation criteria are stricter and, where the criteria are met, the amounts must be capitalised.

For many highly diversified companies, the R&D disclosed in their accounts relates only to part of their activities, whereas sales and profits are in respect of all their activities. Unless such groups disclose their R&D investment additional to the other information in segmental analyses, it is not possible to relate the R&D more closely to the results of the individual activities which give rise to it. The effect of this is that some statistics for these groups, e.g. R&D as a percentage of sales, are possibly underestimated and comparisons with non-diversified groups are limited. By allocating all companies to a single sector, the R&D of diversified companies is allocated to one sector only leading to overstatement of R&D in that sector and under-statement of it in other sectors.

For companies outside the Euro area, all currency amounts have been translated at the Euro exchange rates ruling at 31 December 2024 as shown in **Table 42**. The exchange rate conversion also applies to the historical data. The result is that over time the Scoreboard reflects the domestic currency results of the companies rather than economic estimates of current purchasing parity results. The original reporting currency data can be derived simply by reversing the translations at the rates above. Users can apply their own preferred purchasing parity transformation models.

Definitions of key terms

Research and Development (R&D) investment in the Scoreboard is the cash investment funded by the companies themselves. It excludes R&D undertaken under contract for customers such as governments or other companies. It also excludes the companies' share of any associated company or joint venture R&D investment. However, it includes research contracted out to other companies or public research organisations, such as universities. Being that disclosed in the annual report and accounts, it is subject to the accounting definitions of R&D. We use the definition set out in International Accounting Standard (IAS) 38 'Intangible assets' and is based on the OECD Frascati manual. **Research** is defined as original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding. Expenditure on research is recognised as an expense when it is incurred. **Development** is the application of research findings or other knowledge to a plan or design for the production of new or substantially improved materials, devices, products, processes, systems or services before the start of commercial production or use. Development costs are capitalised when they meet certain criteria and when it can be demonstrated that the asset will generate probable future economic benefits. Where part or all of R&D costs have been capitalised, the additions to the appropriate intangible assets are included to calculate the cash investment and any amortisation eliminated.

R&D expenditures funded by the business enterprise sector (**BES-R&D**), provided by official statistics, refer to the total R&D performed within a territorial unit that has been funded by the business enterprise sector (private or public companies).

Net sales follow the usual accounting definition of sales, excluding sales taxes and shares of sales of joint ventures and associates. For banks, sales are defined as the 'Total (operating) income' plus any insurance income. For insurance companies, sales are defined as 'Gross premiums written' plus any banking income.

R&D intensity is the ratio between R&D investment and net sales. At the aggregate level, R&D intensity is calculated only with those companies for which data exist for both R&D and net sales in the specified year. The calculation of R&D intensity in the Scoreboard is different from that in official statistics, e.g. BES-R&D, where R&D intensity is based on value added instead of net sales.

Operating profit is calculated as profit (or loss) before taxation, plus net interest cost (or minus net interest income) minus government grants, less gains (or plus losses) arising from the sale/disposal of businesses or fixed assets.

Capital expenditure (capex) is expenditure used by a company to acquire or upgrade physical assets such as equipment, property, industrial buildings. In accounts capital expenditure is added to an asset account (i.e. capitalised), thus increasing the asset's base. It is disclosed in accounts as additions to tangible fixed assets.

Number of employees is the total consolidated average employees or year-end employees if average not stated.

Market capitalisation is defined as the total value of a company's outstanding shares of stock. It is calculated by multiplying the current market price (at end of each financial year and measured in US Dollars) of the company's stock by the total number of outstanding shares.

Growth rate is the percentage change over the previous year of a variable: One-year growth = 100*((C/B)-1); where C = current year amount and B = previous year amount.

Box A1. Methodological caveats

Users of Scoreboard data should take into account the methodological limitations summarised here, especially when performing comparative analyses:

A typical problem arises when comparing data from different currency areas. The Scoreboard data are nominal and expressed in Euros with all foreign currencies converted at the exchange rate of the year-end closing date (31.12.2024). The variation in the exchange rates from the previous year directly affects the ranking of companies, favouring those based in countries whose currency has appreciated with respect to the other currencies. In this reporting period, the exchange rate of the Euro appreciated by 3% against the US dollar, by 16.3% against the Japanese Yen, by 7.3% against the Chinese Yuan/Renminbi, and depreciated 2.6% against the Pound Sterling, respectively. However, ratios such as R&D intensity or profitability are based on the ratio of two quantities taken from a company report where they are both expressed in the same currency and are therefore not affected by currency changes.

The growth rate of the different indicators for companies operating in markets with different currencies is affected in a different manner. In fact, companies' consolidated accounts have to include the benefits and/or losses due to the appreciation and/or depreciation of their investments abroad. The result is an 'apparent' rate of growth of the given indicator that understates or overstates the actual rate of change. For example, this year the R&D growth rate of companies based in the Euro area with R&D investments in the US is partly understated because of the 'losses' of their overseas investments due to the appreciation of the US dollar against the Euro (from USD 1.06 to USD 1.04). Conversely, the R&D growth rate of US companies is partly overstated due to the 'gains' of their investments in the Euro area. Similar effects of understating or overstating figures would happen for the growth rates of other indicators, such as net sales.

When analysing data aggregated by country or sector, in some cases, the aggregate indicator depends on the figures of a few firms. This is due, either to the country's or sector's small number of firms in the Scoreboard or to the indicator dominated by a few large firms.

In most cases, companies' accounts do not include information on the place where R&D is actually performed; consequently the approach in the Scoreboard is to attribute each company's total R&D investment to the country in which the company has its registered office or shows its main economic activity. This should be borne in mind when interpreting the Scoreboard's country classification and analyses. In some cases where company are headquartered in countries for fiscal reasons with little R&D or other activity in that country, a misleading impression may be received.

Growth in R&D can either be organic, the outcome of acquisitions or a combination of the two. Consequently, mergers and acquisitions (or de-mergers) may sometimes underlie sudden changes in specific companies' R&D and sales growth rates and/or positions in the rankings.

Other important factors to take into account include the difference in the various' countries' (or sectors') business cycles, which may have a significant impact on companies' investment decisions, and the initial adoption or stricter application of the IFRS.[41].

Table 42. Euro exchange rates

Country	As of 31 Dec 2024	As of 31 Dec 2023
Australia	1.67 Australian Dollar	1.62 Australian Dollar
Brazil	5.34 Brazilian Real	5.34 Brazilian Real
Canada	1.49 Canadian Dollar	1.46 Canadian Dollar
China	7.583 Yuan Renminbi	7.89 Yuan Renminbi
Colombia	4572.56 Colombian Peso	4223.36 Colombian Peso
Czechia	25.185 Czech Koruna	24.725 Czech Koruna
Denmark	7.4578 Danish Krone	7.45 Danish Krone
Hong Kong	8.06 Hong Kong Dollar	8.63 Hong Kong Dollar
Hungary	411.35 Forint	383.14 Forint
India	88.93 Indian Rupee	90.13 Indian Rupee
Indonesia	16829.88 Indonesian Rupiah	17107.64 Indonesian Rupiah
Japan	163.06 Yen	163.51 Yen
Malaysia	4.64 Ringgit	4.69 Ringgit
New Zealand	1.85 New Zealand Dollar	1.80 New Zealand Dollar
Poland	4.275 Złoty	4.348 Złoty
Russia	117.73 Russian Rubel	98.71 Russian Rubel
Saudi Arabia	3.88 Riyal	4.14 Riyal
Singapore	1.45 Singapore Dollar	1.45 Singapore Dollar
South Korea	1532.1 Won	1424.78 Won
Sweden	11.45 Swedish Kronor	11.09 Swedish Kronor
Switzerland	0.941 Swiss Franc	0.92 Swiss Franc
Taiwan	33.89 Taiwan Dollar	33.96 Taiwan Dollar
Thailand	35.676 Baht	37.81 Baht
Türkiye	36.73 Turkish lira	32.55 Turkish lira

[41] Since 2005, the European Union requires all listed companies in the EU to prepare their consolidated financial statements according to IFRS (see: EC Regulation No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002R1606:EN:HTML).

UK	0.829 British Pound	0.84 British Pound
US	1.0389 US Dollar	1.09 US Dollar
United Arab Emirates	3.82 Dirham	4.05 Dirham
Vietnam	26337 Dong	27063.6 Dong

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Annex 3. Global share of business enterprise sector R&D represented by the Scoreboard

The share of business enterprise sector R&D (BES-R&D) represented by companies in the Scoreboard is an important metric, often referenced in scholarly work (Confraria et al., 2024). This metric enables users to trust in the representativeness of Scoreboard data for aggregate R&D activity across sectors and countries, offering assurance that the R&D figures in the report capture most business R&D activities worldwide.

However, the R&D data used for the Scoreboard is constructed differently from the R&D data provided by statistical offices. The Scoreboard accounts for all R&D financed by a company from its own funds, irrespective of where the R&D is conducted. In contrast, BES-R&D refers to all R&D activities funded by businesses and performed within a particular territory, regardless of the location of the business's headquarters. Thus, for any given territory, Scoreboard data include outward R&D expenditures of companies headquartered there, while BES-R&D figures from statistical offices focus on intramural R&D, encompassing R&D by both local and foreign entities operating within the region.

Therefore, direct comparisons between the R&D Scoreboard and BES-R&D are meaningful primarily at the global level. However, even global comparisons require caution due to data limitations for certain regions. For instance, BES-R&D data are unavailable for countries such as India, Israel and Taiwan that have many Scoreboard firms, as well as for all countries in Latin America, Southeast Asia and Africa. Conversely, BES-R&D data exists for some countries where no Scoreboard company is headquartered (e.g. Estonia, Latvia and Bulgaria). Consequently, any direct global comparisons of Scoreboard data with BES-R&D may misrepresent the proportion of R&D represented by Scoreboard companies. Another relevant feature of this year's analysis is the inclusion of Amazon R&D in the Scoreboard total R&D. As the company with the highest R&D expenditure among the top 2 000 in 2024, Amazon positively impacts the share of BES-R&D captured by our data.

To assess how Scoreboard R&D figures compare with territorial R&D statistics, we analysed R&D data from both the Scoreboard and Eurostat for the period 2012–2023[42], comparing two scenarios: (1) the share of R&D of all top 2 000 companies compared to all BES-R&D, and (2) the R&D share of the top 2 000 companies from countries with available BES-R&D data compared to BES-R&D with matching country data. This comparison offers two perspectives on the approximate proportion of business R&D captured by Scoreboard firms over time.

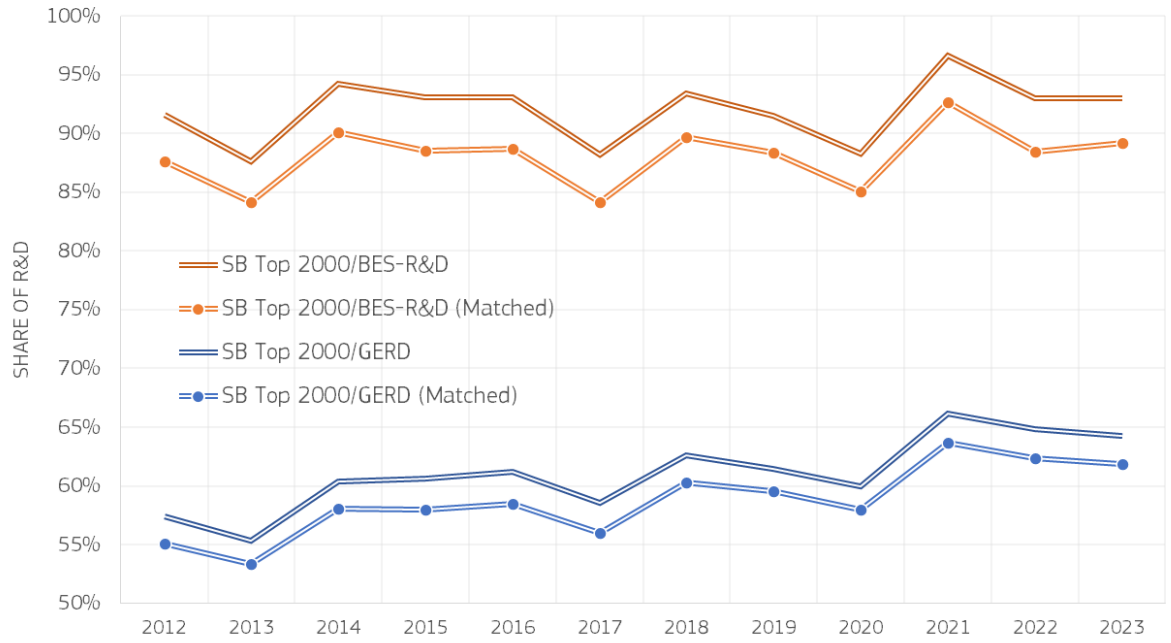
The analysis in **Figure 47** shows that Scoreboard companies have accounted for between 85% and 95% of total BES-R&D, with the scenario typically used on previous Scoreboard editions (Nindl et al., 2023, 2024) (1) yielding an average share of 93%, and scenario (2) an average share of 89%. The

[42] Although Scoreboard data exists until 2024, Eurostat only has R&D data available until 2023.

scenario that excludes countries without BES-R&D data indicates a lower average share because we are reducing the numerator due to the exclusion of large R&D investors, such as TSMC and Hon Hai Precision Industry in Taiwan or Tata Motors in India. This reduced share underscores the impact of limited regional BES-R&D data availability at the global level. The trends across these scenarios are consistent, with a noticeable increase in 2021, likely due to a global reduction in R&D alongside a surge in health-related R&D investments by large pharmaceutical companies during the COVID-19 pandemic, which are all included in the Scoreboard.

Figure 47 also shows the proportion of gross domestic expenditure on R&D (GERD) represented by Scoreboard firms over time, using the two scenarios described. There is an upward trend from 55-57% in 2012 to 62-64% in 2023, indicating that top R&D investors are constituting a growing share of global R&D (both public and private). This trend aligns with the increasing share of BES-R&D in relation to total GERD.[43]

Figure 47. Share of BES-R&D and GERD represented by the R&D Scoreboard between 2012 and 2023



Notes: BES-R&D refers to Business expenditure on R&D (business enterprise sector source of funds). GERD refers to Gross domestic expenditure on R&D (all sectors and source of funds). The ratios of Scoreboard R&D over BES-R&D and GERD were calculated in million Euros.

Source: The 2025 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG R&I. Eurostat (rd_e_gerdfund).

In summary, the analysis confirms that the R&D Scoreboard reliably represents a substantial majority of the global business enterprise sector R&D, with coverage in recent years ranging from **89% to 93%.** Additionally, the Scoreboard's scope of representation within the gross expenditure on R&D has been expanding, with its share growing from 55-57% in 2012 to 62-64% in 2023. These findings affirm the Scoreboard's utility for analysing business R&D trends globally.

[43] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=R%26D_expenditure

Annex 4. Effects of country reclassification exercise 2024

The Scoreboard allocates the companies to the country hosting their headquarter. However, some companies register their legal headquarters in countries other than the operational headquarter, which can lead to biases in our analysis. We thus performed an exercise to control if the country which the Scoreboard identified as the headquarter was also the location of a company's main operational activities.

The reallocation of firms to specific countries involved a multi-step process: we first searched the internet for the operational headquarter location and the location of main activity for over 4 700 companies that appeared in the Scoreboard between 2019 and 2023. This includes the smaller companies from the extended EU sample and considers also the smaller companies from the UK that were sampled the last time in 2019 (after Brexit, the UK companies only enter in the global sample). In cases where there was no clear information about the operational headquarters, we screened companies' reports and analysed the affiliations of inventors and researchers involved in patents and scientific publications to infer where most of a firm's R&D activity occurs. For complex cases, such as the merger resulting in Stellantis, where previous steps provided no definitive answer, the Scoreboard team engaged in thorough discussions to reach a consensus.

It is important to note that we did not split the R&D investments of the firms between countries. Instead, we allocated all R&D activities, along with other variables, to a single country. Even though many Scoreboard companies are multinationals conducting R&D activities in various regions, we do not split R&D investment between subnational regions due to the lack of reliable information for such detailed disaggregation in company reports. Nevertheless, we are confident that the new aggregate allocation of private R&D investment to countries adds value to our analysis. For those interested in the firm level, we provide both the old and new country classification in the data that we publish annually alongside the report. Overall, we adjusted the country information for 144 of the companies covered in the Scoreboard panel.[44] The changes at the country and regional levels are discussed in the remainder of this section.

Top 2000 in the Scoreboard 2024 – changes per country and effects on the regional distribution

In total, for the Top 2000 companies from the 2024 Scoreboard ranking (financial year 2023) 61 companies were reallocated across 22 countries, moving a total R&D investment of EUR 38.5 billion (3.1% of the total EUR 1 257 trillion of R&D investment) across countries (and sometimes regions). While this constitutes a rather small proportion in terms of the total volume, for some countries the changes are substantial; 21 countries out of 43 countries in the 2024 ranking remain unaffected by the reallocation. **Table 43** summarises the changes that the reallocation induces in the number of companies and the amount of R&D assigned to each country covered in the Scoreboard 2024. Uruguay and Jordan re-enter/newly enter the Scoreboard with the new headquarter country classification. We discuss the most important changes for the top 2 000 companies and compare

[44] The Scoreboard Panel, first published in 2023 for the 20th anniversary of the Scoreboard, publishes all data that has been collected for the Scoreboard. It covers over 6 600 individual companies and has data on financial information for the period 2003-2024. Note that the Scoreboard panel cannot be used to reconstruct the results of each Scoreboard report, since the panel puts emphasis on consistency across time, while each year's report provides a snapshot of a particular point in time. For more information and the datasets see https://iri.jrc.ec.europa.eu/scoreboard/2024-eu-industrial-rd-investment-scoreboard

the results on the country level with OECD BERD data for reference (specifically, business enterprise expenditure on R&D financed by the business sector in Euro in current prices). The R&D investment reported in the table refers to the financial year 2023.

Table 43. Change in number of firms and R&D investment per country due to country reallocation, Top 2 000 companies from the Scoreboard 2024

	Firms					R&D investment 2023				
	old	Δ	+	-	new	old	Δ	+	-	new
US	681	27	33	6	709	531 858	9 373	13 756	4 383	541 099
China	524	-2	1	3	522	215 814	-405	131	537	215 408
Japan	185	0	0	0	185	104 791	0	0	0	104 791
Germany	106	5	5	0	111	111 923	615	615	0	112 538
Taiwan	55	0	0	0	55	24 795	0	0	0	24 795
UK	63	-8	2	10	55	35 442	-684	1 090	1 774	34 758
France	50	2	2	0	52	33 675	11 118	11 118	0	44 793
South Korea	40	0	0	0	40	42 548	0	0	0	42 548
Switzerland	39	-2	2	4	37	36 215	-2 374	201	2 575	34 001
Canada	24	0	1	1	24	8 242	30	113	83	8 272
Sweden	22	1	1	0	23	15 278	1 496	1 496	0	16 774
Denmark	23	-1	0	1	22	9 878	-78	0	78	9 800
Italy	17	4	4	0	21	5 428	3 583	3 583	0	9 223
Israel	19	1	2	1	20	3 713	614	700	86	4 327
Netherlands	33	-14	0	14	19	29 854	-18 091	0	18 091	11 763
India	15	0	0	0	15	5 504	0	0	0	5 504
Austria	11	1	1	0	12	1 952	79	79	0	2 031
Spain	11	0	0	0	11	5 667	0	0	0	5 667
Belgium	9	1	1	0	10	3 170	654	654	0	3 824
Australia	7	2	2	0	9	4 167	2 085	2 085	0	6 252
Finland	9	0	0	0	9	5 426	0	0	0	5 426
Singapore	8	-1	0	1	7	2 694	-131	0	131	2 563
Ireland	24	-18	0	18	6	10 372	-9 265	0	9 265	1 107
Brazil	4	0	0	0	4	1 752	0	0	0	1 752
New Zealand	2	0	0	0	2	327	0	0	0	327
Norway	2	0	0	0	2	785	0	0	0	785
Portugal	1	1	1	0	2	222	118	118	0	341
Saudi Arabia	2	0	0	0	2	1 666	0	0	0	1 666
Colombia	1	0	0	0	1	495	0	0	0	495
Hungary	1	0	0	0	1	204	0	0	0	204
Iceland	1	0	0	0	1	95	0	0	0	95
Indonesia	1	0	0	0	1	206	0	0	0	206
Jordan	0	1	1	0	1	0	136	136	0	136
Liechtenstein	1	0	0	0	1	489	0	0	0	489
Luxembourg	3	-2	0	2	1	1 910	-1614	0	1 614	296
Malta	1	0	0	0	1	95	0	0	0	95
Russia	0	1	1	0	1	0	1 046	1 046	0	1 046
Slovenia	1	0	0	0	1	179	0	0	0	179
Thailand	0	0	0	0	1	103	0	0	0	103
Türkiye	1	0	0	0	1	264	0	0	0	264
United Arab Emirates	1	0	0	0	1	336	0	0	0	336
Uruguay	1	1	1	0	1	0	1 456	1 456	0	1 456
Vietnam	1	0	0	0	1	95	0	0	0	95

Notes: R&D investment in million Euro at 2023 exchange rates. Digits were omitted for the ease of readability, which can lead to rounding differences.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The largest reductions

The biggest adjustment affects the Netherlands, which lose 14 companies (from originally 33) and EUR 18 billion corresponding to a 60% reduction of the R&D investment with respect to the initial

country classification. The largest adjustments relate to Stellantis (R&D investment of EUR 7.5 billion in 2023) and Airbus (EUR 3.6 billion), which were both moved to France, where these companies have the largest part of their R&D activities. We are aware that these two companies are particularly difficult cases related to their history (the merger that formed Stellantis and the European project to establish a European aerospace company) and that the allocation to France can be seen as controversial. However, the allocation to Netherlands was not justified because Stellantis has basically no production activities in the Netherlands and Airbus operates in the country only on a very small scale(TNO, 2024).[45] Another significant adjustment for the Netherlands results from Yandex (the 'Russian Google' with EUR 1.1 billion R&D investment in 2023) that moved the headquarter from Netherlands to Russia in 2024 (Reuters, 2024). In the new classification, Yandex is now treated as a Russian company throughout the historical data. Finally, STMicroelectronics (EUR 1.7 billion) was moved away from the Netherlands to Italy, as well as Ferrari (EUR 1.0 billion) and Iveco (EUR 800 million). In terms of regional composition, 4 companies that had previously been treated as EU companies left the EU after the reallocation with one each going to the UK and Russia, and two to the US. The R&D investment of Dutch Scoreboard companies according to the new country classification amounts to EUR 11 billion, which is in line with the OECD BERD data of EUR 10.6 billion in 2021 (the most recent data).

The second largest reduction affects Ireland, a country that provides favorable taxation policies for large multinational companies (Delis et al., 2025)–many US companies use the Irish regime (in some cases also due to the company's history by being founded by Irish immigrants to the US). We adjust for this and reallocate 18 Irish companies, of which 17 were moved to the US and one to the UK. The number of Irish Scoreboard companies thereby falls from 24 to 6, and the R&D investment from EUR 10.3 billion to EUR 1.1 billion (minus EUR 9.2 billion, or minus 89%). The comparison with OECD BERD data (EUR 2.6 billion in 2021) is substantially closer than with the original country data. However, the low value of R&D we are left with - less than 50% of the Irish BERD - suggests that our adjustment might be too strict and that some of these companies perform at least part of their R&D in Ireland. The largest companies that were moved are well-known US pharmaceutical companies such as Medtronic (EUR 2.5 billion R&D investment in 2023), Allergan (EUR 1.6 billion), Accenture, and Aptiv (each EUR 1.1 billion). The Irish case has a visible effect on the EU aggregate and the EU ranking as the EU loses around EUR 9 billion of R&D investment to the US, and 18 companies in the Top 2 000 ranking.

The two other countries experiencing a substantial reduction are Switzerland and Luxembourg. Switzerland loses 4 companies (all 4 go to the US) and gains 2 (one from US and one from UK), resulting in a reduction of R&D investment by EUR 2.2 billion (down 6.1%). However, even with this adjustment the Scoreboard R&D for companies headquartered in Switzerland remains more than twice as high as the corresponding data from the OECD BERD (EUR 16 billion in 2021). This is due to the large number of successful multinational Swiss companies who have R&D activities around the world. Luxembourg loses two companies and remains with only one company in the Top 2 000 ranking. The reassignment of Spotify (EUR 1.6 billion) to Sweden causes a drop of 84%, so that Luxembourg remains with a total of EUR 296 million in the Scoreboard, in line with the OECD BERD for Luxembourg (EUR 323 million in 2021).

[45] With this adjustment, the Scoreboard figures are getting closer to the actual R&D investment of the companies with headquarter in Netherlands, as recently shown by a survey by TNO Vector (2024)

The largest gains

France is the country that gains most from the country reclassification exercise with an increase of EUR 11.1 billion (plus 33%); as discussed above we assigned Stellantis and Airbus to France and removed no company from the country. The total R&D investment by French Scoreboard companies amounts to EUR 44.8 billion in 2023, which exceeds the OECD BERD figure of EUR 29.8 billion in 2021. This overshooting does not come as a surprise since many of the French Scoreboard companies have substantial R&D activities abroad (e.g. Sanofi, Renault, Valeo, Thales, Michelin) or are multination conglomerates with locations in different countries and regions (as discussed above, Stellantis or Airbus).

The second highest gains go to the US with a net increase of EUR 9.6 billion or 1.7% of the US Scoreboard companies' R&D investment in 2023. This figure is the result of a gain of EUR 13.6 billion and a loss of EUR 4.3 billion. As discussed above, EUR 9.1 billion move from Ireland to the US and another EUR 2.5 billion from Switzerland (the companies are Garmin, TE Connectivity, Alcon and Roivant); 5 companies that were reallocated from the UK to the US jointly contribute an additional EUR 1 billion. The two largest companies that were moved away from the US are the online shopping platform Mercadolibre (EUR 1.5 billion R&D investment), assigned to Uruguay, and the software company Atlassian (EUR 1.9 billion), allocated to Australia. In total, the US gains 33 companies in the ranking and loses 6, resulting in an addition of 27 companies in the global ranking.

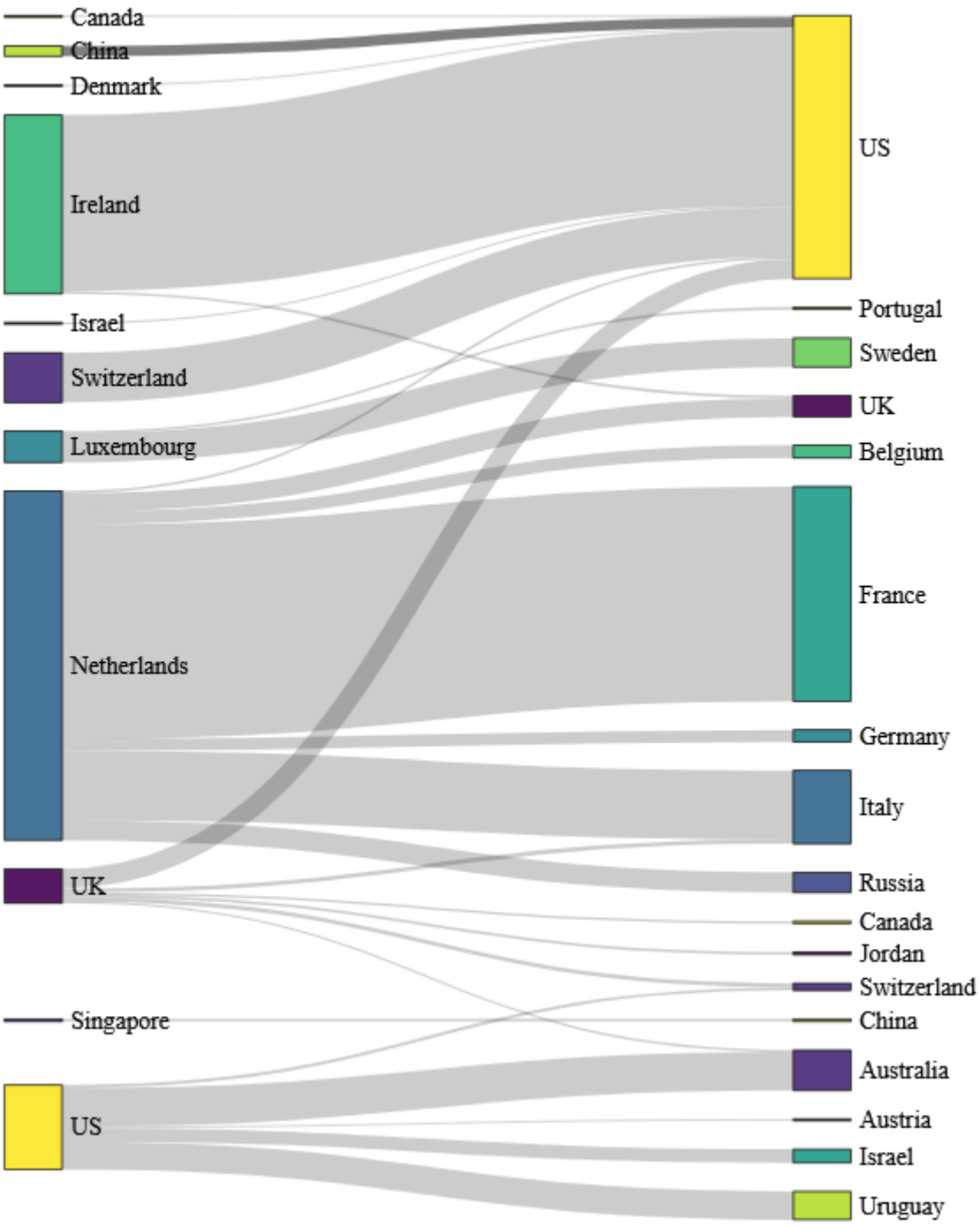
Italy is the country with the third largest gain in terms of R&D investment. With the reallocation the number of Scoreboard companies increased by 4 (to 21) and the R&D investment by EUR 3.8 billion, which corresponds to 70% of Italy's total R&D in the Scoreboard in 2023. 3 out of the 4 newly classified companies were previously registered in the Netherlands (STMicroelectronics, Ferrari and Iveco), and one company was moved from the UK. The total R&D investment by Italian Scoreboard companies now amounts to EUR 9.2 billion, substantially closer to the OECD BERD value of EUR 13.4 billion in 2021.

Another country with a substantial change is Australia, gaining 2 companies and EUR 2.1 billion of R&D investment, an increase of 50%. The main driver is the reallocation of the software company Atlassian from the US – it's R&D investment in 2023 amounted to EUR 1.9 billion. Nevertheless, the total R&D investment financed by companies headquartered in Australia of EUR 6.2 billion remains well below the OECD BERD value of ca. EUR 10 billion, suggesting that foreign companies have substantial R&D activities in the country.

Finally, the country reclassification exercise broadened the number country coverage from 40 countries in the 2024 Scoreboard with 3 countries entering the ranking: Uruguay (Mercadolibre, previously US), Russia (Yandex, previously Netherlands) and Jordan (Hikma Pharmaceuticals, previously UK).

The bilateral R&D flows in 2023 are presented in **Figure 48**.

Figure 48. Sankey diagram of R&D reallocation, 2023, top 2 000

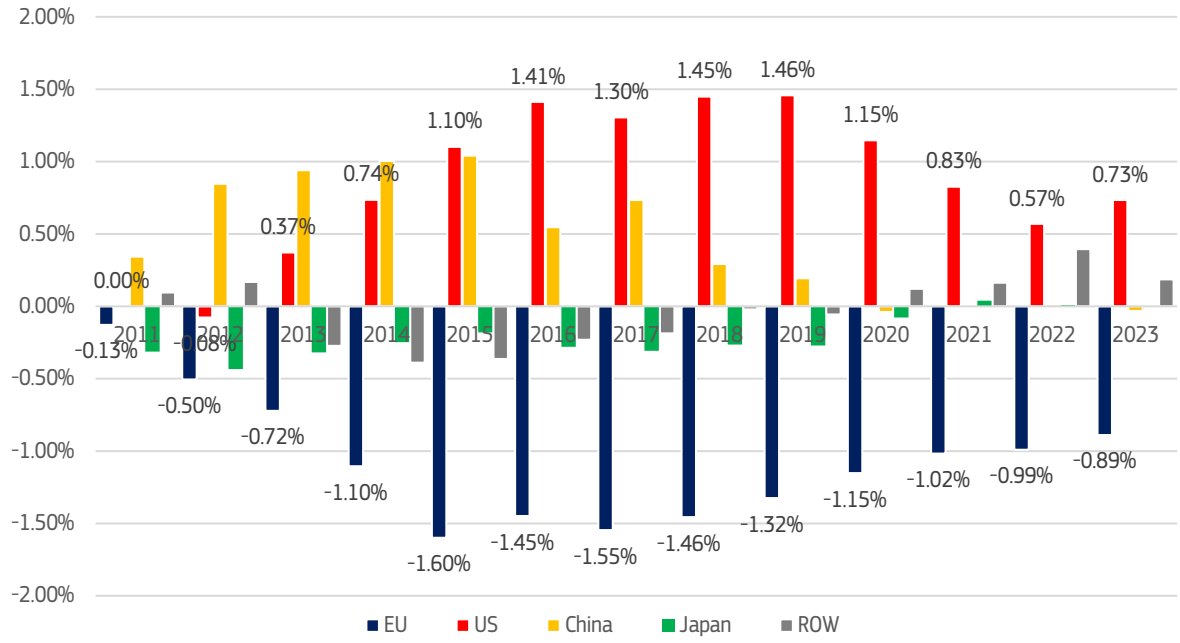


Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Effect on regional R&D distribution

For the regional classification (EU, US, China, Japan, ROW) the reallocation has a minor effect overall. **Figure 49** and **Figure 50** show how each region's share in total R&D investment is affected over time. As described above, the largest movement occurs between the US and the EU due to the reclassification of the firms headquartered in Ireland, with the US gaining and the EU losing. The ROW aggregate is slightly lower in the first years, while in 2022 and 2023 the share increases a bit.

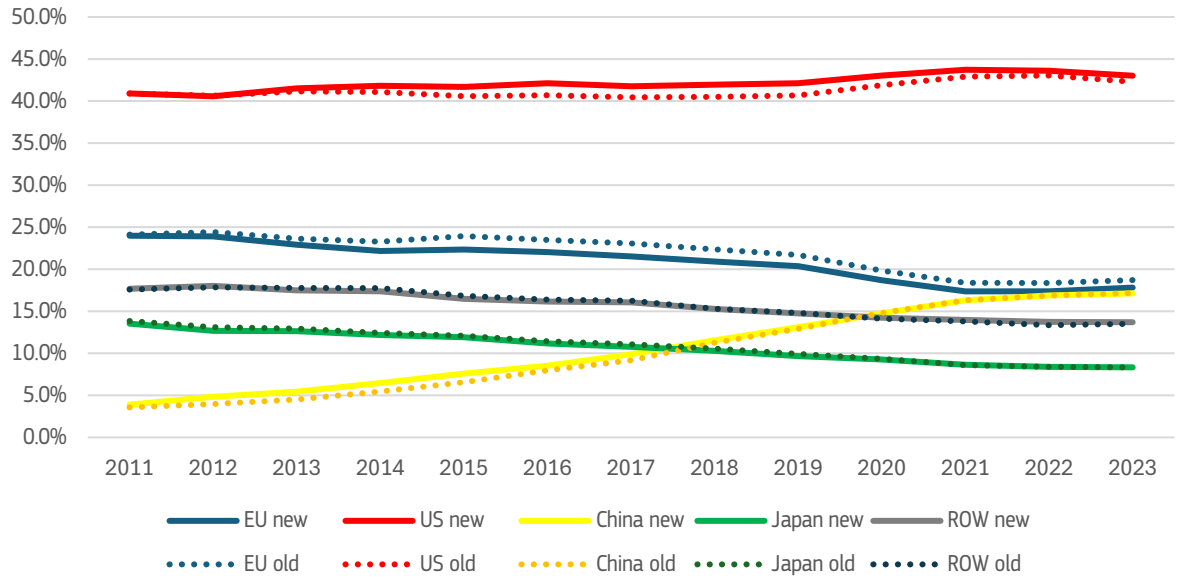
Figure 49. Percentage point change in regional R&D shares due to country reclassification, 2011-2023



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

For 2023, the US share of total R&D investment increases from 42.3% to 43% (note that these calculations are based on the sample before Amazon was included), the EU share decreases from 18.7% to 17.8%, that of China and Japan remain basically unchanged at 17.1% and 8.3%, and the ROW gains slightly (from 13.5% to 13.7%). Overall, the reclassification affects the regional distribution only marginally and does not alter the results and conclusions from the previous Scoreboard editions (see **Figure 50**).

Figure 50. Regional distribution of R&D investment, old vs. new country classification, 2011-2023



Notes: These calculations are based on the 2024 Scoreboard that excluded Amazon Inc., therefore the US shares are lower and those of the remaining countries/regions higher.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Reclassification in the EU800 sample

The Scoreboard collects data on an extended EU sample including also smaller R&D investing companies. In this sample, we reclassified 61 companies, of which 37 were also among the global top 2 000 in 2023, and the remaining 24 companies are in the extended sample of smaller EU R&D investing companies. The specification of this sample adds a layer of complexity to the analysis – if a company moves away from the EU, it opens a vacant spot for another EU company to step up into the ranking of the Top 800 companies from the EU. This implies that a country can see an increase in the representation in the Scoreboard either through the reallocation of headquarters to this country, or by companies stepping up into the Top 800 due to vacant spots higher up in the ranking. As a matter of definition, the companies stepping up enter at the bottom of the distribution (the R&D investment of the 800th company in 2023 was EUR 7 million).

Table 44 presents the results for the EU countries; countries with companies stepping up into the EU 800 are marked with an asterisk. The changes in the EU sample are less intuitive and more intricated to explain, as they are the sum of changes in the headquarter country and the sample composition change due to the changes in the EU 800 ranking. In total, the EU 800 lost 29 companies to non-EU countries, mostly to the US (22 companies with a total R&D investment of EUR 9.4 billion), and the remaining companies were allocated to the UK (5), Switzerland (1) and Russia (1).

Table 44. Change in number of firms and R&D investment per country due to country reallocation in 2023, EU 800 (Scoreboard 2024)

	firms					R&D Investment 2023				
	old	Δ	+	-	new	old	Δ	+	-	new
Austria*	33	2	1	0	35	2 407	64	48	0.0	2 534
Belgium	32	-2	1	3	30	3 752	604	654	0.0	4 356
Croatia**	0	1	1	0	(1)	0.00	67	67	0.0	67
Czechia	1	0	0	0	1	25	0.0	0.0	0.0	26
Denmark*	53	1	0	2	54	10 488	-21	0.0	99	10 467
Finland	41	0	0	0	41	6 291	52	0.0	0.0	6 343
France*	117	9	5	0	126	35 598	11 344	11 216	0.0	46 943
Germany*	233	23	15	0	256	115 082	1 172	938	0.0	116 254
Greece*	4	2	1	0	6	48	33	16	0.0	81
Hungary	1	0	0	0	1	204	0.0	0.0	0.0	204
Ireland*	37	-19	0	20	18	10 794	-9 299	0.0	9 319	1 494
Italy*	38	9	5	0	47	6 044	3 852	3 818	0.0	9 896
Luxembourg	18	-10	0	10	8	2 364	-1 852	0.0	1 867	512
Malta	1	0	0	0	1	94	0.0	0.0	0.0	95
Netherlands	62	-23	0	23	39	30 903	-18 385	0.0	18 398	12 518
Poland	3	0	0	0	3	101	2	0.0	0.0	103
Portugal	5	1	1	0	6	363	118	118	0.0	481
Slovenia	1	0	0	0	1	178	0.0	0.0	0.0	178
Spain*	21	2	0	0	23	5 898	29	0.0	0.	5 927
Sweden	99	5	2	1	104	17 084	1 740	1 543	8	18 824
Total	800	1	33	59	800	247 725	-11 272	18 498	29 692	236 577

Notes: R&D investment in million Euro at 2023 exchange rates. Digits were omitted for the ease of readability, which can lead to rounding differences. Italy gained one company from the UK, which is not reported in the table. Therefore, the total number of losses is 59 instead of 60, the total number of gains 33 instead of 32, and there remains a delta of 1. The difference of 29 countries are those companies whose headquarters were moved away from EU countries.

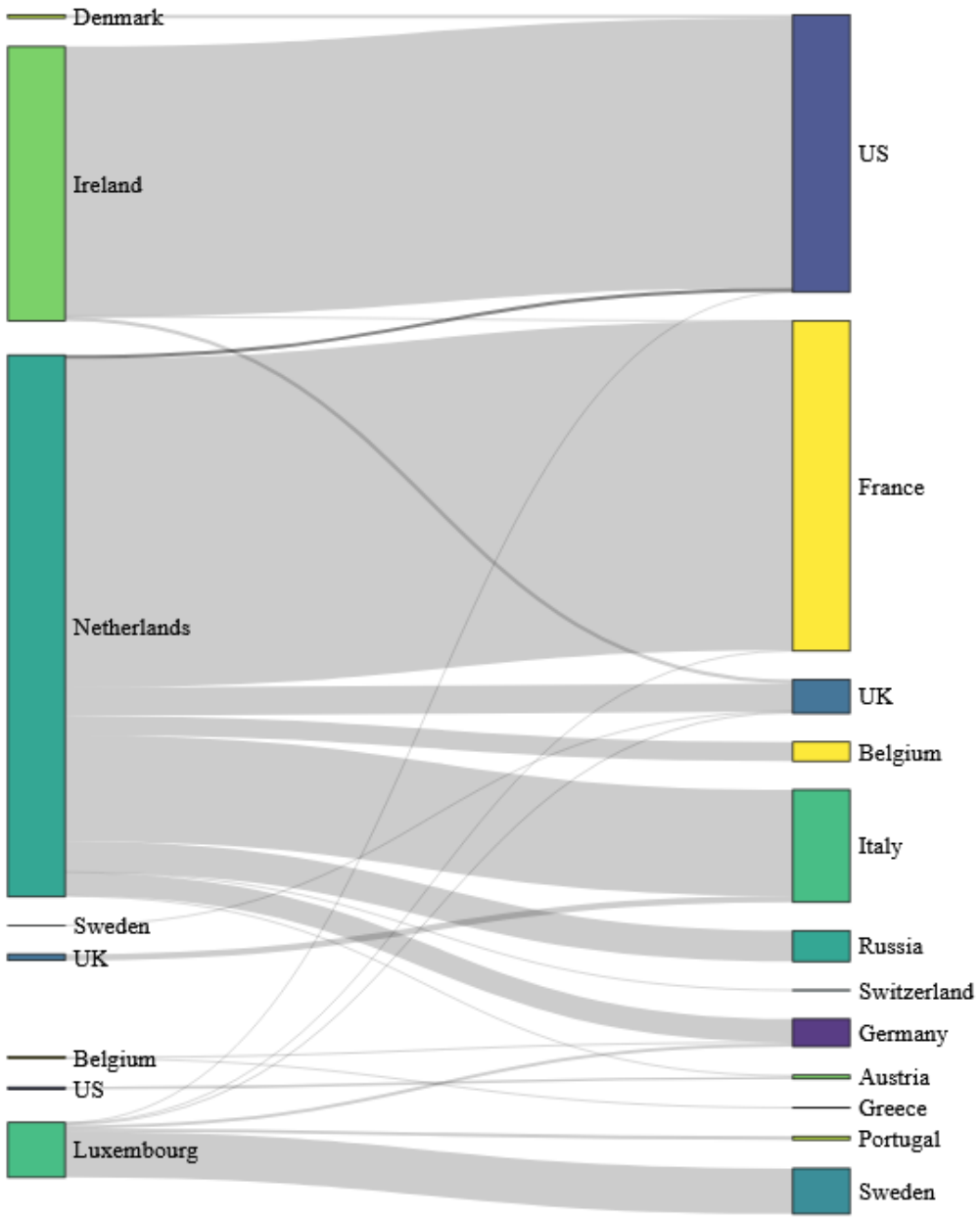
* Country that gained firms in the Top 800 due to the reallocation of EU companies to non-EU countries. The difference between the old and new R&D investment per country therefore does not equal the sum of gains and losses.

**Croatia received one company that was registered in the UK; however, in 2023 the R&D investment of this company was not large enough to reach the global Top 2000, therefore the firm was not observed in the ranking. We therefore provide the 2022 data for this company.

Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

As for the Top 2000, the bilateral R&D flows for EU countries in 2023 are presented in **Figure 51**.

Figure 51. Sankey diagram of R&D reallocation flows, 2023, EU 800



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

The largest reductions

As in the Top 2 000, the biggest adjustment relates to the Netherlands, losing 23 companies in the EU 800 ranking (from originally 62) and EUR 18.3 billion, which corresponds to 61% of the total change in the R&D investment of the EU companies due to the reallocation exercise. However, only a relatively small amount of EUR 2.1 billion leaves the EU (one company each to the US, UK, Russia and Switzerland), the remaining EUR 16 billion are reallocated to other EU countries (see above), and mostly France (EUR 11.2 billion) and Italy (EUR 3.6 billion).

The second largest readjustment affects Ireland with a reduction from 37 to 18 companies (20 relocated, one gained due to vacant ranks) and minus EUR 9.3 billion R&D investment. As discussed in more detail above, the largest part goes to the US (18 companies and EUR 9.2 billion R&D investment). The reallocation from Ireland accounts for 31% of the total change of the EU sample.

Luxembourg is the country with the third largest adjustment, losing EUR 1.8 billion of R&D investment and 10 companies (from 18 down to 8). However, most of the R&D and the companies stays in the EU, with only two companies going to the UK and one to the US. The total loss of R&D investment for the EU sample thus remains low with EUR 71 million (note that these three companies will drop from the Scoreboard as their R&D investment is below that of the company on the 2 000th position of EUR 67 million in 2023).

The largest gains

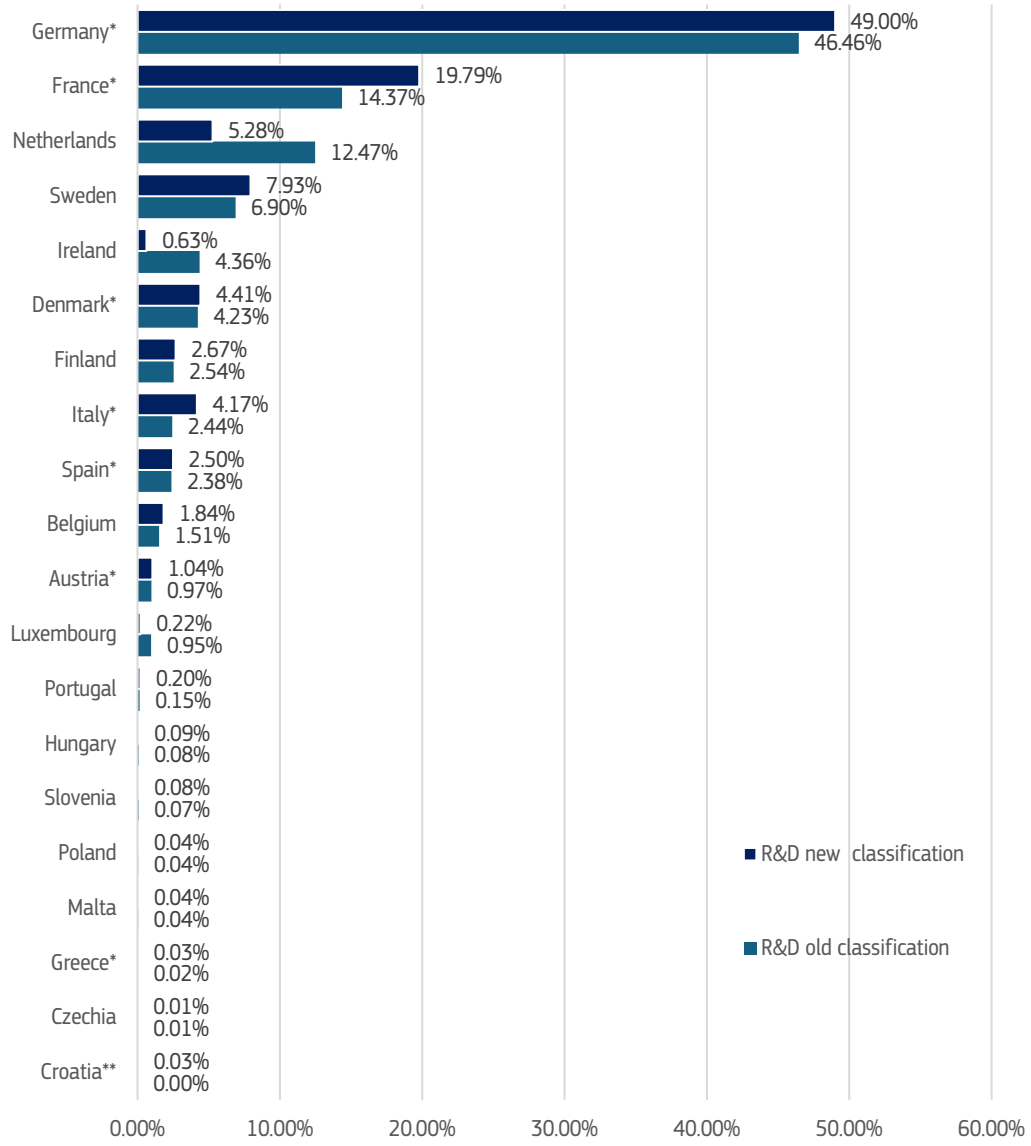
France is the country gaining most from the country reclassification with an increase of EUR 11.1 billion (plus 33%); as discussed above we assigned Stellantis and Airbus to France, and no company was moved away from France. The number of French companies in the Top 800 increased from 117 to 126, with 5 companies being reallocated to France and the remaining four companies stepping up the vacant ranking positions.

The second largest gain is recorded for Italy with an increase of R&D investment by 64%. Also Italy gained 5 companies due to reallocation (among them one from the UK which will newly enter the EU ranking), and four companies stepping up. In total, there are not 47 Italian companies in the Scoreboard EU 800.

Further important changes appear in Germany, gaining 15 companies due to the reallocation exercise. In contrast to other countries, this affects mostly smaller companies that registered their headquarter in the Netherlands (10 companies) or Luxembourg and Belgium (three and two). Many of these companies have their physical location in the border regions of Germany with these countries. With the new allocation the number of German companies in the Scoreboard increased from 233 to 256, while the R&D investment increased by only 1% (EUR 938 million).

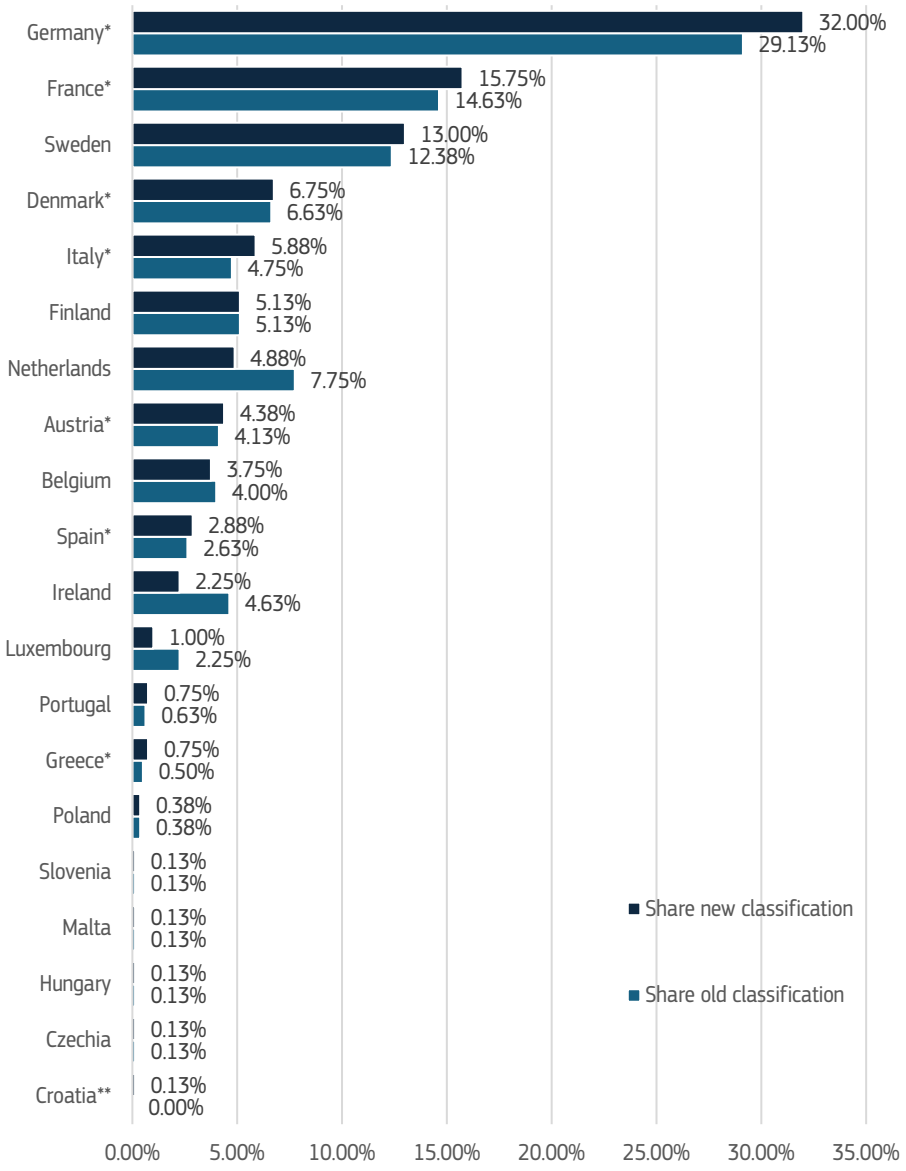
The following two figures show the changes in R&D investment share and the share of firms for the EU 800 per country. Germany becomes even larger with 49% of R&D and 32% of the companies. The share of France grows considerably and reaches almost 20% of R&D, while the share of the Netherlands in terms of R&D fell from 12.5% to 5.3%. Italy almost doubles its share in the total R&D investment of the EU 800 from 2.4% to 4.2%, while the share of Ireland fell from 4.4% to a mere 0.6%.

Figure 52. Share of R&D investment per country, EU 800, 2023



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Figure 53. Share of companies per country, EU 800, 2023



Source: The 2025 EU Industrial R&D Investment Scoreboard, European Commission, JRC/DG R&I.

Getting in touch with the EU

In person

All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online (european-union.europa.eu/contact-eu/meet-us_en).

On the phone or in writing

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

— by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
— at the following standard number: +32 22999696,
— via the following form: european-union.europa.eu/contact-eu/write-us_en.

Finding information about the EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website (european-union.europa.eu).

EU publications

You can view or order EU publications at op.europa.eu/en/publications. Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre (european-union.europa.eu/contact-eu/meet-us_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex (eur-lex.europa.eu).

EU open data

The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

Science for policy

The Joint Research Centre (JRC) provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society

Scan the QR code to visit:

The Joint Research Centre: EU Science Hub
https://joint-research-centre.ec.europa.eu

Publications Office
of the European Union