IMPLEMENT
CONSULTING GROUP

The AI innovation imperative

How Denmark can scale innovative digital businesses with AI to close the innovation and competitiveness gap

November 2024

The upcoming AI era calls for new ways of thinking about innovative businesses

This report examines a unique but highly important group of companies that we refer to as *innovative digital businesses*. Many of these companies have traditionally been described as “startups” or “tech businesses,” but we believe it’s time to broaden these concepts and reframe how we talk and think about them.

More than startups

There is more to the story than just startups. Startups are important—they are where it all begins. However, for both investors and the broader economy, it is essential that a sufficiently large number of these ventures succeed and grow into larger, profitable, and highly productive companies, as their success enhances competitiveness and spreads new technologies throughout society.

More than tech

Similarly, there is more to the story than just tech businesses. The innovation potential of the emerging AI era extends beyond technology companies or industries like IT and telecom. AI has the potential to catalyse the creation of new innovative businesses across all sectors of the economy while boosting their productivity.

Innovative digital businesses are key to capturing the AI opportunity and closing Europe’s innovation and competitiveness gap

The creation of new innovative companies and the ability to scale them is crucial for closing Europe’s innovation and competitiveness gap, as highlighted in the Draghi report.

We are now on the brink of a new era of AI-driven economic growth, which has the potential to elevate Europe’s long-term growth beyond its historical trend. AI holds such transformative power that it could reverse the declining productivity trend in most EU countries.

Innovative digital businesses are key to capturing the AI potential because they:

- Develop new AI tools and applications
- Enable businesses across all sectors to adapt and benefit from AI.
- Demonstrate AI's value by being early adopters and innovators
- Inspire other businesses to use AI technology smartly
- Create healthy competitive pressure on slower adopters

WHAT ARE INNOVATIVE DIGITAL BUSINESSES?

Innovative digital businesses are defined as businesses with scalable business models that are less than 30 years old. Most of these businesses either have digital technology at their core or are heavily enabled by it. To identify these businesses, we use Dealroom data. The analysis focuses on companies headquartered in Denmark and are further classified as startups (2–50 employees), scaleups (51–500 employees), and grownups (over 500 employees).

SUMMARY

AI can super-charge Denmark's ecosystem of innovative digital businesses, boosting productivity and competitiveness

Danish innovative digital businesses create high-value jobs, drive innovation and enhance productivity

Denmark has a strong ecosystem with around 2,300 innovative and digital businesses, employing 51,000 people and accounting for 11% of all new private sector jobs since 2017.

These businesses create high-value jobs and wealth, paying 35% higher wages and boosting employee productivity by 50% compared to Danish businesses on average. Innovative digital businesses that succeed in scaling make an outsized contribution to the economy, exceeding the productivity of the top 10 most productive businesses among Denmark's biggest traded companies (C25 index).

Denmark outperforms European countries on the number of innovative digital businesses, with 61 innovative digital businesses per 100,000 working-age adults compared to an EU average of 19. Despite this strong ecosystem, Denmark struggles to scale and retain enough innovative digital businesses compared to European and global leaders.

AI opens new opportunities

As pointed out in the Draghi report, Europe largely missed out on the digital revolution led by the internet. With AI emerging, we are on the verge of a new tech-driven productivity boom. This opens new possibilities to innovate and build more effective businesses:

- AI can boost Denmark's ecosystem of innovative digital businesses by enhancing the productivity of research and development.
- Innovative digital businesses act as catalysts for broader AI innovation and adoption by being early adopters, adapters and developers.

> *The core problem in Europe is that new companies with new technologies are not rising in our economy.*
>
> **Mario Draghi** in The future of European competitiveness

If Denmark successfully retains and scales innovative digital businesses to be on a par with leading OECD countries, this could:

- **Create 12,000 more high-value jobs,** supporting the future competitiveness of the Danish workforce.
- **Contribute DKK 25 billion annually** to the economy.
- **Enhance the diffusion of AI innovations to the rest of the economy.** Startups have a roughly 50% higher chance of radical innovations than incumbent firms and drive 26% of productivity growth across the economy.

Better framework conditions are needed for innovative digital businesses to be fit for the AI-powered future:

People. Growing, attracting and retaining people with business and AI-relevant talent and ideas.

Technology. Providing access to state-of-the-art AI tools, digital infrastructure, and compute power.

R&D. Accelerating R&D with AI.

Rules. Providing regulatory clarity and reasonable compliance costs.

Capital. Unlocking Europe's fragmented risk capital markets and increasing the attractiveness of venture capital investment in the EU.

1

The economic role of innovative digital businesses

Innovative digital businesses play an outsized role in the Danish economy.

Innovative digital businesses are scalable and tech-enabled

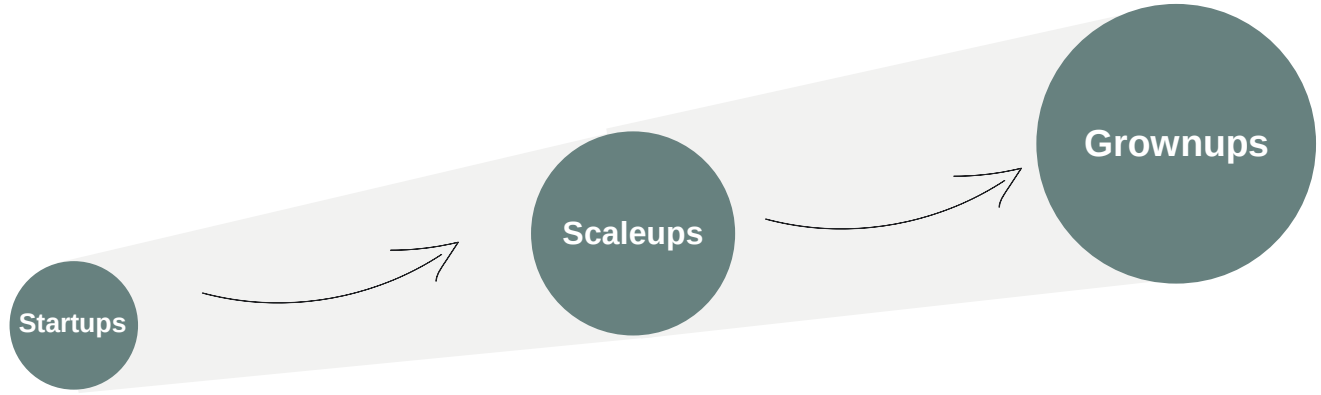
This research defines innovative digital businesses as companies headquartered in Denmark with a scalable business model, less than 30 years old, and whose product and/or business model are inherently innovative.

In most cases, these companies are tech-enabled, either utilising proprietary technology or software, or having business processes that are heavily enabled by technology.

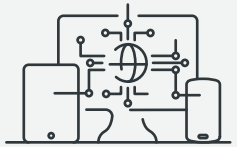
This study categorises innovative digital businesses by employment size into three main stages: startups, scaleups, and grownups.

> Europe cannot afford to remain stuck in the 'middle technologies and industries' of the previous century. We must unlock our innovative potential. This will be key not only to lead in new technologies, but also to integrate AI into our existing industries so that they can stay at the front.
>
> **Mario Draghi** in The future of European competitiveness

Innovative digital businesses



Innovative digital businesses designed to grow fast, employing 2–50 people.	Innovative digital businesses with scaled operation, employing 50–500 people.	Established and stable innovative digital businesses that have successfully scaled, employing more than 500 people.



Digital infrastructure provides the foundational technology and platforms necessary for innovative digital businesses to operate, innovate and scale efficiently. It includes:

- Data centres
- Cloud storage
- Computing capacity and graphics processing units (GPUs)
- AI/ML technologies and tools

Note: The definition of innovative digital businesses is based on Dealroom.
Source: Implement Economics based on Windsor (2024) using Dealroom data.

Denmark is home to around 2,300 innovative digital businesses, employing 51,000 people

Innovative digital businesses employ 51,000 people in Denmark, accounting for 2.5% of private employment. Remarkably, they employ another 50,000 people outside Denmark.

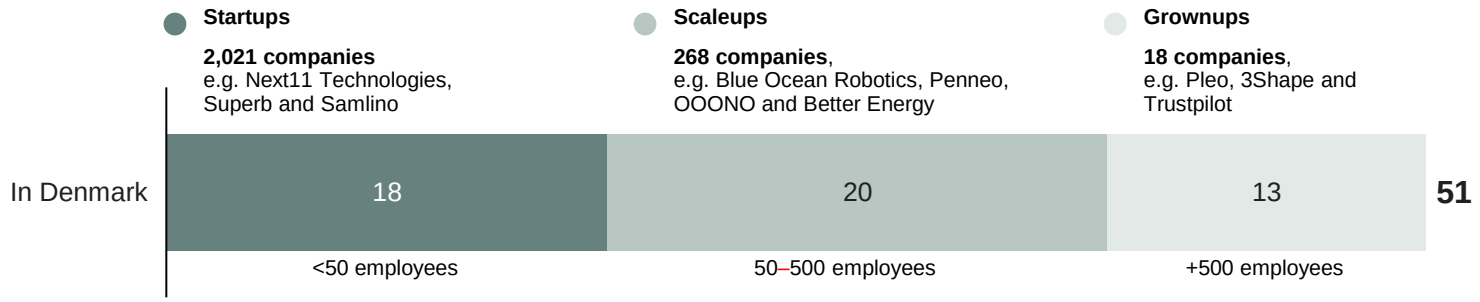
- *Startups* employ 18,000 people in Denmark and 7,000 people abroad.
- *Scaleups* employ 20,000 people in Denmark and a further 13,000 people abroad.
- *Grownups* employ 13,000 people in Denmark and have created 30,000 jobs abroad.

The significant employment by innovative digital businesses in Denmark and abroad highlights their international reach and the facilitation of cross-border knowledge and expertise exchange.

~50% of jobs in innovative digital businesses headquartered in Denmark are abroad

Employment in Danish innovative digital businesses
Employees

51,000 people are employed in innovative digital businesses in Denmark



50,000 people are employed outside Denmark by Danish-headquartered innovative digital businesses

Note: The number of innovative digital businesses and their employment figures are based on companies with “verified” employment data from Dealroom. A number of innovative digital businesses are likely not captured in this data, making this a conservative estimate of their count and employment.
Source: Implement Economics based on Windsor (2024) using Dealroom data.

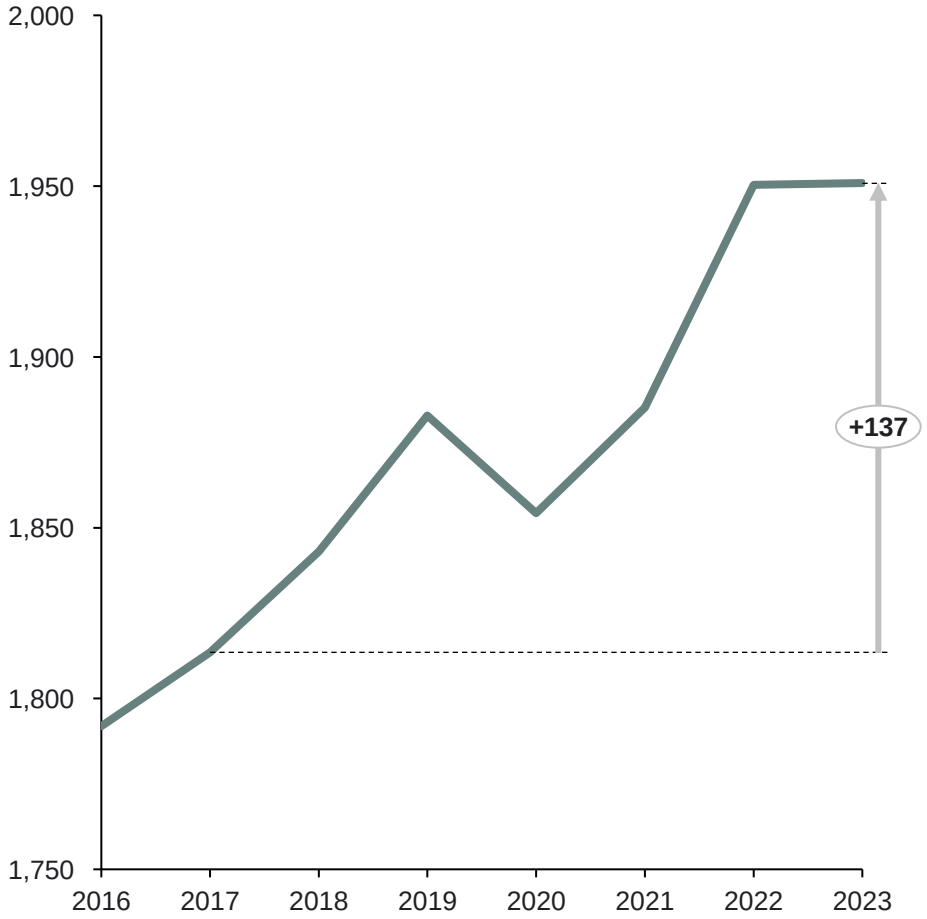
Innovative digital businesses have created 11% of all new private sector jobs in Denmark

Private sector employment in Denmark has grown by 137,000 jobs since 2017.

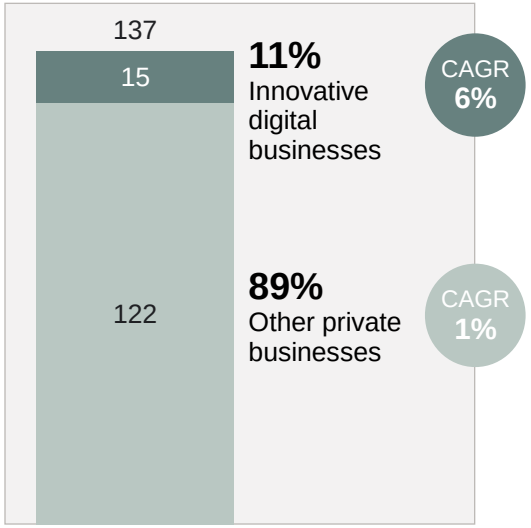
Innovative digital businesses were responsible for 15,000 of these new jobs, corresponding to 11% of all new private sector jobs in Denmark. This is a significant growth contribution, considering these businesses represent only 2.5% of private employment.

The pace of job growth in innovative digital businesses has outpaced other private businesses in this period, growing at an average of 6% per year since 2017. By contrast, job growth in other private businesses was only 1% per year in the same period.

Danish private sector employment
1,000 persons



Net job creation in the private sector from 2017 to 2023
1,000 persons



Note: Calculations based on Orbis data for companies with available employment data.
Source: Implement Economics based on Windsor (2024) using Dealroom data, Bureau van Dijk's Orbis database and Eurostat.

Innovative digital businesses make an outsized contribution to the economy

Innovative digital businesses generally pay higher wages than Danish businesses on average.

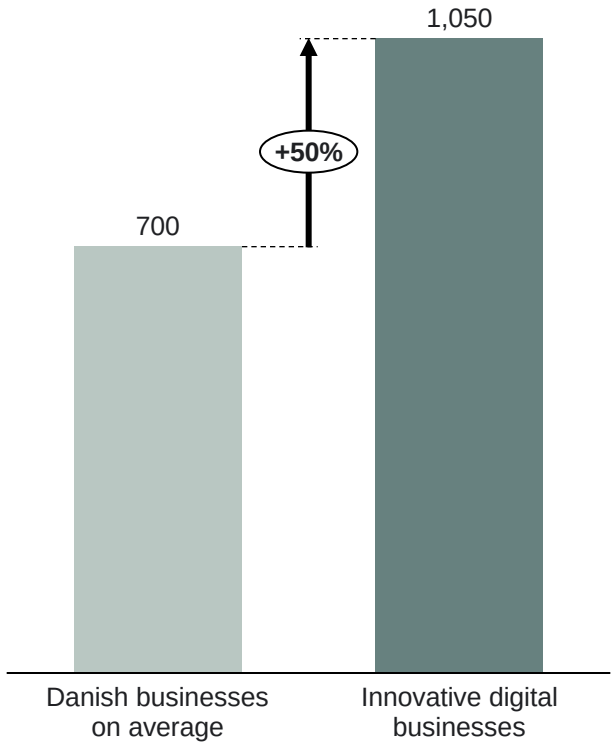
More importantly, they have 50% higher labour productivity than the average business, significantly contributing to the competitiveness of the Danish economy.

If Denmark creates the right conditions for innovative digital businesses to grow, this holds potential to boost productivity.

Danish innovative digital businesses …

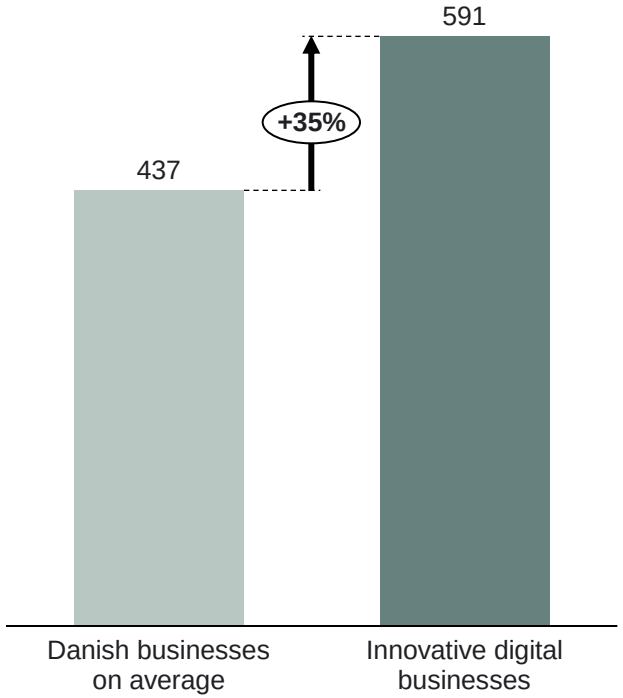
… are more productive.

Average labour productivity
DKK (thousand) per employee



… and pay higher wages

Median wages
DKK (thousand) per employee



Note: Calculations based on companies in Dealroom and Orbis with available financial data. Value added at the company level is approximated as the sum of EBITDA and remuneration to employees. The average number of employees is based on Orbis, and results may therefore deviate from figures recorded in Dealroom.
Source: Implement Economics based on Windsor (2024) using Dealroom data and Bureau van Dijk's Orbis database.

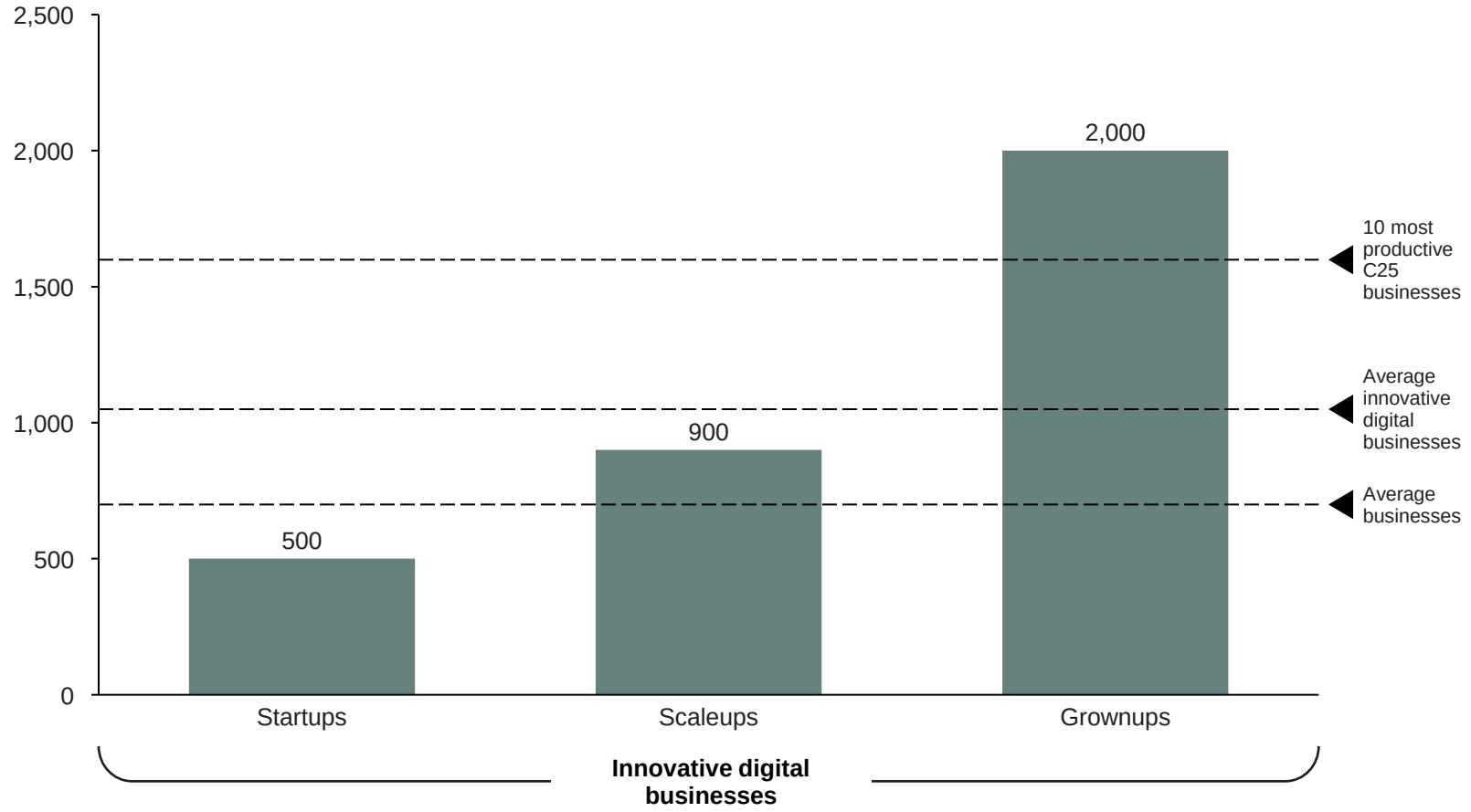
The outsized contribution depends on their ability to scale

Employees in scaleups are generally 25% more productive than those in Danish businesses on average, while successful grownups allow workers to produce up to 3x as much as those in businesses on average, even exceeding average labour productivity in the 10 most productive businesses in the C25 index.

Labour productivity is lower in startups than in businesses on average. This may result from factors such as rapid headcount growth, steep learning curves, or resource constraints on either the operating model or market development.

Thus, while all innovative digital businesses begin as startups, the outsized contribution depends critically on them succeeding in becoming scaleups and grownups.

Average labour productivity by business size
DKK (thousand) per employee



Note: Calculations based on Orbis data with available financial data. Value added at the company level is approximated as the sum of EBITDA and remuneration to employees.
Source: Implement Economics based on Windsor (2024) using Dealroom data and Bureau van Dijk's Orbis database.

Europe and Denmark are not capturing enough venture capital in generative AI

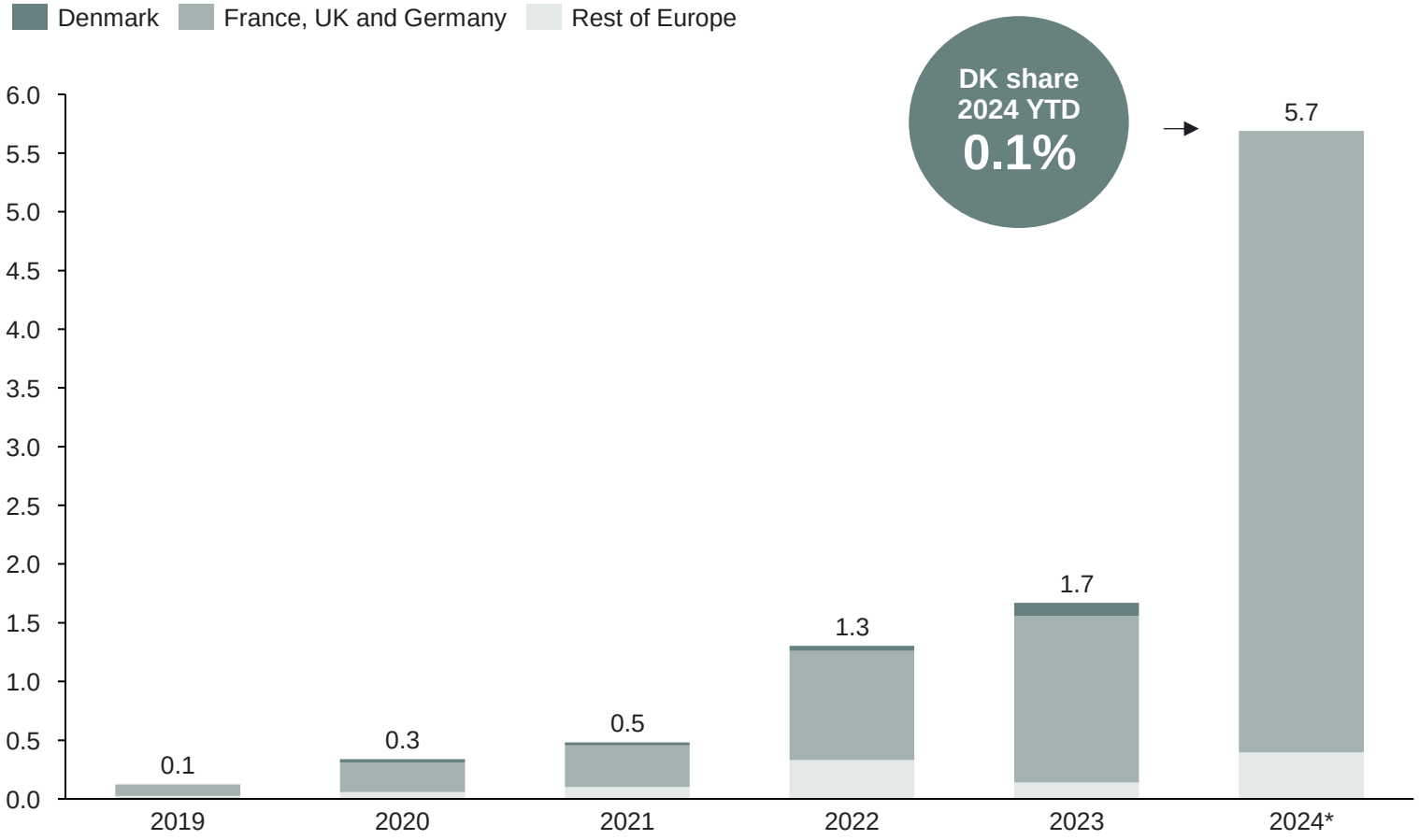
Generative AI investment is projected to reach around EUR 52 billion globally in 2024, but only EUR 5.7 billion (11%) is directed to Europe. Denmark has captured just 0.1% of the funding flowing to Europe, despite accounting for 6.3% of the European economy.

Most European venture capital (VC) funding is concentrated in a few nations: France, the UK, and Germany.

Europe risks falling behind in generative AI; increased funding is crucial to fully seize the opportunities AI presents

11% of global generative AI VC funding is flowing to Europe in 2024 YTD

Europe generative AI VC investment
EUR billion



Note: *2024 numbers are projections by Dealroom.
Source: Implement Economics based on Dealroom.

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Innovative digital businesses use AI to innovate and grow

Innovative digital businesses are major drivers of radical innovation and play a crucial role in the early adoption and diffusion of new technologies

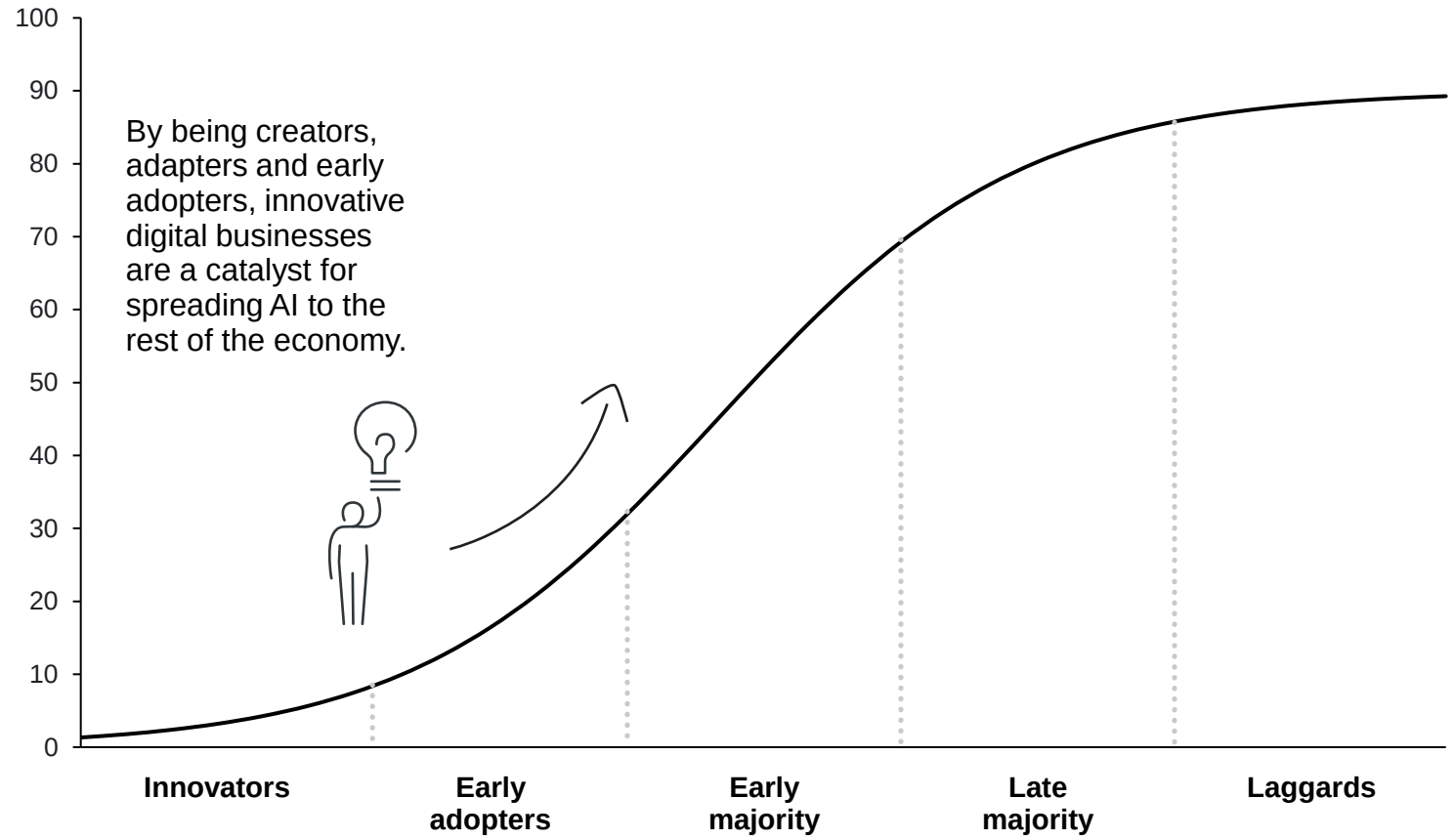
Innovative digital businesses propel AI adoption across the economy

The coming AI era holds major potential economic benefits for Denmark.

Innovative digital businesses develop new AI tools and adapt existing ones, enabling other businesses across sectors to benefit from the new technology. In Denmark, for example, Kaspar A.I. provides AI solutions to help filmmakers automate the selection and editing of large-scale visual material, thereby promoting the diffusion of AI knowledge and skills.

Innovative digital businesses are also early adopters of AI, demonstrating its value and making it easier for other businesses to start using it.

Diffusion of AI technologies in Europe
%



Note: The figure shows generative AI adoption expressed as a share of economy-wide firms exposed to AI automation.
Source: Implement Economics based on Notion Capital survey (2024) and Bruegel (2021).

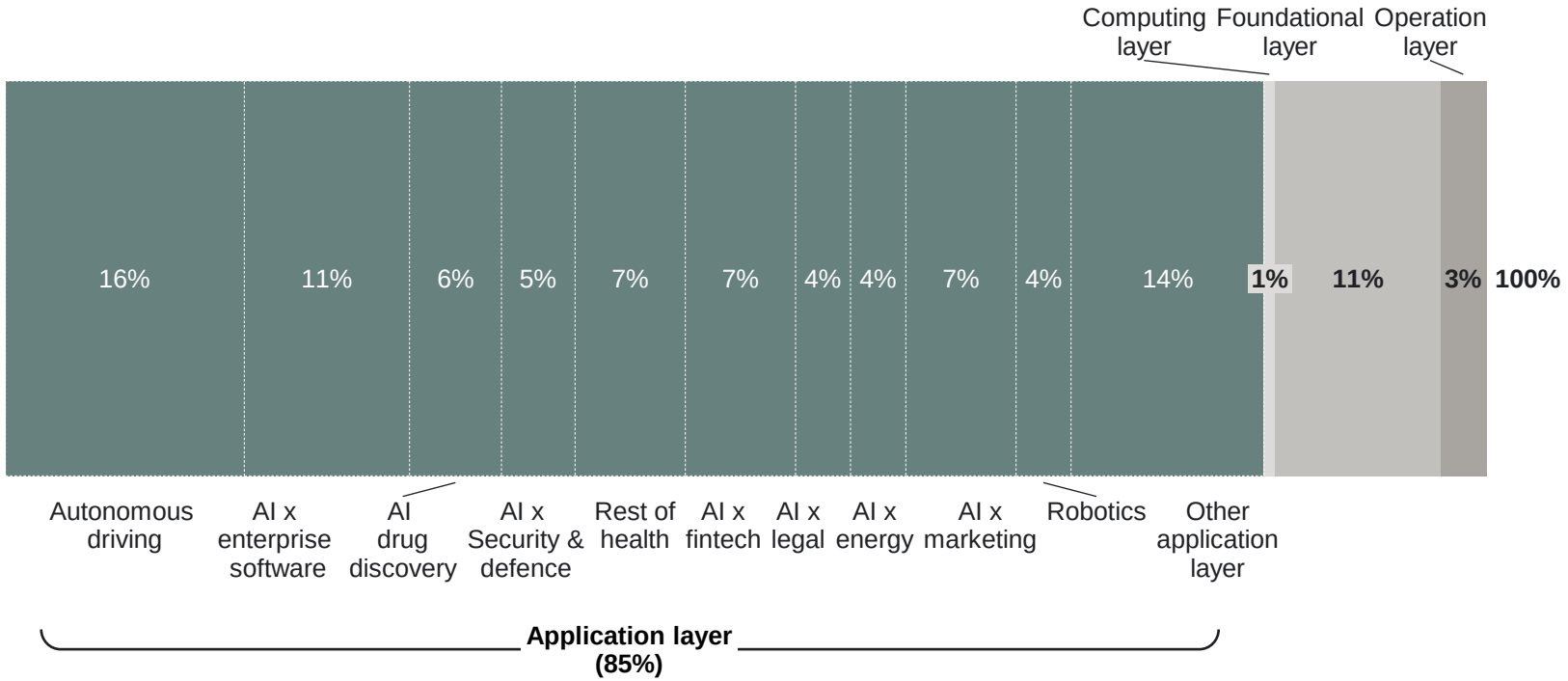
Innovative digital businesses can use AI to transform sectors of across the economy

85% of European AI venture capital funding is directed toward the application layer of AI, focusing on real-world uses and integration into diverse sectors of the economy.

This investment trend reflects AI's transformative potential beyond traditional tech, reaching areas such as transportation, security, and healthcare.

By prioritising practical applications, these investments aim to drive meaningful changes that enhance productivity, safety, and quality of life across multiple industries, underscoring AI's role in reshaping the broader economic landscape.

AI VC funding in Europe by segment (2023/24)
Share of VC funding



Notes: Dealroom data as of 12th June 2024
Sources: Implement Economics based on Dealroom.

4 out of 5 European innovative digital businesses use generative AI

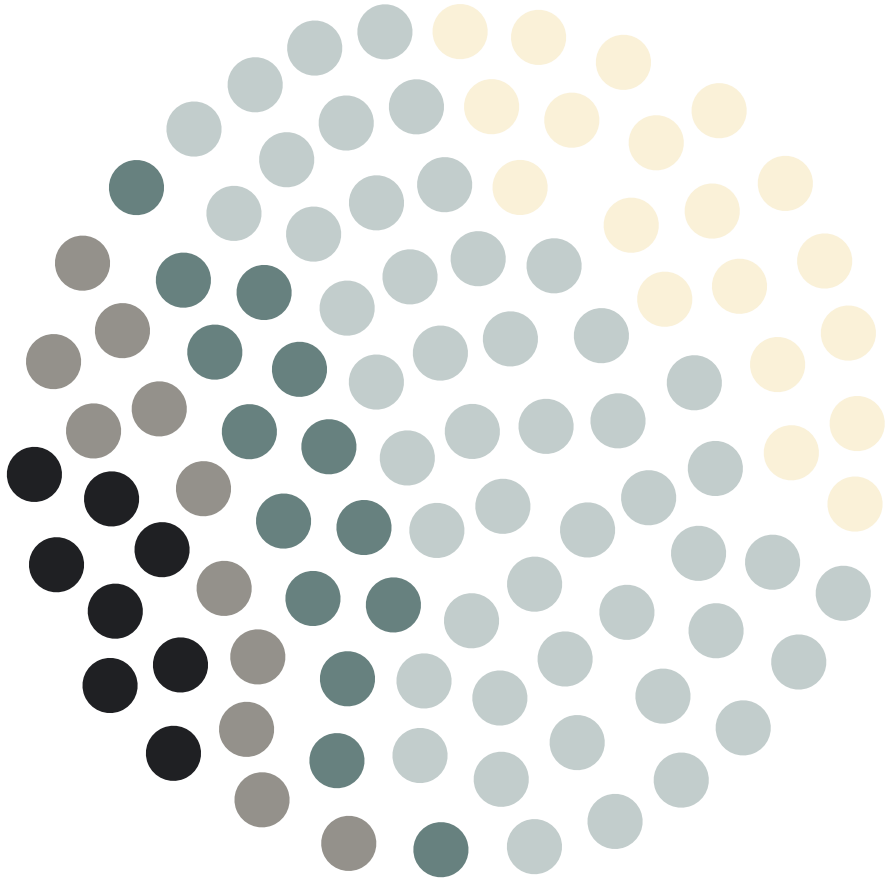
Realising the productivity potential of AI hinges on Danish and European businesses' ability to adopt and develop AI and other technologies. Recent survey results from Notion Capital indicates that digital innovative businesses are early adopters and adapters of generative AI.

Use of generative AI in European innovative digital businesses
% of respondents

Notion Capital poll

79% of European innovative digital businesses use generative AI. (81% in Denmark). This covers…

- … **46%** who have **experimented** with or **partially** adopted generative AI (51% in Denmark).
- **… 14%** who have **fully adopted** generative AI. (14% in Denmark)
- … **11%** who have **adopted and actively adapted** generative AI technology to suit business needs. (12% in Denmark)
- … **8%** who have **generated** new AI technologies to serve business needs. (8% in Denmark)



21% do not use generative AI (19% in Denmark)

Note: Sample size of n=1095 in Europe and n=51 in Denmark for Notion Capital survey.
Source: Implement Economics based on Notion Capital survey (2024).

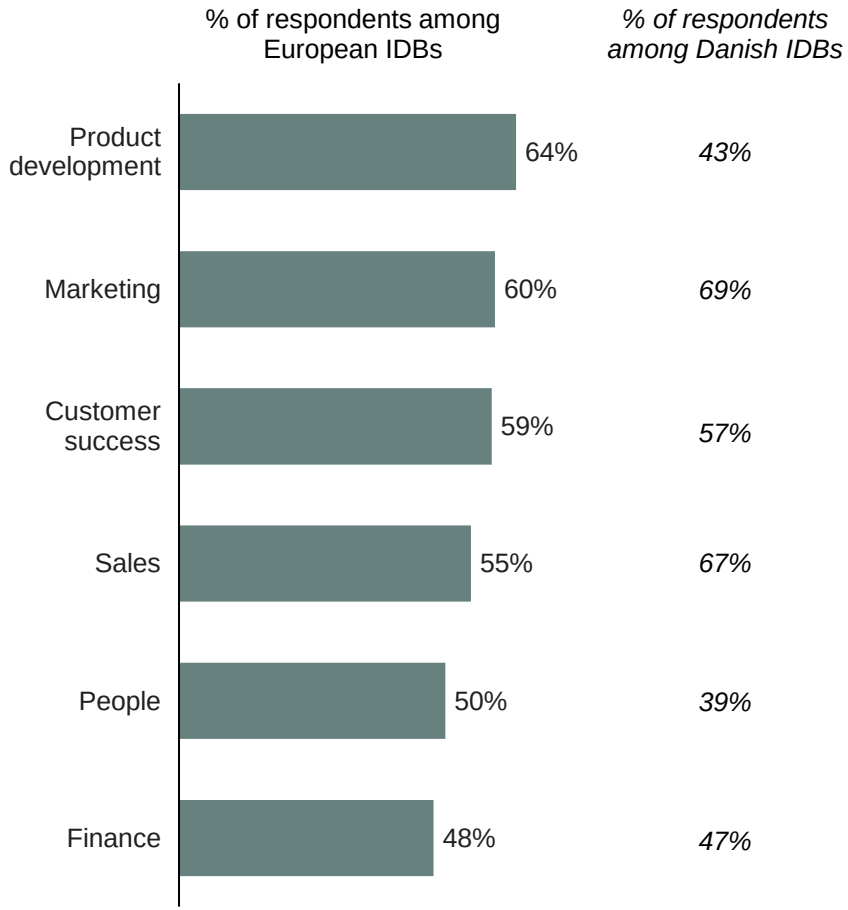
AI boosts value creation and efficiency in innovative digital businesses

Surveyed innovative digital businesses in Europe and Demark use AI to create value across several key business functions. For example, 64% of European innovative digital businesses state that AI has positively influenced their product development, while 60% state it has improved their marketing.

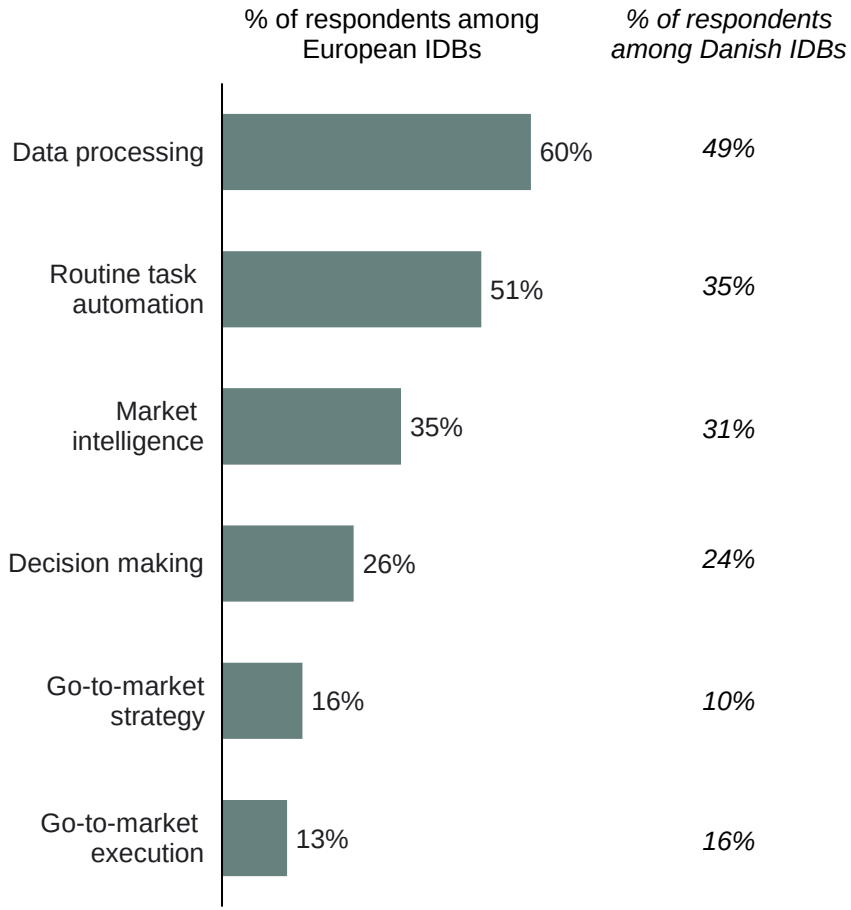
In addition, surveyed innovative digital businesses report that AI has improved efficiency across multiple areas, helping optimise and streamline operations. For example, in Europe 60% report improved data processing, and 51% point to improvements in routine task automation.

Responses from Danish innovative digital businesses are similar to average response rates across Europe. To ensure a large sample size, European polling results are reported.

How has AI influenced the following value creation activities in your company?
% of respondents answering *slight positive impact* or *significant positive impact*



In which areas, if any, has AI improved efficiency in your company?
% of respondents



Note: Sample size of n=1095 in Europe and n=51 in Denmark for Notion Capital survey.
Source: Implement Economics based on Notion Capital survey (2024).

Innovative digital businesses benefit from global access to AI technology

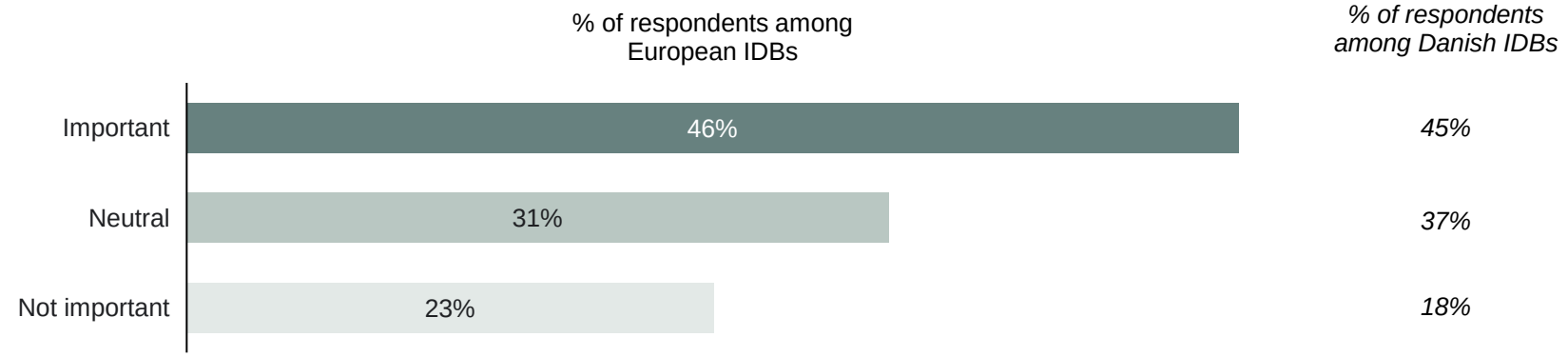
Generative AI is a general-purpose technology with broad application across industries and countries. While the majority of foundational AI models (73%) are developed in the US, according to the Draghi report, companies worldwide can benefit from them.

European innovative digital businesses express that they benefit from AI models developed outside Europe, with 46% saying that access to cutting-edge AI technologies from non-European companies is important for their business. Most respondents (58%) source these technologies from North America.

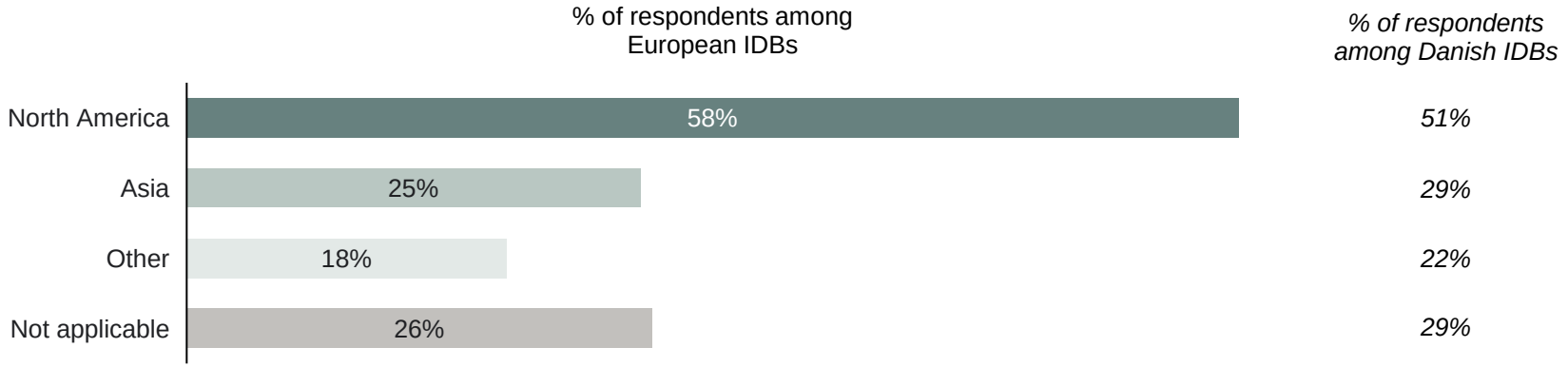
Access to these pre-trained models allow innovative digital businesses to develop AI applications efficiently without the risk and cost of training models from scratch.

Responses from Danish innovative digital businesses are similar to average response rates across Europe. To ensure a large sample size, European polling results are reported.

To what extent is access to cutting edge AI technologies built by companies outside of Europe important to your business?
% of respondents



If important to your business, from which continent(s) are you sourcing cutting edge AI technologies?
% of respondents among innovative digital businesses



Note: Sample size of n=1095 in Europe and n=51 in Denmark for Notion Capital survey. A foundational AI model is a large, pre-trained model designed to perform a wide range of tasks, serving as a versatile base that can be fine-tuned or adapted for specific applications in various domains.
Source: Implement Economics based on Notion Capital survey (2024) and the Draghi report.

Innovative digital businesses work to solve societal challenges

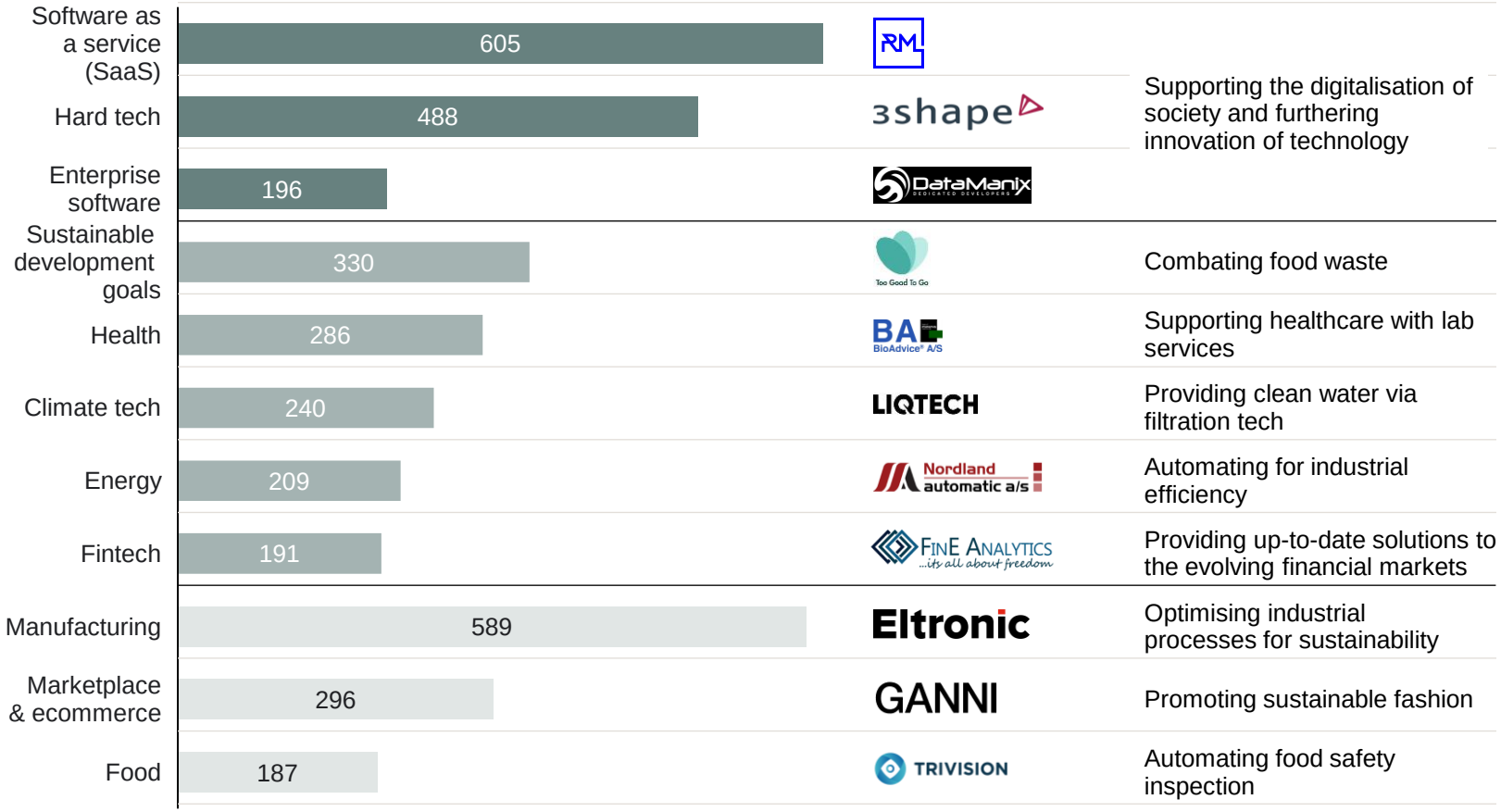
Digital innovative businesses have novel products or business models and are in most cases tech-enabled with proprietary technology, software, or tech-driven business processes.

In Denmark, 605 of them work within software as a service (SaaS), 488 work in hard tech, 589 in manufacturing and 196 in enterprise software.

Many of them work to address societal challenges, including 286 in health, 209 in energy and 240 in climate tech.

> Integrating AI 'vertically' into European industry will be a critical factor in unlocking higher productivity.
>
> **Mario Draghi** in The future of European competitiveness

Focus areas of Danish innovative digital businesses
Number of innovative digital businesses operating in the focus area
Note that each business can be active in multiple areas



Note: Categories are not mutually exclusive, i.e. businesses may be working within multiple business areas. Calculations are based on self-reported tags of companies' business areas.
Source: Implement Economics based on Windsor (2024) using Dealroom data.

Innovative digital businesses are key to innovation and diffusion of new technologies to the rest of the economy

Academic studies show that …

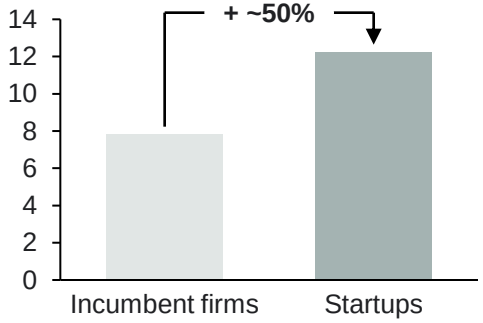
… startups create transformative innovations …

~50% higher chance of 'outlier innovations' than incumbent firms.

Startups, and hence innovative digital businesses, are more likely to introduce transformative innovations compared to incumbent firms.

These "outlier inventions", defined as innovations within the top 5% of the citation distribution, can be transformative due to their profound impact on business processes and industries.

Likelihood of outlier innovations
% of inventions



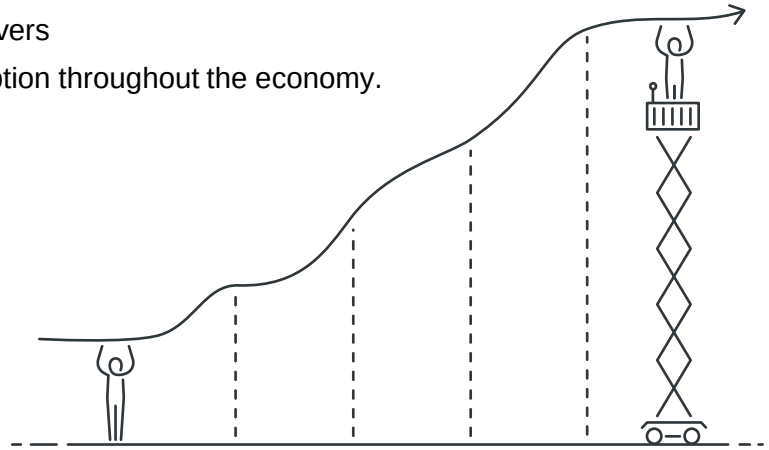
> Startups generate innovations that are more radical and disruptive than those of incumbent firms.
>
> **Kolev et al. (2022)**

… and these innovations have positive spillover effects throughout the economy

26% of productivity growth in the economy is estimated to be driven by new businesses.

The entry of new businesses drives positive change by bringing new ideas to the market and creating competitive pressures that:

- Incentivise incumbents to innovative
- Create knowledge spillovers
- Push technological adoption throughout the economy.



Note: These metrics are based on various academic studies with different definitions of market entrants, startups and high growth businesses. While these definitions differ slightly from ours, they are closely correlated, making the results both indicative of broader trends and applicable to our definition of innovative digital businesses. Based on US business-level data, Akcigit & Kerr (2016) estimate that 25.7% of aggregate growth due to innovation is driven by new entrants, defined as businesses entering the census data during the sample period. Kolev et al. (2022) report that startup patents are about 40% more likely to be classified as "outlier inventions", placing them within the top 5% of the citation distribution. Kortum & Lerner (2000) find that venture capital investments are three times more impactful in terms of producing patented innovations compared to conventional corporate R&D spending.
Source: Implement Economics based on Kolev et al. (2022), Akcigit & Kerr (2018), and Kortum & Lerner (2000).

3

The potential of scaling innovative digital businesses

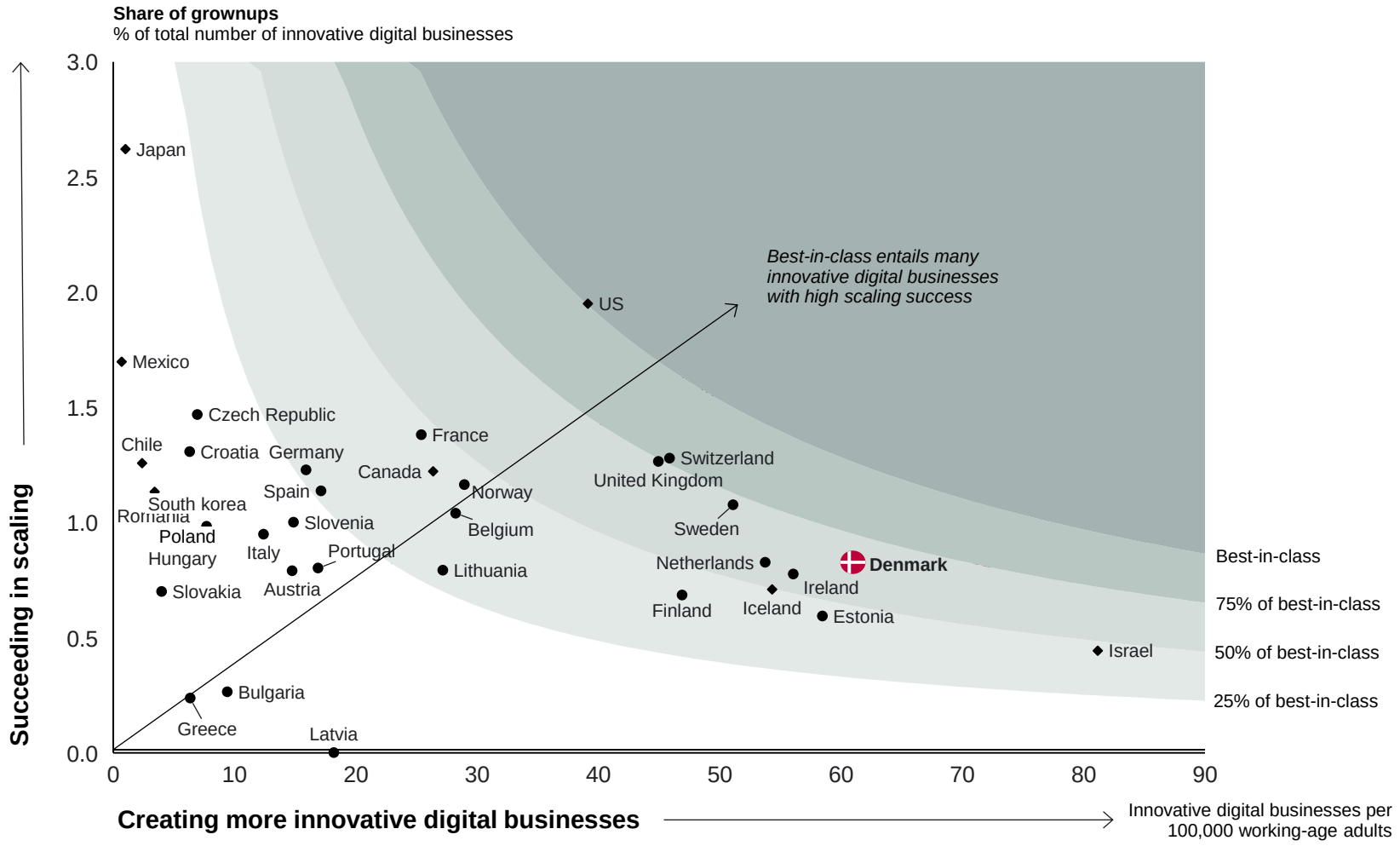
Successful scaling of innovative digital businesses holds major economic potential for the Danish economy.

Denmark is the EU leader on number of innovative digital businesses

Denmark outperforms other EU countries on the number of innovative digital businesses, with 61 innovative digital businesses per 100,000 working-age adults compared to the EU average of 19.

Denmark can unlock significant economic growth by improving the success rate in terms of the share of innovative digital businesses reaching the grownup scale.

The success of these businesses is also crucial for capturing the AI opportunity because they are instrumental in spreading the technology across the economy.



Source: Implement Economics based on Windsor (2024) using Dealroom data and Eurostat.

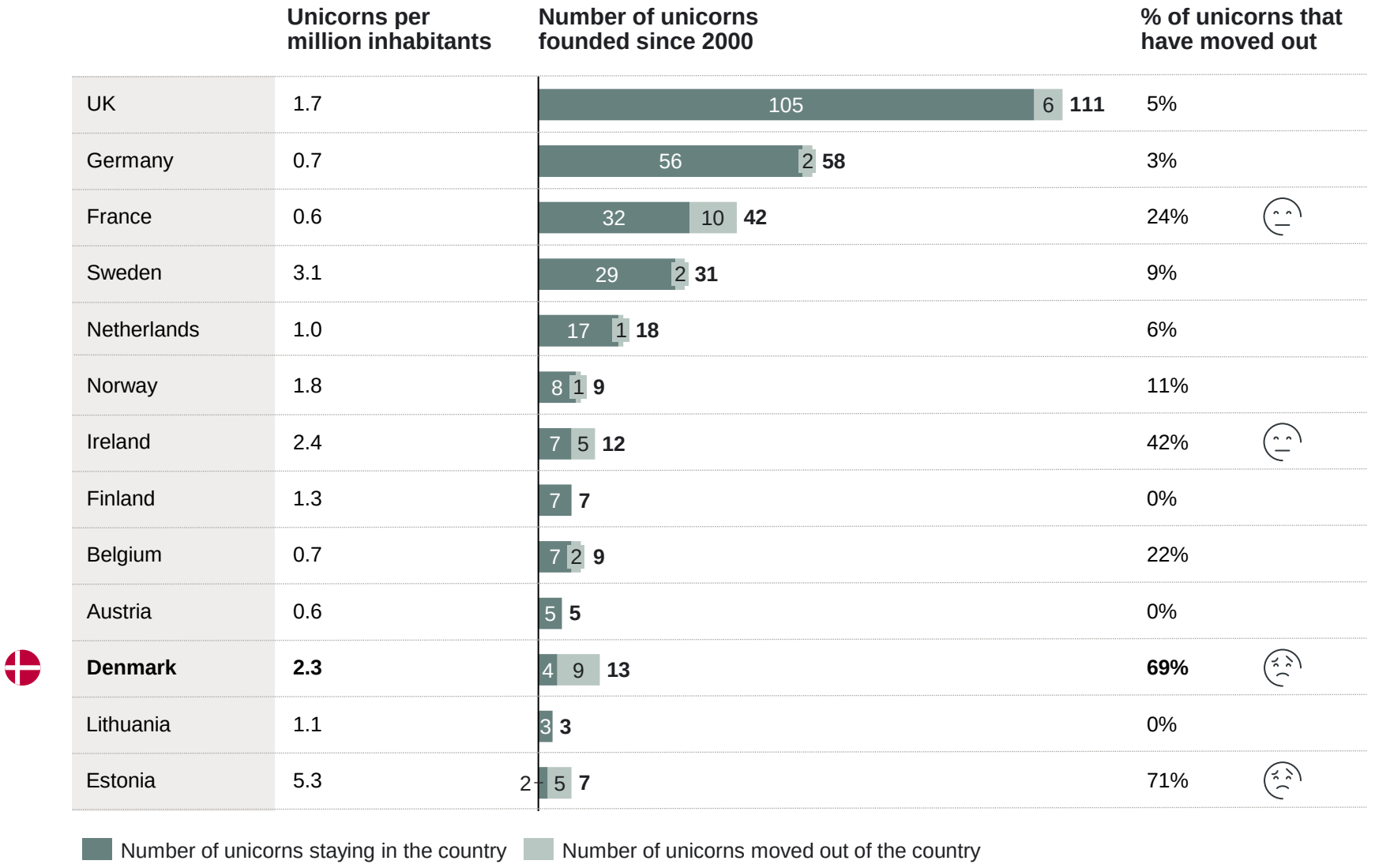
Denmark struggles to retain innovative digital businesses as they scale

Since 2000, Denmark has produced 13 unicorns (2.3 per million people), surpassing Finland (1.3) and the UK (1.7), but trailing Sweden (3.1). Unicorns are startups that reach a valuation of USD 1 billion and are not listed on the stock market.

However, 69% of Danish unicorns, such as Unity and JustEat, founded since 2000 have moved their headquarters abroad, compared to 9% from Sweden and none from Finland.

Retaining these innovative businesses holds great economic potential for Denmark.

> … many innovative companies end up seeking out financing from US venture capitalists (VCs) and see expanding in the large US market as a more rewarding option than tackling fragmented EU markets.
>
> **Mario Draghi**
> in The future of European competitiveness



Note: Unicorns as of 2023. Many unicorns in Finland have been sold to US or Chinese companies, while keeping their HQs in Finland, contributing to Finland's strong record of retaining unicorns.
Source: Implement Economics based on Dansk Erhverv, Dealroom and World Bank Group.

Growing and retaining innovative digital businesses could foster economic growth

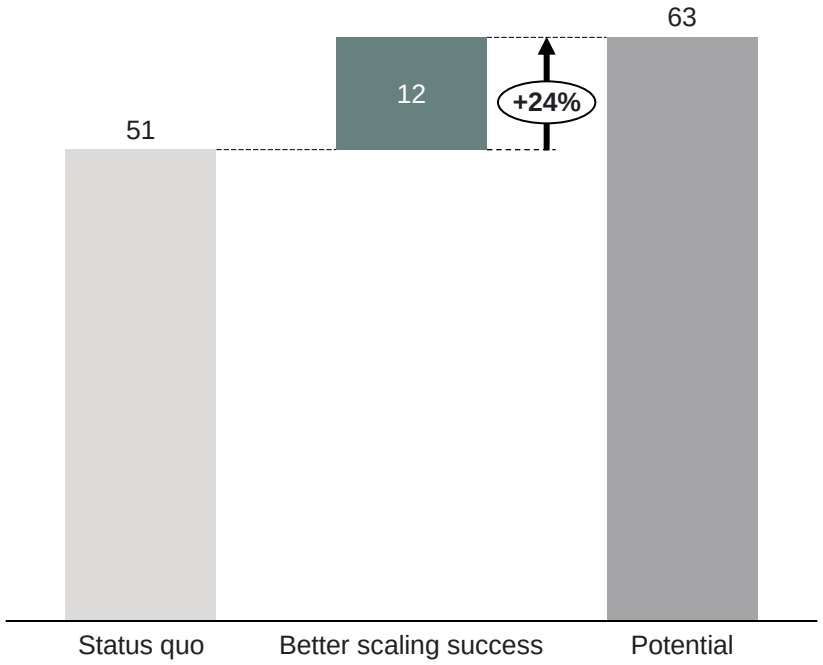
Denmark can unlock significant economic growth by improving the scaling success of startups and making it attractive for them to stay in Denmark.

If Denmark can transform more startups into grownups, reaching the same relative levels as the three leading OECD countries, it could create 12,000 jobs and contribute DKK 25 billion to the Danish economy.

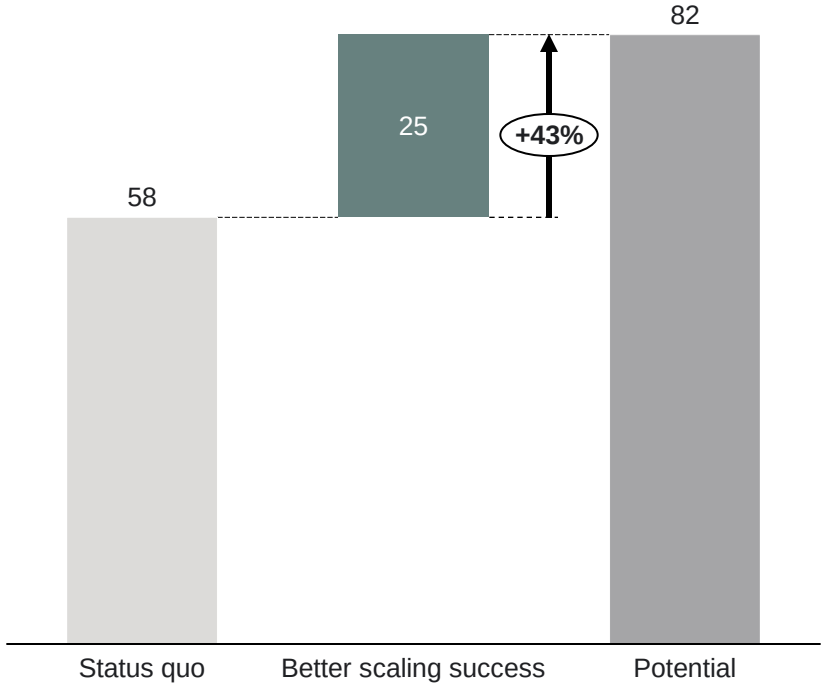
If these businesses succeeded in scaling, it would also have significant spillover effects from the diffusion of AI to the rest of the economy.

Workers in the new jobs may otherwise have been employed in average-productivity jobs. Accounting for this implies the overall net impact to the Danish economy is DKK 16 billion.

Jobs
Thousand



GVA* in innovative digital businesses
DKK billion



Note: Higher scaling success is defined as performance corresponding to the average of the top three OECD countries (UK, Switzerland and the US). *GVA: Gross Value Added.
This report's calculations do not presuppose a given timeline to achieve the potential.
Source: Implement Economics based on Windsor (2024) using Dealroom data and Bureau van Dijk's Orbis database

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The way forward

> Denmark must be a world-class entrepreneurial nation.
>
> Morten Bødskov, Minister for Business,
> at the launch of Denmark's broad Entrepreneurial Deal (Iværksætterpakken)

Denmark has strong framework conditions to grow innovative digital businesses, but challenges remain

Innovative digital businesses need…	Denmark is generally well-positioned to grow innovative digital businesses:
People Growing, attracting and retaining the people with business and tech talent and ideas	The Danish workforce is generally well-equipped, but skill shortages highlight the need for continuous upskilling and attracting skilled foreign labour to grow innovative digital businesses and fully realise the AI potential.
Tech Accessing state-of-the-art AI tools, digital infrastructure and compute power	Access to open, flexible and secure cloud platforms and AI tools/models is critical for growing efficient innovative digital businesses. Denmark's digital infrastructure is a solid foundation, which was further strengthened with the recent launch of the Gefion supercomputer. However, to fully capture the AI opportunity, significant expansions in the digital infrastructure capacity are needed across Europe.
R&D Accelerating R&D with AI	AI has the potential to accelerate scientific breakthroughs and innovation, and Denmark has a strong starting point to harness this opportunity with high R&D spending and Danish companies being prepared to adopt digital technologies. However, Denmark's declining business R&D intensity since 2016 calls for increased foreign R&D investment to fully realise its innovation potential.
Rules Regulatory clarity and reasonable compliance costs	Regulatory barriers make it especially hard for innovative digital businesses to grow, particularly small businesses.
Capital Unlocking Europe's fragmented risk capital markets and increasing the attractiveness of venture capital investment in the EU	The lower levels of venture capital investment in Europe are a symptom of a low expected risk-adjusted after-tax return.

The Danish workforce holds key potential for AI-driven economic growth

People

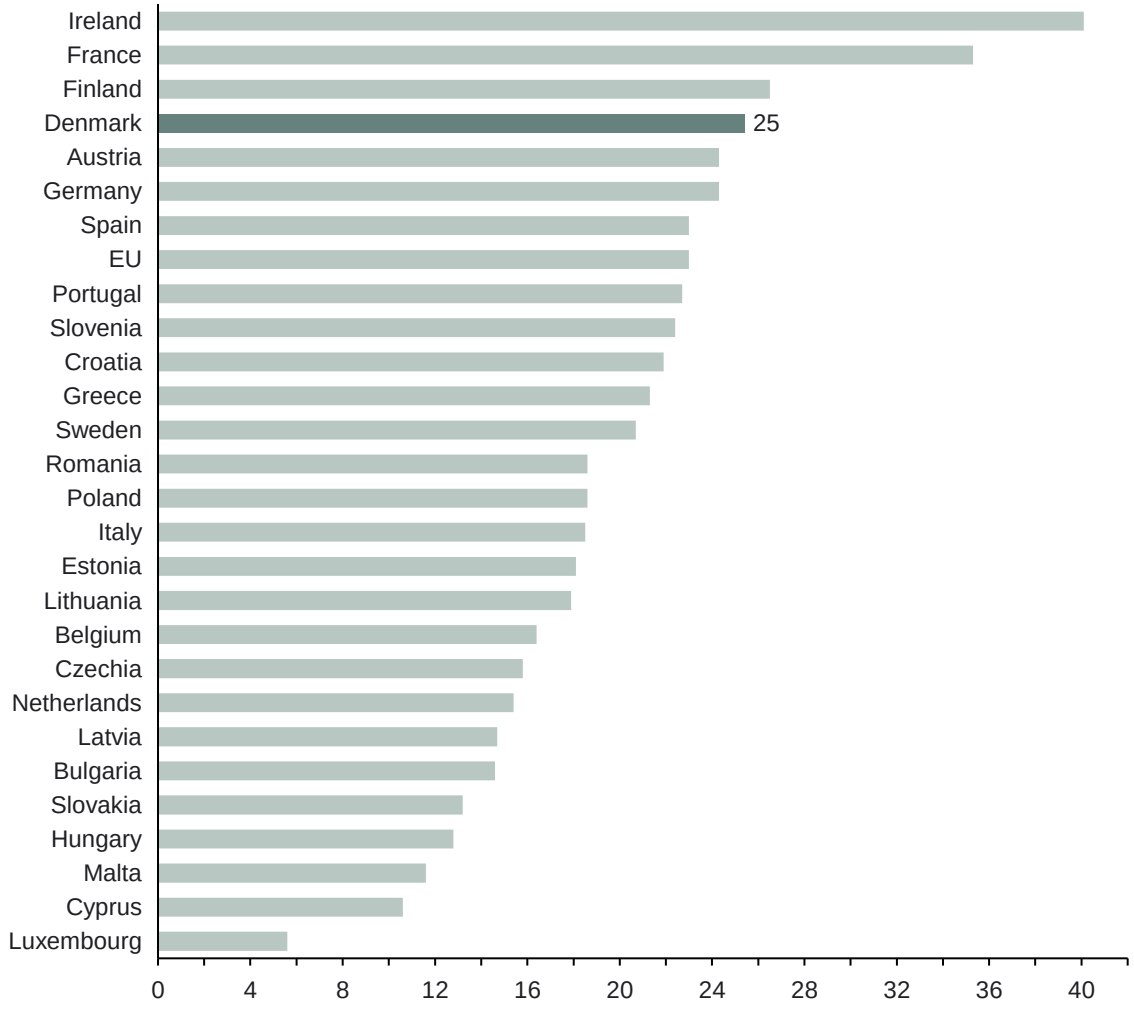
A skilled workforce is essential for growing digital innovative businesses. Using and innovating on top of cutting-edge technology like AI requires a well-educated workforce with strong technical capabilities, creative problem-solving skills and specialised AI skills.

The Danish workforce is digitally enabled and well-educated, ranking 4th on human capital in DESI, with 49% of the adult population possessing above-basic digital skills (EU average 36%) and having a large share of STEM graduates compared to peers. However, skill shortages challenge Danish businesses, with 58% finding it hard to fill vacancies for ICT specialists.

Attracting highly skilled labour will be key to developing innovative digital businesses in the future. Denmark has a good track record of highly skilled labour immigration, with 40% of foreign citizens in Denmark having attained tertiary education compared to the EU average of 27%.

The potential of generative AI is especially large for highly educated individuals because it can significantly free up time from mundane tasks such as coding and writing, allowing more time for creative thinking and problem solving.

Graduates in STEM
Per 1,000 of population aged 20–29



Source: Implement Economics based on OECD Employment Outlook (2023), World Economic Forum's Future of Jobs report (2023), Eurostat, and DESI (2022)

Denmark's strong digital infrastructure is a good starting point for growing digital innovative businesses

Tech

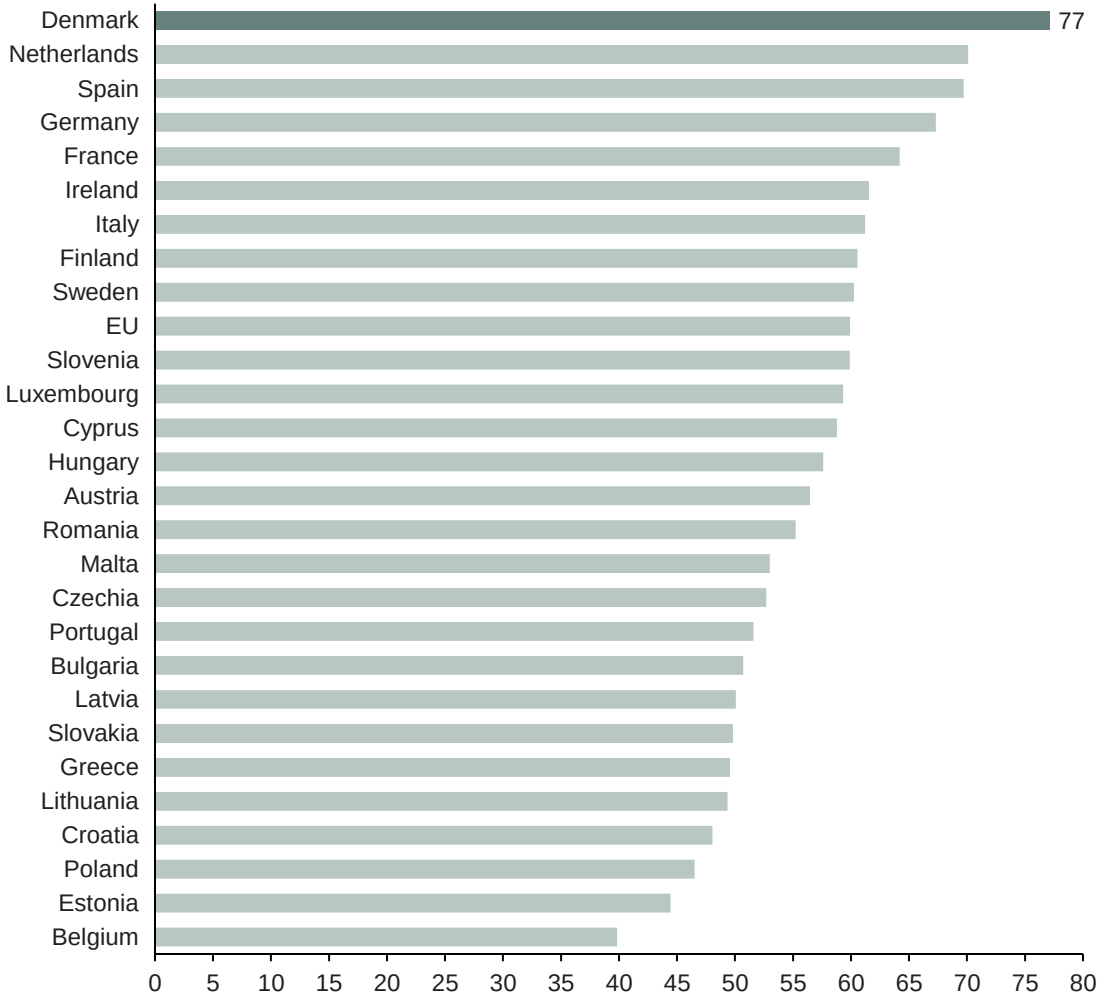
Access to open, flexible and secure digital infrastructure is critical for startups that usually cannot afford large upfront investments or in-house IT expertise. Digital infrastructure includes data centres, cloud and compute power.

Access to top-performing AI/ML tools like Google Vertex and Hugging face is central for Danish innovative digital businesses. According to Notion Capital polling, 46% of European innovative digital businesses already rely on international models, mostly from North America.

Denmark has strong and sustainable digital infrastructure, ranking 1st on connectivity in DESI and 10th on AI infrastructure among EU countries. In addition, one of the world's most powerful AI supercomputers, Gefion, has recently been launched.

However, capturing the AI opportunity requires significant expansions in the digital infrastructure. IDC projects that global data centre demand will nearly triple by 2027, highlighting the need for more and smart investments in digital infrastructure.

DESI 2022, Connectivity
Score (index)



Note: The connectivity index is measured as the total score of fixed broadband take-up, fixed broadband coverage, mobile broadband and broadband prices.
Source: European Commission, The Digital Economy and Society Index (2022).

AI has the potential to lift the productivity of R&D significantly

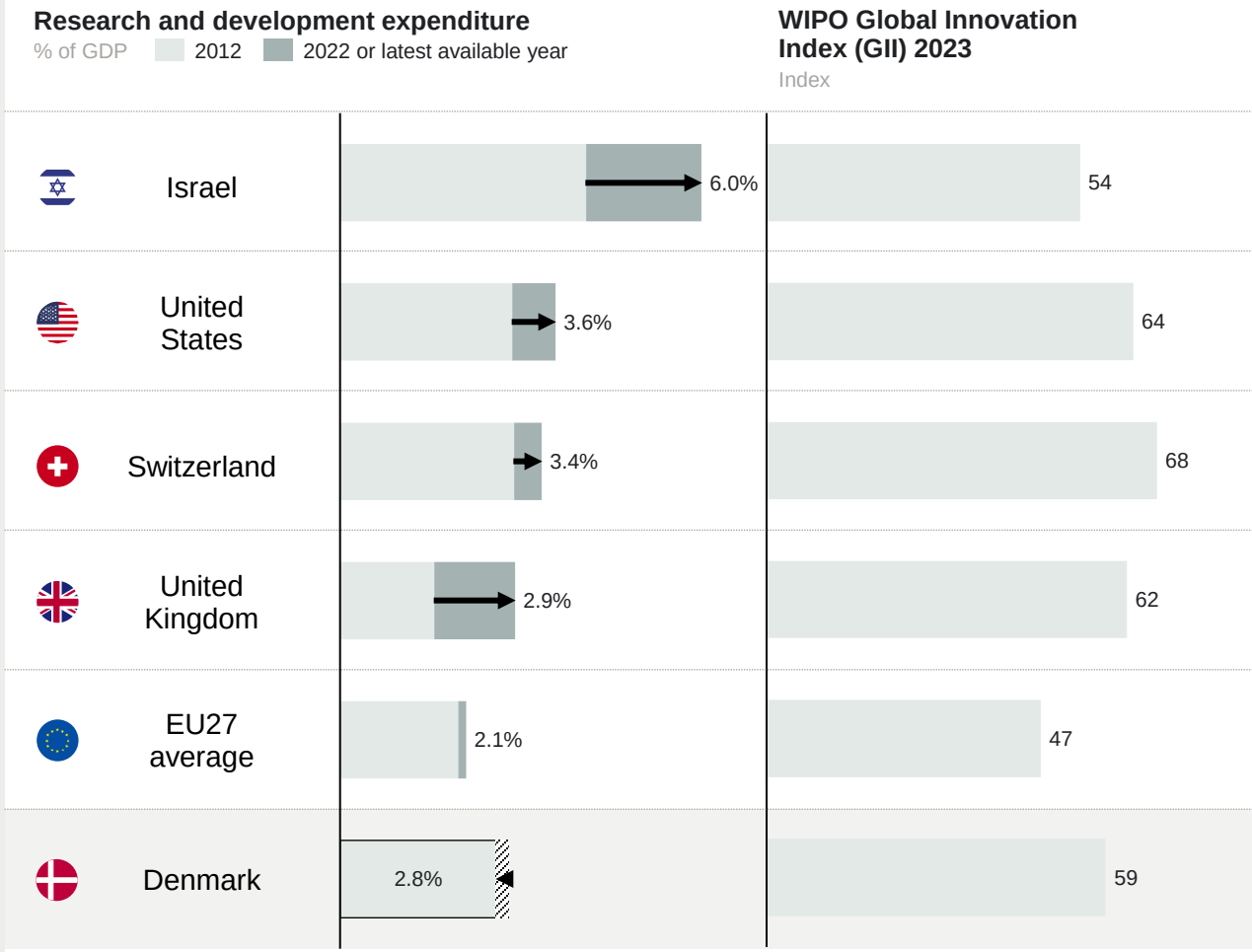
R&D

The productivity of research in general has been declining for the past century, while the number of researchers has increased.

Denmark has relatively high R&D spending, above the EU average and nearly matching the US. In addition, Denmark has strong capacity and success in innovation as measured by the WIPO Global Innovation Index (GII).

Denmark faces the challenge of a declining trend in business R&D intensity since 2016, threatening its leading position and competitive edge in innovation. Attracting more foreign R&D investment could help Denmark harness its scientific strengths and fully benefit from the globalisation of R&D.

Leveraging AI could be a key advantage for Denmark, as AI has the potential to accelerate scientific breakthroughs by addressing the growing complexity of scientific knowledge and vast volumes of research literature. By adopting generative AI, Denmark could enhance R&D productivity, enabling researchers to stay current and identify breakthrough opportunities.



Source: Implement Economics based on the European Commission, OECD Economic Surveys: DESI, European Innovation Council, World Development Indicators database, Bloom et al. (2020), Philippon (2022) and Goldman Sachs (2023).

Regulatory barriers to scaling are particularly burdensome for small and fast-growing innovative digital businesses

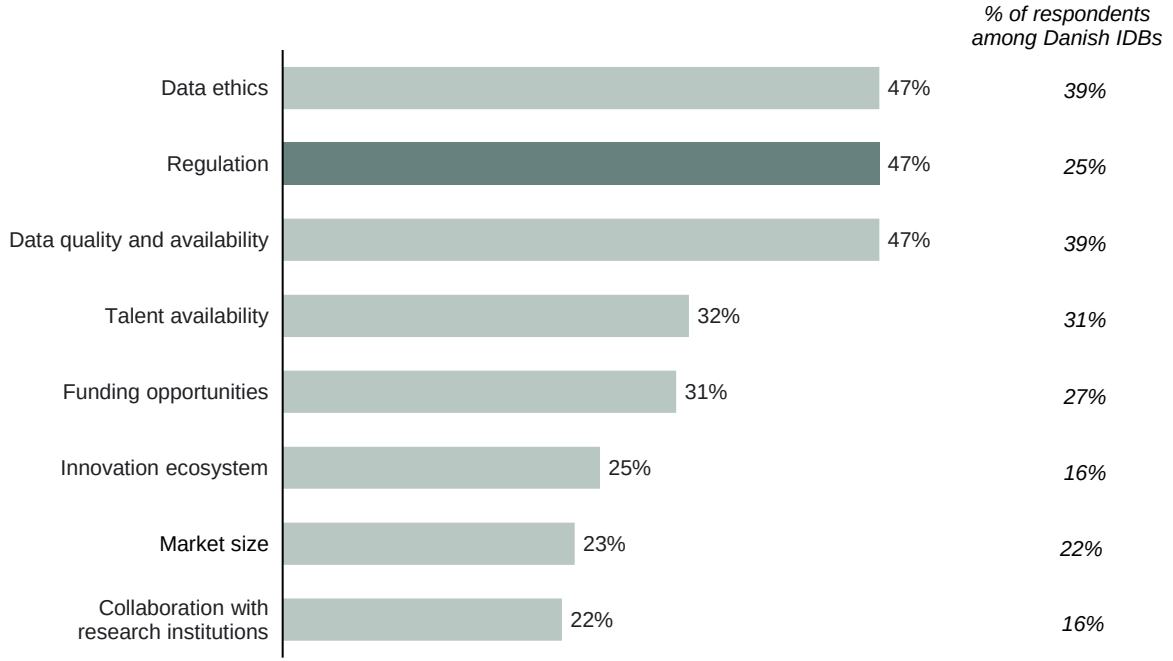
Rules

The complexity of EU regulation hampers innovation and investment. The EU now has around 100 tech-focused laws and over 270 regulators active in digital networks across EU Members.

Compliance costs are substantial and particularly burdensome for small businesses. GDPR enforcement alone led to an 8% reduction in profits by covered businesses, with small tech companies experiencing double the impact. CEPOS recently estimated that EU directives implemented in Danish law over the past five years cost Danish businesses DKK 12 billion every year (0.4% of GDP).

Regulatory uncertainty delays AI innovation and adoption. 47% of European innovative digital businesses see regulation as an obstacle to developing cutting-edge AI technologies. Large companies like Apple, Meta and OpenAI have also announced AI product delays or cancellations due to regulatory ambiguity.

What are the main challenges faced by European startups developing cutting-edge AI technologies?
% of respondents among European innovative digital businesses



> … innovative companies that want to scale up in Europe are hindered at every stage by inconsistent and restrictive regulations.
>
> **Mario Draghi** in The future of European competitiveness

Source: Implement Economics based on iapp (2024), Draghi (2024), Bruegel (2014), Chen et al. (2022), Euronews, and survey by Notion Capital (2024)

Increase the attractiveness of investing in Europe's innovative digital businesses

Lower levels of venture capital investment in Europe are a symptom of a low expected risk-adjusted after-tax return

Capital

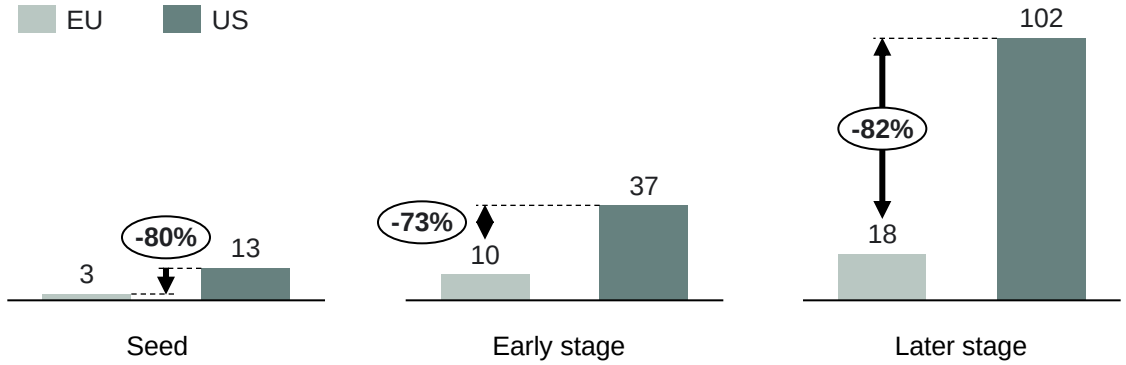
Europe is not lacking money. In 2022, EU household savings were EUR 1,390 billion, compared to EUR 840 billion in the US, according to the Draghi report.

But Europe attracts around USD 100 billion less in venture capital investment than the US. Venture capital is the main source of financing for innovative digital businesses, especially those aiming to grow aggressively towards the 'grownup' scale.

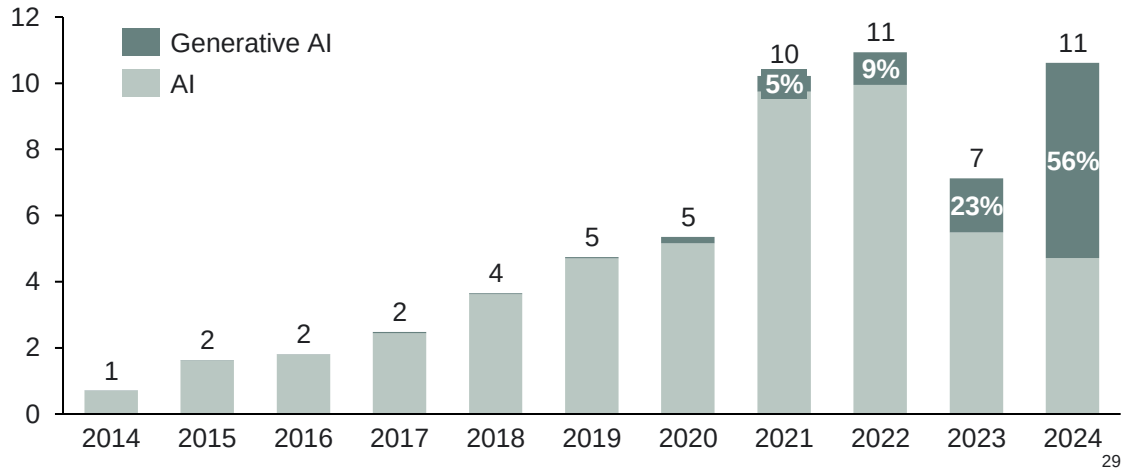
Europe's fragmented capital markets hamper the flow. Different rules in each EU country make it difficult for investors in one country to fund projects in another. This prevents the EU from using its full scale to create large investment funds that can support risky projects.

Regulatory uncertainty and excessive regulatory costs are a further negative element. Unclear rules and higher regulatory burdens reduce the expected return on the capital needed to scale up Europe's innovative digital businesses.

Venture capital investment by development stage
USD billion, 2023



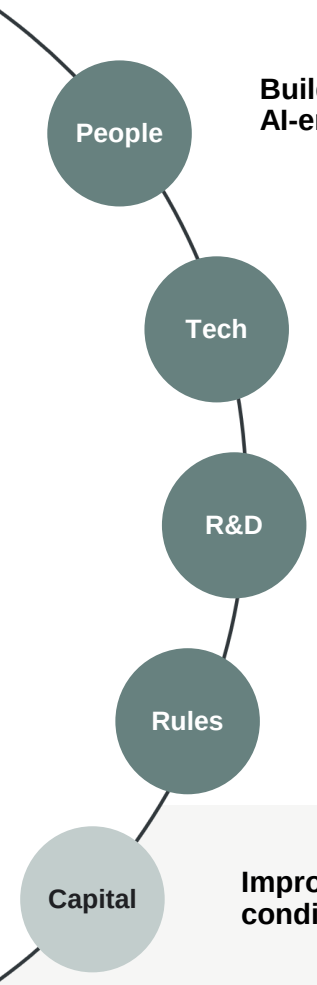
Europe AI venture capital investment
EUR billion



Source: Implement Economics based on Draghi report and Dealroom.

Unlocking the potential of digital innovative businesses with AI

The Danish government can upgrade the existing framework conditions for innovative digital businesses to be fit for the AI-powered future:



Build human capital and an AI-empowered workforce	• Build an AI-empowered workforce by investing in human capital, education and training systems. This means treating AI as a core component of the education system. • Focus training and upskilling on areas where AI enhances and augments the capabilities of workers, so that workers are trained to work together with the new technology. The aim should be to *improve the marginal productivity of workers* rather than replace them.
Invest in AI infrastructure and compute power	• Ensure the right incentives and regulation for public and private entities to invest in AI infrastructure and compute capacity such as graphics processing and the supercomputers needed to drive the powerful AI models. • Enable trusted cross-border data flows in trade agreements and ensure regulatory interoperability and non-discrimination in the EU.
Enable innovation and invest in AI research and development	• Invest in long-term public AI research and encourage private investment in basic and applied research at national and EU level. Make AI tools available to entrepreneurs and scientists so they can use AI in support of other discoveries and innovations. • Support innovation on top of already developed foundational models and findings, e.g. by leveraging the new EU AI innovation package.
Create conducive and aligned AI regulation	• Avoid siloed approaches to AI regulation to minimise the risk of misalignment and fragmentation through increased international co-operation. • Adopt a risk-based approach to AI regulation to provide clarity to developers, adopters and users about which uses are disallowed.
Improve framework conditions to attract capital	• Speed up the creation of a Capital markets union. • Strengthen the above framework conditions by investing in skills, R&D and sustainable digital infrastructure, and ensuring regulatory clarity.

Note: For more details on policies, see OECD AI principles, OECD AI Observatory, EU's ethics guidelines for trustworthy AI, EU's AI innovation package, Google's AI principles and paper on "An Opportunity Agenda for AI". For more details on carbon free energy and digital decarbonisation, see European perspective and global perspective.

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