

## Greece 2020 – Factsheet on Internationalization, innovation, and smart specialisation: improving manufacturing competitiveness

### Key points

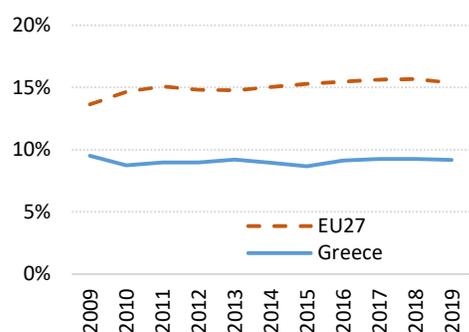
- The Gross Value Added (GVA) of Manufacturing in Greece has systematically been low, around 9% of GDP compared to an EU average above 15%.
- Manufacturing's gross exports have increased by almost 64% during 2009-2019 reaching €19.1 billion in 2019. The upward trend is partly driven by Agro-food sector performance, while basic metals and pharmaceuticals also represent significant export shares.
- Greek Manufacturing R&D expenditure remains well below other European countries. Computer, electronics and pharmaceuticals are sub-sectors with the highest R&D spending.
- Overall economy public and private spending on research and development as a percentage of GDP has increased since 2010 but is still significantly lagging the average share in the EU.
- Greece's overall innovation performance has improved since 2011 but remains well below EU average.
- While employment in research and development activities is increasing, the loss of skilled human capital (brain drain) is a major challenge for the Greek research and innovation system.
- Links between academia and the productive sector remain weak.
- There is potential for significant improvement in innovation performance, internationalization and smart specialisation in Greece's manufacturing sector.

# 1. FACTS & FIGURES

## Manufacturing

- Greek Manufacturing Gross Value Added (GVA) was on average at 9.1% of GDP during 2009-2019, significantly below EU average (above 15%).
- Manufacturing GVA has slightly improved since 2015, by almost 0.5 pps, reaching 9.2% in 2019.

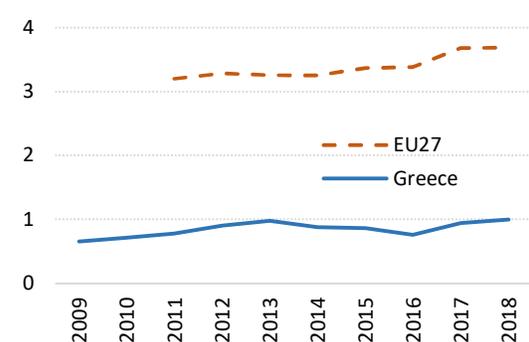
Figure 1: Gross Value Added of Manufacturing, % of GDP



Source: Eurostat, National Accounts

- The average turnover for a Greek manufacturing firm was €0.85 million during 2009-2019, well below EU average. This may partly explain the comparative disadvantage in innovation performance since the share of innovative firms increases with firm size.
- The average turnover has increased since 2016, by almost 6%, reaching its highest value, around €1 million in 2018.

Figure 2: Average firm size in manufacturing, annual turnover per firm in million €, 2011-2019



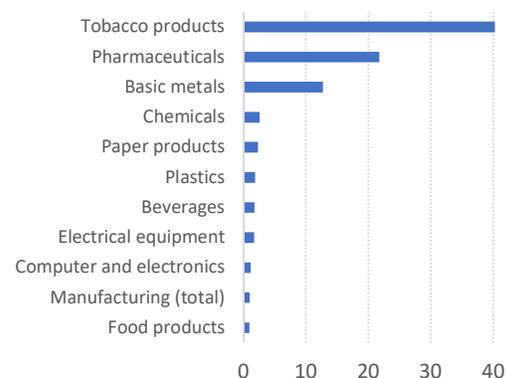
Source: Eurostat, Structural Business Statistics

- Across manufacturing sub-sectors, Tobacco and Pharmaceutical products recorded the

highest average turnover, reaching €40.3 million and €21.8 million respectively, in 2018.

- Basic metals' average turnover was €12.7 million, followed by Chemical products and Paper products stood at the area of €2.3-2.5 million.

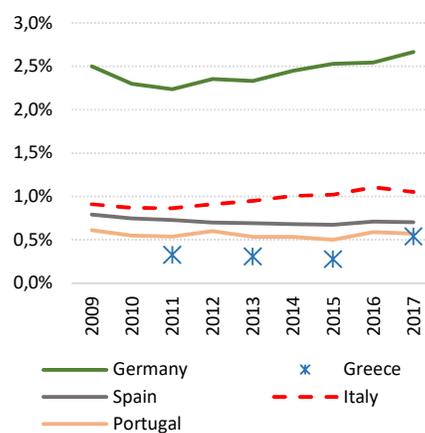
Figure 3: Greek manufacturing sub-sectors with largest average firm size, turnover per firm, in million €, 2018



Source: Eurostat, Structural Business Statistics

- Manufacturing R&D expenditure remained rather flat during 2011-2015, with the index slightly increasing at 0.5% of total turnover in 2017, still well below other European countries.

Figure 4: R&D expenditures in manufacturing across selected EU countries, % of turnover, 2009-2017

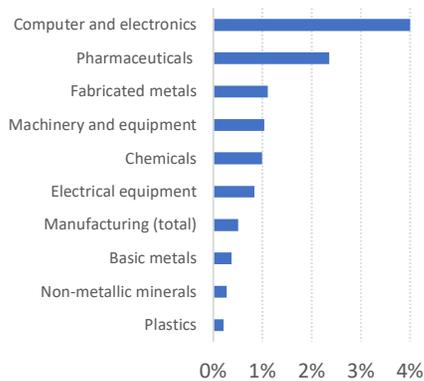


Source: Eurostat

- Computer and electronic products appeared to be the most innovative sub-sectors, with R&D expenditure amounting to 4.0% of turnover in 2017.
- R&D expenditure by Pharmaceuticals amounted to 2.4% of their turnover,

followed by Fabricated metal products and Machinery and equipment, at the area of 1.0%.

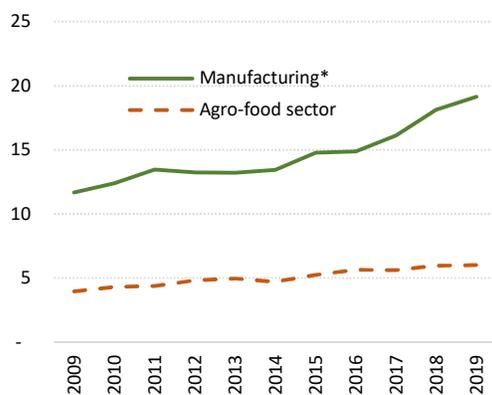
Figure 5: Top Greek manufacturing sub-sectors in R&D expenditures in 2017, % of turnover



Source: Eurostat

- Manufacturing's gross exports have increased by almost 64% during 2009-2019 reaching €19.1 billion in 2019. The upward trend is partly driven by Agro-food sector's gross exports, which recorded a cumulative increase by 52% during the last decade, exceeding €6 billion in 2019.

Figure 6: Gross Greek exports, in € billion, 2009-2019



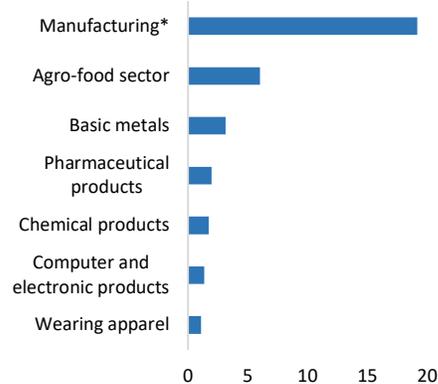
Source: Eurostat, ComExt

Note: Petroleum products are excluded from Manufacturing sector in this presentation. Agro-food sector includes both Food Manufacturing and Primary food sector in this figure.

- Across manufacturing sectors, Basic metals recorded the highest value of gross exports

reaching €3.1 billion, followed by Pharmaceutical and Chemical products at €1.9 billion and €1.7 billion, respectively.

Figure 7: Top Greek manufacturing sub-sectors in gross exports in 2019, in billion €



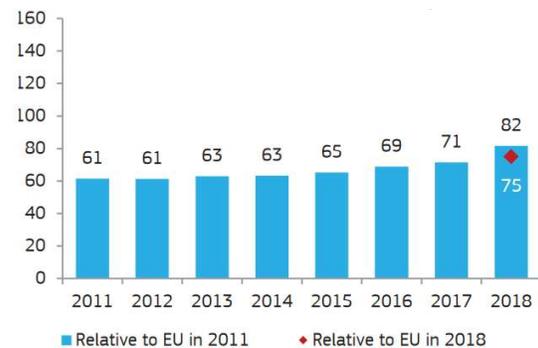
Source: Eurostat, ComExt

Note: Petroleum products are excluded from Manufacturing sector in this presentation. Agro-food sector includes both Food Manufacturing and Primary food sector in this figure.

## Innovation in Greece

- Greece's innovation performance has improved since 2011 but remains well below EU average. Greece is hence a "Moderate Innovator", according to the European Innovation Scoreboard 2019.

Figure 8: Innovation performance for Greece



Source: European Innovation Scoreboard 2019

- Innovators, Linkages and Employment impacts are the strongest innovation dimensions of Greece.
- Innovative SMEs collaborating with others, SMEs innovating in-house, and SMEs with

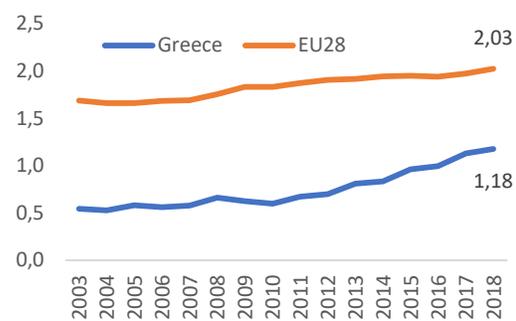
marketing or organizational innovations are the strongest points of the country.

- In contrast, intellectual assets, innovation-friendly environment, and Finance and support are the weakest innovation dimensions.
- Greece scores low in the following indicators: Foreign doctorate students, Medium and high-tech product exports, and Venture capital expenditures.
- Gross domestic spending on R&D has increased for Greece reaching 1.18% of GDP in 2018. Despite the progress, Greece is significantly lagging the average EU28 performance (2.03%).
- The number of researchers in Greece, during the years after the 2009 acute crisis, has increased and reached the EU28 average in 2017 and 2018.
- While employment in R&D is increasing, the loss of skilled human capital (brain drain) remains a major challenge.
- Business investment in research development and innovation has been increasing slowly in recent years but remains low.
- Collaborations between the academia and productive sectors should be encouraged more. Although Greek universities perform well in research output, its degree of commercialization is low, as indicated by the relatively low number of patents.
- Clusters policies can stimulate cooperation on innovation between universities and businesses and along the supply chain. Such policies not so far been extensively developed in Greece.
- Towards this direction, relative funding for Clusters, focusing on innovation, was announced in 2019 through the programme "Clusters of Innovation (in Greek "Συνεργατικοί Σχηματισμοί Καινοτομίας – ΣΣΚ").
- The first organisation established in Greece for encouraging the development of innovation clusters, is Corallia. Corallia acts as a cluster facilitator providing support actions to cluster initiatives involving all

innovation ecosystem stakeholders such as industry, universities, research centres, financial institutions, regional and national authorities, etc. Corallia has been involved in the development of three clusters in knowledge-intensive thematic sectors in Greece:

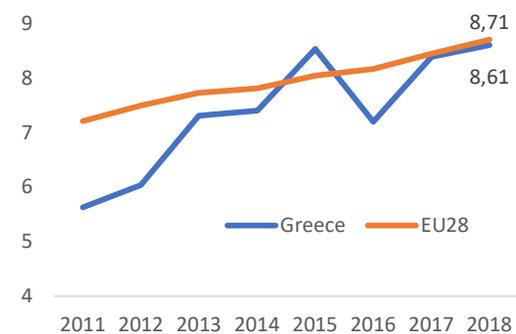
- The gi-Cluster (gaming and creative technologies & applications),
- the mi-Cluster (nano/microelectronics based systems and applications) and
- the si-Cluster (space technologies and applications).

Figure 9: Gross domestic spending on R&D Total, % of GDP, 2000 – 2018



Source: OECD statistics

Figure 10: Researchers Total, per 1000 employed

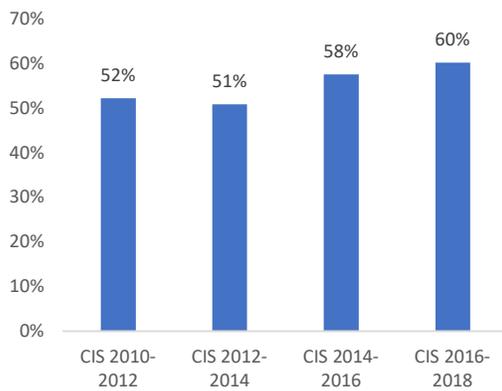


Source: OECD statistics

## Innovation at firm level

- The proportion of innovative enterprises in Greece rose to 60.3% during 2016-2018, (increase 2.6pps compared to 2014-2016), according to the Community Innovation Survey (CIS).

Figure 11: Share of Innovative enterprises in Greece



Source: National Documentation Center (EKT), CIS

- In the industry sector, the percentage of innovative enterprises was 62.3% during 2016-2018 (59.5% in 2014-2016). The highest percentage of innovative enterprises (62.9%) was reported in Manufacturing.
- In the Services sector, the share of innovative enterprises reached 58.9% during 2016-2018 (56.5% in the 2014-2016). The highest percentage of innovative enterprises (67.1%) was reported in the 'Information and Communication' sector.
- The percentage of innovative firms is increasing with enterprise size. Specifically, for the period 2016-2018, it amounted to 58.0% for enterprises with 10-49 employees, 70.4% for enterprises with 50-249 employees and 87.3% for enterprises with more than 250 employees. The shares of the previous survey period were 55.3%, 67.2% and 83.9% respectively for each size segment.
- In the period 2016-2018, the proportion of firms in Greece with product innovation amounted to 42.5%, compared to 30.7% in the previous three-year period, indicating an increase of 11.8 percentage points. Compared to the first reference period of 2010-2012, this percentage is more than double.
- For the same period, 55.2% of firms implemented new or improved processes in business operations such as the production of goods and services, logistics, financial

management, IT applications, work organisation and marketing.

- The ratio of firms that collaborated with other enterprises or organisations for the implementation of innovative activities was equal to 20.8%.
- The degree of co-operation improves with firm size. 59.2% of large enterprises established innovative partnerships relative to 18.2% of small enterprises and 31.2% of medium-sized enterprises.
- Start-up and 'later stage' venture capital investment remains around half of the EU average: 0.02% of GDP in 2018, compared to 0.05% of GDP in the EU (Invest Europe, 2019).

### Smart Specialization

Smart Specialisation, as conceived within the reformed Cohesion policy of the European Commission, is a territorial-based approach characterised by the identification of strategic areas for intervention based both on the analysis of the strengths and potential of the economy and on an Entrepreneurial Discovery Process (EDP) with wide stakeholder involvement.

The Greek authorities' National Strategy for Research, Innovation and Smart Specialisation (2014-2020) has identified eight **smart specialisation priority areas** for Greece:

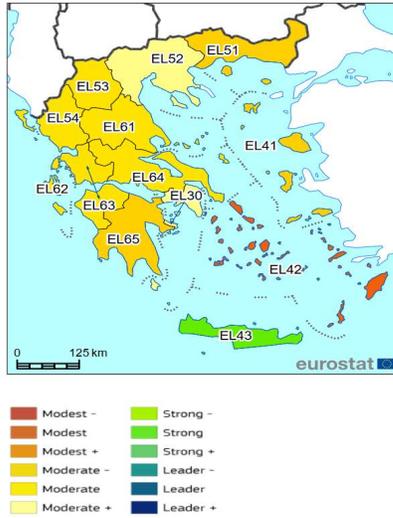
1. Agri-Food;
2. Health Bio-sciences;
3. ICT;
4. Energy;
5. Environment & Sustainable Development;
6. Transport & Logistics;
7. Materials & Construction;
8. Tourism, Culture & Creative Industries.

Smart specialisation focuses on the regional competitive advantages to stimulate growth and employment rates. Comparative advantages of each region are detected by involving a great range of stakeholders such as local authorities, academia, business circles and the civil society.

Only 3 out of 13 regions established a Smart Specialisation Technical Office, and only one is operating. Kriti is the only Strong Innovator and

the most innovative Greek region. Most of the other regions are Moderate Innovators while the Notio Aigaiio region is assessed as a “modest innovator”.

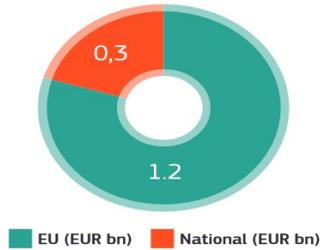
Figure 12: Regional Innovation Performance for Greece



Source: European Commission, Regional Innovation Scoreboard 2019

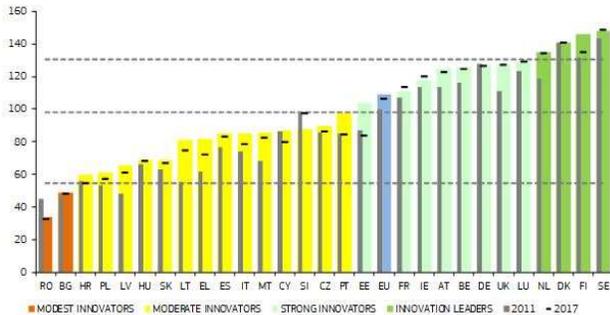
Figure 13: EU funded Research & Innovation in Greece

ESI Funds total budget for Research and Innovation: Greece - EUR 1,5 Billion



Source: European Commission

Figure 14: European Innovation Scoreboard country ranking



Source: European Innovation Scoreboard 2019

Notes: Coloured columns show innovation performance in 2018, horizontal hyphens show performance in 2017, and grey columns show performance in 2011, all relative to the EU average in 2011.

## 2. Open Discussion Questions

- What are the key policies needed for increasing innovative performance in Greece? (e.g. cluster development, market fragmentation, cost of patenting, slow standard-setting, skills shortages?)
- How can innovative and sustainable manufacturing play a bigger role in creating value in the Greek economy? What factors need to be addressed to strengthen the sector?
- How can smart specialisation policies be used to stimulate industrial modernisation?
- How should the current innovation model of manufacturing and industry in Greece be strengthened in view of Industry 4.0?
- The pandemic crisis: a threat or rather an opportunity? Role for the Next Generation EU recovery package?

## 3. Sources

European Innovation Scoreboard 2019

European Commission, (26.02.2020), 'Country Report Greece 2020'

European Commission, (20.05.2020), 'Council Recommendation on the National Reform Program of Greece'

European Commission, Joint Research Centre:

<https://s3platform.jrc.ec.europa.eu/what-is-smart-specialisation->

[https://s3platform.jrc.ec.europa.eu/documents/20182/223684/GR\\_RIS3\\_201508\\_Final.pdf/c06bd75d-49c4-43e1-bf77-39351c41f245](https://s3platform.jrc.ec.europa.eu/documents/20182/223684/GR_RIS3_201508_Final.pdf/c06bd75d-49c4-43e1-bf77-39351c41f245)

National Documentation Centre (EKT.gr): <http://www.ekt.gr/en/news/24329>

Corallia clusters facilitator (corallia.org): <https://www.corallia.org/en/activity-fields/clusters.html>