

CHAPTER 1.7

CONCLUSIONS AND POLICY IMPLICATIONS

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Part I of this Report has provided an overview of the research and innovation (R&I) performance in Europe, following an indicator-based analysis. It has assessed the impacts of R&I on fostering productivity growth and the changes they bring to the job market, highlighting the changing nature of innovation in a digitised economy, where the digital and physical spheres are increasingly converging.

The productivity slowdown in Europe can be traced back to increasing challenges for breakthrough innovations to be scaled up and diffused quickly in the economy, across different sectors and types of companies. This is particularly noticeable at the company level, where a limited number of leading companies, whose productivity growth has been robust in the past, contrast with the evolution of a wider set of companies in the economy, whose productivity growth has been disappointing and are lagging behind. This divergence in productivity across companies, coupled with the profound changes that many new technologies such as automation and artificial intelligence are bringing into the job market, is leading to growing polarisation of jobs and wages. The decline in routine task jobs and pressure on low and medium skill wages can have a significant impact on inequality, with the negative social, economic and political consequences associated with it.

While more analytical evidence is necessary, breakthrough innovation and innovation diffusion in Europe seems to be hampered by a combination of lower investment levels in R&I and other intangible assets and challenges in the conditions required to spur and support innovation and innovation diffusion due to weaker framework conditions. These factors seem to be hindering Europe's ability to quickly adapt to the profound and rapid changes in innovation

dynamics, with potentially serious consequences for Europe's continued prosperity.

More precisely, innovation – and notably breakthrough innovation – is increasingly linked to the convergence of several technologies, much enabled by digitalisation, that are returning to their scientific and technological roots and that are not easy to master or to obtain off the shelf. To fully reap the benefits of innovation, there is a need for a change in business models, which usually require substantial economic and, at times, financial capacity. Many breakthrough innovations are being introduced rapidly into the markets and are bringing about complete game-change scenarios in increasingly converging industries and markets. This is giving rise to new global superstar companies, notably in the United States, where the benefits from innovations tend to become highly concentrated in 'winner takes most' companies.

Against this backdrop, innovation currently requires sufficient and efficient investment in R&I and other intangible assets to support innovation creation and the ability to absorb and apply innovation, as well as redefining the conditions for innovation to flow quickly across the economy. The speed and depth of the changes we are experiencing enhances the urgency of these requirements which should be applicable to all countries, including those performing relatively well, as complacency now can lead to sleepwalking into trouble in the near future.

The Report shows that Europe remains a global R&I powerhouse, although it is failing to invest as much as other economies, notably the United States, in business R&D, education and skills development, ICT and economic competences, such as management and organisational skills – a gap that is widening over time. This affects the ability of stakeholders to build stronger knowledge

flows and impacts negatively on Europe's technological and innovation output, including the development of new emerging technologies. This hinders the ability to capitalise on Europe's scientific excellence.

In addition, the analysis shows that overall Europe suffers from weaker framework conditions for innovation and innovation-led entrepreneurship, notably in terms of more stringent conditions for labour and goods markets, less access to risk capital, and a still fragmented market in certain areas, such as digital, capital and services that hinder companies' ability to scale up innovations quickly. As a result, Europe lags behind in benefiting from new technological champions or more generally transformational entrepreneurship, i.e. disruptive innovators who reshape existing markets to become global giants.

However, this aggregate analysis masks large differences across Member States and while the innovation divide persists in Europe, it is now more nuanced, notably for investment patterns as several Member States have made significant progress towards boosting their investment levels. The analysis also shows that there are persistent challenges in transforming investment into scientific and technological outputs, as many R&I systems continue their restructuring.

Based on this analysis of R&I performance number of policy considerations follow:

1- Boost investment in R&I and other intangible assets in Europe

Public investment in R&I and other intangible assets in Europe can help bridge the current investment gap against other economies. Lifelong learning aimed at developing the skills needed for a changing economy will contribute not only to spurring innovation but also to mitigating the risks associated with it in terms of potential job losses. While Member States benefit from differ-

ent fiscal spaces for public investment, those that can do so should invest more in intangible assets. In addition, this will bring spillover benefits to other countries. Those countries that have experienced low or even declining public investments should make it a priority to cement the basis of future growth on such investments. In addition, the leveraging of business investment, an area in which Europe particularly lags behind, is critical. The right framework conditions for private companies to innovate must be in place.

2- Urgently rethink public support for R&I today, notably for market-creating breakthrough innovations

Europe lacks sufficient investment in market-creating breakthrough innovations, where private capital shies away. Supporting bottom-up transformative innovative projects can bridge this gap. In addition, public R&D investment will benefit from moving away from supporting specific fields towards more comprehensive trans-sectoral and trans-disciplinary mission-oriented policy approaches. Missions should have a transformative potential, set direction, maximise the impacts of public R&D, galvanise business investment and be capable of mobilising all stakeholders. Policy experimentation in these fields can help establish more robust evidence about the impacts of these changes in public R&D funding.

3- Improve the conditions to speed up knowledge creation and diffusion to support innovation and innovation diffusion, by opening up national science and innovation systems

Supporting investment in R&I and other intangible assets improves an economy's absorptive capacity and its ability to diffuse knowledge. Measures to open up science and innovation systems within Europe and to the world will support faster and stronger knowledge flows, innovation outputs and their commercialisation. Against this backdrop, initiatives to boost

the conditions for open science, thanks to the opportunities offered by digital technologies, and for open innovation, including through stronger science-business, will be critical for faster and stronger innovation diffusion.

4- Ensure innovation-friendly regulations and innovation demand policies that support breakthrough innovation and innovation diffusion across sectors

It is crucial to develop innovation-friendly regulations that facilitate the smoother adoption of innovations, notably in relation to the myriad of opportunities that digital technologies offer, across all sectors of the economy and specifically in relation to highly regulated sectors such as education, health and transport. In addition, innovation demand policies, such as public procurement or the empowerment of consumers to develop consumer-based innovations, will be critical. These actions will speed up the creation of benefits from innovation.

5- Rethink competition policy in a digitised economy

While there is not yet sufficient evidence, it appears that changes in the innovation dynamics are leading to a higher concentration of innovation benefits and to the creation of potential monopolies or dominant positions in relation to the access and use of key new resources, such as data, and notably big data. This may have implications for ensuring a level playing field with equal opportunities for transformative innovations.

6- Complete the internal market in all sectors to support the rapid scale-up of European innovation

Europe's ability to scale up innovations is being hindered by an incomplete internal market, notably in strategic areas such as digital or services. Achieving that internal market in all areas is crucial to give innovations 'born in Europe' the opportunity to scale up and become global players.

7- Boost adequate access to risk capital in Europe to support innovation

Risk and patient capital, while recovering, remain very low compared to the United States. Public efforts to invest and leverage private risk capital are crucial. Initiatives like the Capital Markets Union or the creation of a Pan-European Venture Capital Fund-of-Funds which aim to make European capital markets deeper, broader, better integrated and with a greater capacity to leverage business resources will help bridge this gap.

8- Strengthen the pace of structural reforms and improve framework conditions for the creation, growth and orderly exit of firms, to unlock resources from unproductive companies

Continuing structural reforms that allow markets to react better and faster to the changes that innovations bring about in the markets and that facilitate the entry, but also the orderly exit of firms, will help reallocate resources towards the most innovative and productive companies, avoiding the negative lock-in of resources in unproductive and zombie companies.

9- Raise R&I capacities across the European Union

Bridging the innovation divide in Europe in order to build the foundations of sustained growth across all Member States and regions will require renewed efforts to sustain investments in R&I and other intangible assets and the commercialisation of products and services accruing from innovation. It will also require the design, implementation and evaluation of the necessary accompanying reforms to boost the quality, efficiency and institutional capacity in R&I. Smart specialisation strategies that are about enabling regions to turn their needs, strengths and competitive advantage into marketable goods and services are already helping in this process. The mobilisation of na-

tional and European resources towards these activities will bring scientific excellence and impactful innovation performance.

10- Europe must capitalise on the increasingly global innovation landscape by opening up its science and innovation to the world

As the global R&I landscape has changed profoundly with the rise of new innovation poles, Europe needs to make sure that it can capitalise on all the new knowledge that is created around the world by building strong R&I partnerships and by supporting the strengthening of R&I capacity in other countries, so that global knowledge can quickly expand and more countries can contribute to and benefit from global progress.

Finally, the current analysis has also unveiled a number of areas where we continue to lack sufficient robust evidence and that will require further research to provide better evidence-based policy input. These include:

- ▶ How can investment in intangible assets support innovation and innovation diffusion and what mechanisms are in place at the micro-economic level?
- ▶ How can R&I, ICT, skills and social policies best coordinate to ensure innovation and the wide participation of innovation benefits in society?
- ▶ How is the current concentration of innovation, notably in the United States, affecting the creation of a level playing field where incumbents and new entrants can compete fairly? What role is there for regulation and competition policy?
- ▶ How can R&I policy instruments support innovation diffusion?
- ▶ How can public R&D investment better leverage private R&D investment? What role is there for mission-led public research to mobilise increasing public and private investments?