Presentation Report

INICIATIVA PER LA PRODUCTIVITAT I LA INNOVACIÓ

CERCLE D'ECONOMIA

CONTENTS

1. **Executive Summary** 3

2. **Introduction: Context** 5
   2.1 European Context 5
      2.1.1 A Spectre Haunting Europe: Low Productivity 5
      2.1.2 Key Factors Explaining the Productivity Gap 7
   2.2 The Spanish and Catalan Context 13
      2.2.1 The Problem of Low Productivity in Catalonia and Spain 13
      2.2.2 Key Factors Behind Low Productivity 18

3. **The Initiative for Productivity and Innovation (IPI)** 20
   3.1 Overview of the Initiative 20
   3.2 Mission 20
   3.3 Roadmap and Main Objectives in the Short, Medium and Long Term 21
   3.4 Governance 21
   3.5 Objectives and Expected Outcomes 21

4. **Catalonia's Potential** 22
   4.1 The Digital Economy Sector 22
      4.1.1 Assessment 22
      4.1.2 Strategic Objectives 22
      4.1.3 The Digital Economy in Catalonia 23
   4.2 The Automotive Sector 25
      4.2.1 Assessment 25
      4.2.2 Strategic Objectives 26
      4.2.3 The Automotive Sector in Catalonia 26
   4.3 Health and Life Sciences 27
      4.3.1 Assessment 27
      4.3.2 Strategic Objectives 27
      4.3.3. The Life Sciences Sector in Catalonia 28

1. EXECUTIVE SUMMARY

Catalonia, like the rest of Europe, faces the challenge of low productivity – a burden that is widening the gap in per capita income growth between Europe and global competitors such as the US and China.

This gap is primarily technological. The European economy, operating in a fragmented services market and caught in the 'middle technology' trap, is falling behind global competitors in digitalisation and the creation of disruptive technologies. This occurs in the context of multiple structural challenges, including an ageing population, the green transition and the decline of the rules-based international system. Overcoming these challenges requires Europe to lead the transition to a new, more innovative and efficient economic and industrial model – one that is sustainable and enjoys greater strategic autonomy.

Catalonia's economy, despite a diversified industrial base, strategic sectors and a leading research ecosystem, has seen productivity stagnate compared with Europe's most dynamic regions and even compared with the Spanish average. European structural challenges are compounded by Spain-specific issues. Spain remains below the EU average on many indicators, including R&D expenditure – particularly in the private sector. Catalonia's and Spain's economic and industrial model relies too heavily on low value-added sectors, with economic growth over the past two decades driven more by the accumulation of production factors than by efficiency gains or investment in high value-added sectors.

It is in this context that the Initiative for Productivity and Innovation (IPI), led by the Cercle d'Economia, was established. Its goal is to drive the transformation of Catalonia's economic and industry model, address the low productivity challenge and position Catalonia among Europe's most innovative and competitive regions by 2030.

The IPI stems both from concern over the European and Catalan economic context and from the conviction that Catalonia has strengths that can help overcome current challenges, taking advantage of the opportunities generated by its strategic sectors and specific assets. The initiative brings together experts and representatives from key social, economic and academic actors to generate analysis, debate and proposals.

The IPI combines think tank activities – analysing and diagnosing structural challenges – with action tank activities, developing disruptive proposals and fostering collaboration between institutions and companies.

In the short term, it aims to bring together key actors to establish shared assessments and set out an action plan. In the medium and long term, it seeks to consolidate a benchmark centre for analysis and innovation in public policy that will influence strategies related to productivity, competitiveness and innovation.

The IPI is spearheaded by the Cercle d'Economia, with support from an Advisory Board of professionals from the economic, industrial and academic spheres, an Executive Committee and a Technical Secretariat.

This report aims to outline the context of low productivity, from Europe to Catalonia, introduce the initiative and highlight Catalonia's economic potential across three strategic sectors: the digital economy, automotive industry, and health and life sciences.

2. INTRODUCTION: CONTEXT

2.1 European Context

2.1.1 A Spectre Haunting Europe: Low Productivity

Concern about the slowdown in economic growth in Europe compared with the US is not new. Following the post-war years of economic catch-up under the Bretton Woods framework, a growing gap has emerged between per capita GDP growth in Europe and the US. Since 1980, Europe has never outpaced the US in per capita GDP growth; instead, the gap has steadily widened.

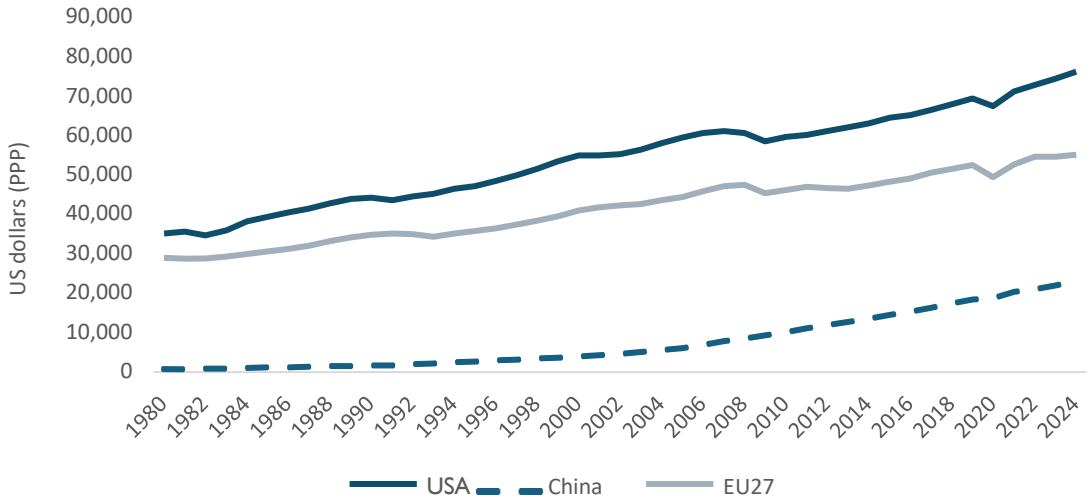

Figure 1: Evolution of per capita GDP at constant prices in the US, China and the EU27, 1980–2024.
Source: Compiled by the authors using International Monetary Fund data (October 2024).

It is worth noting that, despite starting from substantially lower per capita GDP levels, China has been advancing rapidly since the beginning of the century, achieving growth rates higher than those in Europe – even during the two most recent global crises: the 2008 Global Financial Crisis and the 2020 pandemic.

In this context, the report *The Future of European Competitiveness*, commonly known as the *Draghi Report*, has been widely discussed and debated in recent months. It identifies and describes the principal challenge limiting economic growth in Europe: low productivity. This structural issue raises questions about the continent's economic leadership and global competitiveness, while other powers – particularly the US and China – consolidate their positions and take the lead.

Productivity growth is vital for ensuring a society's long-term well-being. When discussed, productivity typically refers to the output generated by a worker per hour worked – also known as labour productivity (real GDP per hour worked). Productivity growth is linked to higher GDP per capita, increased incomes, reduced working hours and a significant decline in poverty.[1]

In recent years, labour productivity growth has slowed across most advanced economies. Europe, however, continues to trail the US, with the gap steadily widening over the past decades.

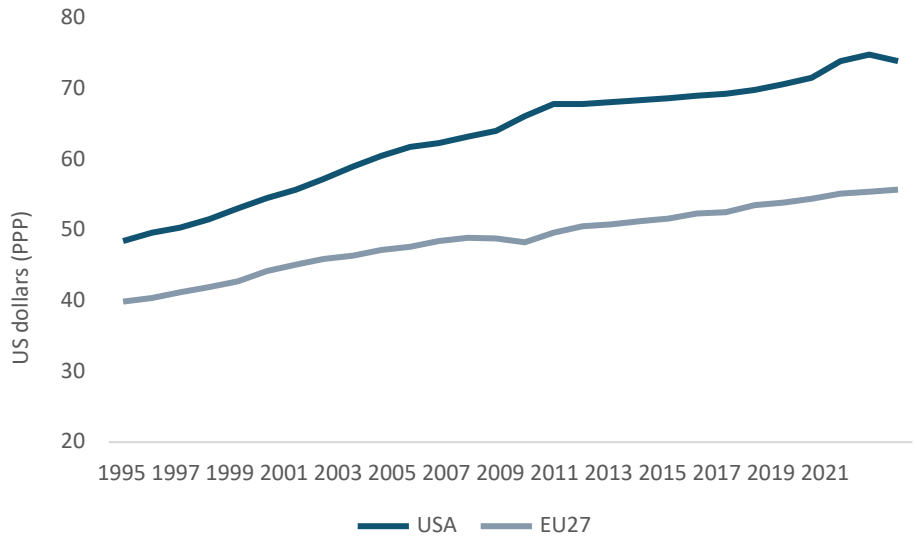

Figure 2: Evolution of GDP per hour worked at constant prices in the US and the EU27, 1995–2022.
Source: Compiled by the authors using OECD data (2024).

To understand this gap, it is necessary to break the indicator down into its components. Labour productivity generally depends on three factors: capital per hour worked (capital accumulation), the skills and capabilities of workers (labour composition) and the efficiency with which production factors are used (also referred to as Total Factor Productivity, TFP). TFP captures the portion of productivity growth that cannot be explained by changes in physical or human capital. It reflects how efficiently labour is applied and combined in the production of goods and services, resulting from organisational, productive and technological improvements.[2]

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[1] Aspachs, O.; Solé Vives, E. (2024). Evolució de la productivitat a Europa: una mirada regional [Evolution of Productivity in Europe: A Regional Perspective]. Papers Cercle 05. Barcelona, Spain.

[2] Erixon, F.; Guinea, O.; Du Roy (2024). *Keeping Up with the US: Why Europe's Productivity is Falling Behind.* Policy Brief 09/2024. European Centre for International Political Economy.

Total Factor Productivity (TFP) is considered the key driver of sustained long-term economic growth, as it reflects advances in technology and innovation. According to the Draghi Report and supporting studies, these advances are central to explaining why the European economy is losing competitiveness compared with North America and China.

EU productivity began diverging from that of the US in the mid-1990s, primarily due to Europe's failure to capitalise on the first digital revolution led by the internet. This underperformance is evident both in the limited creation of new technology companies and in the insufficient integration of digital technology across European economic sectors. In fact, if the new technology sector were excluded, productivity growth in Europe would be comparable to that of the US.

Since 1965, both the EU and the US have experienced a slowdown in TFP growth, declining from 3% annual growth in the US and 4% in the EU-12 to around 0.5% today. TFP growth in the EU, however, fell more sharply during the Global Financial Crisis and the early 2010s sovereign debt crisis. This slowdown, though, had already begun prior to these events, indicating deeper structural factors (Erixon et al., 2024).

Europe has not only failed to capitalise on the first digital revolution, but it is also currently not fully exploiting the potential of disruptive technologies such as artificial intelligence. While the US clearly leads this technological race, China has advanced significantly and, in some strategic fields, has already overtaken both Europe and the US, with the potential to establish global monopolies. According to a study by the Australian Strategic Policy Institute, China leads in 37 of the 44 technologies examined, including electric batteries, hypersonics and advanced communications such as 5G and 6G.[3]

2.1.2 Key Factors Explaining the Productivity Gap

Why is Europe falling behind in the technological race? The literature, including the Draghi Report, points to several factors. Some are structural, rooted in the political nature of the European Union, and are therefore difficult to address in the short to medium term. Others concern the design and priorities of European innovation policies and are consequently more flexible.

I. "Middle Technology Trap" and Low Investment in High-Productivity Sectors

Traditionally, the European economy has excelled in mid-technology sectors such as the automotive industry, manufacturing, transport and wholesale and retail trade.

[3] Australian Strategic Policy Institute (2024). Critical Technology Tracker. https://techtracker.aspi.org.au/

For over 20 years, the same companies – mostly in the automotive sector – have dominated innovative activity in the EU;[4] but these sectors have not led the most disruptive technological transformations.

In contrast, the US economy has been more dynamic, redirecting resources and investment towards information and communication technologies (ICT) and associated digital services – the sectors that have seen the largest productivity gains in recent years – while investment in Europe has remained concentrated in traditional sectors. This has caused Europe to miss out on productivity gains in recent years, coinciding with the rise of new disruptive technologies.

Since 2013, the drivers of TFP have begun to diverge substantially between the EU and the US. In the EU, manufacturing continues to play a significant role, whereas in the US, most of the total contribution to TFP comes from IT and professional services. In both the EU and the US, aggregate TFP appears increasingly driven by services; however, while the leading sectors in the US are IT, professional and financial services, in the EU the largest contributor is wholesale and retail trade.[5]

Within the EU, some manufacturing sectors – including transport equipment, chemicals, computers and electronic equipment – have made a positive contribution to overall TFP growth. In contrast, in the US, the only manufacturing sector with a positive and significant contribution to aggregate TFP growth is computer and electronics manufacturing.

In the long term, TFP growth is directly linked to the capacity to incorporate superior knowledge and technological innovations into products and production processes. The accumulation of intangible capital, such as investment in R&D, software and databases, has a significant positive impact on economic growth, both directly and through a greater contribution to TFP growth.

Although the growth of intangible capital in the EU has remained resilient since the post-Global Financial Crisis recovery, it still lags significantly behind US levels. This gap is partly due to the much smaller share of intangible investments in high-tech services in the EU, combined with the relatively larger role of the manufacturing sector, particularly in transport equipment.

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4 Fuest, C. et al (2024). *EU Innovation Policy: How to Escape the Middle Technology Trap.* EconPol Policy Report.
5 Nikolov, P; Simons, W; Turrini, A; Voigt, P. (2024). *Mid-Tech Europe? A Sectoral Account on Total Factor Productivity Growth from the Latest Vintage of the EU-KLEMs Database.* Discussion Paper 208. European Commission.

The European economy has therefore become trapped in sectors or industries of intermediate technology (the "middle technology trap") that do not lead the most disruptive technological transformations.

II. Fragmented and Uneven Single Market

Comparisons between the EU and the US, or between the EU and China, are frequent; however, these are three very different political entities. While the US and China are single states, the EU is a union of 27 member states, each with its own legislation and priorities regarding innovation policies. The creation of the European Single Market has been key to advancing the integration of European economies. However, while this integration is highly developed in the market for goods, it remains much weaker in the services market – particularly in the digital sector and in related areas such as communications and new technologies.[6]

This fragmentation greatly reduces the opportunities to generate economies of scale in these sectors. As a result, many young European technology companies choose to expand into other markets where scaling up is easier, such as the United States.

Political fragmentation also hampers the development of strategic economic sectors with a European scope. The continent's priorities do not always coincide with those of individual countries, whose governments often prioritise domestic agendas over the European one.

This fragmentation has also produced uneven productivity outcomes across European regions, a gap that has widened over the years. While central and northern European regions have strengthened their leadership in productivity, and eastern Europe has also made notable progress, southern regions have fallen behind (Aspachs et al., 2024).

III. Regulatory Barriers

Political fragmentation naturally leads to a proliferation of regulatory barriers. Unlike in the US or China, the EU experiences a phenomenon known as "gold plating", where national governments, when transposing EU directives or regulations, introduce additional requirements that go beyond the minimum standards set by those directives. This phenomenon, together with the regulatory boom that the EU's digital sector has experienced

[6] Letta. E (2024) Much more than a market.

over the past decade (see Figure 3), makes the European digital market comparatively more difficult for start-ups and emerging companies to navigate. As a result, many of these businesses look to other markets instead.

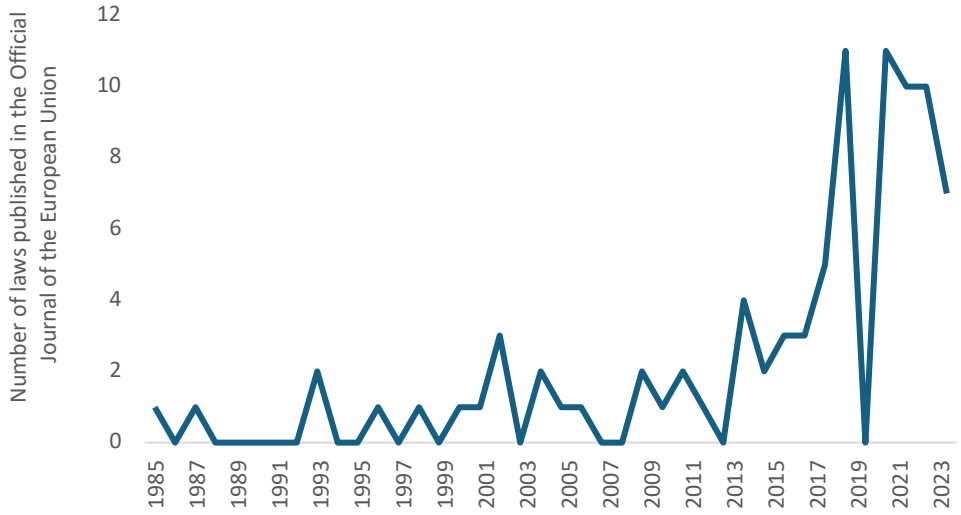

Figure 3: Evolution of EU legislation in the digital sector, 1985–2024.
Source: Compiled by the authors using Bruegel data (A dataset on EU legislation for the digital world, 2024).

IV. Limited and Poorly Targeted R&D Investment

Traditionally, the EU has devoted, on average, a smaller share of its GDP to R&D expenditure than countries such as the US, China or South Korea.

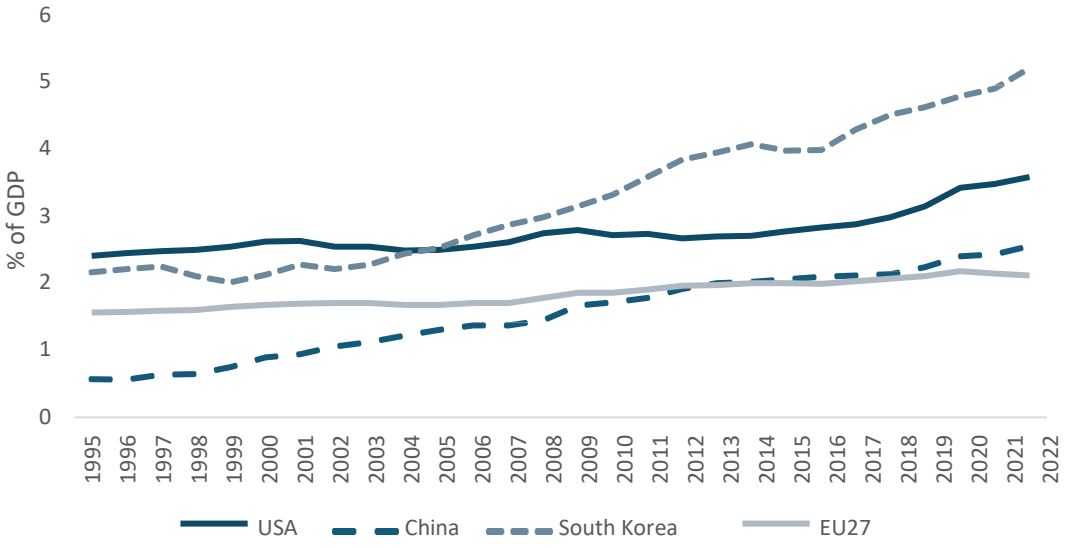

Figure 4: Evolution of total expenditure on R&D in a selection of countries, 1995–2022.
Source: Compiled by the authors using OECD data (2024).

One of the reasons for this gap lies in the EU's strategic dependence on the US through NATO, which also helps explain why European economies generally allocate a lower percentage of GDP to defence spending than other global powers. Evidence suggests that government-funded R&D – particularly in defence – effectively increases a country's overall investment in innovation within a given industry. The ultimate effect of publicly funded R&D on total R&D expenditure significantly exceeds its direct economic value, as this type of funding encourages additional private sector investment in R&D.[7]

The Draghi Report also notes that Europe's strategic dependence on the US has allowed the EU to allocate part of the GDP share that would otherwise have been invested in defence to other areas, such as social policies. In the current geopolitical context, where the international rules-based system is breaking down, maintaining the EU's economic and social model requires greater strategic autonomy – and therefore increased investment in R&D. It should be noted that R&D investment levels vary significantly within the EU: some countries, including Sweden, Belgium, Germany and Austria, invest more than 3% of their GDP, while others, such as Spain, invest less than 2%.

The gap in European R&D investment is not only quantitative but also qualitative. The EU's Horizon Europe programme – a key framework for research and innovation with a budget of nearly €100 billion – is of great importance. However, its funding is spread too thinly across different areas, which limits its impact. In addition, access to the programme is complex and highly bureaucratic, and it is not sufficiently focused on promoting disruptive innovation.

V. Low Levels of Technology Transfer

Europe has a strong university and research system and remains a global leader in areas such as patent production and basic research, supported by world-class universities and research institutions. However, even in these fields, the European economy is losing ground to its global competitors. One of the main weaknesses of the European research system is its limited ability to translate the results of basic research into market applications; in other words, much of the knowledge generated in universities remains there, without being commercially leveraged.

[7] Moretti E., Steinwnder C., Van Reenen J. (2019): The Intellectual Spoils of War? Defense, Productivity and International Spillovers. National Bureau of Economic Research. Cambridge, Massachusetts (USA).

Low levels of knowledge transfer, particularly in the field of new technologies, represent a critical challenge for productivity growth in Europe. As already noted, technological innovations are among the main drivers of total factor productivity (TFP) growth, as they enable more efficient use of resources and optimisation of production processes. When this knowledge fails to reach the economic and industrial fabric, Europe loses the opportunity to generate innovative products and services that could enhance business competitiveness and open up new markets.

This lack of knowledge transfer can be attributed to several factors. On the one hand, the links between universities, research centres and businesses are often weak in Europe, compared with regions such as the United States, where innovation ecosystems like Silicon Valley have succeeded in integrating research and entrepreneurship far more effectively. On the other hand, the fragmentation of the European market and the lack of regulatory harmonisation make it difficult for an innovation developed in one Member State to scale up easily across the EU. This is compounded by the limited availability of venture capital and financing mechanisms for start-ups, which hinders the development of technological projects emerging from the academic sphere.

VI. Smaller Company Size

This lack of knowledge transfer directly affects the size and structure of Europe's business landscape. Unlike in the United States, where well-established innovation ecosystems enable many tech start-ups to scale quickly into major global companies, Europe is dominated by a high proportion of small and medium-sized enterprises (SMEs). These firms often have limited capacity to absorb technological innovations from research, due to restricted resources for R&D or for forming partnerships with universities and research centres. This creates a vicious circle: low knowledge transfer constrains business growth, and the scarcity of large, global firms reduces the ability to scale innovations and compete in international markets. As a result, Europe has fewer global "technology champions", and its companies struggle to lead major technological transformations, further weakening productivity growth and its overall competitive position.

VII. STEM Skills Deficit

Although Europe has a strong education system and produces highly qualified professionals,

the number of STEM graduates remains insufficient[8] to meet the demands of an increasingly technology-driven labour market.

This shortage of STEM talent particularly affects European companies, especially SMEs, in their ability to adopt disruptive technologies such as AI, big data and quantum computing. A lack of skilled professionals in these fields not only limits adoption but also forces many firms to rely on external solutions or to forgo certain innovation processes. Moreover, this scarcity intensifies competition among companies and sectors, pushing up labour costs for STEM roles and making it even harder for smaller firms to access these resources.

Two structural factors further exacerbate this skills gap. First, Europe is one of the world's most ageing continents, and from 2040 onwards the workforce is expected to shrink by 2 million workers annually, with the ratio of active workers to retirees falling from 3:1 to 2:1.[9] Second, many European economies experience a brain drain to other markets offering higher salaries and better quality of life.

2.2 Spanish and Catalan Context

2.2.1 The Problem of Low Productivity in Catalonia and Spain

The structural challenges facing Europe in terms of productivity, innovation and competitiveness are also strongly evident in Catalonia and across Spain. Moreover, the slowdown in productivity growth in the Spanish economy has been more pronounced than the European average. Specifically, between 2000 and 2022, Spanish productivity fell from 6% below the European average to 12% below it (Aspachs et al., 2024).

A key factor exacerbating Spain's productivity problem is that, since the start of the century, all productivity gains have come mainly from increases in production factors (labour and capital), rather than from improvements in the efficiency with which these resources are used (TFP). In fact, Spain experienced a cumulative decline in TFP of -7.7% between 2000 and 2022, in stark contrast to developed countries such as the US, where TFP grew by 15.5% over the same period,

[8] The EU produces around 850 STEM graduates per million inhabitants per year, compared with over 1,100 in the US, according to the Draghi Report.

[9] Draghi Report.

or Germany, which saw an 11.8% increase. However, following the Great Recession, Spanish TFP began to recover modestly, rising by 1.2% cumulatively between 2013 and 2019, before being interrupted again by the pandemic.[10]

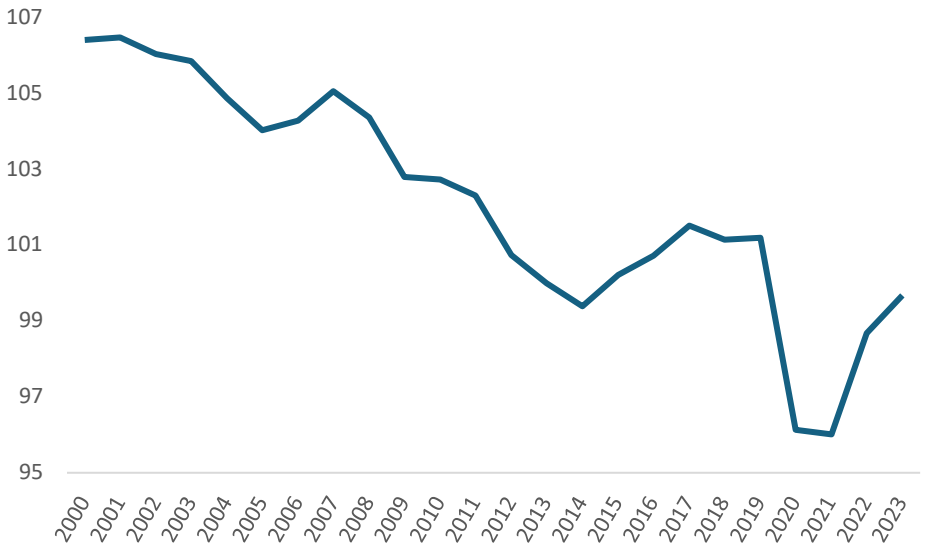

Figure 5: Contribution of TFP to the growth of Spanish GVA, 2000–2023 (2013=100).
Source: BBVA Foundation (2024). Observatory of Productivity and Competitiveness in Spain.

COVID-19 temporarily reversed this trend, with TFP falling by 5.1% in 2020. After the pandemic, TFP growth resumed, increasing by 3.5% cumulatively between 2021 and 2023 (1.2% per year), recovering more quickly than after the previous crisis. Nevertheless, Spain's TFP growth remains below that of the main European economies and the US.

This negative TFP trajectory shows that during the pre-Great Financial Crisis "boom" years, when the Spanish economy was growing at 3–4% of GDP per year, growth was largely driven by the accumulation of production factors (more workers in the economy and higher capital investment, particularly in real estate), rather than by greater efficiency in the use of resources. This indicates that efficiency levels are low, leaving considerable scope for improvement in technological innovation (investment in and adoption of new technologies) as well as operational and organisational innovation.

[10] BBVA Foundation (2024). Observatory of Productivity and Competitiveness in Spain.

Between 1995 and 2021, the Gross Value Added (GVA) of Catalonia's economy grew at an average annual rate of 1.59%.

Of this growth, 1.33% came from gains in labour productivity, 0.7% from capital productivity and -0.44% from Total Factor Productivity (TFP). This indicates that Catalonia's economic growth over the past decades has been driven primarily by labour, and to a lesser extent capital, rather than by advances in innovation, technology or productive efficiency. The graph below illustrates how Catalonia compares with the other Autonomous Communities:

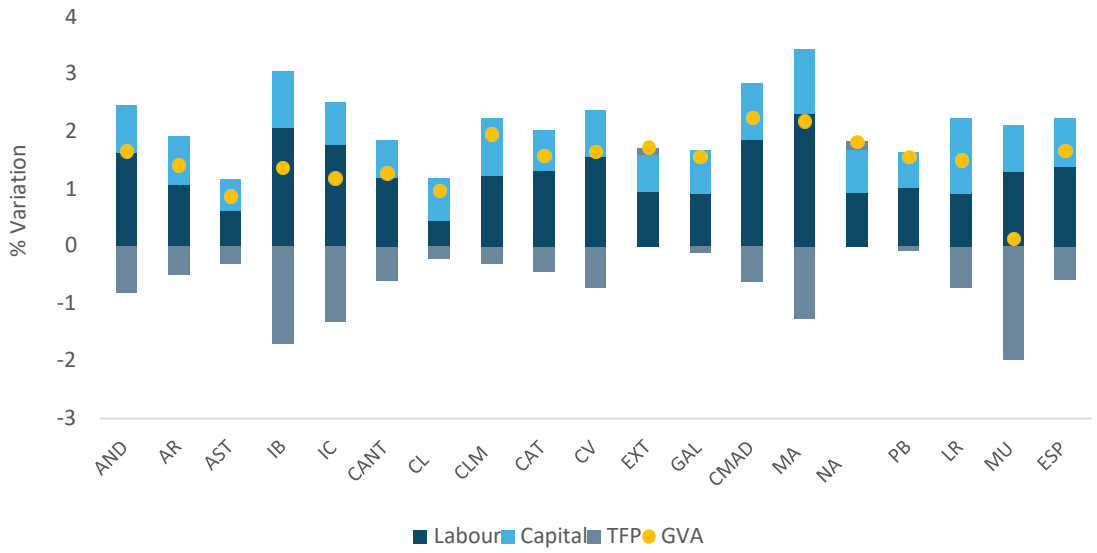

Figure 6: Contribution to Gross Value Added growth by Autonomous Community, 1995–2021.
Source: Compiled by the authors using data from the Observatory of Productivity and Competitiveness in Spain, 2024.

In general, across all Autonomous Communities, productivity gains during this period are largely attributable to the factors of labour and capital. Only the Autonomous Community of Navarra and Extremadura show a positive trend in TFP, followed by the Basque Country and Galicia.

There are two periods in which Catalonia's TFP shows a positive trend: just before the Global Financial Crisis (1.5% annual growth in 2007) and just before the pandemic (0.6% cumulative growth between 2013 and 2019). However, in 2022, the gap between Catalonia's productivity and that of the most productive European regions stood at 16%, rising to 21% in the case of the Community of Madrid (Aspachs et al., 2024).

Catalonia outperformed the Spanish economy in terms of TFP during the early expansion years of the 21st century and up to the end of the Global Financial Crisis, but in the last decade (2013–2022) this trend has reversed (see Figures 7.1 and 7.2).

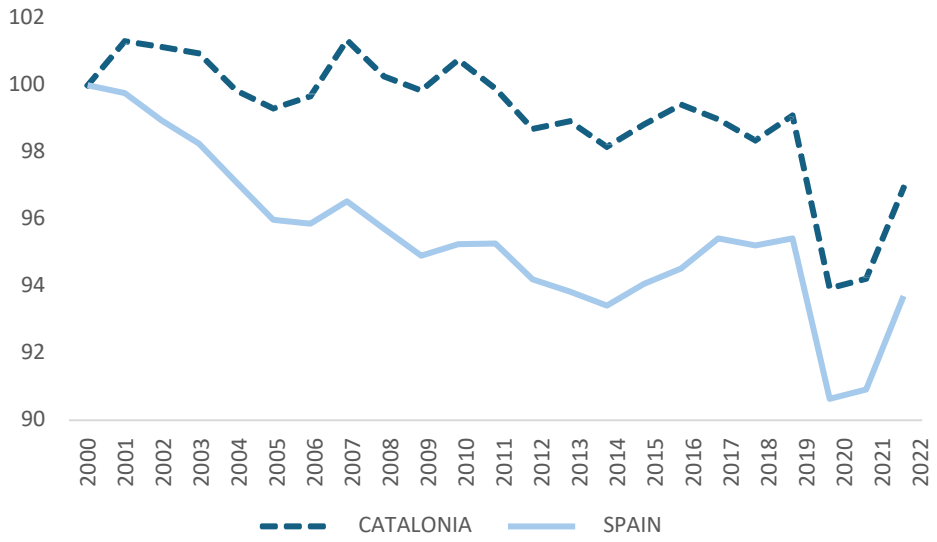

Figure 7.1 Contribution of TFP to GVA growth, 2000–2022 (2000=100).
Source: BBVA Foundation (2024). Observatory of Productivity and Competitiveness in Spain.

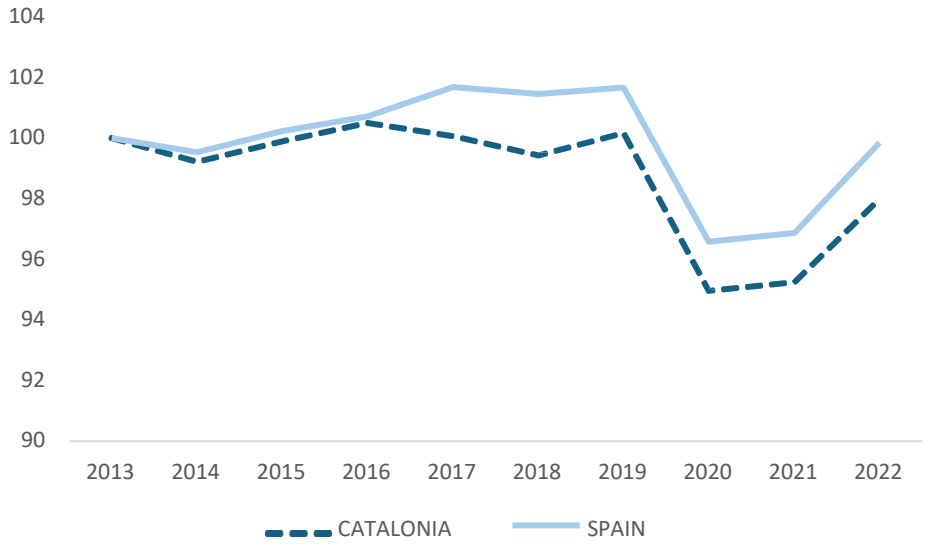

Figure 7.2 Contribution of TFP to GVA growth, 2013–2022 (2013=100).
Source: BBVA Foundation (2024). Observatory of Productivity and Competitiveness in Spain.

It is worth noting that, despite this low-productivity context, Catalonia has managed to maintain a strong competitive position within Spain. Over the past ten years, industry has consistently accounted for around 20% of GDP, accompanied by a significant rise in exports and growth in non-tourism services. However, this competitive position has been achieved largely through low wages and other cost-cutting measures, rather than through improvements in productive and organisational efficiency or investment in new technologies.

A closer look at productivity and its components in Catalonia shows that the contribution of TFP to productivity growth per hour worked was higher in 1995 than in 2022 (Figure 6).

Over this period, labour productivity has increased, but hours worked have risen significantly as well, indicating that productivity gains are not being driven by productive or organisational efficiency (TFP). It is also important to note the marked decline in the productivity of capital over this period.

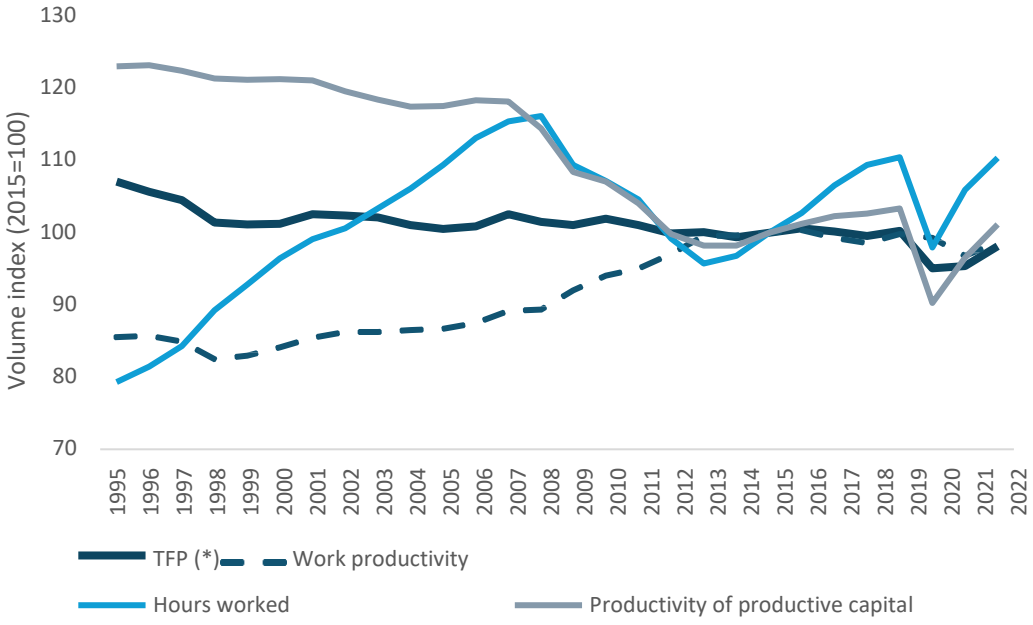

Figure 8: Trends in Catalonia's productivity components, 1995–2022.
Source: Compiled by the authors using data from the Observatory of Productivity and Competitiveness in Spain.
(*) Contribution of TFP to productivity growth per hour worked.

This stagnation in productivity has also translated into stagnating living standards, measured by per capita income. Since the start of the century, Catalonia's GDP per capita has fallen relative to the Eurozone average, despite isolated periods of growth (just before the Global Financial Crisis and, to a lesser extent, just before COVID-19). By 2022, Catalonia's GDP per capita was 10% lower than in 2000 compared with the Eurozone average, showing no convergence with the EU countries with the highest per capita incomes.

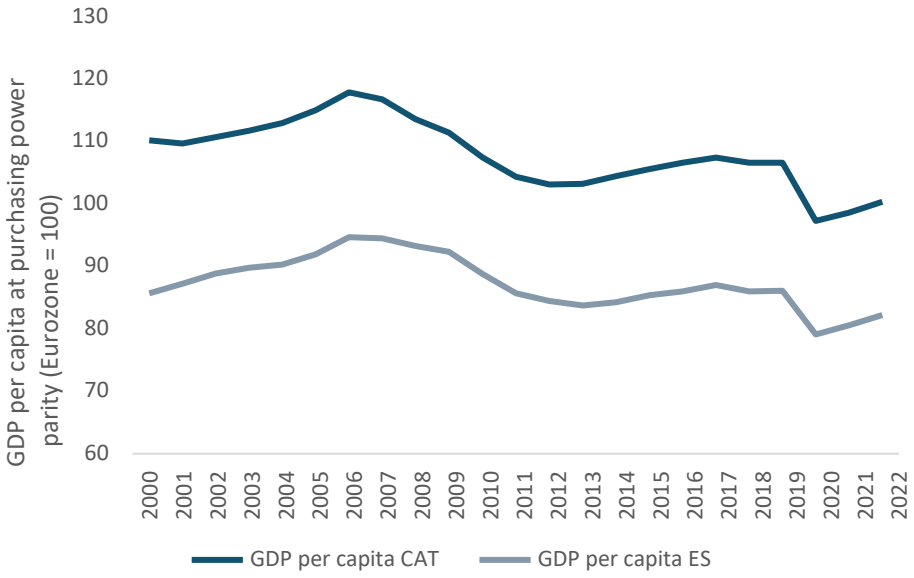

Figure 9: Evolution of GDP per inhabitant in Catalonia relative to the EU-27 and the euro zone.
Source: Department of Economy and Finance, Generalitat Government of Catalonia, 2024.

2.2.2 Key Factors Behind Low Productivity.

The factors explaining low productivity in Catalonia and Spain, as fully integrated economies within the European single market, are largely similar to those identified for the European economy as a whole. However, the fact that the decline in productivity has been more pronounced than the European average can be attributed to several distinctive factors:

I. Greater reliance on low value-added service sectors

The Spanish and Catalan economies are characterised by the importance of the services sector, particularly tourism, retail and other low value-added activities. While these sectors generate employment, their contribution to productivity growth is limited. Moreover, this reliance makes the economy more vulnerable to external shocks, as was clearly demonstrated during the Global Financial Crisis and the COVID-19 pandemic. Compared with other European economies where industry or technology-based sectors play a larger role, this economic structure restricts the capacity to adopt technological innovations and strengthen competitiveness.

II. Excessive accumulation of real estate capital

During the economic boom at the beginning of the century, growth in the Spanish economy was driven largely by the construction and property sectors, both residential and non-residential. This build-up of tangible capital diverted resources that could otherwise have been channelled into more productive areas such as innovation, technology and R&D. Following the bursting of the property bubble and the subsequent Great Recession, a significant proportion of these real estate

assets have remained partially unused or underutilised, while sectors with greater growth potential have suffered from underinvestment. This inefficient allocation of capital has constrained productivity growth.

III. (Even) lower investment in R&D, ICT and other intangible assets

Public and private spending on R&D remains below both the EU average and that of neighbouring countries. According to Eurostat data for 2022, investment in R&D represented 1.4% of GDP in Spain and 1.79% in Catalonia, compared with 2.24% for the EU as a whole, and over 3% in countries such as Belgium, Sweden, Austria and Germany. In the United States, this figure is close to 3.5%, and in South Korea it reaches 5%.

At regional level, based on 2021 data, Catalonia's per capita R&D expenditure was lower than that of the Community of Madrid and the Basque Country, and significantly below that of regions such as Baden-Württemberg, Flanders and Auvergne-Rhône-Alpes (see Figure 9).

When R&D expenditure is broken down by performing sector (public administration, higher education and private sector),[11] the data show that the private sector consistently accounts for the largest share of total R&D expenditure. Nevertheless, in Catalonia the public sector represents a comparatively higher proportion (17.8%) – and in Madrid even more (22.3%) – both well above the EU average of 11.7%. By contrast, in Baden-Württemberg, the public sector accounts for only 7.82%, while businesses make up 82% of total R&D expenditure.

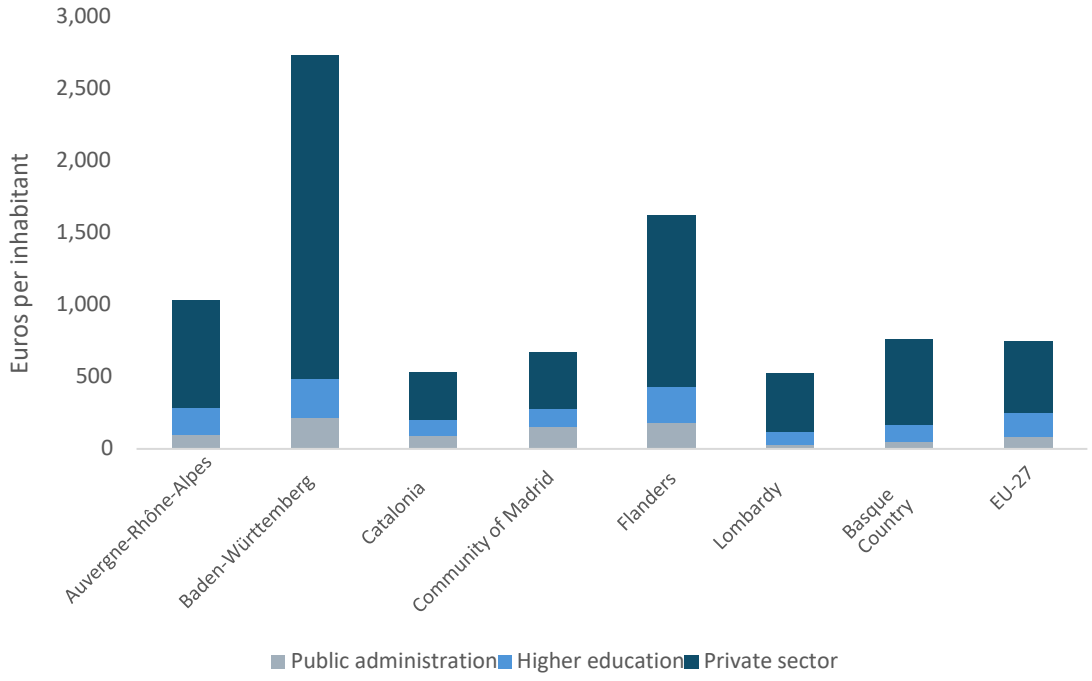

Figure 10. Gross R&D expenditure by performing sector, 2021.
Source: Compiled by the authors using Eurostat data for the regions (NUTS 2).

[11] This includes both business sector expenditure and that of private non-profit organisations.

3. THE INITIATIVE FOR PRODUCTIVITY AND INNOVATION (IPI)

3.1 Description of the Initiative

As concluded in Section 2, Catalonia must urgently tackle the issue of low productivity to catch up with Europe's most competitive and innovative regions in terms of well-being. Despite the challenges this context presents, Catalonia's diversified industrial structure and leading research ecosystem provide substantial strengths and considerable potential.

The **Initiative for Productivity and Innovation** (IPI), led by the Cercle d'Economia, aims to transform Catalonia's economic and industrial model to meet current and future societal challenges and improve collective well-being. The initiative brings together experts and representatives from key sectors to foster a deep, cross-cutting debate on boosting productivity and competitiveness, promoting collaboration among the public, private and academic sectors. Its goal is to connect knowledge, experience and capabilities to design transformative solutions.

Productivity is not just an economic indicator; it is a fundamental tool for improving well-being, creating quality jobs and ensuring a sustainable future for Catalonia's economy. Catalonia has the potential to lead the transition toward a more efficient, innovative and sustainable model, but achieving this requires collective effort and strong political commitment.

Only through collaboration between experts and institutions can innovative solutions be identified that deliver real and lasting impact. Coordinated action focused on strategic sectors – such as automotive, biotechnology and new technologies – is essential to ensure sustainable growth and long-term competitiveness for Catalonia.

3.2 Mission

The IPI functions as a hybrid between a think tank and an action tank.
As a think tank, it seeks to:

- **Generate analysis, knowledge and debate**: Highlight low productivity as a strategic priority and identify its causes and effects.
- **Consolidate expertise**: Bring together experts in economics, industry, innovation and public policy, and develop actionable proposals.

As an action tank, it seeks to:

- **Co-create disruptive solutions**: Develop concrete, innovative proposals through analysis and debate with leading experts and representatives from key institutions and organisations across Catalonia.

- **Generate impact**: Provide actionable recommendations for public institutions, companies and the broader productive ecosystem.

- **Facilitate collaboration**: Strengthen connections within Catalonia's innovation ecosystem, share experiences, align interests and promote joint projects.

3.3 Roadmap and Main Objectives: Short, Medium and Long Term

- **Short term**: Bring together the key actors from Catalonia's innovation ecosystem and core industries to establish shared analyses and define an action plan. The aim is to shift priorities in the economic model to boost productivity, transforming structural challenges into strategic opportunities.

- **Medium and long term**: Establish Catalonia as a benchmark centre for policy analysis and innovation with a European perspective, influencing both public and private policies on productivity, competitiveness and innovation – both locally and across Spain.

3.4 Governance

The IPI is led by the Cercle d'Economia and governed by an Advisory Board made up of experts and professionals from the fields of economy, industry and research. The Advisory Board sets the strategic direction of the initiative for the short, medium and long term, provides content and advises on its development.

The IPI also has an Executive Committee and a Technical Secretariat, composed of members from the Cercle d'Economia and Eurecat.

3.5 Objectives and Expected Outcomes

The main goal of the IPI is to position Catalonia among Europe's most innovative and competitive regions by 2030 – for instance, advancing from its current status as a Strong Innovator –(minus) to an Innovation Leader, according to the European Commission's Regional Innovation Scoreboard. To achieve this, the IPI will focus on the key industries that give Catalonia a competitive edge. The following section introduces these sectors and highlights their potential.

4. CATALONIA'S POTENTIAL

This section focuses on three strategic sectors of the Catalan economy: the digital and new technologies sector, the automotive sector and the life sciences sector. It begins with a brief assessment of the main challenges facing these sectors at the European level, based on the Draghi Report, along with improvement objectives. It then situates these sectors in the Catalan context, highlighting their growth potential and the positive impact they could have on the productivity and competitiveness of the Catalan economy.

4.1 The Digital Economy

4.1.1 Assessment

The European digital sector is at a competitive disadvantage compared with the US and China, which lead in key areas such as AI, cloud services, semiconductors and quantum computing. Europe has fallen behind globally due to lower investment in R&D, disruptive technologies and the capacity to scale innovations – especially in sectors where economies of scale are decisive, such as digital platforms and cloud services, which are dominated by US companies.

In semiconductors, the EU has capabilities in equipment and components but relies on Asian countries for memory chips, advanced processors and critical raw materials. This dependency is compounded by the lack of harmonisation among EU countries, which creates barriers for multinational companies, and by limited venture capital availability, with only 6% of global AI investment in Europe compared with 65% in the US.

In terms of infrastructure, the EU is lagging in 5G networks and the development of Edge Computing – essential for advanced applications – despite possessing assets such as supercomputing networks. These challenges are further exacerbated by a regulatory framework that, while robust in protecting fundamental rights, generates bureaucracy that slows innovation and technology adoption in competitive sectors like AI and cloud computing.

4.1.2 European Strategic Objectives

1. **Strengthen European strategic autonomy**: Reduce dependence on third countries for critical technologies, including semiconductors and cloud services. Develop domestic capabilities in design, manufacturing and innovation in cloud computing and AI.

2. **Promote innovation and digitalisation**: Expand high-speed communication networks (5G, Edge Computing) and supercomputing infrastructure. Prioritise key sectors such as health, energy and mobility for the deployment of AI-based solutions.

3. **Promote investment and collaboration**: Increase public and private investment in R&D, particularly in disruptive technologies. Establish public–private partnerships to strengthen innovation hubs and foster scientific excellence.

4. **Develop a digital single market**: Harmonise regulations to remove barriers to the development of digital technologies and services. Ensure interoperability and data security across EU countries.

5. **Strengthen talent and research:** Attract and retain specialised STEM talent through training programmes and incentives. Expand collaboration between universities, businesses and research centres to promote technology transfer.

4.1.3 The Digital Economy in Catalonia

Despite the burden of low productivity, Catalonia is positioned as an innovative European region with high growth potential in the digital economy sector.

According to RIS2023,12 Catalonia is one of four Spanish regions classified as Strong Innovators in 2023, alongside the Basque Country, Navarra and the Community of Madrid, ranking 26th at the European level. This represents a significant improvement compared with 2021, when Catalonia was in the Moderate+ Innovator category. However, this recognition is not new. As early as 2009, Catalonia was considered a strong innovation region, but it lost ground from 2012 onwards due to a sharp decline in public and private investment in innovation, a direct consequence of the Global Financial Crisis.

At the European level, Catalonia stands out for its output of international scientific publications, trademark registrations, digital skills and sales of innovative products, both within companies and on the market. According to RIS2023, the number of Catalan SMEs introducing product innovations has doubled since 2016, and the sales generated by these innovative products are twice the European average.

Catalonia also ranks among the five most digitalised regions in Europe, according to the DESI Index,[13] which assesses four dimensions: Human Capital, Connectivity, Digital Technology Integration, and Digital Public Services. In all these areas, Catalonia has seen growth since 2020, as shown in Figure 11.

[12] The Regional Innovation Scoreboard (RIS) is the regional counterpart of the European Innovation Scoreboard (EIS), which assesses the innovation performance of European regions using a limited set of indicators. RIS 2023 provides a comparative evaluation of the innovation systems of 239 regions across 22 EU countries, as well as Norway, Serbia, Switzerland and the United Kingdom. Cyprus, Estonia, Latvia, Luxembourg and Malta are analysed at the national level.

[13] The Digital Economy and Society Index (DESI), developed by the European Commission since 2014, is a composite index measuring the progress of EU countries towards a fully digital environment.

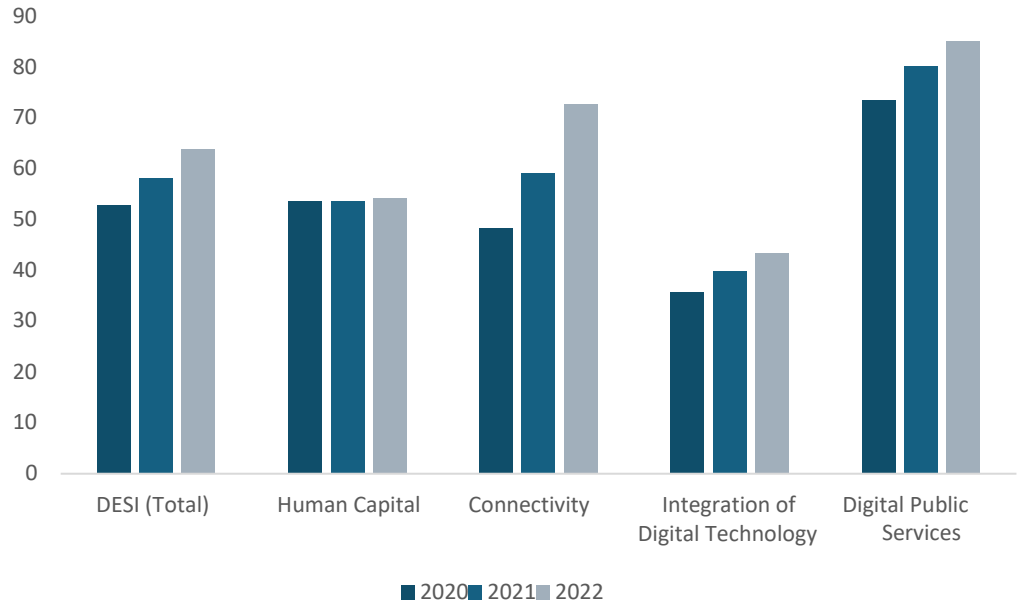

Figure 11: Evolution of the DESI Index, 2020–2022.
Source: Compiled by the authors based on the report Digital Economy and Society of Catalonia: DESI 2022 by the Cercle Tecnològic de Catalunya.

Catalonia also possesses key assets such as the **Barcelona Supercomputing Center and an emerging digital ecosystem**, putting it in a strong position to play a decisive role in this transformation and to drive the development of strategic technologies across Europe, particularly in applied AI.

Barcelona has, in fact, established itself as a hub for innovation, talent and investment. The city was recently chosen by the European High-Performance Computing Joint Undertaking (EuroHPC JU) to host one of the seven AI factories being set up across the EU to accelerate innovation in this field. This initiative marks a significant step forward, aiming to build a robust ecosystem for training advanced AI models and developing AI-based solutions.

Key Figures for the Sector[14]

- In 2022, the digital sector generated €34.783 billion in revenue, up 6.3% on the previous year, cementing its position as one of the most dynamic sectors in Catalonia.

- The region is home to 23,482 digital companies, representing 12.9% of its GDP and employing 185,851 people. This reflects a 1.5% increase in the number of companies and a 1.7% rise in employment compared with 2021.

[14] Based on ACCIO's sector report, "The Digital Economy in Catalonia", February 2024.

- Between 2019 and 2023, Catalonia attracted 408 foreign direct investment (FDI) projects, creating 27,415 jobs and strengthening its position as one of Europe's most attractive regions for technology investment.

- SMEs (companies with less than €50 million in turnover) account for 99.9% of the sector, alongside a significant number of startups and established firms that are driving growth.

- Around 86% of companies are located in the province of Barcelona, with notable clusters in Vallès Occidental, Baix Llobregat and other metropolitan areas. This concentration reinforces Barcelona's role as a leading tech hub in southern Europe.

- With 2,102 startups, Catalonia – and particularly Barcelona – is the primary startup hub in southern Europe, excelling in areas such as AI, Big Data and IoT, which together account for 31% of all technologies.

- In 2022, Barcelona had 103,300 digital professionals, highlighting the region's strong talent pool in areas such as cybersecurity, application development and artificial intelligence. This is further supported by a robust educational ecosystem, producing 2,350 ICT graduates annually.

4.2 The Automotive Sector

4.2.1 Assessment

The European automotive industry, a key contributor to EU employment, value added and exports, is undergoing a major transformation towards green mobility and digitalisation. This shift involves the transition to electric vehicles, digitalisation of software and integration with the circular economy. Despite Europe being home to four of the ten largest automotive companies, it is losing ground to China and the US, which lead in cost efficiency, innovation and production.

Key challenges include high labour and energy costs, reliance on critical raw materials – especially for batteries – and the complexity of building an adequate charging infrastructure. The transition to electric vehicles is also affecting the supply chain, with engine designs being simplified and new competitors, particularly from China, entering the market. European regulations have driven decarbonisation, but inconsistencies and a lack of technological neutrality have sometimes hindered the sector's capacity to adapt.

4.2.2 European Strategic Objectives

1. **Accelerate the transition to sustainable and competitive mobility**: Promote the production of electric vehicles, especially in more affordable segments, and ensure the widespread deployment of accessible charging infrastructure, including in low-demand areas and for heavy transport.

2. **Strengthen technological sovereignty and supply chain sustainability**: Diversify and secure access to critical raw materials, while supporting battery production and recycling across Europe through circular economy models.

3. **Enhance competitiveness and technological innovation**: Integrate disruptive technologies such as AI and advanced robotics into vehicle development and production, while fostering the training and retention of skilled talent to lead the sector's digital transformation.

4.2.3 The Automotive Sector in Catalonia

The automotive sector in Catalonia is one of the country's most important industrial pillars, accounting for **6.5% of GDP**. The sector has grown by 1.7% in terms of the number of companies compared to 2021 and is notable for its strong focus on **innovation and internationalisation**, with 55.6% of companies engaged in exports. Catalonia ranks as the third-largest autonomous community in Spain for vehicle production, with 320,654 units manufactured in 2022, representing 17% of national output.

The Catalan automotive industry has a robust value chain and a diversified ecosystem that includes major companies, industrial clusters and R&D centres. Sustainability is a key priority, with initiatives such as the development of electric vehicles in Martorell, led by Seat, and the electrification of industrial facilities. The region's technology hubs, top-tier logistics infrastructure and adoption of trends such as Industry 4.0 and sustainable mobility establish Catalonia as a benchmark for the transition towards a greener and more innovative automotive sector.

Key Figures for the Sector[15]

- 365 automotive companies, accounting for 22.1% of the national total.
- Total turnover: €14.73 billion, representing 11.3% of Catalonia's industrial turnover.
- 320,654 vehicles produced in 2022, 17% of national production.
- 36,655 employees, 7.6% of Catalonia's industrial workforce.

[15] Based on the ACCIO sector report, "The Automotive Sector in Catalonia", May 2023.

- 90.8% of companies are SMEs, with 18.3% being foreign subsidiaries.
- 55.6% of companies are exporters, with 44.4% exporting regularly.
- Catalonia leads Spain with 4,487 electric vehicle charging points.
- 23% of Spain's automotive exports come from Catalonia, up 19% in 2022.
- Foreign direct investment: 25 projects between 2018 and 2022, worth €2.341 billion and creating 4,661 jobs.

4.3 Health and Life Sciences

4.3.1 Assessment

The health and life sciences sector faces structural challenges at both European and global levels that limit its ability to innovate, compete and meet the growing demands of an ageing population with increasingly specific health and wellbeing needs. Demographic ageing is placing greater pressure on healthcare systems and requires sustainable solutions to manage chronic diseases and develop personalised therapies. At the same time, adopting disruptive technologies such as AI, Big Data and digital health is essential for improving diagnostics and reducing costs, although limited access to harmonised data and the fragmented European market hinder this transformation.

Despite Europe's strong sales performance[16] and well-established scientific base, it lags behind the United States in R&D investment, particularly in the most dynamic areas, including advanced therapies and biological medicines. Fragmented public investment and the absence of clusters with sufficient critical mass prevent Europe from competing with global hubs such as Boston or San Francisco. Furthermore, the EU drug approval process is slower and more complex, while dependence on countries like China and India for essential components exposes a structural vulnerability.

A transition to more sustainable models and greater coordination among European countries is urgently needed to ensure that this strategic sector can continue to drive economic and social development over the coming decades.

4.3.2 European Strategic Objectives

- **Strengthen Europe's leadership in healthcare R&D and innovation**: Prioritise public and private investment in the most disruptive areas, support the creation of transnational innovation clusters capable of competing globally, and establish harmonised mechanisms to speed up the approval of medicines and medical devices.

[16] The European pharmaceutical industry is a strategic sector, accounting for 5% of industrial GVA and 11% of EU exports.

- **Enhance the sector's strategic autonomy and sustainability**: Develop local production capacities for raw materials and active ingredients, implement circular economy models and build a healthcare data infrastructure that supports AI-driven research and innovation.

- **Attract and retain highly skilled talent**: Promote European programmes for specialised training in STEM and digital fields, offer competitive working conditions to retain talent and provide incentives for professionals to participate in high-value public and private projects.

4.3.3. Life Sciences Sector in Catalonia

Catalonia has become one of the most dynamic and promising ecosystems in Europe for life sciences and healthcare. With its strong scientific tradition, extensive network of leading research infrastructures and concentration of innovative companies, the sector plays a central role in transforming Catalonia's economic and industrial model into a more knowledge- and innovation-driven economy. This transformation responds to rising global demand for healthcare and biotechnology solutions, driven by factors such as an ageing population, advances in personalised medicine and the digitalisation of healthcare.

Catalonia hosts internationally recognised biomedical research centres, including the Institut de Recerca Biomèdica de Barcelona (IRB Barcelona), the Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), and the Vall d'Hebron Institut de Recerca (VHIR). These centres collaborate closely with universities, hospitals and companies to promote healthcare innovation. Catalonia also leads in attracting foreign investment and serves as a centre of excellence in biomedical research.

The ecosystem includes biotechnology, medical technology, pharmaceutical and digital health companies, working in partnership with a broad network of university hospitals, research centres and science parks. This integration of science, technology and business positions Catalonia as an international reference in innovation and sustainability, with the potential to deliver advances that improve wellbeing while strengthening the competitiveness of its economy. The combination of highly skilled talent, state-of-the-art infrastructure and institutional support makes the sector a key driver of economic and social growth over the coming decade.

Key Figures for the Sector[17]

The life sciences sector in Catalonia comprises **1,300 companies**, including:

- 335 in biotechnology
- 228 in medical technology
- 126 in pharmaceuticals
- 202 in digital health

The sector generated **€21.3 billion** in revenue in 2021, accounting for **4.4% of Catalonia's GDP**).

It employs **57,718 people**, with a high proportion of highly skilled professionals.

Catalonia is Spain's leader in life sciences exports, with €7.78 billion exported in 2021 –52.9% of the national total.

Barcelona is the top city for R&D investment, hosting 31.7% of all foreign direct investment (FDI) projects in the sector between 2017 and 2021.

The region is supported by **91 research institutions**, including 41 research centres, 19 university hospitals and 14 science parks.

[17] Based on the ACCIO Sector Report, "The Health and Life Sciences Sector in Catalonia", October 2022.

INICIATIVA PER LA
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