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Stuck in the mid-tech trap: Why Europe needs more disruptive digital innovations

Digital technology is a vital source of innovation and productivity growth, particularly in high-tech sectors. However, the strongest productivity growth in Europe has predominantly come from mid-tech sectors. Targeted policies could stimulate greater high-tech innovation across the continent

Mario Draghi's report highlighted that Europe's productivity growth lags behind the US's, particularly in high-tech sectors

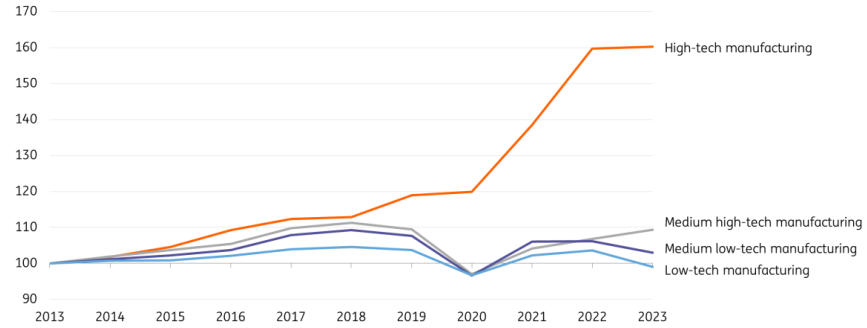
In September 2024, Mario Draghi presented a detailed and comprehensive plan to revitalise the EU economy. Economic growth in Europe has long been weak compared to the US and China. As the report makes clear, Europe is lagging behind in the breakthrough digital technologies that will drive future growth. In this article, we discuss the role of technological innovation and productivity in the performance of European technology sectors.

High-tech sector led industrial production growth over the last decade

High-tech manufacturing has been the growth engine of industrial production in Europe over the past 10 years. It has increased production by 60%, while less technologically advanced segments achieved less than 10% production growth over the same period. Within high-tech, pharmaceutical companies (including biotech) and makers of electronic devices and components were the standout performers, achieving annual growth rates of 9% and 7.5%, respectively. This picture is more or less the same for the large eurozone countries.

High-tech by far the fastest growing EU industrial production segment

Annual production volume EU, 2013 = 100



Source: Eurostat

Value creation in high-tech grew two to four times faster than average

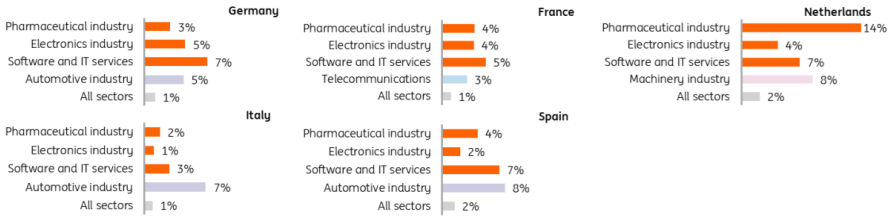
The three big high-tech sectors – pharmaceuticals, electronics and IT services – also appear to account for above-average value creation. The development of gross value added in these sectors – the difference between the sector's production value and the total value of purchased energy, materials and services in the same sector – was two to four times higher than total GDP growth in the five largest euro area countries from 2012 to 2022. Nine of the fifteen fastest-growing industrial and ICT subsectors are high-tech sectors, which have grown at least 4% per year.

In Germany and France, the IT sector was the fastest growing and in the Netherlands, it was the pharmaceutical industry. But high tech was not the leader everywhere. In Italy, for example, the automotive industry grew by far the fastest at 7% per year. This was also the case in Spain (+8%). In the Netherlands, the machinery industry expanded by 8% per year over the entire period and since 2017, has grown more than 12% per year. The rise of chip machine makers, led by ASML, has contributed a lot to this. This is a subsector that is closely linked to

the global high-tech production of semiconductors.

High tech has been good for growth in the largest eurozone countries; autos also contributed greatly

Average annual growth of gross value added for high tech sectors and the (next) biggest growth sector, between 2012 and 2022, constant prices*



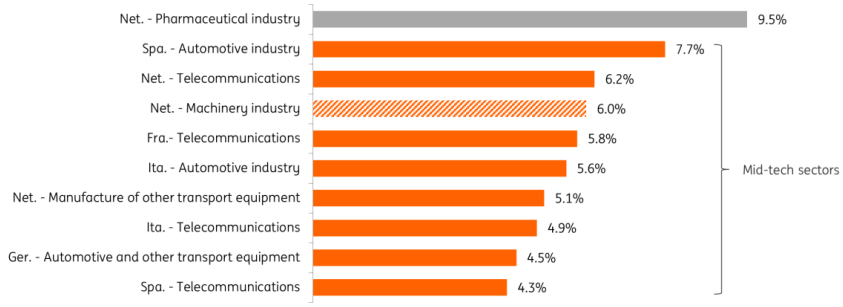
Source: Eurostat *Excluding industrial coke and refined petroleum products manufacturing

But highest productivity growth mainly in mid-tech sectors

The growth of labour productivity is an important indicator of the ability to grow structurally. In the immortal words of Paul Krugman, 'productivity is not everything, but in the long run it is almost everything'. Although high-tech sectors show relatively strong growth, it is the mid-tech sectors that achieve the highest productivity growth. Among the top five sectors with the highest productivity growth, only slightly more than 25% are classified as high-tech, on average, in the five major euro countries. And the top 10 (technology) sectors with the fastest growing productivity for the five countries combined appear to consist almost entirely of mid-tech sectors. Only one high-tech sector emerges: the Dutch pharmaceutical industry. Although it has grown strongly, the size of this sector – EUR 8.5 billion in added value – is limited by European standards.

Highest productivity growth mainly in mid-tech sectors

The 10 industrial and ICT sectors with the highest labour productivity growth between 2012 and 2022*



Source: Eurostat, ING Research *No data available for German metal/ plastics industries or French, German wood and paper industries; manufacture of industrial coke and refined petroleum products excluded; chip equipment makers constitute more than half the turnover of the Dutch machinery industry, arguably the sector can be categorised as partly high tech.

As the figure above shows, in Europe the transport equipment industry (including automotive) and the telecom sector account for eight of the ten strongest growth sectors in terms of productivity. This is characteristic of the concentration of European R&D in mid-tech sectors, also known as the "middle technology trap". The common denominator among the fastest-growing sectors is that high productivity growth in all these sectors was accompanied by high R&D intensity, supported by strong regional innovation clusters and solid investments in, for example, rapid scaling up and automation. Whether it's automation, robotisation and scaling up (automotive), fundamental and applied research and co-creation (pharma and chip machines) or network investments by the government and strong competition (telecom), these elements have been critical to driving growth.

The highest R&D expenditure in Europe is still made by car manufacturers. Sales in that sector are under pressure and competition from the US and China has increased sharply. The same applies to the machinery industry, where ASML is the exception to the rule, partly due to a strong, long-standing commitment to R&D and a fast-growing high-tech sales market. The telecom sector – another major grower in terms of productivity – has also made great strides, but in Europe, compared to the US and China, it still consists of many, relatively smaller players. Cross-border consolidation for economies of scale has proven more difficult in Europe due to fragmented and stricter regulation and competition policies for consumer protection.

High-tech productivity in Europe has grown significantly less than in the US

The Draghi report clearly shows that European productivity growth is lagging behind US productivity growth, particularly in high-tech sectors. From 2000 to 2019, only business services and financial services fell further behind than high-tech. The European IT sector, electronics industry and pharma (health and life sciences sector in total) have all increased productivity much less than their American counterparts. The main driver of the productivity gap between the US and Europe has been the difference in the development and implementation of digital technology.

Europe lags behind US in productivity growth of high-tech sectors

EU-US gap in annual productivity growth, in percentage points by sector, 2000-2019

Source: Part A of the 'Draghi Report' - The Future of European Competitiveness

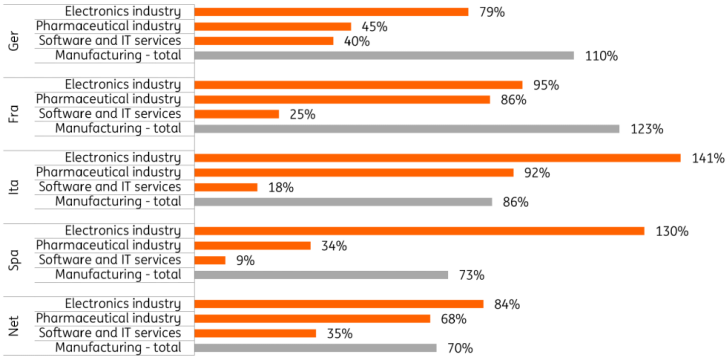
Europe's high-tech growth only partially achieved through productivity increases

Groundbreaking innovation and very strong growth are mainly taking place in high-tech sectors worldwide. The demand for high-tech products in the world is growing structurally due to digitalisation, electrification and the breakthrough of artificial intelligence. The fastest-growing companies are often R&D-intensive and focus on the development and rapid scaling up of innovative technologies in domains such as biotech, AI, (photonic) chips and quantum computing. Despite the strong growth of technological sectors, Europe has few globally leading high-tech companies or unicorns (startups that have achieved a market valuation of at least one billion dollars). In European high-tech sectors, on average only 65% ⊠⊠of added value growth over the past 10 years has come from productivity increases. Excluding the IT sector, this is 85%, compared to 93% in the manufacturing industry as a whole. The differences between the five large euro countries are, however, large. In no country do all three

high-tech sectors stand out positively. The number of digital breakthrough technologies from Europe has so far remained limited. This has led to a high dependence on mainly American Big Tech companies, for example in cloud computing and fundamental AI models (such as GPT-4 and Gemini).

Productivity has not been a bigger growth driver for high tech than for total manufacturing

Share of labour productivity growth in total value added growth per sector, 2013 - 2022



Source: Eurostat, ING Research

Fewer barriers, more venture capital and targeted government investments

Despite the shortfall, it remains worthwhile for Europe to invest in high-tech innovations. Many new technologies such as AI and photonics are far from fully developed and offer sufficient opportunities for future growth. In this context, Draghi rightly points to lowering regulatory barriers and improving access to venture capital to successfully bring technological innovations to the market. In addition, more targeted government investments can ensure more European high-tech innovations.

Author

Edse Dantuma
Senior Sector Economist, Industry and Healthcare
edse.dantuma@ing.com

Diederik Stadig
Senior Economist, Healthcare & Technology
diederik.stadig@ing.com

Bert Colijn
Chief Economist, Netherlands
bert.colijn@ing.com

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