dfir brief
NR. 42
02-11-2023

Danish innovation must be driven by a broad range of companies

The number of private Danish companies investing in and engaging with research and development (R&D) is decreasing, and R&D investments are becoming concentrated in fewer and larger companies. Especially small businesses with between 10 and 49 employees are investing less. This indicates that Denmark is losing the broad base of companies that are meant to deliver knowledge-based innovation. This is happening at a time when there is an increasing need for innovative solutions in areas such as climate change and security. Companies' innovation is supported by a wide range of instruments offered by the public sector. DFiR has mapped out innovation policy instruments and their distribution in Denmark in a new background report. Following this, DFiR's annual conference on November 7, 2023, will focus on how external factors such as climate change and geopolitical instability challenge the Danish innovation system. The conference invites a discussion on how we can future-proof the Danish innovation system.

A Branching Innovation System

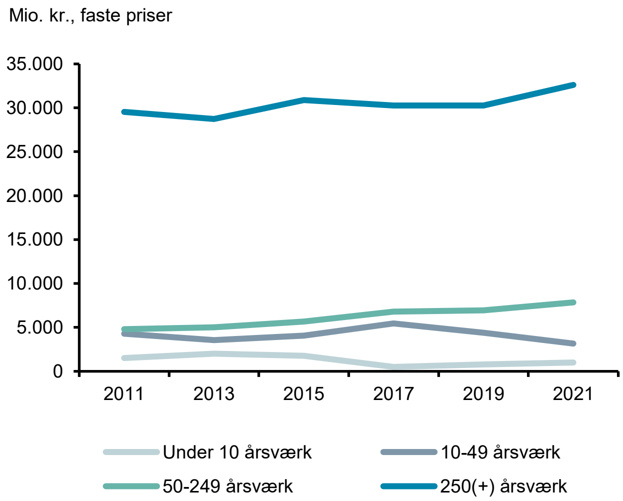
In connection with the analysis project "Innovative SMEs – Robust Societies Have Smart Companies," DFiR has mapped out the most frequently used policy instruments to promote knowledge-based innovation in private companies, the international evidence for the effectiveness of these instruments, and the political goals for Danish innovation policy since 2019[1]. In 2019, an international expert panel evaluated the Danish research and innovation system and presented a series of recommendations to maintain and strengthen Denmark's position as an innovation leader in a European context[2]. DFiR's mapping shows that recent political strategies have utilized a broad range of instruments, with a particular focus on building the capacity of the innovation system, which has included investments in knowledge and business clusters. The mapping also reveals that there is limited knowledge about which instruments are effective and under what conditions they have an impact. Therefore, significant work remains to develop insights into the individual instruments, including how they should be evaluated.

Challenges for Small and Medium-Sized Companies

It is important for Denmark to ensure that a wide range of companies invest in research and development (R&D). R&D investments are particularly significant for SMEs. This was highlighted at a workshop held by DFiR on September 21, in collaboration with the Danish Center for Research Analysis (CFA), on international trends in SMEs' R&D investments. A key message from the workshop was that R&D-active SMEs are more likely to engage in disruptive research than larger R&D-active companies, thereby contributing to the development of early markets for new technologies. SMEs also contribute a large part of the overall production, and their R&D investments are crucial for their productivity and economic growth. Therefore, it is concerning that the share of SMEs' R&D investments in the total business sector across the OECD has declined and has not recovered since the financial crisis in 2009. However, there are several OECD countries where R&D investments by SMEs have increased, prompting consideration of whether there are specific challenges within the Danish system for promoting innovation.

In Denmark, growth in investments is observed for large companies with over 250 employees and medium-sized companies with 50-249 employees, as shown in Figure 1. However, R&D investments have declined for small companies with fewer than 50 employees. At the same time, the number of Danish companies investing in R&D has decreased across all company sizes. This means that the business sector's capacity to conduct research and development is becoming concentrated in fewer and often larger companies (DFiRbrief 37).

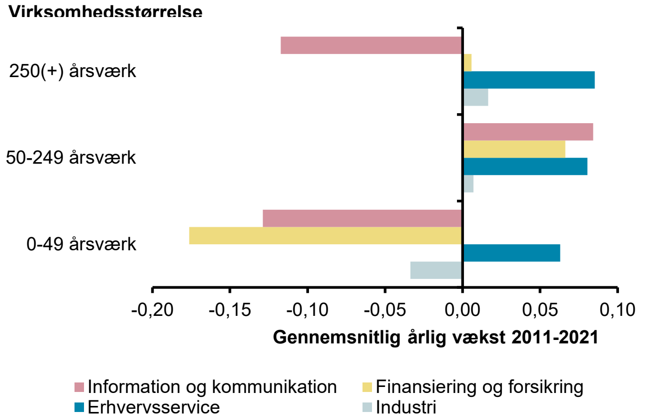
Figure 1: Development from 2011-2021 in companies' investment in research and development, adjusted to 2021 prices



Source: Danmarks Statistik

However, there is a significant difference in the development across sectors, as illustrated in Figure 2, which shows the average annual growth in companies' own R&D investments separately for the four most R&D-active sectors. The manufacturing industry, which also includes the pharmaceutical industry, accounts for the largest share of the private sector's total R&D investments. R&D investments have slightly increased for companies with over 50 employees but have decreased for companies with fewer than 50 employees. Conversely, large and small companies within the information and communication sector have reduced their R&D investments over the period, while R&D investments in business services have increased across all company sizes. Business services include consulting and knowledge services.

Figure 2: Development in Investments in Own R&D from 2011-2021 by Company Size within the Four Most R&D-Active Sectors.



Source: Danmarks Statistik and own calculations.

For three out of the four most R&D-active sectors, there has been a decline in investment levels for companies with fewer than 50 employees over the past 10 years. Generally, the decline in investment levels in small companies and the number of R&D-active companies may indicate that the Danish innovation system does not sufficiently compensate for the increasing capacity and financial leeway required to conduct research and development.

Need for a Comprehensive Strategy?

Over the past three years, several national strategies and initiatives that include innovation policy instruments have been launched to strengthen innovation capacity. These include, for example, Future Green Solutions (2020), the Life Science Strategy (2021), and the Quantum Technology Strategy Parts 1 & 2 (2023). In addition, there are strategies developed at the EU level, regionally, and within individual institutions. High coordination and integration across these diverse efforts are necessary. A comprehensive national innovation strategy could provide a framework to ensure that these various strategies and initiatives support each other. The need for a unified strategy for the Danish innovation system was highlighted by the international expert panel as early as 2019.A key element of a national strategy should be the development of a stronger framework for evaluating and understanding the effects of individual instruments. DFiR's mapping of innovation policy instruments indicates limited insight into the effects of the various components of the extensive Danish innovation promotion system. The background report can be read here.

DFiR Annual Conference 2023

On Tuesday, November 7, DFiR will hold the 2023 annual conference "Innovation in a Time of Climate and Geopolitical Turmoil." At the conference, we will discuss the role of climate change and geopolitical instability in the interplay between political priorities for the Danish research and innovation system, including which factors are crucial for our current system to best support knowledge-based innovation.
You can read more about the conference here.

Read More

DFiR's background report" Kortlægning *af innovationspolitiske instrumenter og nyere strategier for dansk innovationspolitik*", the workshop on September 21, and the annual conference on November 7 are part of DFiR's analysis program Knowledge-Based Innovation, which aims to contribute to the debate on knowledge-based innovation and explore the scope for future political efforts. Read more about the analysis program on the project website here.

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Notes

[1] DFiR. 2023. "Kortlægning af innovationspolitiske instrumenter og nyere strategier for dansk innovationspolitik". Uddannelses- og forskningsministeriet

[2] Ketels, C., Hanouz, M. D., Hunter, J., Kuhlmann, S., Raven, T., Heringa, P., & Palmberg, C. (2019). "Peer Review of the Danish R&I System – Ten steps, and a leap forward: taking Danish Innovation to the next level". European Commission.