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By Christopher Pissarides, Costas Meghir,
Dimitri Vayanos and Nikos Vettas

A Growth Strategy for the Greek Economy

**CENTRE FOR
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A GROWTH STRATEGY FOR THE GREEK ECONOMY

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List of abbreviations

AADE	Audit Centre of the Independent Authority for Public Revenue
AKIS	EU Agricultural Knowledge and Innovation System
ASEP	Supreme Council for Civil Personnel Selection
ATHEX	Athens Stock Exchange
CAP	Common Agricultural Policy
Cedefop	European Centre for the Development of Vocational Training
DESI	Digital Economy and Society Index
DRD	Dispute Resolution Directorate
EAP	Economic Adjustment Program
EAPND	Committee Evaluating the Quality of the Law-Preparation Process
EaSI	EU Programme for Employment and Social Innovation
EAT	Hellenic Development Bank
EATE	Hellenic Development Bank for Investment
ECHI	Euro Health Consumer Index
EFKA	National Social Security Agency
EHR	electronic health record
EIF	European Investment Fund
EIS	European Innovation Scoreboard
EKDD	National Centre for Public Administration and Local Government
ELKE	Special Account for Research Funds
ELSTAT	Hellenic Statistical Authority
ENFIA	Uniform Real Estate Property Tax
EOPYY	National Organization for the Provision of Health Services
EP	employee benefit
EPA	export promotion agency
EPAL	vocational high school
EPS	Special Planning Zone
ERC	European Research Council
ERDF	European Regional Development Fund
ESI	European Skills Index
EU	European Union
EU ETS	EU Emissions Trading System
GCI	Global Competitiveness Index
GDP	gross domestic product
GHG	greenhouse gas

GMI	Guaranteed Minimum Income
GP	general practitioner
GPS	General Zoning Plan
GSEE	General Confederation of Greek Workers
GSRT	General Secretariat for Research and Technology
GVA	gross value added
HCAP	Hellenic Corporation of Assets and Participations
HCC	Hellenic Competition Commission
HCMC	Hellenic Capital Market Commission
HDB	Hellenic Development Bank
HFRI	Hellenic Foundation for Research & Innovation
HR	human resources
HRADF	Hellenic Republic Asset Development Fund
HRM	human resource management
ICT	information and communication technologies
IEK	Institute of Vocational Training
IFRS	International Financial Reporting Standards
ILO	International Labour Organisation
IMF	International Monetary Fund
InCiSE	International Civil Service Effectiveness
IOBE	Foundation for Economic and Industrial Research
IP	intellectual property
ITDA	integrated tourism development areas
KEE	Central Union of Chambers of Greece
KEPE	Centre of Planning and Economic Research
KPI	key performance indicator
KTYP	Ktiriakes Ypodomes
MICE	meetings, incentives, conferences and exhibitions
MOOC	massive open online course
MTFSF	Medium-Term Fiscal Strategy Framework
MWh	megawatt hour
NCRTI	National Council for Research, Technology and Innovation
NECP	National Energy and Climate Plan
NPE	non-performing exposure
NPEC	National Plan for Energy and Climate
NSK	Legal Council of the State
NSO	National Science Organisation

NSRF	National Strategic Reference Framework
NWMP	National Waste Management Plan
OAED	Manpower Employment Organization
OECD	Organisation for Economic Co-operation and Development
PATHE	Patras-Attica-Thessaloniki
PDE	protected designation of origin
PE	private equity
PGI	protected geographical indications
PHC	primary healthcare
PIAAC	Programme for the International Assessment of Adult Competencies
PIP	Public Investment Programme
PISA	Programme for International Student Assessment
PPA	Port of Piraeus
PPC	Public Power Corporation
PPP	public-private partnership
PWDs	persons with disabilities
R&D	research and development
RES	renewable energy sources
RMS	road management system
SCC	Sectoral Scientific Council
SDG	Sustainable Development Goal
SEV	Hellenic Federation of Enterprises
SHOAP	Open City Spatial and Residential Organization Plans
SME	small and medium-sized enterprise
SOE	state-owned enterprise
SSM	Single Supervisory Mechanism
STEM	science, technology, engineering, mathematics
TEI	technological educational institute
TEU	twenty-foot equivalent unit
ThPA	Port of Thessaloniki
TPS	Local Zoning Plan
TTO	technology transfer office
UN CRPD	United Nations Convention on the Rights of Persons with Disabilities
VAT	value-added tax
VC	venture capital
WIPO	World Intellectual Property Organization

Foreword

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The influential ‘Pissarides report’, commissioned by the Greek government and first published in Greek in 2020, analyses the Greek economy's strengths and weaknesses, offering policies for the next decade. Now translated into English, its relevance extends beyond Greece, serving as a useful guide for policymakers in small European economies on how to increase competitiveness and effectively leverage the European market.

The authors outline a comprehensive growth plan for the Greek economy, rooted in economic analysis and international evidence. The proposed policies, which are tailored to Greece's economic characteristics, aim to enhance productivity and workers' earnings, ultimately raising household welfare. Addressing current economic rigidities, the plan organises policies into actions for the public sector, market improvements and industry-focused initiatives. The report underscores the interconnectedness of Greece's economic challenges, attributing them to institutional inefficiencies and ineffective public administration. Highlighting the country's recent economic decline relative to European counterparts, the report advocates for immediate policy reforms to reverse this trend.

The report stresses the importance of systematic implementation, which requires coordination across the public sector and ongoing monitoring for necessary adjustments. Already, its influence has reverberated in both government policy and public discourse, playing a significant role in advancing Greece's economic reform initiatives.

CEPR is grateful to Christopher Pissarides, Costas Meghir, Dimitri Vayanos and Nikos Vettas for their expert authorship of the eBook. Our thanks also go to Anil Shamdasani for his skilled handling of its production.

CEPR, which takes no institutional positions on economic policy matters, is delighted to provide a platform for an exchange of views on this important topic.

Tessa Ogden
Chief Executive Officer, CEPR
December 2023

Introduction

This report presents a coherent plan for the growth of the Greek economy. The proposed policy actions are based on economic analysis and evidence from other countries. Our recommendations are adapted to the characteristics of the Greek economy, to recent developments in Greece and abroad and to international trends. Should the growth plan be implemented in a consistent manner, it would lead to a higher level of household welfare, through enhancements to the economy's productivity and workers' earnings.

The report analyses the main characteristics and trends of the Greek economy, the main global trends that will affect its future course, the general direction in which it should move for stronger growth in the medium term, and the main rigidities that currently hold back its growth. It proposes policy actions to deal with these rigidities and speed up growth. The proposed policies are organised, in that order, into actions that concern the public sector, horizontal actions that concern the markets, and vertical actions focusing on industries and sectors that are central to the economy.

In recent years, the Greek economy has been gradually slipping into lower levels of income and welfare, with its performance retreating across several essential indicators relative to most other European economies. The report demonstrates that important features of the Greek economy, such as its low productivity and its inward-looking nature, have common causes and reinforce each other. Although the causes are many, we believe that they mainly result from the ineffective functioning of the economy's institutional structure and its public administration.

The report adopts a medium-term perspective. Any meaningful strengthening of the economy's productive base requires structural changes that are expected to continue evolving for many years, so the full results will not be visible immediately but experienced gradually. This does not mean, however, that our proposed reforms should not start as soon as possible. Powerful positive results would be experienced from the start. An important case in point is investment, which depends on expectations. A credible policy reform that is expected to lead to stronger growth can immediately attract investment in high technology and encourage more highly trained workers to stay in the country. In contrast, if nothing is done and opportunities for technological upgrading are missed, the Greek economy's relative position will deteriorate further and its exposure to international risks will increase. These risks can often be unpredictable, as proven by the ongoing COVID-19 pandemic. The depth and the ultimate end of the COVID-19 recession cannot easily be predicted, but it makes it even more urgent to bring in policies that will enhance the productive capabilities of the economy, in addition to the short-term management of the situation.

While the report recommends policies for implementation, it is not an operations manual. For the proposed actions to be successful, systematic implementation is, naturally, of critical importance. This requires the coordination of functions across the public sector, including the central government administration, the local administration and several other organisations and entities. It is also important to monitor progress continually and make any necessary adjustments learned on the way to full implementation.

Executive summary

FEATURES OF THE GREEK ECONOMY

Despite its continual participation in the core European economic institutions – the European Union (EU), the Single Market and the euro area – the Greek economy has been characterised for decades by low investment, labour force participation and productivity. As a result, periods when real incomes grew at high rates proved to be unsustainable and led to crisis, as they were funded by excessive external borrowing that could not be repaid. The failures have not only been in the economy's productive potential; Greece also fell behind significantly in achieving environmental targets, covering both climate change and the circular economy.

More specifically, we emphasise the following features of the Greek economy and of our plan:

1. Even though there has been an alignment of the formal institutional framework to that of the EU in most areas, the way that the public administration and many institutions function is ineffective in practice. The causes for this are a lack of transparency, absence of effective performance evaluation, absence of clear targets set, and generally a structure that has not adapted to modern forms of governance and public administration. The excessive administrative and regulatory burden is one of the key factors underlying the poor development of markets, the low level of foreign direct investment and the low competitive and innovative intensity.
2. Low productivity, combined with the fact that businesses are operating in an institutional framework that lacks transparency, underlies the lack of openness in the economy. A disproportionate share of businesses and jobs operate in sectors that produce internationally non-tradable goods and services. A related problem is that firms tend to be relatively small, while the shares of self-employment and of the shadow economy are large.
3. While the trade balance and the economy in general systematically benefit from the contribution of tourism and shipping, the contribution of manufacturing and new technologies – the main sectors of internationally tradable goods incorporating innovation – is small. Exports of goods have been on the rise in recent years, but they continue to represent a small share of the economy and to systematically lag behind imports of goods. The corresponding business investments are low, as is foreign direct investment.

4. The support of vulnerable households, with a large share of the population close to poverty thresholds, remains an important challenge. The problem is directly linked to their ineffective access to the labour market as well as their low productivity, leading to low wages. Effective solutions to the problem, through the social protection system, are hindered by the large size of the informal economy. The current system often discourages official employment and, eventually, traps many households in low levels of welfare.
5. The country's adverse demographic characteristics represent challenges for the prospects of the economy in the medium term. The number of births is decreasing, the population is ageing and the number of economically active individuals is falling, while the overall migration balance is negative, especially for people of more productive ages and with relatively better qualifications.
6. As part of the three successive fiscal adjustment programmes of the last ten years, the twin deficits – fiscal and external balance – have been corrected. Competitiveness has also improved through the reduction of the unit labour cost, and the country has regained access to international financial markets for its financing needs. However, the prolonged uncertainty associated with the adjustment programmes and the investment slump that followed led to a deep recession and to the accumulation of public and private debt. During the same period, there has been good progress in several economic and administrative areas, but the progress regarding structural reforms has been too slow and incomplete. Reasons for this include a lack of adequate access to financing, in both the public and private sectors, that was needed to achieve a strong reform momentum.
7. The Greek economy returned to positive growth rates in 2014, which were again overturned in 2015, amidst positive growth rates for the European economy. In the last two years and upon expiry of the third adjustment programme, the growth of the Greek economy gradually strengthened to rates higher than those of many other euro area economies. The COVID-19 pandemic violently overturned this dynamic, dragging Greece, and almost the entire global economy, into a deep recession.
8. The measures already adopted and those expected to be soon adopted by the EU are strengthening the financing of the economy. The relevant support is critical and necessary, since without it the Greek economy would run the risk of being dragged into a deeper and more prolonged recession, as it is vulnerable in important sectors such as tourism and transport and has limited possibilities to protect itself.

9. The EU funds that are scheduled to become available over the coming years should be used according to a plan that would enhance the productive base and change the direction of the Greek economy, rather than for short-term consumption-boosting purposes. More specifically, they should be used to support essential infrastructure as well as for the financing of structural reform initiatives. They should, in other words, be used alongside a framework for institutional changes aimed at the public sector and the production base, shifting the country to a higher growth trajectory.

TARGETS FOR THE GREEK ECONOMY

The main goal for the Greek economy over the next decade should be to systematically increase real per capita income, so that it gradually converges to the European average. The strengthening of social cohesion and the improvement of Greece's environmental performance should also be primary goals during this convergence process.

There are two main conditions for achieving a real convergence to the European average income. The first is strong employment growth, through a reduction of unemployment and higher labour market participation of under-employed population groups, such as women and the young. Higher employment will further contribute to the easing of social exclusion and the strengthening of social cohesion. The second condition is a strong increase in labour productivity, which will safeguard household welfare in the longer run. Productivity growth requires an increase in productive capital and therefore new investments, from both domestic and foreign firms. It also requires the integration of innovative production methods and new technologies. As these activities require a high degree of specialisation and the domestic market of a small country like Greece is limited, it is necessary to increase Greece's export capacity.

The following targets are related to employment and productivity growth:

- a. Increase in total fixed investment and especially business investment from today's low levels of 10.1% and 5.4% of GDP, respectively, towards the averages of other small open EU economies, which are close to 23% and 14%.
- b. Increase in private and public expenditure on research and development from 1.2% of GDP currently towards the EU average of approximately 2% of GDP, and a better interconnection between research and production. Establishment of leading-edge technology hubs that will develop and implement innovation on a global scale.
- c. Gradual increase in both overall exports and exports of goods, from the current levels of 37% and 19%, respectively, towards the averages of other small open EU economies, at 66% and 48%.

- d. Increase in the number of large and medium-sized enterprises, which is a necessary condition for increasing productivity and enhancing exports. Strengthening of smaller enterprises, which in a country like Greece will inevitably represent the majority of businesses, is also important as they can join value chains and form stronger connections with larger enterprises, so that the overall openness and productivity of the economy are enhanced further.
- e. Higher labour market participation, especially among the younger population and women, from current levels of 42% and 65%, respectively, towards the averages of other small open EU economies, at 62% and 73%.
- f. Strengthening of the economy as a regional hub, based on attracting human capital from its wider geographic area and leveraging Greece's distinct history and culture.

ECONOMIC POLICY ACTIONS

The achievement of the above-mentioned main goals and specific targets could take place gradually over the coming years with combined actions across the entire economic policy range. These actions are analysed in the following chapters of the report. A summary of the main actions is presented here.

A **first set of actions** concerns changes to the institutional framework that governs the functioning of the economy, to facilitate production activity. These actions include the reduction of the burden on formal labour resulting from taxes and social security contributions. They also include the reduction of the regulatory and administrative burdens, which result from the complexity and the lack of transparency of the institutional framework.

1. Reduction of the burden on salaried employment through combined measures such as (a) a reduction of social security contributions (for example, through a flat amount of health contributions for all employed individuals); (b) the abolition of the 'solidarity surcharge'; and (c) a reduction of the upper limit for social security contributions. Taxing all incomes on a single scale, irrespective of their source. Higher transparency of monetary transactions through strong positive incentives for use of electronic payments – for buyers and sellers alike – targeted to sectors and occupations where there is high tax evasion, and extension of that measure to legal entities.
2. Greater proportionality and transparency of the distributional (pay-as-you-go) first pillar of the social security system and, at the same time, development of a second and third pillar, providing incentives for private savings. Transition from pay-as-you-go to a funded scheme of supplementary insurance, with immediate

implementation for those entering the labour market for the first time and on a voluntary basis for workers who wish to be included in the new system. Implementation of an effective system of supervision for the pension funds of the second pillar, including a public sector fund.

3. Continuation and deepening of the codification and evaluation processes for the Greek legislation. Institutional upgrading of the public administration, through measures such as longer duration of terms and greater mobility in upper administrative ranks, as well as upgrading of the role of the Supreme Council for Civil Personnel Selection. Universal roll-out of personnel evaluations. Further digitalisation, with an emphasis on the interconnection of systems and their user-friendliness for the public.
4. Expansion of specialised courts for cases of economic interest that require specialised knowledge. Expansion and support of out-of-court settlement mechanisms. More systematic assistance for judges, through the hiring of judicial employees and the introduction of judicial assistants. Upgrade of the system of education, training, evaluation and professional development of judges.
5. Strengthening financial supervision in the area of investor protection. Improving corporate governance and transparency in capital markets. Goal setting for a swifter reduction in non-performing bank loans. Emphasis on effective implementation of the new insolvency code. Tax incentives to boost long-term household savings and strengthen the domestic capital market.
6. Swift completion of the land registry, forest maps and the definition of land uses through the drafting of Local Urban Development Plans. Greater participation by the local administration to the relevant procedures. Curbs on construction outside zoned areas. More transparency on land use and environmental data. Upgrade of the Environment Inspectorate to an independent authority.
7. Transfer of powers to the local level in sectors such as education and land planning, with the central administration having the role of overall planning and coordination. Merger and simplification of all property taxes and partial transfer of these to the local level. The revenues of local authorities should be proportionate to their mandate, and the transfers should be based on transparent procedures and application parameters.

A **second set of actions** concerns the strengthening of social cohesion. These actions include improved access to a dynamic labour market for all, universal access to high quality education and health services, as well as a targeted system of social benefits for the more vulnerable.

8. Modernisation of the education system at all levels. Emphasis on preschool education. Larger school units with more autonomy, including in hiring, and evaluation. Universal development of digital infrastructure and content, expansion of all-day schooling programmes, transfer of powers to the local administration. Radical modernisation of the governance system in higher education and effective linkage of Greek universities to universities abroad, to the economy and to the broader society.
9. Restructuring of the healthcare system, with an emphasis on the establishment of a digital patient record system, primary healthcare and prevention. More autonomy for public hospitals and implementation of a system for monitoring costs and for performance evaluation. Rationalisation of public expenditure for the procurement of pharmaceuticals and medical supplies, with an increase in the volume of generics, provision for innovative treatments and implementation of prescription protocols. Interconnection of the imposed clawbacks and rebates with innovation, research and development. Upgrade of the clinical trials system.
10. Radical upgrade of the training system for both the unemployed and employed. Increase in financing, alignment of incentives and reward of providers based on training results. Restructuring of the Manpower Employment Organization with a reorientation towards active labour market policies.
11. Making it easier for women to enter the labour force and stricter implementation of laws against gender discrimination, to close the gender gap in wages. More policies and stricter implementation to address discrimination of any type. Development of a system of preschool care and education, with universal access from the age of six months. In parallel, enhancement of the system for caring for the elderly.
12. Improvement in the structure and targeting of social benefits so that they do not provide disincentives for employment. Programmes for training immigrants and for better integration in the labour market. Specialised programmes for including individuals with disability in the labour market.

A **third set of actions** concerns better infrastructure through public and private investment.

13. Modernisation of the system for planning and implementing public projects. Upgrade of digital infrastructures with the acceleration of key investments and public-private partnerships.
14. Energy upgrade of buildings (residences and offices) with the aim of reducing energy consumption. Shift towards renewable energy sources, with a parallel reduction of transition costs during the lignite phasing-out process. Development of circular economy and waste management systems.

15. Improvement of rail and road access to the borders for the creation of efficient routes for traded goods. Upgrade of export-oriented ports and their interconnection with the remaining transport infrastructures. Upgrade of the central railway network.

A **fourth set of actions** concerns individual industries and sectors of the Greek economy. These actions refine some of the above actions, recognising that the priorities differ across sectors.

16. Lower production costs in manufacturing, mainly through accelerated tax amortisation for equipment investments, higher working time flexibility and lower energy costs. Systematic recording and elimination of obstacles in sectors with higher capacity for export activity.
17. Implementation of programmes for supporting small and medium-sized enterprises, mainly in their access to finance for investments relating to digital upgrades, innovation or openness, or that promote social cohesion or environmental protection.
18. Improve the quality of tourism services by upgrading infrastructure and digital services, introducing education and training programmes, and improving the country's international image and recognisability. Emphasis on the protection and promotion of the natural and cultural environment.
19. Enhancement of basic research through the abolition of rigidities faced by universities and research centres and the creation of a stable financing entity for basic research with a long-term research strategy and transparent financing criteria. Enhancement of innovation, with incentives for research in firms focusing on manufacturing, agri-food and other sectors, and development through smart specialisation.
20. Agglomeration and modernisation of holdings in the agri-food sector, human capital training, enhancement of technology and research, and increase in the value added of products.

The shift in the direction of the economy should take place under fiscal discipline, but with different fiscal characteristics than in recent years. Public expenditure and revenue should increase at a slower pace than gross domestic product (GDP). Crucially, the mix of public expenditure and revenue should change to better support the new growth model. On the expenditure side, the Public Investment Programme should be strengthened relative to the spending programmes on general operations or pensions. On the revenue side, the tax base should be broadened, through targeted incentives for electronic payments, so that the tax burden is distributed in a fairer manner and the burden on salaried employment eases.

In the context of the European recovery support measures, fiscal space is being created in the short term for Greece as well, which should be effectively utilised so that it has a high development multiplier. Given the current crisis, the financing opportunities from the European funds and the complementarity between the different kinds of reforms, the most urgent priorities from the actions described above are the following:

Production and investment: Drastic reduction of the cost associated with formal employment through the reduction of the tax and social security burden. More beneficial tax treatment of amortisations for investment in mechanical equipment and innovation. Energy upgrade of buildings. Investment in infrastructure, prioritising the transport of traded goods and the travel of passengers on busy routes for domestic traffic and tourism. Boost of manufacturing export sectors by lowering energy costs and the administrative burden. Waste management and circular economy.

Human capital: New programmes and training structures for working individuals and the unemployed. Organisational interventions in schools. Expansion and upgrade of preschool education. Facilitation of the fuller integration of women in the labour market. Adjustment of the institutional framework for enhancing leading-edge research in universities and research centres that would support production clusters.

Public sector and administration: Acceleration of the digitalisation of public sector services. Strengthening of the primary healthcare sector and hospitals with a strong role in monitoring systems. Expansion of special divisions in courts for financial cases and broadening of the mechanisms of out-of-court settlement. Strengthening of the financial supervision system regarding investor protection.

Main features and trends of the Greek economy

This chapter outlines the course of the Greek economy, both before and during the crisis of the previous decade. The description is inevitably concise, but it illustrates the main characteristics of the country's current growth model, setting the basis for the diagnosis of its main weaknesses and economic policy proposals in the chapters that follow. Our main summary of the economy's features is in the first section. This is followed by a brief assessment of the ten-year crisis and the adjustment that it necessitated. Finally, we prepare the ground for the chapters that follow by describing the state of the economy in the present time.

1.1 TRENDS IN THE MAIN ECONOMIC AGGREGATES

1.1.1 Main macroeconomic aggregates and indicators

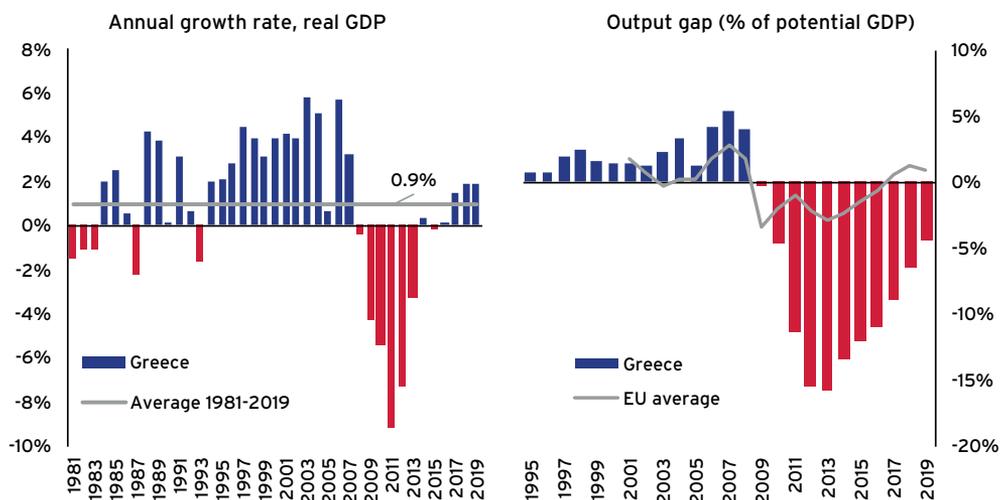
High but unsustainable GDP growth rates before 2009

The Greek economy grew rapidly during the period 1961-1980, with a real annual rate that exceeded 6.5%, followed by a period of slow growth during 1981-1994, with a mean annual rate of approximately 0.8%. Afterwards, the convergence and the initial years of its entry in the European monetary union marked a period of rapid but unsustainable growth, with an annual rate close to 3.5%, followed by the Greek debt crisis starting in 2009, during which there was an annual contraction rate of approximately -2.2%. Considering the period during which Greece was a member of the EU (the European Economic Community at the time of Greece's entry) – that is, 1981-2019 – the mean annual growth rate in Greece was 0.9% (Figure 1.1) while the corresponding per capita rate was lower at approximately 0.6%.

During the first years following Greece's entry in the monetary union (2001-2007), the country recorded high average growth rates, exceeding 4%, inter alia due to the favourable effect of lower borrowing costs and of the stable exchange rate environment with a significantly lower inflation risk. However, these favourable conditions were not exploited to improve the country's production model. Low-cost private and public sector borrowing were primarily used to boost domestic consumption and for the purchase of assets in non-tradable sectors of the economy, and not for productive investments or exports. This led to a growth of GDP to levels systematically higher than the country's

potential output (Figure 1.1) – an indication of an ‘unsustainable’ growth rate – which eventually led to the debt crisis. In contrast, in 2010-2019, Greece’s total output was systematically lower than its potential, indicating that there is a lot of unexploited growth potential and pointing to the need for a sustainable growth programme.

FIGURE 1.1 GDP GROWTH (%) AND OUTPUT GAP IN GREECE (% OF POTENTIAL GDP)



Note: The output gap is defined as the difference between actual and potential GDP in each year. Potential GDP is defined as the maximum GDP estimated to be produced in a year, given the factors of production of an economy and without creating inflationary pressure. The graph shows the European Commission's estimate as published in the Ameco (2020) database.

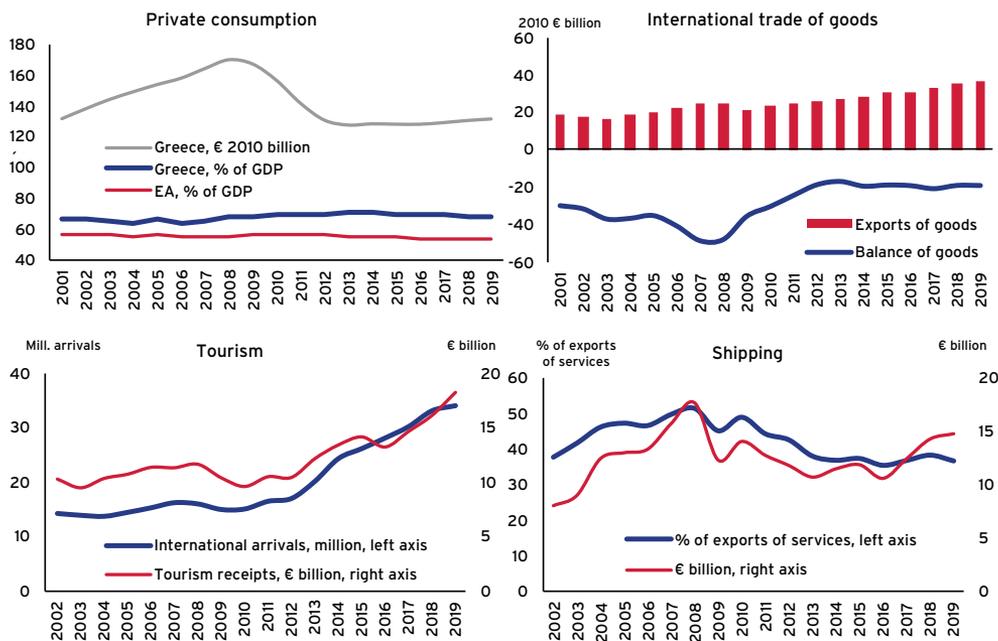
Source: Eurostat, Ameco.

Anaemic recovery after the crisis, primarily supported by tourism and secondarily by exports

Following the prolonged recession caused by the debt crisis, costing almost a quarter of the country’s GDP, the fiscal and external balances have been restored and the economy has shown signs of recovery, albeit with weak characteristics. For example, private consumption continues to make up a large share of GDP, significantly larger than the euro area average (Figure 1.2).

A positive development in recent years has been the large increase in the value of exports of goods – by 68% in constant prices. However, exports remain at low levels as a percentage of GDP and the trade balance remains in deficit, as the deficit in the balance of goods is only partially offset by the surplus in the balance of services. The negative effects of the crisis on the foreign balance were only partially mitigated by the strong increase in incoming tourism, revenues from which more than doubled in the last decade. A systematic source of revenue for the balance of services was the ocean-going shipping industry, which increased significantly in 2016-2019 after a period of stagnation.

FIGURE 1.2 LONG-TERM TRENDS IN INDICATIVE COMPONENTS OF GDP



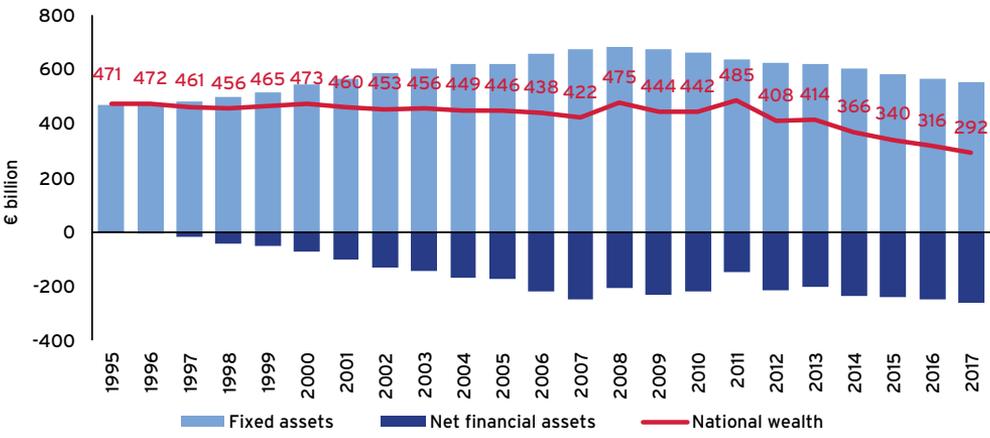
Source: Eurostat, Bank of Greece.

The country's liabilities grew faster than its assets

The unsustainable nature of the rapid GDP growth in the period before 2009 is also evidenced by the fact that this growth did not lead to national wealth accumulation (Figure 1.3). More specifically, the value of the country's fixed assets (dwellings, other buildings and structures, machinery and equipment, cultivated biological resources and intellectual property products) increased from €545 billion in 2000 to €674 billion (in 2015 prices). Over the same period, however, the country's external financial balance significantly deteriorated from -€71 billion to -€231 billion, as the country's liabilities towards the rest of the world increased sharply. As a result, the country's national wealth (measured as the sum of net financial and non-financial assets for which there are available data) fell from €473 billion in 2000 to €444 billion in 2009 (in 2015 constant prices).

Ever since, while the country's net financial assets have relatively stabilised (-€262 billion in 2017), the value of fixed assets has decreased significantly (€553 billion in 2017, or a 20.5% reduction since 2009). As a result, the country's national wealth declined significantly between 2009 and 2017 by 36.3% (to €292 billion in 2015 prices).

FIGURE 1.3 FIXED AND FINANCIAL ASSETS, COUNTRY TOTAL, 2015 CONSTANT PRICES, 1995-2017



Note: Due to a lack of data, national wealth estimates do not include the value of non-produced, non-financial assets such as natural resources, contracts, licenses, etc. Values at current prices have been converted to values at constant 2015 prices using the GDP deflator.

Source: Eurostat.

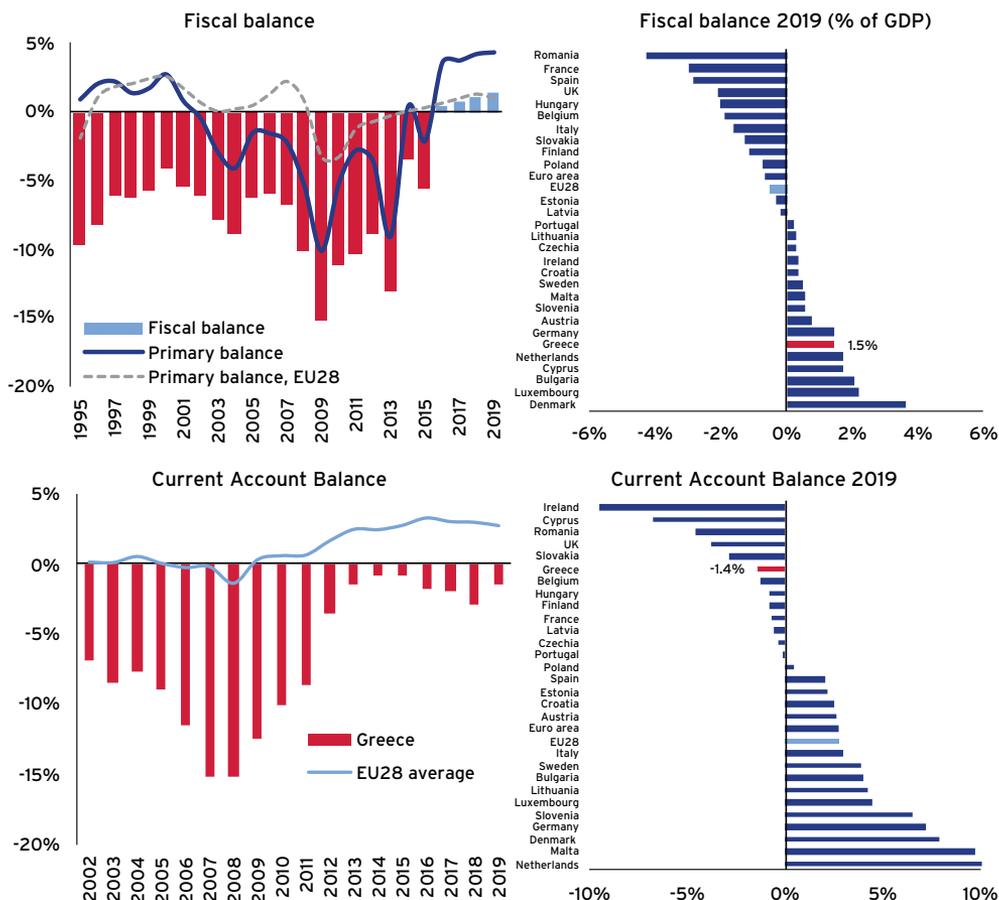
Systematic twin deficits in fiscal and external balances

Greece’s admission to the European monetary union took place after the country had achieved a primary surplus, but its overall fiscal and external balances were in deficit. In the first decade in the currency union, its fiscal deficit tripled and the current account deficit doubled (Figure 1.4).

To a significant extent this was due to pro-cyclical expansionary fiscal policies that led to a deterioration of the fiscal balance and at the same time to a loss of competitiveness, which made the external balance worse. The rise in the twin deficits increased the public financing needs and led to uncertainties about the capacity of the country to repay its very large public debt, which pre-dated its admission to the monetary union.

In 2009, a few months before the Hellenic Republic lost access to international financial markets, the fiscal and external deficits exceeded 15% and 12% of GDP, respectively, which are extremely high levels for a developed economy in peacetime. In the following years, Greece managed to balance the twin deficits, on the one hand by turning chronic fiscal deficits to surplus (+1.5% of GDP in 2019) and on the other by limiting the current account deficit (-1.4% of GDP in 2019).

FIGURE 1.4 FISCAL AND EXTERNAL IMBALANCES (% OF GDP)



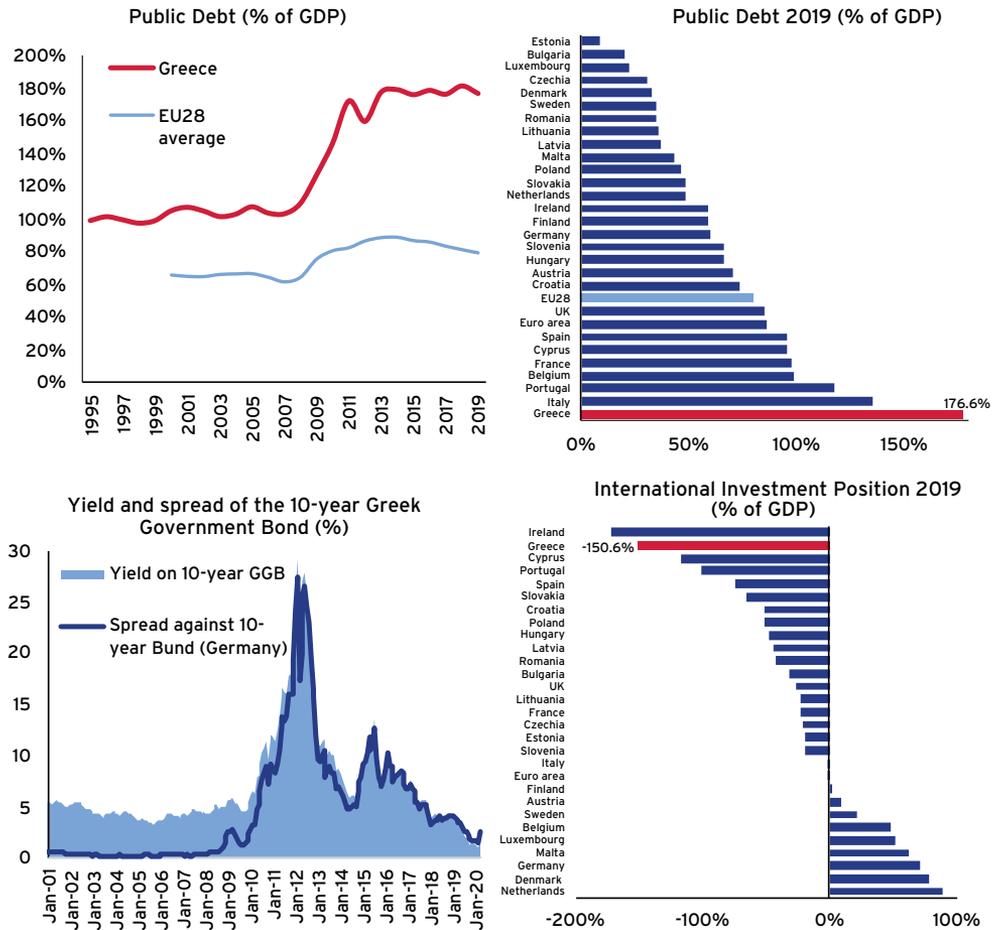
Source: Eurostat, Ameco.

Accumulation of public debt and skyrocketing borrowing costs

Greece's public debt was systematically high, exceeding the value of its GDP even before its accession to the monetary union. Despite the rules of the Stability and Growth Pact, the deteriorating fiscal imbalance in flow terms in 2001-2009 led to Greece having the highest relative level of public debt amongst all EU member states, at 127% of GDP in 2009. This development, coupled with the rising twin deficits, sharply increased the cost of new borrowing in early 2010 and essentially excluded Greece from the international financial markets, prompting the country to request economic support from the international community through an economic adjustment programme. The borrowing cost started to come down from 2012, but it sharply increased again in 2015, also due to the crisis in the domestic financial system and the imposition of capital controls. During the same period, other European countries benefited from European-level liquidity-boosting measures from which Greece had been excluded.

Following the fiscal adjustment and the partial debt-restructuring measures during the programme period, public debt stabilised, with a low mean annual servicing cost and a long mean duration, although it has remained above 170% of GDP (Figure 1.5). Its sustainability will therefore require high economic growth rates, which will facilitate achieving primary surpluses, if necessary.

FIGURE 1.5 PUBLIC DEBT AND BORROWING COSTS



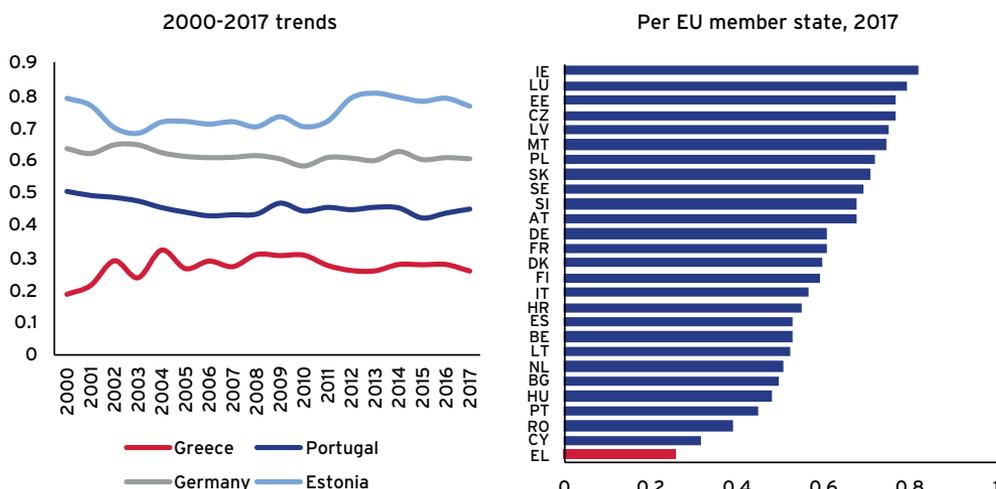
Source: Eurostat, Ameco, ECB

1.1.2 Production factors and productivity

Low productivity and efficiency

The allocation of production factors in the Greek economy has been chronically inefficient. The country ranks last in the EU in the degree of allocative efficiency at the country level (macro-level allocative efficiency,¹ see Figure 1.6) (European Commission, 2018b).

FIGURE 1.6 MACRO-LEVEL ALLOCATIVE EFFICIENCY INDEX



Note: Based on labour productivity in terms of value added per worker.

Source: EU KLEMS, research team calculations.

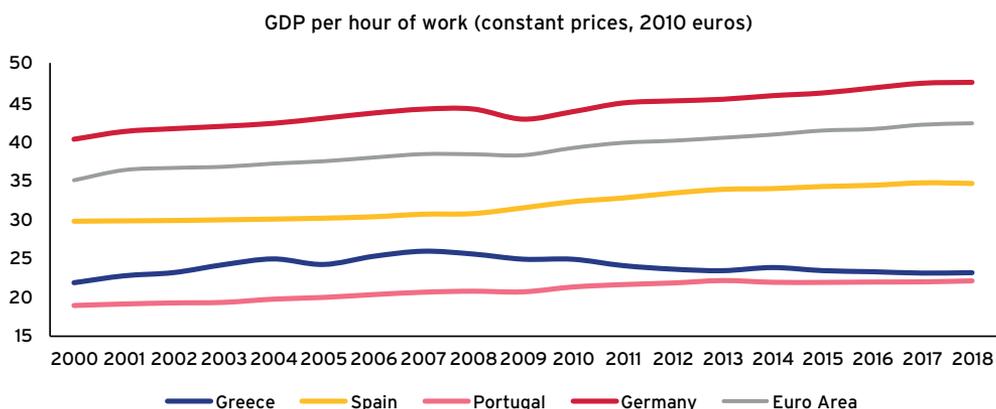
The utilisation of resources in ineffective production processes results in low productivity for the economy as a whole, in terms of both capital and labour, and in Greece's low performance in terms of international competitiveness. Compared to other euro area economies, Greece's shortfall in productivity has widened since 2007 (Figure 1.7).

Furthermore, Greece's performance in terms of innovation is particularly weak. Greece lags behind on the European Innovation Scoreboard (European Commission, 2019a), with its performance amounting to only 75% of the EU average. The biggest gaps amongst the individual categories of the index are recorded in venture capital expenditure (16.0% of the EU average), intangible assets (36% of the EU average) and R&D spending in the

¹ The degree of allocative efficiency at the country level (macro-level allocative efficiency) is defined as the ratio of labour productivity at the economy level divided by the simple mean of the productivity of the economy's sectors. The indicator compares an economy's productivity to a hypothetical situation, where employment is equally distributed in the economy's sectors, while the distribution of capital is taken for granted (European Commission, 2018a, p. 17). If the allocation of resources is close to the optimum level, then total economy productivity will exceed, or at least will not be far from, the simple mean of the productivity in the economy's sectors. If, by contrast, total productivity is far from the hypothetical allocation, this implies that there is significant room for increasing total economy productivity through the reallocation of employees between economic activity sectors.

business sector (39.3% of the EU average). Just 14.3% of employees in manufacturing in Greece are employed in high-technology manufacturing sectors, compared to 37.5% in the EU. The above categories reveal the existing large room for improvement, especially if synergies with areas performing above the EU average are established, such as the percentage of the population with tertiary education and the degree of innovation amongst small and medium-sized enterprises.

FIGURE 1.7 LABOUR PRODUCTIVITY INDICATORS



Fragmented entrepreneurship with low productivity

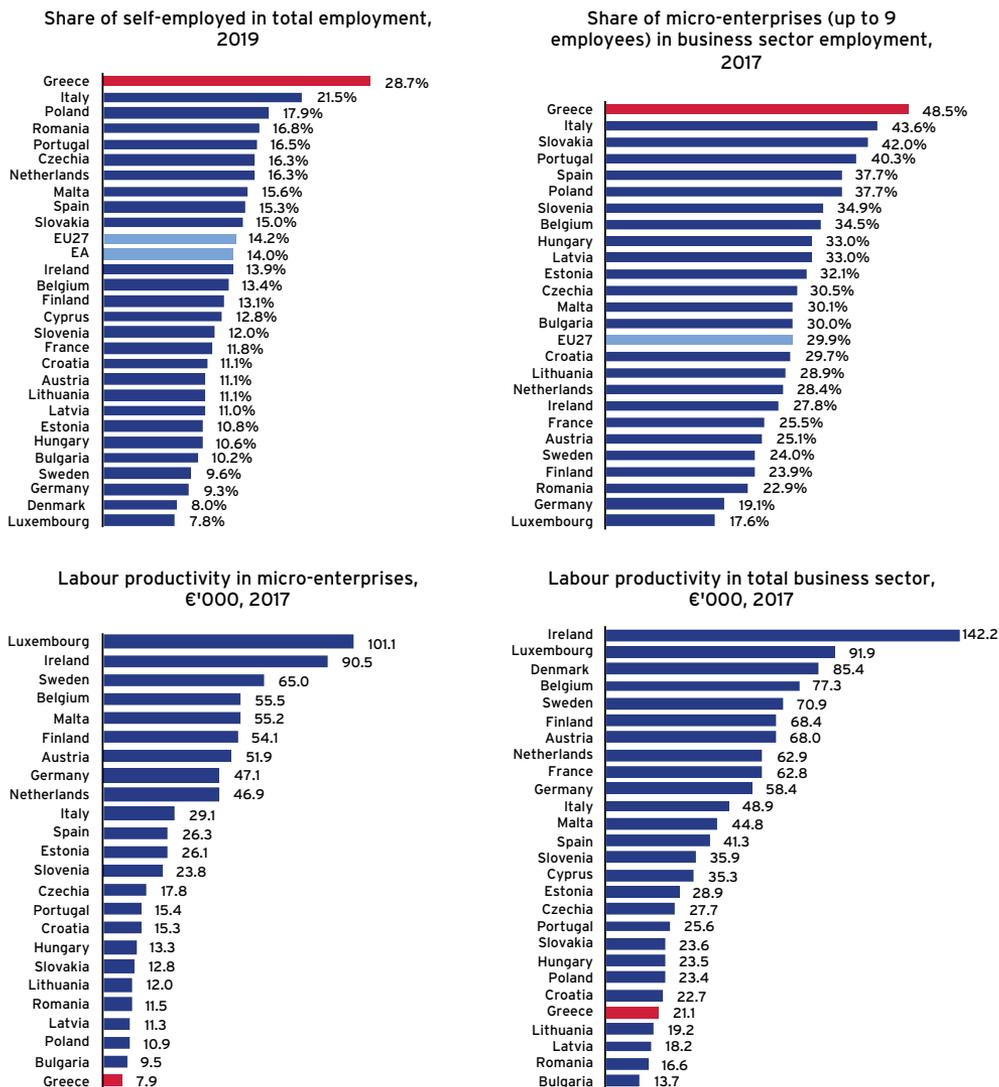
Compared to other European countries, Greece has a large share of small businesses and self-employed individuals. In 2017, 48.5% of employees in the country's non-financial business economy were employed in firms with up to nine employees, while 28.7% of the country's workers were self-employed based on 2019 data (Figure 1.8). For both indicators, Greece ranks first amongst the EU member states.

The high level of employment in individual and small businesses leads to low labour productivity, as productivity is positively associated with business size. The small size of Greece's businesses does not allow them to exploit economies of scale and cutting-edge technologies. As a result, small-sized entrepreneurship mainly focuses on the provision of services aimed at domestic consumption.

The problem is exacerbated in Greece by the low productivity of the country's small businesses. While the entire business sector produces a net added value of €21,100 per employee, the fifth lowest in the EU, the productivity of Greece's small businesses is just €7,900 per employee, placing it last amongst EU member states.

The small size of Greek businesses is the result of institutional rigidities that hinder their development and give them incentives to remain small.

FIGURE 1.8 EMPLOYMENT COMPOSITION AND BUSINESS SECTOR PRODUCTIVITY



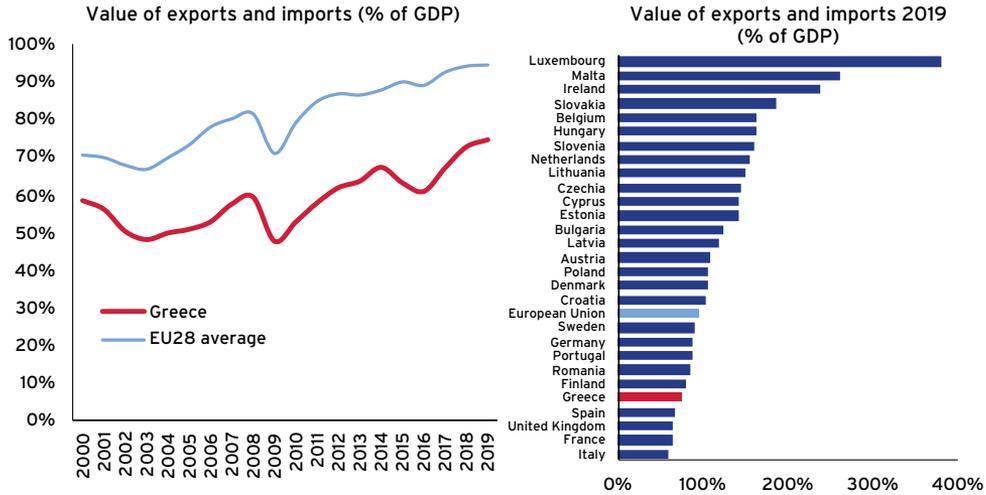
Notes: The non-financial business economy includes enterprises in sectors B (Mining and quarrying) to N (Administrative and support service activities), as well as sector 95 (Repair of computers and personal and household goods), while sector K (Financial and insurance activities) is excluded and sector A (Agriculture, forestry and fishing) and sectors O (Public administration and defence; compulsory social security) up to U (Activities of extraterritorial organisations and bodies) of the 2008 STSCOD are not included. No data on small enterprises are published for Cyprus and Denmark, and there are no data on small business productivity for France.

Source: Eurostat.

The Greek economy can become more open

Despite the increase in exports, primarily of services but also of goods during the last decade, the level of Greece's total external trade (as a share of GDP) deviates significantly from the European average (Figure 1.9). In 2019, the sum of the value of total exports and imports reached 74% of GDP for Greece, the fifth lowest performance amongst the EU member states and the lowest amongst comparably small countries, while the corresponding percentage for the EU average was 95%.

FIGURE 1.9 OPEN ECONOMY INDICATORS



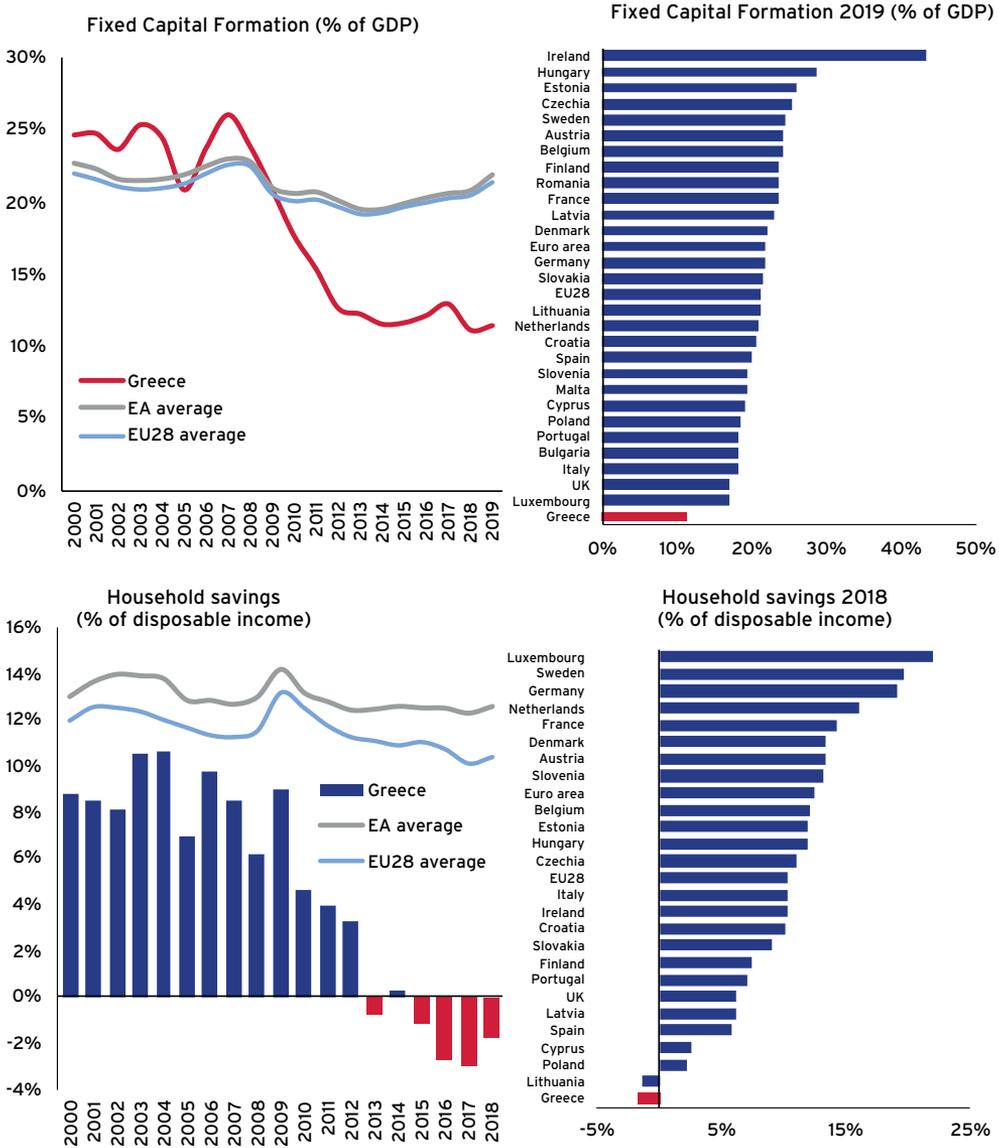
Source: Ameco

Significant gaps in investment and savings

During the last decade, fixed business investment as a share of GDP was below the euro area average (Figure 1.10). The fixed investment gap between Greece, calculated against the EU average, was on average approximately 7% of annual GDP during 2010-2019, or cumulatively around €130 billion. In 2019, Greece was ranked last in the EU in terms of fixed investments with just 11.4% of GDP, compared to an average of 21.3% in the EU.

At the same time, domestic savings, which feed into investment, declined during the crisis and have essentially been zero since 2013, as Greek households have recorded negative saving rates in recent years. These negative saving rates are to a large extent due to the decline of incomes during the crisis, as households run down assets to maintain basic consumption and financing needs. Greek households' savings gap, calculated against the EU average, was on average 11% of the annual disposable household income in 2010-2018, or cumulatively €125 billion. In 2018, Greece ranked bottom in the EU in terms of household savings.

FIGURE 1.10 INVESTMENT AND SAVINGS GAP BETWEEN GREECE AND THE EU



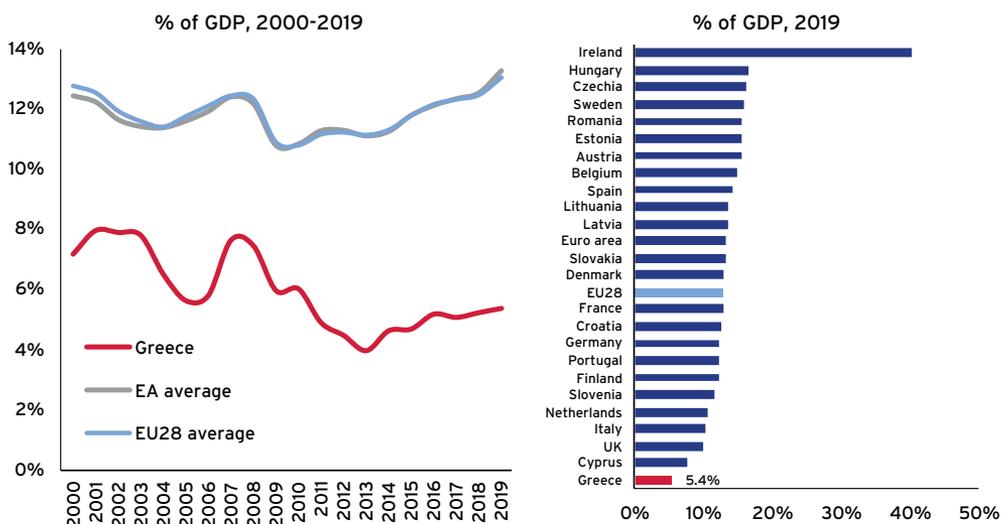
Source: Eurostat.

Systematically low business investment

The weaknesses of the economic growth model in the pre-crisis period include systematically low rates of business investment. Investment in fixed capital of non-financial corporations, excluding the construction and building sector, was on average just 6.9% of GDP in 2001-2009, compared to an average of 11.9% in the EU.

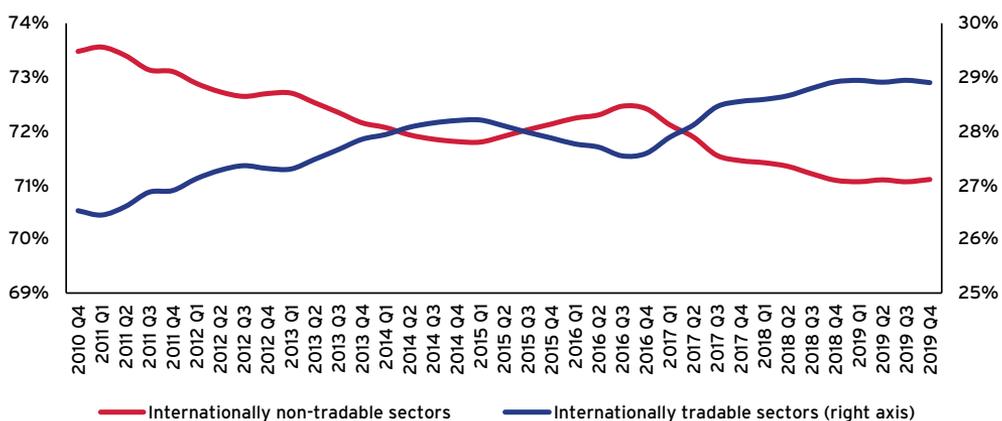
After the global financial crisis and before the outbreak of the Greek debt crisis in 2009, Greece recorded the lowest level of business investment amongst all EU member states, at just 5.9% of GDP, while the corresponding EU average was close to 11%. Despite the small recovery of business investment in 2016-2019, its level as a share of GDP in 2019 (5.4%) remained the lowest amongst the EU countries (Figure 1.11).

FIGURE 1.11 FIXED CAPITAL INVESTMENT OF NON-FINANCIAL CORPORATIONS IN GREECE AND EU COUNTRIES



Source: Eurostat, Gross Fixed Capital Formation (changes in inventories are not included).

FIGURE 1.12 GROSS VALUE ADDED BETWEEN TRADABLE AND NON-TRADABLE SECTORS (% OF TOTAL)



Note: (1) Agriculture, forestry and fishing, (2) Mining and quarrying, manufacturing, energy, water supply, sewage treatment, waste management, sanitation, (3) Transport and storage, (4) Accommodation and food service activities were included in this chart as sectors producing internationally traded goods and services.

Source: Eurostat.

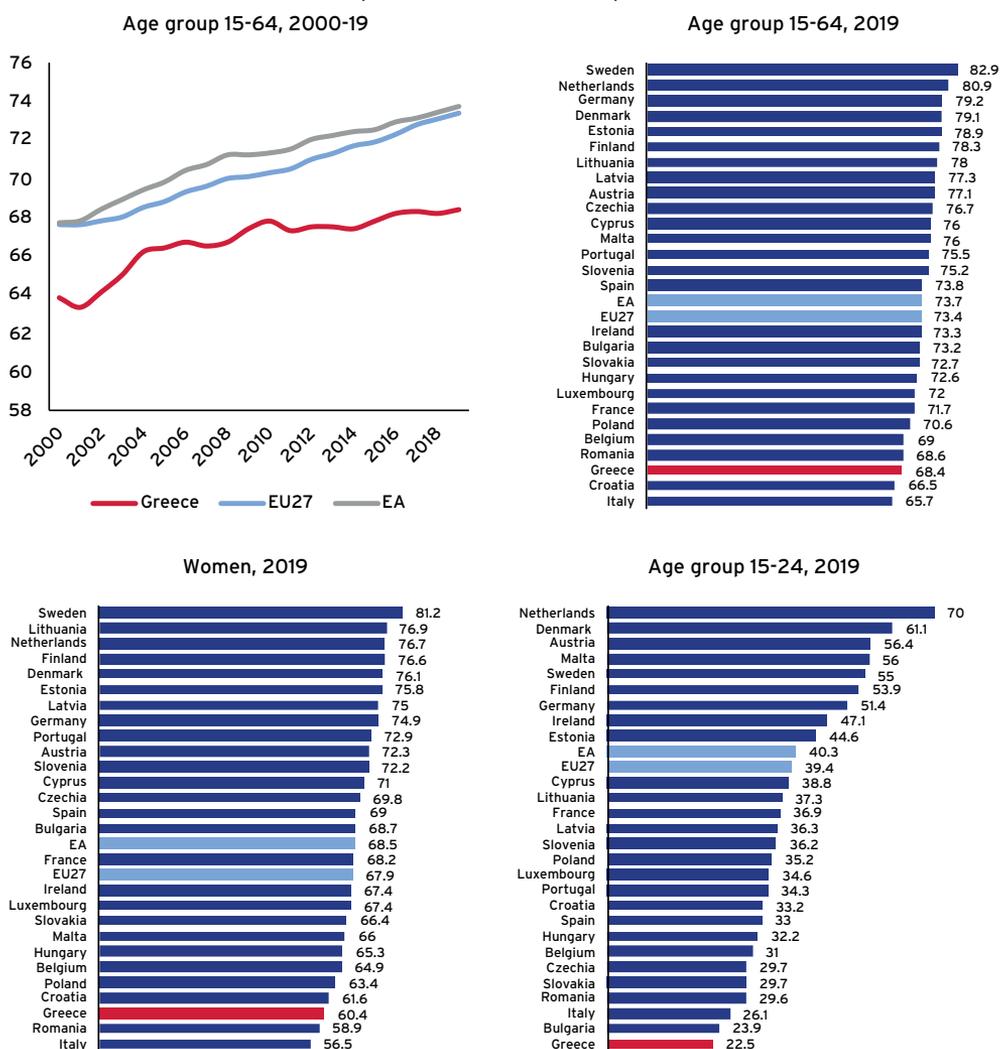
Slow turn to sectors that produce internationally traded goods and services

The Greek economy has traditionally been characterised by high shares of resource absorption and production in non-tradable sectors, such as the public sector and retail trade. Correspondingly, the share of value added in tradable sectors, especially manufacturing, has remained low. Over the last decade, resources have gradually been reallocated towards internationally tradable goods (Figure 1.12), albeit at a rather slow rate, but their share in the total economy has remained below one-third.

Low labour market participation

The country has also chronically underutilised labour, even in the years preceding the debt crisis. The share of the active population (that is, which participates in the labour market) is typically lower than the European average (Figure 1.13).

FIGURE 1.13 ACTIVE POPULATION (PERCENTAGE OF TOTAL)



Source: Eurostat.

In 2009, 67.4% of the country's population aged 15-64 was employed or seeking employment, compared to 70.1% on average in the EU. During the crisis, the share of the active population in the total population of the corresponding age group slightly increased in the five years from 2014 to 2019 (68.4% in 2019), but the distance from the EU average (73.4% in 2019) grew further. As a result, the country's position in the EU ranking based on the specific indicator slid from ninth lowest in 2009 to third lowest in 2019.

The problem of low labour market participation in Greece is mainly due to low participation of women and youth. For women, the share of the active population in 2019 was just 60.4%, compared to 68.5% on average in the euro area and 67.9% in the EU, with the country occupying the third lowest position in the ranking (just above Italy and Romania). In the 15-24 age group, labour market participation is estimated at 22.5%, compared to 40.3% in the euro area and 39.4% in the EU, with Greece occupying the lowest position in the EU. The low female labour market participation reduces the country's productive potential, as the mean education level of women who do not participate in the labour market is high.

1.1.3 Welfare state

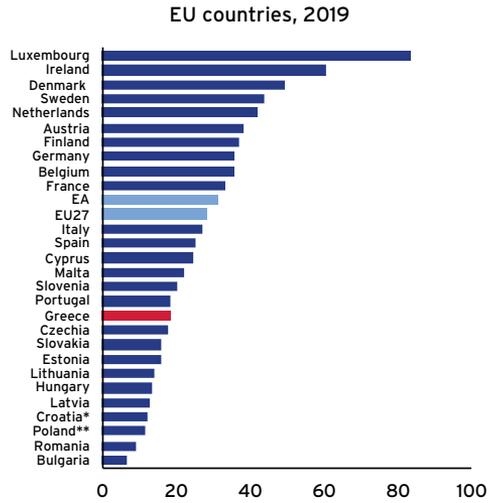
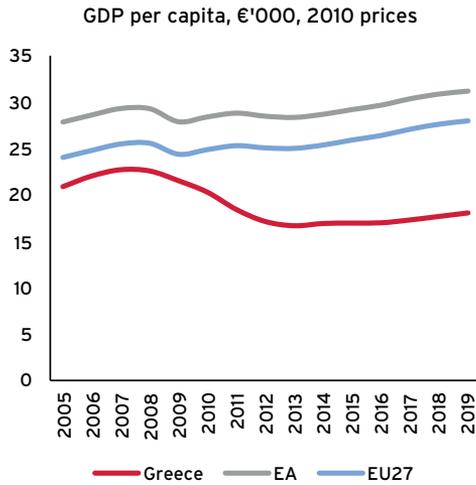
The impact of the economic crisis on average income was significant

The economic crisis of the previous decade has left Greece with deep social wounds. In 2019, the country's per capita GDP was €18,200 (in 2010 prices), 20.0% lower than in 2007 (€22,700). At the same time, Greece's gap with the European averages increased considerably during the crisis period, from 11% and 22.7% below the EU (€25,500) and the euro area (€29,400), respectively, in 2007, to 35.1% (€28,000) and 41.9% (€31,300) below in 2019. Currently, Greece occupies 17th place amongst the 27 EU member states in per capita GDP (down from 14th in 2007, see Figure 1.14), with only countries of the former Soviet bloc below it.

Unemployment remains at exceptionally high levels

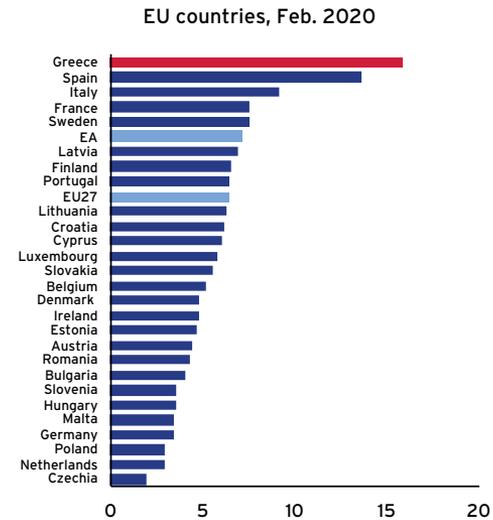
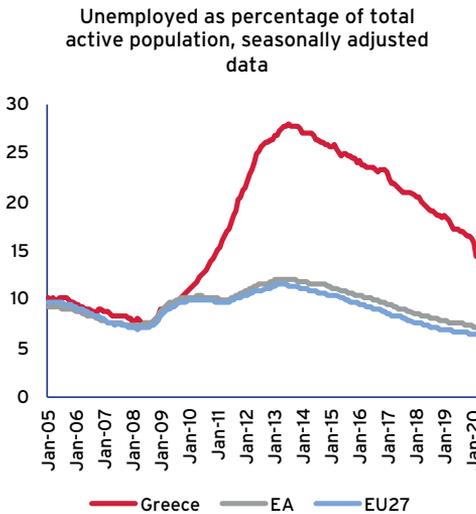
In February 2020, before the adoption of pandemic measures, 15.9% of the country's active population was unemployed (based on seasonally adjusted data). Even though the unemployment rate has decreased significantly compared to the exceptionally high levels recorded in 2013 (up to 27.8%), it remains much higher in comparison to both its pre-crisis levels (7.2% in June 2008) as well as the euro area and EU averages (7.2% and 6.4%, respectively, in February 2020). Compared to the other EU countries, Greece remains the country with by far the highest unemployment rate (Figure 1.15).

FIGURE 1.14 GDP PER CAPITA



Note: The latest available GDP per capita data for Croatia and Poland are for 2018 and 2017, respectively.
Source: Eurostat.

FIGURE 1.15 UNEMPLOYMENT RATES

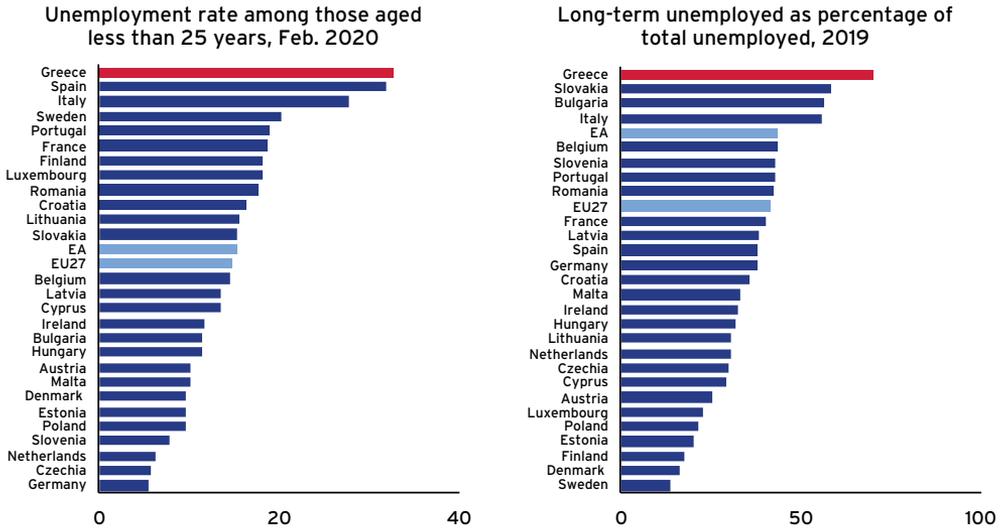


Source: Eurostat.

Exceptionally high youth and long-term unemployment rates

The unemployment rate amongst individuals below 25 years of age was 32.7% in February 2020, more than double the average in the euro area (15.2%) and the EU (14.8%). Correspondingly, 70.1% of the unemployed persons in Greece remain without a job for a period exceeding 12 months, compared to 43.6% in the euro area and 41.4% in the EU (Figure 1.16). Greece ranks highest in the EU with respect to both indicators.

FIGURE 1.16 YOUTH AND LONG-TERM UNEMPLOYMENT RATES, BY EU COUNTRY



Source: Eurostat

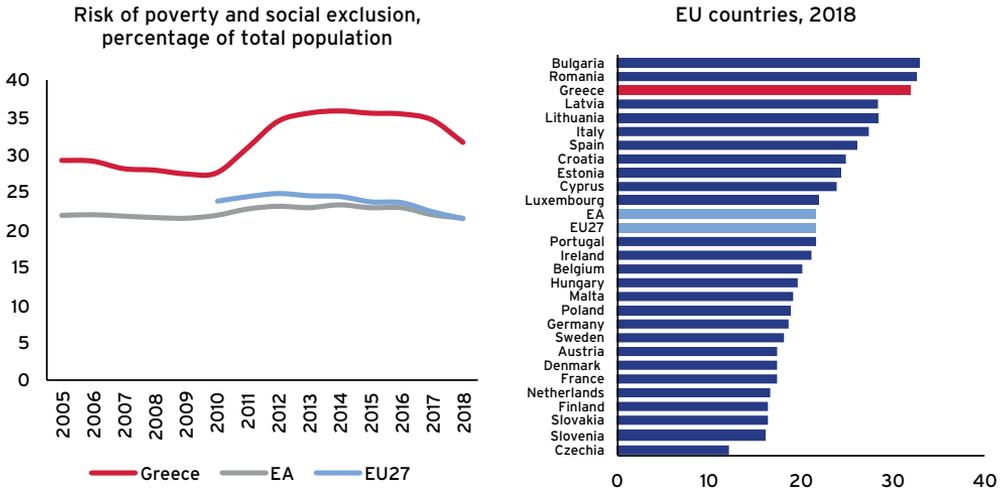
Besides the high unemployment rate, there is also under-employment in the Greek labour market. The mean annual working hours per employed person is much lower now than it was at the end of the previous decade, and the share of workers that are characterised as under-employed (i.e., working for fewer than eight hours a day, even though they would wish to work longer) is approximately 7%.

Ineffective welfare state

The high unemployment rate and the adverse trajectory of per capita income, as well as the ineffectiveness of the social benefits system to smooth social inequalities, are reflected in the increased share of individuals that are at risk of poverty and social exclusion. Based on the latest available data for 2018, 31.8% of the Greek households face the risk of poverty and social exclusion, down from 36.0% in 2014 but up from 28.1% in 2008. Based on the specific indicator, Greece is in the third worst position in the EU and performs better than only Romania (32.5%) and Bulgaria (32.8%) (Figure 1.17).

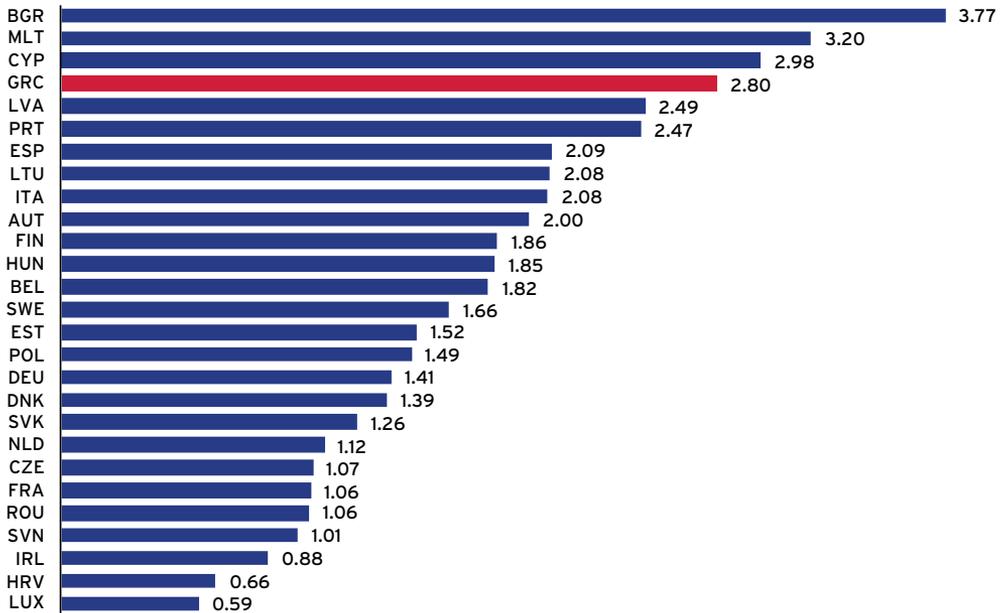
Ineffectiveness is also recorded in the national healthcare system. The burden of out-of-pocket expenditure for healthcare on household budgets is the fourth highest in Europe based on 2017 data at 2.80% of GDP (Figure 1.18), which is lower than only Bulgaria (3.77%), Malta (3.20%) and Cyprus (2.98%).

FIGURE 1.17 RISK OF POVERTY AND SOCIAL EXCLUSION



Source: Eurostat.

FIGURE 1.18 HOUSEHOLD OUT-OF-POCKET HEALTH EXPENDITURE, 2017 (PERCENTAGE OF GDP)

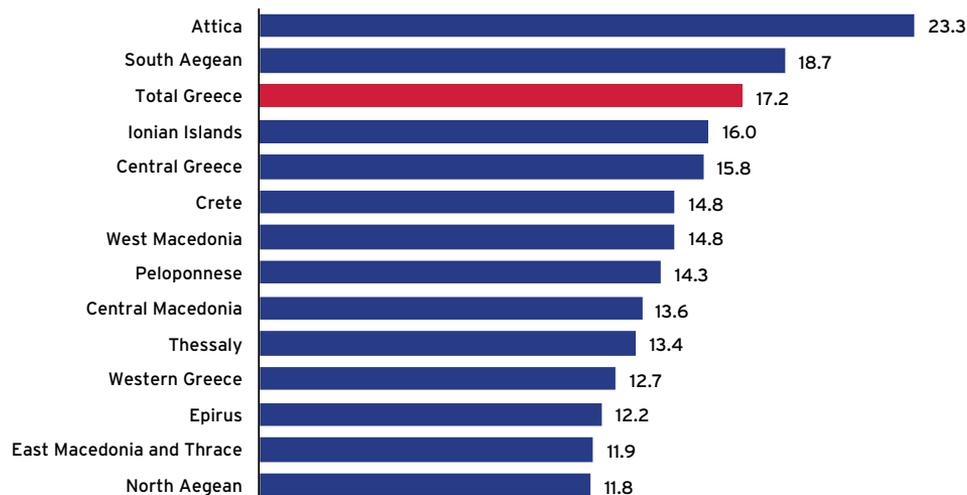


Source: OECD

High regional disparities

The country's current development model is characterised by significant social and economic disparities between the country's regions. More specifically, per capita GDP in Eastern Macedonia-Thrace (€11,900) and in the Northern Aegean (€11,800) is approximately half that in Attica (€23,300 in 2018, at current prices) (Figure 1.19).

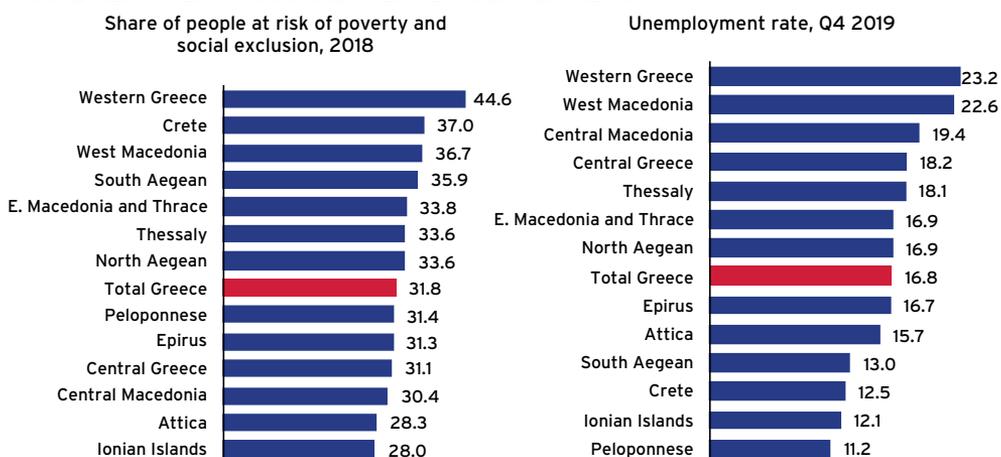
FIGURE 1.19 GDP PER CAPITA BY REGION, 2018 (THOUSANDS OF EUROS, CURRENT PRICES)



Source: Eurostat, ELSTAT.

Significant disparities between regions are also observed with respect to social indicators (Figure 1.20). The share of individuals at risk of poverty or social exclusion in Western Greece is particularly high (44.6% in 2018), followed by Crete (37%), Western Macedonia (36.7%) and the Southern Aegean (35.9%). Correspondingly, the unemployment rates in Western Greece (23.2% in the fourth quarter of 2019) and Western Macedonia (22.6%) are more than double that in the Peloponnese (11.2%). High unemployment rates compared to the country average are also observed in Central Macedonia (19.4%), Central Greece (18.2%), Thessaly (18.1%), Eastern Macedonia-Thrace (16.9%) and the Northern Aegean (16.9%).

FIGURE 1.20 POVERTY RISK AND UNEMPLOYMENT BY REGION



Source: Eurostat

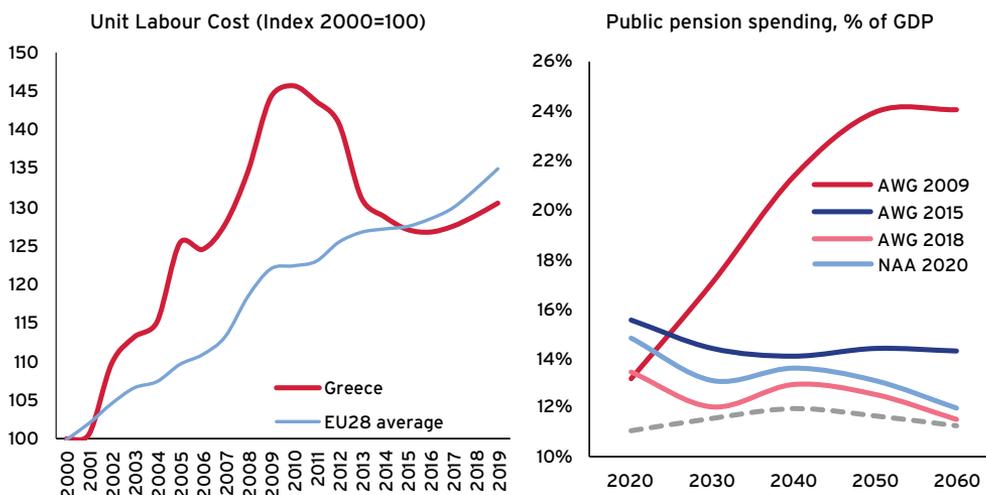
1.2 MAIN REFORMS AND EFFECTS OF THE ECONOMIC ADJUSTMENT PROGRAMMES

Fiscal consolidation was achieved, but debt remains high

The financing of the Greek state with funds from the official sector in 2010–2018 was accompanied by three economic adjustment programmes, which included fiscal measures and structural reforms. Through these programmes, Greece managed to balance an exceptionally high and rising level of public debt by turning persistent fiscal deficits into a surplus. The adjustment took place through both expenditure cuts and significant increases in direct and indirect taxes. Despite the public debt stabilisation, with a low mean annual servicing cost and a long mean duration, debt remains above 170% of GDP. Debt servicing requires high economic growth rates and fiscal discipline.

During the programmes, reforms that increased labour market flexibility and improved the sustainability of the social security system also took place. The labour market reforms aimed at improving the competitiveness of the Greek economy as well as at promoting flexibility in labour relations. The ultimate objective was that the painful adjustment would rely more on changes in wages and less on a reduction in employment or an increase in informal labour arrangements. Therefore, while unit labour costs had increased twice as fast as the EU average, and cumulatively by 45%, in 2000–2010, they were adjusted drastically down by 13 percentage points in 2011–2015, which corresponds to a level lower than the long-term trend of the EU average (Figure 1.21). This development, however, reflects a deterioration in the average wage rather than an improvement in productivity.

FIGURE 1.21 UNIT LABOUR COSTS AND PUBLIC PENSION EXPENDITURE



Source: Ameco, Aging Working Group (AWG), National Actuarial Authority.

In pensions, the reforms overturned the projected sharp increase in public pension expenditure. Extensive cuts were applied which, although preventing the burden on the state budget from spiralling out of control and saving the fiscal consolidation programme, undermined the trust in the pension system. Despite the improvement in its long-term sustainability, the burden that the pension system imposes on the labour cost remains high, while the limited development of professional and private insurance prevents the beneficial impact on domestic savings and investments observed in countries with more balanced pension systems.

Important reforms were adopted in other sectors

The adjustment programmes also promoted a series of reforms in the financial sector, in markets for products and services, as well as in public administration. Indicative reform examples in the financial sector include measures for shielding banks' capital adequacy and liquidity, strengthening of their supervisory mechanisms and their governance procedures, and the adoption of an out-of-court mechanism for settling arrears. In the public sector, measures aimed at reducing bureaucracy and increasing transparency were implemented, including e-prescriptions, a digital database for the registry of civil servants, a single payment authority and an independent authority for public revenue. However, in many areas the country still falls short of international best practices. A plethora of reforms were promoted for increasing competitiveness in product markets and for opening up 'closed' professions.

Partial improvement of the business and investment environment

The reform efforts led to a partial improvement in the business and investment environment. In the World Bank's Ease of Doing Business rankings, based on entrepreneurship indicators, Greece currently occupies 79th position, up from 96th in 2009. With respect to the indicator that measures divergence from best practices (i.e., distance to the frontier), the country's performance improved in 2010-2015, but it has remained stagnant ever since (Figure 1.22).

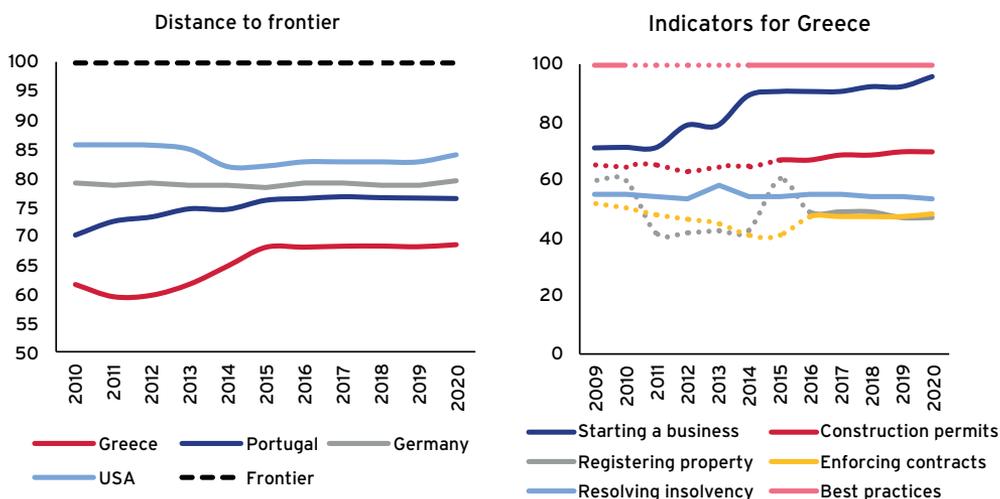
The improvement mainly concerns the process for setting up new businesses, where the country is now close to international best practices (11th highest position in the global ranking), while in procedures such as bankruptcy, registering property and contract execution, no noticeable progress has been made.

1.3 GENERAL ASSESSMENT OF THE CURRENT CONDITIONS AND PROSPECTS

Despite the balancing of the large twin deficits – fiscal and external balance – the Greek economy continues to face a series of challenges. Structural weaknesses and a divergence from international best practices are recorded in crucial areas and, as a result, both fixed investments (at just 11% of GDP in 2018, compared to a euro area average of 21%) and

projected long-term rates of potential growth (estimated by the International Monetary Fund (IMF) at just 0.9%) remain at exceptionally low levels. Dealing with these weaknesses will open up significant possibilities for a new push in economic growth through economic convergence.

FIGURE 1.22 ENTREPRENEURSHIP INDICATORS (EASE OF DOING BUSINESS)



Source: World Bank.

The constraints arising from the existing and expected future fiscal conditions, which depend on the large public debt and the country's commitments towards its partners and creditors, should of course also be considered. This entails specific and strict constraints in the implemented policies and clearly indicates that the Greek economy will not be able to grow through public borrowing.

But sustainable and inclusive economic growth remains a feasible and realistic target for Greece, and to this end the country can exploit three groups of comparative advantages that relate to: its geographic position, its human capital, and its natural environment combined with its historic and cultural heritage. If the economy's current starting point is also taken into account, with a large share of productive resources remaining underutilised and with some reforms gradually taking place, one can conclude that there are possibilities for sustainable economic growth, provided that a set of growth-enhancing economic policies are implemented.

Greece can significantly strengthen its position in international trade and human capital flows by further utilising its geographic position, being at the crossroads between three continents. To this end, the upgrade of its transport infrastructure is of strategic importance. The upgrade of this infrastructure would pave the way to a more dynamic

participation of the domestic productive base in international value chains, with positive outcomes for exports and innovation. In the wider geographic region, Greece can showcase significant comparative advantages from a solid institutional framework related to its multi-year participation in the EU and the euro area.

The country's human capital potential is not being fully utilised, which could be a critical factor in the shift of the production model towards an open and innovative economy. This includes the domestic under-employed human capital, as well as the Greeks of the diaspora and the large number of highly specialised and highly skilled Greeks who emigrated during the recent economic crisis. At the same time, the tendency of the average Greek family to aim to secure a good education for their children can be a potential advantage to the extent that the education system can promote critical thinking and enhance modern skills. Despite a divergence recorded in the skills of the country's domestic human capital compared to the European average, in several specialties there is availability of highly trained personnel. Combined with collaborations with Greeks living abroad ('brain gain'), this could allow the development of a dynamic international competitiveness in innovative sectors.

The internationally recognisable 'brand' of Greece remains strong mainly due to the country's special natural environment and climate, but also due to its unique historical and cultural heritage. Despite the country's recent credibility crisis due to the economic slump, the establishment of a strong national brand has large potential benefits, especially for high-quality Greek products and services that respect the country's traditions, culture and environment. The areas that can be primarily developed include tourism, culture and agri-food, but the beneficial effects are broader.

Looking ahead towards the immediate future, the COVID-19 pandemic and the health-related measures for its containment have generated unprecedented challenges, but also important opportunities in terms of global economic policy. On the one hand, the interruption of activity in a series of economic sectors and the sharp decline in cross-border passenger transport led to a significant loss of income, especially in countries like Greece where international tourism is an important revenue source. On the other hand, addressing the economic effects of the crisis has mobilised significant common resources at the European level. The availability of these resources generates fiscal space, for a limited period, which was not available in the last decade.

At this juncture, it is particularly important that the additional fiscal space is not wasted on an effort to return to the development model that the country followed before 2009. The funds scheduled to become available will produce significant opportunities for supporting infrastructure and for completing structural reforms which could not be completed or could not bear fruit due to the country's tight fiscal constraints since the crisis outbreak. Therefore, an important window of opportunity is opening for Greece to enter a trajectory of sustainable convergence towards the top performers in the EU.

Global trends and challenges

Greece is a small open economy bound by international agreements, especially those originating from the EU. International trends and changing commitments provide a context within which its economic and social policy should be shaped to stay ahead of developments. This chapter outlines the trends expected to have the most significant influence on the development of Greece.

Three global trends will have a particular influence on the Greek economy in the coming decades until the end of the 21st century. These relate to climate change, digital technology and automation, and the structure of global trade.

2.1 CLIMATE CHANGE

Climate change has been one of the core themes of the international agenda over the recent past, with its importance growing as new data are released by the scientific community. It is widely accepted that unless collective action takes place to halt greenhouse gas (GHG) emissions at a global level, the damages to the environment, to humanity and our prosperity will be irreversible. The consequences will be extremely serious for today's youth throughout their lifetime. The fact that the main source of GHGs is the energy sector points to the need to restructure the energy infrastructure and sources. The penetration of renewable energy sources (RES) in the heat and transportation sectors, which are the biggest energy consumers, has remained very small (9% and 3.3%, respectively) (Independent Group of Scientists appointed by the Secretary-General, 2019).

Greece, due to its size, does not contribute significantly to global GHG emissions. However, the country must ensure compliance with the existing international treaties and preparedness in three areas. First, Greece must be competent to address the transition risks, which are mainly focused on the impact of the climate change mitigation policies foreseen under international treaties. Second, the country must be able to identify and utilise the growth-related opportunities from the implementation of the treaties. Third, the country must be able to address the material risks that arise due to climate change in its wider geographical region.

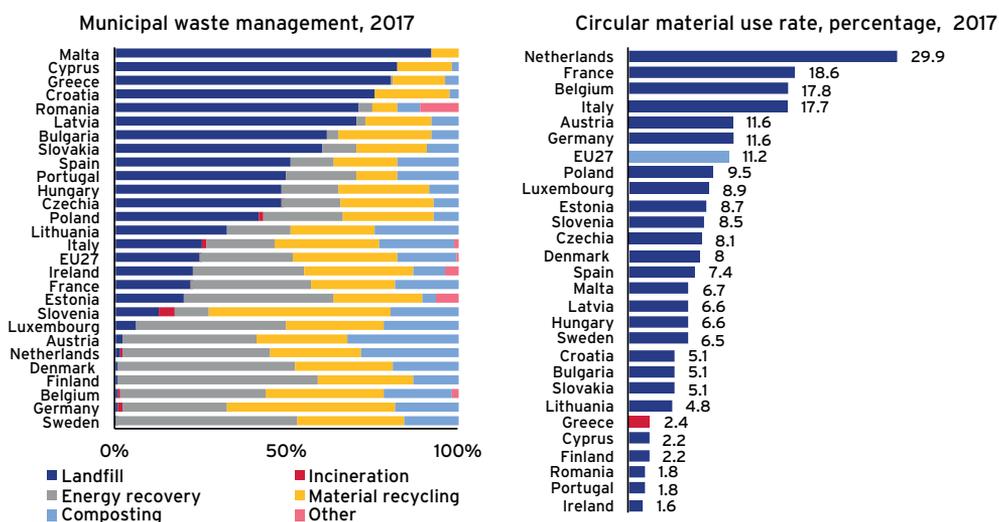
2.1.1 International treaties and environmental performance

The main international treaties that Greece needs to comply with are the United Nations Sustainable Development Goals (SDGs) and the European Green Deal. The main SDG related to climate change is to phase out the use of fossil fuels and transition to clean electricity. Greece is obliged to achieve the zero emissions target by the middle of the current century. However, progress towards this target is slow. Greece ranks 50th globally, based on the latest report on sustainable development, followed only by one EU member state (Cyprus) (Independent Group of Scientists appointed by the Secretary-General, 2019).

The European Green Deal will transform the EU into a carbon-neutral continent by 2050. It consists of policies and a road map covering aspects such as energy sources, the circular economy, biodiversity, livestock, building renovation and scientific innovation. Greece ranks low in terms of progress towards the Green Deal's objectives, especially with regards to themes related to waste management and the circular economy. According to recent evaluations (Eunomia, 2018), there are high chances that Greece will not achieve the 50% recycling goal by 2020, mostly because of the absence of the necessary infrastructures for the separation of recyclables, the low awareness level of society and the absence of economic incentives such as a landfill tax.

More specifically, based on the latest data available for 2017, 80.1% of generated solid waste is disposed of in landfills (Figure 2.1). The EU average for landfilling is 24.5%, while in several EU member states, almost all the the municipal solid waste generated is valorised through recycling, composting or waste energy recovery. Based on this indicator, Greece ranks in third worst position, ahead of only Malta and Cyprus.

FIGURE 2.1 WASTE MANAGEMENT INDICATORS



Source: Eurostat.

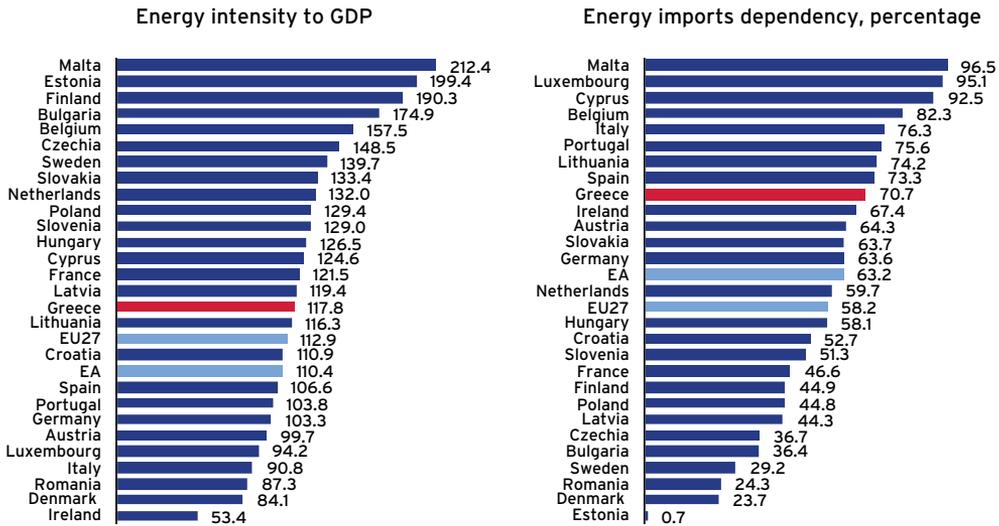
The performance of Greece in terms of the circular economy, based on the circular material use rate, is disappointing, with just 2.4% of materials consumed domestically deriving from recovery processes (compared to an average of 11.2% in the EU and 29.9% in the Netherlands). Greece ranks in sixth worst position, above Ireland, Portugal, Romania, Finland and Cyprus.

The performance of the energy sector is also problematic (Figure 2.2). Energy intensity is slightly higher than the EU average (117.8 compared to 112.9 tonnes of oil equivalent per million of GDP, in purchasing power parities). Taking under consideration the favourable climate (with a high average temperature during winter) and the structure of the economy (the high contribution of services to GDP), there is significant room for improving the country's energy efficiency performance. Indicatively, the country's ratio of energy consumption to GDP is higher than most other Southern European countries (including Italy, Portugal and Spain), and higher than several Central and Northern European countries with developed manufacturing sectors, including Germany.

Deficiencies in energy efficiency are linked to relatively high dependency on imported energy. In Greece, 70.7% of energy resources derive from abroad, compared to 63.2% in the euro area and 58.2% in the EU27. Energy imports might increase with the phasing out of lignite from the energy mix, highlighting the need for higher energy savings and higher penetration of the renewable energy sources.

Improving the country's performance in the above aspects calls for coordinated actions. In December 2018, the national strategy for the circular economy was presented. The aims of this strategy are to upgrade the legal framework, to connect innovation with entrepreneurship and to create funding tools to ensure sound waste management and a transition to a more circular economy. At the time of writing, several delays had occurred in the implementation of the strategy. In December 2019, Greece published the revised National Energy and Climate Plan (NECP), which foresees ambitious targets for 2030. The NECP foresees the phasing out of lignite electricity production by 2028, an increase in the penetration of RES to 35% of gross final energy consumption, a reduction of GHG emissions by 42% compared to 1990, and an increase in the share of electric vehicles to 30% of total sales by 2030.

FIGURE 2.2 ENERGY CONSUMPTION INTENSITY AND IMPORT DEPENDENCE, 2018



Note: 1 Tonne of oil equivalent to GDP in million purchasing power units.

Source: Eurostat.

2.1.2 Transition risks

The Greek economy is exposed to major transition risks. According to recent estimates, the full decarbonisation of the economy will take out 2.7% of the productive capital in Greece, compared to 0.8% in Austria, 0.6% in Belgium, 1.4% in France, 1% in Germany, 2.1% in Italy and 3.6% in the UK (Cahen-Fourot et al., 2019). The risk is considerable in the manufacturing industry (8.1% in Greece compared to 2.4% in Austria, 3% in Belgium, 2.1% in France, 2.8% in Germany, 4.9% in Italy and 2.9% in the United Kingdom) and in the energy production sector (17.1% in Greece compared to 12.5% in Austria, 1.2% in Belgium, 23.3% in France, 12.2% in Germany, 14% in Italy and 35.7% in the UK). These sectors combined represent approximately 12% of the Greek economy in terms of gross value added. The potentially high effect of decarbonisation on the productive capital reflects the size of the Greek oil refinery industry and the dependence of the country's electricity production on lignite.

In the energy sector, the increase of the price of carbon emission allowances in the EU Emissions Trading System (EU ETS) to above €24 per tonne of CO₂ in 2019, from approximately €5 in 2017, is the main factor behind the reduced share of electricity generated by lignite in Greece. The potential increase of the carbon price above €30 per tonne by 2030 will render electricity production from lignite unprofitable by the end of the decade. These developments benefit the production of electricity by natural gas. However, the further development of RES and storage technologies will hinder the increase of this type of energy source even before 2050, when the EU foresees halting the use of any fossil fuels in electricity generation.

Besides the use of more environmentally friendly energy sources, there is a strong need for energy savings. Insulation of buildings and houses and the withdrawal of polluting vehicles from the existing fleet are measures that could further support the improvement in energy efficiency and energy savings.

The currently ongoing transition of the economy towards reducing GHG emissions will also have significant social implications. The change in prices will inevitably affect segments of the population badly unless compensation policies are implemented. The announcement of an increase in the carbon tax on fuels in France, for example, provoked strong reactions for several weeks that started in rural areas, where transportation costs account for a significant share of household expenditure. Therefore, the growth strategy must include initiatives for overcoming any negative effects of this transition. These could include subsidisation for investments in improving energy efficiency in buildings, subsidies for the modernisation of the fleet of private vehicles and works to improve public transportation.

2.1.3 Development opportunities

Climate change mitigation policies generate opportunities. These are mostly connected to the development and implementation of innovative processes in energy saving, renewable energy sources, electric mobility and smart grids. Several opportunities are also created by policies related to the wider environmental sustainability aspects in sectors such as waste management and recycling. These sectors are presented in Chapter 6.

The country's performance in promoting basic research and innovative firms, as well as in diverting resources towards the most effective production processes, is crucial to the utilisation of the above opportunities.

2.1.4 Material risks

Greece is expected to be heavily affected by climate change. If adequate adaptation policies are not implemented, the cost has been estimated at €701 billion by 2100 (Bank of Greece, 2011). The increase of the average temperature, the high risk of forest fires, the more frequent extreme weather phenomena and the possible sea level rise call for more civil protection projects, while the insurance sector is already facing the impact of climate change. The above factors must be taken into consideration during the design of projects and infrastructures.

Tourism is also affected by the material risks of climate change. As temperatures, but also transportation costs, increase, vacation conditions in northern countries during the summer will improve. That said, climatic factors are also prolonging the duration of the tourist season in Greece.

The material risks with severe socioeconomic implications include increased migratory flows. Extended periods of drought in Darfur (South Sudan) and in Syria are considered to have contributed to their destabilisation and to humanitarian crises that led to refugee waves. Intensifying climate change will most likely destabilise other vulnerable areas. Therefore, the design of an applicable and realistic strategy for the inclusion of those migratory flows should be an important factor in the EU's and Greece's long-term growth strategies.

2.2 DIGITALISATION AND AUTOMATION

Since the introduction of computers to the office on a large scale in the 1980s, developments in digital technologies, especially in robotics and artificial intelligence, have allowed the large-scale automation of the production of goods and services. The current leaders in digital technologies are the United States, China and some Northern European countries, especially Germany and some Scandinavian countries. Southern Europe lags behind Northern European countries and Greece lags behind the rest of southern Europe. Any comprehensive programme for the development of the Greek economy must include plans for building a robust digital infrastructure, ensuring fast broadband Internet connectivity across the entire country, along with an extensive plan for the digitalisation of government services. Failure to implement such plans will widen the gap between Greece and its European peers.

Some important aspects of the structural changes currently being implemented in other European countries that are more advanced than Greece with regard to digitalisation are discussed below. This discussion may help illustrate the challenges that Greece faces.

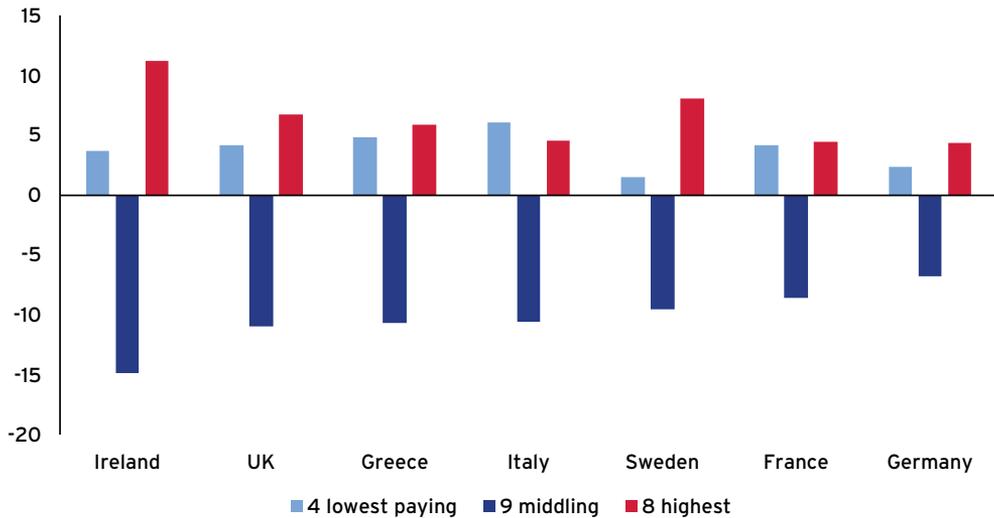
Extensive use of digital technologies started in the 1980s with the introduction of computers and advanced word-processing and spreadsheet software, with Microsoft playing a leading role. These developments led to a 'polarisation' of employment, that is, to fewer jobs requiring medium-level skills such as office assistant and administrative assistant jobs, and to more jobs requiring either higher-level or lower-level skills.² This process took place in Greece, just as in many other countries. As demonstrated by Goos et al. (2009), this process created a polarisation in the Greek labour market as extensive as that in other European economies (Figure 2.3).

In the second phase of digitalisation, which took place in the 1990s, robotics was the major technology. The pioneering achievements helping to introduce robots in production lines were the development of technologies allowing them to move autonomously, and thus to replace workers in many tasks such as moving heavy objects, welding, assembly of parts, and so on. Robots were used chiefly in manufacturing, with 99% of production robots used in that sector. The leaders in robotics applications are currently South Korea and

2 A distinguished analyst who has worked on this process is David Autor at MIT (see Autor and Dorn, 2013; Autor, 2019).

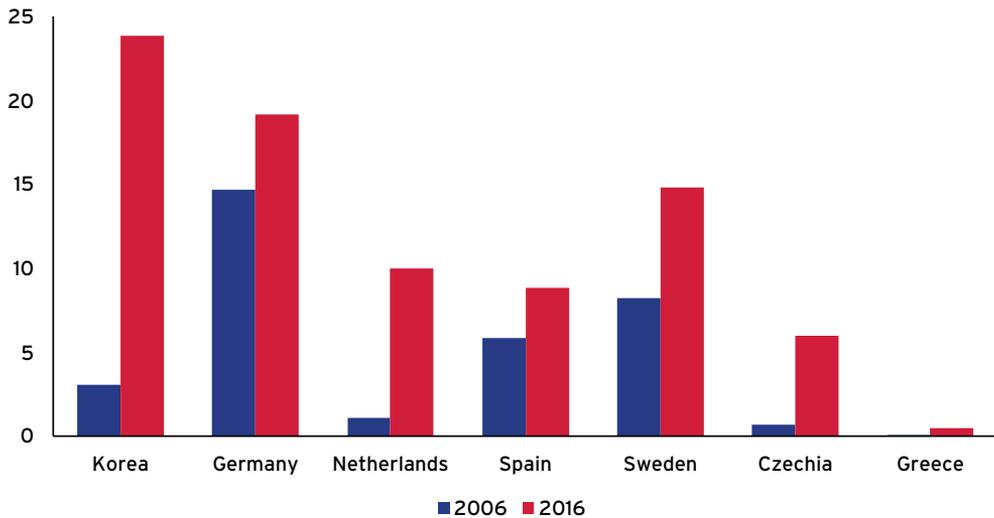
Germany. Some smaller European economies have also successfully introduced robots in their production, such as Denmark and Sweden. Greece lags far behind such countries in manufacturing automation. Density of robot use in manufacturing, an index defined as the number of robots used per million of hours worked by employees annually, is only 0.5 in Greece, compared to 15 in Denmark, 10 in Austria and the Netherlands, and 9 in Spain (Figure 2.4).

FIGURE 2.3 PERCENTAGE CHANGES IN EMPLOYMENT IN SELECTED PROFESSIONS, 1993-2010



Source: Goos et al. (2009).

FIGURE 2.4 ROBOT-USE DENSITY IN MANUFACTURING, SELECTED COUNTRIES (NUMBER OF ROBOTS USED PER MILLION OF HOURS WORKED BY EMPLOYEES ANNUALLY)



Source: International Federation of Robotics, 2017 (for robot use); OECD data portal (for hours worked).

It is not yet clear if using robots leads to an overall reduction of employment. However, even if robots do not reduce employment, enterprises introducing robots in their production need to restructure their production operations, affecting their use of labour. Nevertheless, there are clear indications that using robots boosts productivity in manufacturing (Graetz and Michaels, 2018). Yet, in order to increase productivity, firms must implement complex skill-improvement projects and many employees must go through a potentially difficult transition process. Firms introducing robots will need more specialised labour, as robots will be performing most of the tedious tasks hitherto carried out manually. In construction, for example, robots can now build walls but they can only carry bricks from storage and lay them in simple patterns. A worker is still needed to secure the bricks in position and to build more complex structures, such as curved walls. This is a task requiring more dexterity than simply laying bricks for a straight wall.

Workers leaving manufacturing because of the increasing use of robots may find jobs in other expanding economic sectors, mostly in services and perhaps particularly in healthcare, care for the elderly, hospitality, tourism and retail trade. Notably, though, the skillsets required for work in such sectors are different than those required in manufacturing.

The latest phase of the introduction of digital technologies to production concerns artificial intelligence. Artificial intelligence is already being used extensively in countries like the United States and China, particularly for applications in areas related to financial transactions processing and monitoring. Artificial intelligence is perhaps more controversial than other digital technologies, especially to the extent that it involves problem-solving and decision-making without human interference. Artificial intelligence was inspired and sprang from efforts to understand and to artificially replicate the human brain. Initially, the practical applications of artificial intelligence were limited. However, starting in the 1990s there was a revolution in the development of this field, leading to artificial intelligence implementations which handled decision-making processes in ways fundamentally different from those typically followed by humans. These developments opened the way for many applications, such as medical diagnosis, target selection by autonomous aircraft (drones), self-driving automobiles and many others. The leading researchers in artificial intelligence technology are mostly in the United States and China. To a lesser extent, Northern European countries are advancing with the use of artificial intelligence in production, chiefly in manufacturing and services. Many Southern European countries and some Asian countries, such as India, are also gradually adopting such technologies, albeit slowly. However, Greece is once again among the slowest economies to adopt this new digital technology, alongside Romania, Bulgaria and several Asian countries (McKinsey Global Institute, 2018).

One of the greatest challenges on the road to widespread use of digital technologies in Greece is managing the consequences these changes will have on employment. Digital technologies will improve production processes, but they will also require adjustments on the part of workers in various economic sectors. These adjustments may include a substantial improvement of workers' skills, potentially facilitated by the firms employing the workers. Yet, these necessary adjustments may also include workers moving from one economic sector to another, which will require that some acquire new skills to fit their new jobs. It is crucial that the structure of the economy, and particularly the structure of the labour market, facilitates such processes. Government assistance is also important, in the form of programmes helping workers to acquire new skills and helping them navigate the new economic landscape formed by the introduction of digital technologies. Chapters 4 and 5 discuss policy recommendations regarding worker skills improvement and other technical education programmes.

It is not just low-skill jobs in manufacturing that will gradually be lost to automation by digital technologies, but also jobs in services, transportation and many other more specialised jobs. Increasing use of electronic banking (e-banking) and mobile banking, electronic payment systems and innovative financial technology (fintech) applications have already led to employment reductions in the financial sector in advanced economies. In Greece, employment in the financial sector dropped by 23.1% in 2013-2018 (from 51,200 to 39,400 employees), while in other countries, such as the Netherlands, employment in this sector dropped even more sharply (-25.1%). Out of the 27 EU countries, 21 recorded employment reductions in the banking sector. However, in the same period the value added created by the banking sector in Greece increased by 26.7% (from €4.6 billion in 2013 to €5.8 billion in 2018). As a result, productivity in banking, in terms of the value added created per worker, grew impressively, from €89,000 in 2013 to €147,000 in 2018.

Other sectors in which tasks are expected to be widely automated may see similar developments. It has been suggested that between 14% and 20% of adult workers in the EU face a high risk of being affected by automation (i.e., the probability that the tasks they perform will be automated is higher than 70%), while only 12-14% of workers face a risk lower than 30% of being affected. The lowest risk from automation is recorded in social and personal services, education, healthcare and in sectors involving cultural activities (Pouliakas, 2018; Manyika et al., 2017; Nedelkoska and Quintini, 2018).

Greece must also create favourable conditions and the necessary infrastructure for the widespread use of digital technologies. Creating the national digital strategy (Guidelines for the Digital Transformation) has been an important step in this direction, along with the implementation of the associated tasks. Moreover, a functional digital environment requires high-quality universities and close cooperation between universities and enterprises, along with well-trained personnel (Schwab, 2019; Cornell University et al., 2019; European Commission; 2017). Sections 4.3, 5.3 and 5.4 present policy recommendations in this direction.

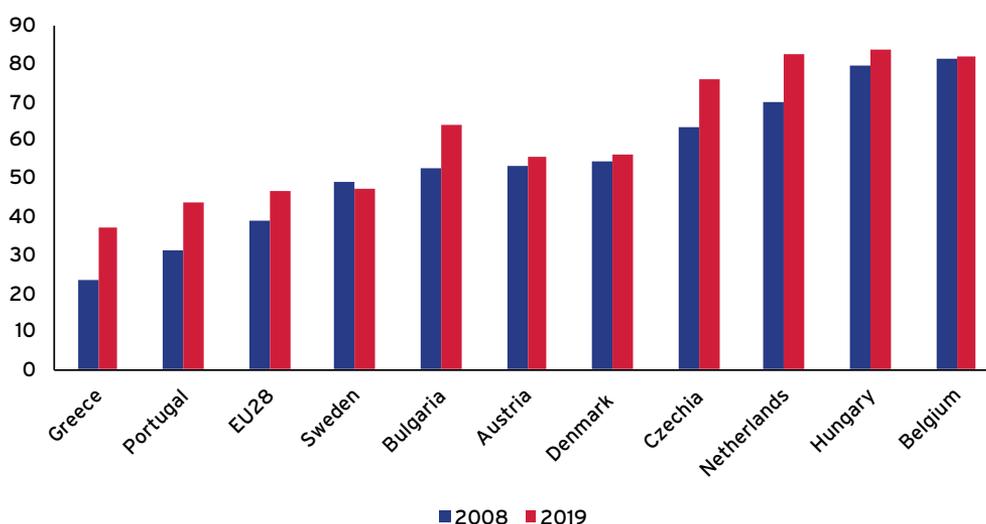
The impact of the COVID-19 pandemic may be crucial to how the technological trends discussed above unfold in the future. On the one hand, the pandemic has led to faster automation adoption: firms that were planning to automate some processes within a few years are now planning to accelerate automation within the next few months. On the other hand, firms have been slow to create new jobs, afraid of possible new waves of the pandemic. This is a serious problem for workers, as jobs are lost at an ever-faster pace, while the benefits from employment shrink. The great challenge of the 'Fourth Industrial Revolution' – the transition of workers to new economic sectors – is becoming harder and government help to assist this transition is urgently needed.

2.3 STRUCTURE OF WORLD TRADE

Since China's 'opening' in the 1980s, the centre of gravity of world trade flows has been gradually shifting from the Atlantic Ocean to the East. It is now located in the middle of Asia. Although Greece is an open economy, it does not export enough, especially goods. Given its position as a small economy in a large EU market that promotes free trade with foreign countries, Greece ought to be exporting more. However, some progress has been made recently on this matter. Policies are needed to adjust Greek production to the demands of Asian markets. Asian markets are providers of goods and investment for Greek industry and are increasingly interested in European tourism destinations and high-quality European products. The recognition of Greece by the Chinese leadership as a major link on the new trade route to northern Europe (the Belt and Road Initiative) is important because it can bring great benefits. Italy has taken the lead in this, but Greece can achieve even more as the 'gateway' to Europe. The Chinese side seems willing to use the port of Piraeus as an entry point into Europe, in combination with high-speed trains that will transport goods to Northern and Eastern Europe. This is an opportunity that offers many benefits to Greece, so the infrastructure and agreements that are necessary for it to succeed must be actively pursued.

Greece's export performance is poor, given its size. On average, the members of the EU export almost 50% of their GDP, but Greece exports only 37%. In 2012, the respective percentages were 46% and 29%, so the gap has narrowed, but one reason for the increase in Greece's exports-to-GDP ratio is that GDP has fallen. Greece, of course, is one of the smallest countries in the EU and smaller countries export, on average, a greater proportion of their GDP than bigger countries. It is useful to list data from economies that have comparable populations to Greece – from Denmark, with a population of 5.8 million, to the Netherlands, with a population of 17.5 million. There are ten countries in this group, including Greece. The average export ratio for nine of them is 67.5% of GDP, compared to 37.2% in Greece (Figure 2.5). There is obviously room for great improvement in this area.

FIGURE 2.5 EXPORTS AS A PERCENTAGE OF GDP FOR SMALLER EUROPEAN COUNTRIES, 2008 AND 2019



Source: Eurostat.

Regarding destination, Greece is not overly dependent on any single market, except of course the Single Market of the EU, which absorbs 56% of its exports (Table 2.1). By country, the largest partner is Italy, which absorbs just over 10% of Greek exports. China does not appear in the list of countries that attract 1% or more of Greek exports. By contrast, Chinese goods accounted for 3.7% of imports in 2005 and 7.6% today, the third highest after Germany and Italy. This statistic shows Greece's failure to exploit the Chinese market – importing its products but not responding by offering the goods in which Greece has a comparative advantage. The EU is performing better on this index, with exports to China accounting for about half of imports from that country.

The composition of Greece's exports does not give clear indications of how the country could benefit from the expansion of trade with Asia (Table 2.2). Petroleum products dominate the exports of goods and raw materials occupy a prominent position. The European products that have penetrated Asian markets the most are luxury products, such as luxury vehicles from Germany, cosmetics and designer clothes from France and Italy, and agri-food products such as wine and specialised small items that have a high added value. We believe that Greece could do well in the Chinese, Korean and other Asian markets with affluent consumers if it were to further develop its high value-added agriculture and luxury products. Greece's companies face the challenge that they are too small to compete with larger companies operating in countries such as France and Italy that trade similar products. Greece can establish the 'Made in Greece' label as a brand and government policy could help with a campaign that promotes Greek products for their high quality and European origin. Italy has been successful in this respect and lessons can be learned from the way it has managed to establish its brand.

TABLE 2.1 EXPORTS AND IMPORTS (% OF TOTAL)

Exports	2005	2010	2019	Imports	2005	2010	2019
Germany	12.5	9.3	6.8	Germany	14.4	12.2	11.1
Italy	11.2	9.2	10.8	Italy	13	10.5	8.6
Cyprus	6.2	6.9	6.1	Russia	7.4	9.7	7.3
Turkey	5	5.7	5.8	China	3.7	4.6	7.3
Bulgaria	5.5	5.4	4.8	Netherlands	5.7	5.4	5
United Kingdom	6.9	4.8	3.7	France	6.2	5.2	4.3
USA	5.2	4.6	3.9	South Korea	2.5	1.6	1.1
France	4.4	3.1	3.5	Belgium	3.6	3.4	3.1
Romania	2.8	3	3.1	USA	2.5	2.8	2.2
Gibraltar	0.3	3	1.4	Spain	4	3.2	3.7
Other countries	40.1	44.9	50	Other countries	37.1	41.4	46.2

TABLE 2.2 THE TEN MAIN EXPORTABLE PRODUCTS OF GREECE IN 2019

Product	Value (millions of euros)	Annual change
Petroleum products	9,857.0	-8%
Medicines	1,571.0	38,9%
Aluminium plates	639.0	-3.4%
Cotton	525.9	55.3%
Computers	503.3	2.6%
Fish	503.2	0.5%
Prepared or preserved vegetables	491.2	2.5%
Pipes	459.1	-1.8%
Cheese	458.2	3.9%
Confidential trade	431.3	-6.0%

Source: Panhellenic Exporters Association.

Greek shipping and tourism are also major attractions for the Asian markets. Shipping may be virtually unaffected by government policies due to the international nature of the sector, although offering more support services at low cost may encourage more shipping companies to settle in Greece for management services. Tourism is an area that can benefit much more from high-spending visitors. In particular, considering the distance and the 'Asian type' of tourism that prefers cultural rather than 'sun and sea' destinations, Greece has the opportunity to further develop high value-added sites that today do not attract many tourists, such as inland cultural and historical destinations.

This would make Asian tourism complementary to European tourism (which is more attracted to islands and coastal areas). Britain has had some success in making this transformation in its tourism, with many quiet traditional villages now appearing on Chinese tourist routes.

The COVID-19 pandemic is changing the patterns of world trade in potentially substantial ways. Production chains are being disrupted and many companies are showing a preference for establishing integrated production processes in their own countries. When a country imports crucial intermediate goods from other countries to complete its production, it depends on each country's restraint policies, which are beyond its control. One interruption is enough to stop an entire production process. This creates opportunities for Greece, as a small and relatively low-wage country in the very large European market, but also challenges for Greek companies that actively cooperate with Asian producers as part of a supply chain.

Vision and goals for the Greek economy

3.1 MAIN GOALS

The main goal for the Greek economy over the next decade should be to systematically increase real per capita income, so that it gradually converges to the European average. The strengthening of social cohesion, mainly through social mobility and better opportunities for more vulnerable households, and the improvement of Greece's environmental performance should also be primary goals during the convergence process.

There are two main conditions for achieving a real convergence to the European average income. The first is strong employment growth, through a reduction of unemployment and higher labour market participation of under-employed population groups such as women and young workers. Higher employment will furthermore contribute to the easing of social exclusion and the strengthening of social cohesion. The second condition is a strong increase in labour productivity, which will safeguard household welfare in the longer run. Productivity growth requires an increase in productive capital and therefore new investments, from both domestic and foreign firms. It also requires the integration of innovative production methods and new technologies. As these activities require a high degree of specialisation and the domestic market in small countries such as Greece offers limited opportunities, it is necessary to increase the country's export capacity.

The following targets are related to employment and productivity growth:

1. Increase in total fixed investment, especially business investment in fixed capital, from today's low levels of 10.1% and 5.4% of GDP, respectively, towards the averages of other small open EU economies, which are close to 23% and 14%.
2. Increase in private and public expenditure on research and development from 1.2% of GDP currently towards the EU average of approximately 2% of GDP, and better interconnection between research and production. Establishment of leading-edge technology hubs that will develop and implement innovation on a global scale.
3. Gradual increase in exports, and specifically exports of goods, from 37% and 19% of GDP, respectively, currently towards the averages of other small open EU economies, at 66% and 48%.

4. Increase in the number of large and medium-sized enterprises, which is a condition for increasing productivity and enhancing exports. Strengthening of small and medium-sized enterprises, which will in any case represent the large majority of businesses, and also strengthening of their interconnection with value chains and large enterprises, so that the openness and productivity of the economy are enhanced further.
5. Increase labour market participation, especially for young workers and women, from 42% and 65%, respectively, currently towards the average of other small open EU economies, at 62% and 73%.
6. Strengthening of the economy as a regional hub, based on attracting human capital from the broader geographic area and leveraging Greece's distinct history and culture.

The achievement of the above main goals and specific targets could take place gradually over the coming years with combined actions across the entire economic policy range. The required actions mainly focus on the operation of the institutions that define the economic activity context and shape behavioural incentives for firms and households. The actions would also help tighten the link between the Greek economy and trends in the European and global economy and support the development of comparative advantages. They are further analysed in Chapters 4, 5 and 6.

A common element between many of the required actions is the facilitation of work, entrepreneurship and competition in markets. The tax and social security burden on official labour and on production should be greatly reduced. The regulatory and administrative burden, which is largely due to the current institutional framework's complexity and lack of transparency, should also be eased. The economy should operate as a more open system, with simpler and more stable rules.

A second common element between the required actions is the strengthening of social cohesion. A dynamic labour market should be accessible to everyone. There should also be universal access to high-quality education and health services, as well as a targeted system of social benefits for the more vulnerable. Currently, social mobility is low, large population groups such as women and the young have limited opportunities, persons with physical or mental disability are marginalised and there are no systematic policies for the integration of immigrants and for reducing regional disparities.

A closer link between the Greek and the global economy is a prerequisite so that the country's production structure can fully exploit international trends and respond to future changes. This development is directly linked to the improvement of environmental performance, digitalisation, and adaptation to the changing patterns of comparative advantages and international trade flows.

The next section specifies the main GDP growth target, linking it to individual quantitative targets for higher employment, productivity, investment and exports. In Section 3.3, these targets are linked to international trends, for specific economic activity sectors and in the overall economy.

3.2 QUANTITATIVE ANALYSIS AND DIRECTIONS

An ambitious reform plan would be to target an increase in annual GDP of 3.5% on average over the next decade. This target could be achieved through an annual increase in employment of 1% and an annual increase in labour productivity of 2.5%. An increase in productivity of 2.5% would lead to a gradual convergence of the Greek economy's productivity to the European average.³

Achieving the employment target is based on two main conditions. The first is that the labour market recovery that started in 2013 continues, so that the unemployment rate drops further from 17.2% in 2019 to 7%.⁴ The second is that the labour market participation rate of the working-age population (20-64 years old) increases. Currently, it stands at just 74% (2019 data), the fourth lowest in the EU.⁵ This performance is mainly due to the low participation of the 20-24 age group (42% participation rate in Greece compared to 62% in the EU), the 55-64 age group (50% in Greece compared to 63% in the EU) and of women (65% in Greece compared to 73% in the EU).⁶ Raising labour market participation will be necessary in view of the expected reduction of the working-age population by 7.5% between 2020 and 2030, according to projections by the Hellenic Statistical Authority (ELSTAT). The target for the total increase in the number of employed individuals could be achieved if the labour market participation of the 20-24 and 55-64 age groups were to increase to 62% and that of women to 72%.⁷

The reforms of the previous decade greatly increased labour market flexibility and supported the growth of annual employment by 1.2% in 2013-2019. However, for a further increase in employment based on attracting new population groups to the labour market, additional reforms are required. These reforms should reduce the early retirement rates and the tax burden on salaried employment, offer training compatible to the evolving production needs, and facilitate access to the labour market for marginalised population groups (see also Chapters 4 and 5).

3 According to long-term OECD projections, labour productivity in the EU will increase by approximately 1.5% on an annual basis during 2020-2030 (Guillemette and Turner, 2018).

4 The unemployment rate stood at 9% before the crisis. With the labour market reforms proposed in this report, it can decrease further to 6-7%.

5 The labour force consists of employed and unemployed (i.e., those who are not working but are seeking employment) persons. The working-age population that is not working and not seeking employment is considered economically inactive and is not included in the labour force.

6 About 93% of men in the main working-age group (25-54 years old) participate in the labour force, a percentage higher than the European average.

7 The participation rate of men in the main working age (25-54 years old) does not need to increase, as it is already very high.

The target for increasing productivity can be split into two discrete parts. The first relates to horizontal interventions to the economy that would enhance total factor productivity (described in detail in Chapters 4 and 5). Based on the experience from the previous decades, we estimate that 40% of the future increase in productivity would come from improvements in total factor productivity,⁸ which will therefore need to increase by 1% on an annual basis (or 10.5% over the course of the decade). This target is ambitious but there is a relatively recent precedent: in 1995-2002, total factor productivity increased by 1.1% annually, although it slowed down significantly in the following years.⁹ Furthermore, in the previous decade many market malfunctions amassed and the elimination of these can be an additional source of increased productivity. For example, the large stock of non-performing loans is trapping a considerable part of capital and human resources in non-productive activities. Settling these loans could improve the allocation of resources, thus increasing the productivity of the economy.

The second part of the target for labour productivity relates to growth of investment that enhances the capital equipment used in the production process. Capital equipment per employee should increase by 20% and total capital equipment (taking into account the projected increase in the number of employed persons) by 31% between 2020 and 2030, so that they can contribute to an annual increase in productivity of 1.5%.¹⁰ This development requires that productive investments (which can be either private or public, excluding investment in residences and changes in inventories) reach 17.5% of GDP annually, which is the average for small open EU economies.¹¹ Such a level of productive investment is higher than but comparable to the pre-crisis level (15% in 1995-2008), albeit almost double the rate recorded during the crisis (9.8% in 2010-2019, and 9.4% in 2019). The increase in investment to pre-crisis levels, and even above those, is probably the most difficult development goal. Significant interventions in both the institutional environment and in financing will be required to achieve it.

8 GDP growth per employee (labour productivity) in 1995-2008 can be broken down into an increase in capital per employee and in total factor productivity (labour productivity decreased after 2008, so a similar analysis for the subsequent period is not informative). Assuming a Cobb-Douglas production function with employment and capital as inputs and a 0.6 employment elasticity (equal to the share of income from employment, according to Eurostat data) and a 0.4 capital elasticity (constant returns to scale of production), we estimate that 61% of the productivity growth came from growth in capital per employee and 39% from total factor productivity growth, with relatively small fluctuations over time.

9 In 2002-2008, the annual growth rate was just 0.5%, collapsing to -3% in 2008-2013 and only partially bouncing back to 0.2% in 2013-2019. The calculation of the total factor productivity change was done in the same way as described above.

10 The increase in labour productivity due to investment is equal to the increase in capital per employee adjusted by the elasticity of the production function in relation to capital. Therefore, an increase in labour productivity of 16% (1.5% annually for ten years) requires an increase in capital per employee of 28% and an increase of total capital of 40%. Part of the capital increase will come from more intensive use of existing capital, which has been under-utilised since 2008: the long-term 'utilisation rate' of capital in Greece was 76% on average in 1985-2008 (Business and Consumer Surveys, European Commission), falling to 65% in 2012 and gradually recovering to 71% in 2019. Assuming that in the coming years the utilisation rate will recover to 76%, 'new' capital per employee and new total capital need to reach 20% and 31%, respectively.

11 This calculation is based on a mean amortisation rate of 7.5%, as estimated in the EU KLEMS database (www.euklems.eu).

If the above targets are achieved, then in 2030 per capita GDP (in purchasing power parity) will reach 81% of the EU level (from 67% in 2019) while unemployment will drop to 7% (from 17.2% in 2019).¹² Further, the economy will become more open: taking into account that, historically, productivity in the economy's tradable sectors has grown by almost 2-2.5 percentage points more than in the non-tradable ones,¹³ and using an international trade general equilibrium model, we estimate that real exports will increase by 90%, while the share of exports in GDP will reach 50.5% (from 37.2% in 2019). Assuming an average inflation rate of 1.74% (according to long-term OECD projections), the projected real increase in exports corresponds to an annual increase of 7% in nominal terms. This is slightly higher than the annual nominal increase of 6.6% in 2000-2008, which took place however within a more beneficial international economic environment.

The COVID-19 crisis naturally affects the dynamics described above. The Greek economy recorded a deep recession in 2020, as did most other European countries. The slump may continue in 2021, hindering and delaying the achievement of the growth targets. The funds from the European Recovery Fund will play a significant role in the achievement of these targets. They should be mainly used for the development of infrastructure that will strengthen the country's growth prospects. They should also be a catalyst for the implementation of significant structural reforms.

The absorption of European funds will take place during the first half of the coming decade. During this period, part of the growth dynamic could come from investments that the funds will support, as well as from the improvement in expectations resulting from their proper use. During the second half of the decade, growth could come mainly from private investment, attracted by the improved infrastructure and the more beneficial institutional environment resulting from the interventions during the first half of the decade.

If the reform programme outlined in this report is not implemented and the economy continues on the same course as in the past few years, the growth dynamic will be weak. There will be a gradual recovery from the very deep recession of the previous decade, but without a significant increase in productivity, without an increase in labour market participation, and finally without a convergence to the European average. In particular, unemployment may drop towards 9% by the end of the decade, but without the reforms to boost labour market participation, employment will increase in total by only 2% due to the adverse demographic developments. At best, labour productivity will increase by the same rate as in the EU (i.e., 1.5% annually), which means that the distance between

12 The calculation for the relevant per capita GDP assumes a stable population in the EU and Greece and 1.5% GDP growth for the EU (OECD) and 3.5% for Greece.

13 Sectors that export more than 20% of the value added that they produce are defined as 'tradable'. According to the OECD Trade in Value Added database, sectors A (Agriculture, Forestry, Fisheries), B (Quarrying, Mining), C (Manufacturing), H (Transportation, Storage) and I (Accommodation, Food services) are tradable. Using Eurostat's sectoral data to calculate labour productivity growth rates in the tradable and non-tradable sectors in 1995-2008, there is a difference of 2-2.5 percentage points.

Greece and the EU will remain unchanged. Finally, exports will increase by 44% by 2030. Under these assumptions, growth in the next decade will be 1.7% annually, and in 2030 Greece's per capita GDP will reach just 68% of that of the EU – a negligible convergence compared to the current level of 67%. Lastly, exports will increase by 44%, while their share in GDP will reach 44.5% compared to 37.2% currently.

3.3 INTEGRATION WITH INTERNATIONAL TRENDS AND DIVISION OF LABOUR

The integration of the economy with the trends shaping the international division of labour and with the industries and sectors generating new jobs would be congruent with the strengthening of the economy's specialisation and openness.

Currently, Greece's employment and unemployment rates are unjustifiable for a European economy. The growth plan in this report aims at creating new jobs that would offer employment opportunities not only to those unemployed or under-employed but also to population groups currently not participating in the labour market. If the proposed policies are implemented, unemployment rates can fall to 6-7% for all working individuals and to 15% for the young. Based on experiences in other economies, it will take approximately five years from the implementation of interventions in the labour market for unemployment to drop to these levels.¹⁴

Technological development will play a decisive role in the labour market. As also highlighted in Chapter 2, the new technologies that have emerged in the past three decades in industrial OECD countries are mainly of the digital kind, based initially on personal computers and software, and more recently on robotics and artificial intelligence. These developments have enhanced productivity in the manufacturing sector and increased labour quality in the services sector, in ways that cannot yet be accurately assessed. They have not, however, had the same effect on all the sectors of the global or the European economy. As a result, they have caused a strong shift of human resources away from the manufacturing, agricultural and mining sectors, towards the services sector. This shift has an impact on the structure of labour markets, as well as on future labour prospects.¹⁵

Employment in manufacturing has fallen internationally, but in Greece it has declined excessively. This is attributable to distortions that have led to too many self-employed individuals and small businesses that are dominant in the specific environment. In more technologically mature EU member states (the so-called EU15 group), the share of labour in the manufacturing sector was 20% in 2000, and just 14% in 2019. The reasons behind this reduction are new technologies and globalisation, in particular China's emergence and its impact on international trade. In Greece, 14% of the labour force was employed in

14 For example, the Schroeder-Hartz reforms in Germany were implemented in 2002-2005 but their positive effect on the labour market only started to become noticeable in 2007.

15 The issue of the future structure of the labour market is analysed in more detail in Pissarides (2018).

manufacturing in 2000 and 8.2% in 2019. Based on Greece's technological lag compared to the EU15 countries and its relatively closed economy, one would expect that the share of employment in manufacturing would be larger than in the EU15. Indicatively, in Portugal, which is at the same technological level as Greece, 22.7% of the labour force was employed in manufacturing in 2000 and 17.6% in 2019.

It is important to contain the reduction of employment in Greece's manufacturing sector and to achieve a convergence to the EU average. Currently, Greece exhibits one of the lowest shares of manufacturing activity in the EU, comparable only with the Netherlands and the Nordic countries – economies with much higher per capita income and greater industrial maturity. Policy proposals for enhancing Greece's manufacturing sector, and the remaining sectors examined in this section, are examined in detail in Chapter 6. This section summarises the main directions.

The support of salaried employment is critical to the growth of the manufacturing sector in Greece. Greek manufacturing firms are generally small, in part due to the particularly high number of self-employed in the services sector. When measures to support salaried employment are adopted, these businesses will have a greater comparative advantage in the international markets and will grow.

The growth of Greece's manufacturing sector relates to the production of a wider range of new products. Sectors such as food processing (with packaging and exporting of high-quality products), the pharmaceutical industry (with the production of generic medicines) and light industry (with the manufacturing of components and other high-technology products) have significant room for further development. The Greek economy cannot easily rely on heavy industrial activity like Italy or Germany, but there are prospects for establishing strong light industrial activity that would participate in global production chains. The COVID-19 pandemic renders this model more sustainable, as production chains that involve remote Asian countries have been disrupted. Production chains within the EU will be far less affected by both the current and future pandemics and by geopolitical developments. An annual study carried out by the World Economic Forum, with questionnaires handed to business executives and used as part of the *World Competitiveness Report*, reveals that Greek businesses regularly report good availability of scientists and engineers – better than in countries such as the Netherlands and Denmark. The fact that these firms are not equally productive, thus giving the country a relatively low position in the ranking, showcases the growth potential that can be realised in the manufacturing sector.

The environmental industry is another potential source of sustained employment. As is evident from Chapter 2, the degrading of ecosystems and climate change give rise to serious social and economic challenges and showcase the need to protect the environment. At the same time, international policies adopted to address these issues form a major opportunity for attracting investment in various economic sectors. The fight against climate change and the environmental upgrading of ecosystems will create jobs

because more environmentally friendly production tends to be more labour-intensive compared to most methods put to use today.¹⁶ The policy for creating jobs relevant to the European Green Deal is a central part of the EU's exit plan from the COVID-19 crisis. Amongst Greece's comparative advantages are its unique natural environment and rare biodiversity. Furthermore, its climate and weather benefit the transition towards a new energy model in which renewable sources of energy will play a key role.

Tourism will of course remain one of the main sectors of the economy, due to the country's comparative advantages. Primarily for environmental reasons, tourism should focus on quality instead of quantity. For this to happen, the offered product should be improved, not only in specific locations but in the country overall. While tourism to the islands for the sun and the sea cannot, and maybe should not, be discouraged, Greece has a rich cultural heritage and biodiversity that can attract the top tiers of the tourism market, if appropriately developed with good services and infrastructure. Creative sectors, such as film production, and professional travelling (e.g., company retreats) will be attractive products if they survive the COVID-19 crisis. The sectors relevant to tourism and culture are labour-intensive and will be a stable source of job generation as living standards grow internationally and the pursuit for high-quality leisure time expands.

There is also significant room for growth in other sectors that make use of comparative advantages. For example, the country's geographic location, at the crossroads of three continents, provides a strong advantage for developing the transport and logistics sector, especially taking into account the shift of the centre of gravity of global trade towards Asia. The country's beneficial climate, the quality and variety of locally produced agricultural products and the international recognition of Mediterranean dietary traditions provide strong advantages for developing the agri-food sector.

¹⁶ According to the *World Employment Social Outlook for 2018* from the International Labour Organisation (ILO), the transition to a sustainable economy will result in the creation of approximately four times the number of jobs globally in the energy sector that will be lost due to the gradual abolition of the fossil fuel industry by 2030 (ILO, 2018).

Barriers and policy proposals: The public sector

In this and the next chapter, we examine the core structural attributes of the Greek economy and identify the main barriers holding growth back. We perform this analysis for a number of policy areas, and for each area we propose policy changes. These changes can act as accelerators that will have beneficial effects on growth and incomes. This chapter brings together policy areas related to the public sector. The next chapter brings together areas related to markets.

4.1 PUBLIC ADMINISTRATION

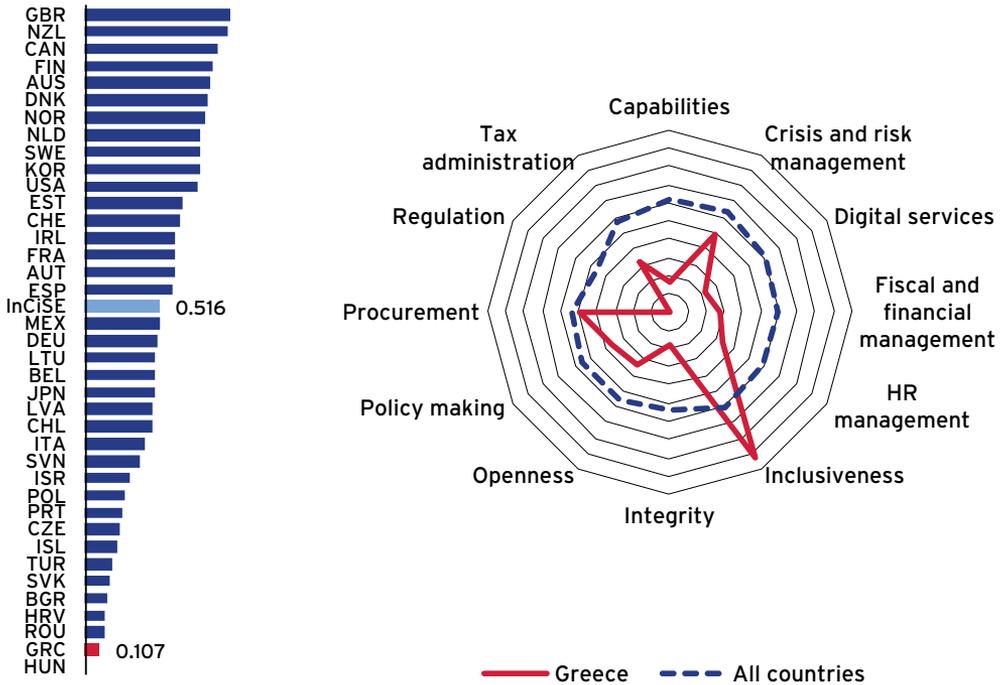
4.1.1 Indicators

The Greek public administration has undergone many reforms over the last decade. Significant improvements have been made, but gaps remain relative to other countries. The gaps are reflected in international rankings. For example, on the International Civil Service Effectiveness (InCiSE) ranking, which is calculated based on the performance of public administration across twelve areas and includes measurements by organisations such as the World Bank, Greece ranked 37th out of a total of 38 OECD member countries in 2019.

The sub-areas in which the Greek public administration receives particularly low ratings are Regulation, Capabilities and Integrity. Ratings are also low for Digital services, Fiscal and financial management, HR management, Openness, Policy making and Tax administration. Figure 4.1 summarises the InCiSE ranking for Greece.

The findings of the InCiSE ranking, as well as of most international rankings, show that improving public administration must be a top priority in Greece. An inefficient public administration drains the public finances, provides low-quality services and cannot support the implementation of a reform programme for the economy.

FIGURE 4.1 PERFORMANCE OF THE GREEK PUBLIC ADMINISTRATION



Source: InCISE 2019.

4.1.2 Barriers

Recruitment, promotions and incentives

Recruitment and promotion procedures affect the quality of public servants and their incentives to perform. The procedures can be evaluated based on two criteria: (a) whether the best candidates are hired and promoted, and (b) whether politicians can influence who is hired and promoted.

Procedures that result in the best candidates being hired and promoted are obviously desirable. Besides selecting the best candidates, these procedures improve the performance incentives of those who are hired, as better performance makes future promotions more likely.

Whether it is desirable for politicians to influence who is hired and promoted is less clear-cut. Politicians should have some influence on recruitment and promotions in the upper echelons of public administration. This ensures that the public administration is not unaccountable, but instead can be held accountable to the elected representatives of the public. At the same time, political influence must be limited, so that there are checks and balances. If senior public servants rely heavily on their political superiors for their promotions and careers, they will not be willing to challenge decisions that serve the narrow interests of their superiors but are harmful to the public.

These conclusions are well-established in academic research (Dalhstrom and Lapuente, 2017). They are also reflected in international best practice. For example, in the United Kingdom, which ranks first in the InCiSE rankings, permanent secretaries (the highest administrative rank in each ministry) are appointed for a five-year term. When their term ends, there is an open procedure for all interested candidates to submit their dossier. A committee consisting of the head of the public administration (Head of the Home Civil Service), permanent secretaries in other ministries and other senior officials examines the candidates' dossiers and proposes a short list to the Prime Minister. The Prime Minister then chooses among these candidates. Similar procedures are followed when appointing Director Generals and Deputy Director Generals in the European Commission. These officials are appointed for a five-year term.

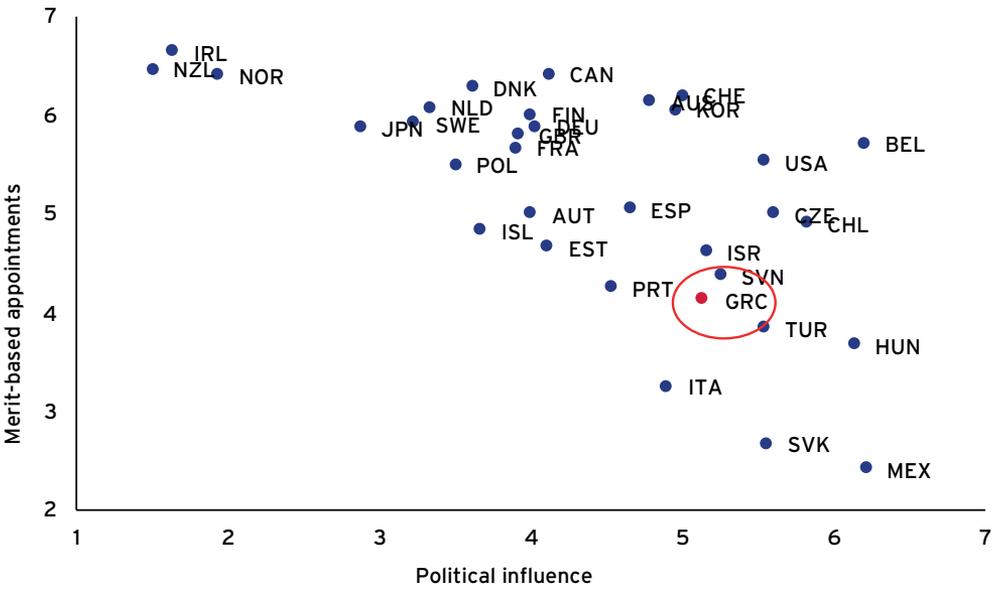
In Greece, the highest administrative positions in the ministries are (in hierarchical order): Administrative Secretary General, General Director, Director, and Head of Department. These positions are advertised publicly, and successful candidates are appointed for a three-year term. Candidates are evaluated using a scoring system that allocates points based on formal qualifications (academic degrees, etc.), work experience and performance in an interview. Recruitment decisions are made by a five-member committee consisting of members of the Supreme Council for Civil Personnel Selection (ASEP), the Legal Council of the State (NSK), the National Centre for Public Administration and Local Government (EKDD) and administrative superiors of the announced position.

In theory, the recruitment process for senior administrative positions in Greece gives less influence to politicians, compared to international best practice. Politicians' influence is limited because of the scoring system and because of the participation of members of ASEP, which is an independent authority. For example, the five-member committee for hiring an Administrative Secretary includes four members of ASEP.

In practice, politicians yield significant influence over senior administrative appointments. Figure 4.2 (based on the Quality of Government Expert Survey 2015 by the University of Gothenburg)¹⁷ shows that political influence over such appointments is high in Greece relative to an average of developed economies (in the metric "the top political leadership hires and fires senior public officials", Greece ranks 23rd among 33 developed countries). Greece ranks even lower in terms of the degree of meritocracy in recruitment (in the metric "when recruiting public employees, the skills and merits of the applicants decide who gets the job", it ranks 28th among 33 countries). The figure also shows a negative correlation between meritocracy and political influence: more political influence is associated with less meritocracy.

17 We use data from 2015 as it is the last year for which the relevant indicators have been calculated.

FIGURE 4.2 POLITICAL INFLUENCE AND MERITOCRACY IN GREECE AND OTHER OECD COUNTRIES



Source: Quality of Government Expert Survey 2015.

The difference between theory and practice is due to a combination of factors (Spanou, 2018). The scoring system for each position and the basic requirements that candidates must meet have changed multiple times during the past decade. The changes favoured different groups of candidates each time, and those groups corresponded to different political audiences. Favours can be given not only to groups but also to individuals. For example, some members of the five-member committee are appointed and influenced by the government. Moreover, the conditions that candidates must meet are often decided by the department that advertises a position, and can be designed to favour a particular candidate.

Political influence in recruitment procedures creates a power gap between senior administrators and politicians, making the latter overly powerful. This power gap is made wider by the fact that the senior administrators are appointed for a three-year term, which is shorter than the four-year election cycle. When their term ends and if is not renewed, they return to their previous position, which may lie much lower in the hierarchy. Therefore, if they challenge a decision of their political masters, they may suffer large negative consequences.

The effort to limit political influence in recruitment processes has resulted in an over-emphasis on qualifications that are easy to measure but that may not be the most relevant for the job. Subjective factors, such as ‘soft’ management skills and qualitative aspects of qualifications, are hard to incorporate into the scoring system and are

downplayed, even though they may be more relevant. The emphasis on easy-to-measure qualifications also incentivises candidates to collect as many formal degrees as possible. Therefore, while the scoring system reduces political influence (without eliminating it), it does not necessarily result in the best candidates being hired.

To sum up, there is a significant power gap between senior administrators and their political masters. Furthermore, soft management skills are not valued enough in the recruitment process. The combination of these two factors explains why performance evaluations in the Greek public administration are non-existent or non-informative (often all employees are rated high). Informative evaluations require a common understanding between those doing the evaluations and those being evaluated about the evaluation criteria, some of which cannot be easily measured. It is difficult to create such a common understanding when senior administrators and evaluators change frequently. Their lack of institutional power also makes them reluctant to apply the criteria in a strict and homogeneous manner. The absence of informative performance evaluations in the Greek public administration explains most of its other problems (further analysed below).

Independent authorities

Independent authorities oversee important aspects of the economy, such as competition in markets (Hellenic Competition Commission, Hellenic Telecommunications and Post Commission, and Regulatory Authority for Energy), the financial system (Bank of Greece and Hellenic Capital Market Commission), the collection of taxes (Independent Authority for Public Revenue) and the compilation of national statistics (Hellenic Statistical Authority). In some cases, responsibilities overlap across independent authorities, creating ambiguity and conflict. There are also large disparities in resources across authorities: some have sufficient funding, while the funding of others is insufficient relative to the tasks they are required to perform.

Political interference in the operation of independent authorities has been declining in recent years. However, it is not uncommon for a new government to change the head of an independent authority before they complete their term. Moreover, lack of funding makes it difficult for independent authorities to be truly independent.

Production of laws and regulations

The Greek public administration scores particularly low in Figure 4.1 in the production of laws and regulations. Many laws create unnecessary burdens for businesses and households. Laws also often overlap and sometimes even conflict with previous laws (Sotiropoulos and Christopoulos, 2017). The resulting complexity creates ample scope for different interpretations of the laws by different public agencies or in different parts of the country. It also creates corruption incentives in the public administration, burdens unnecessarily the justice system and hampers investment especially by new entrants.

The laws and regulations issued by each ministry should be evaluated in terms of their legal soundness and their economic impact. Law 4048/2012 stipulates that every law submitted to Parliament must be accompanied by an impact report. In most cases, however, an in-depth analysis of the economic effects is missing. A recent legislative initiative requires all impact reports to be evaluated by a Committee Evaluating the Quality of the Law-Preparation Process (EAPIND-EAPND), which reports to the Prime Minister's office. If EAPND determines that the impact report is inadequate, they may refer it back to the proposing ministry, which will have to introduce amendments to both the report and the law. The establishment of EAPND is an important step forward.

Local government

Local government in Greece has limited powers and responsibilities relative to other European countries. For example, in 2010 local government expenditure in Greece amounted to 2.8% of GDP, compared to 7.1% in Portugal, 18.1% in Austria, 19.7% in Belgium and 14.6% in the EU (European Commission, 2012, Table IV 3.1).

Overlaps between the responsibilities of central government and local government are common, in part because central government is involved in many local activities. For example, both the Civil Protection Agency, which is part of the central government, and the regional authorities are responsible for dealing with natural disasters. Another example concerns the running of schools and hospitals. The Ministry of Education is responsible for recruiting the teachers, the municipalities are responsible for maintaining the buildings, the Ministry of the Interior is responsible for covering basic operating expenses such as electricity and heating, and a separate state agency (Ktiriakes Ypodomes, or KTYPI-KTYP) is responsible for the purchase of computers and other equipment. Likewise, some types of expenses of public hospitals are approved by the Ministry of Health, other types are approved by the region and some others by the health district, which may span a different geographical area than the region.

Overlaps between the responsibilities of different layers of government reduce accountability and performance incentives, and thus the quality of the services that are provided. For example, a health district may blame poor performance of the hospitals in its area on the Ministry of Health failing to cover the costs for which it is responsible, overlooking that the health district itself is also failing to cover some costs.

Compared to the EU average, the resources of local government in Greece come to a large extent from transfers from the central administration (European Commission, 2012, Figure IV 3.7). This is not necessarily a problem. It is a problem, however, that transfers are not determined by some pre-agreed parameters, but by prevailing needs and political conditions. This reduces accountability even more. In the hospital example mentioned above, the health district may claim that it is unable to cover the expenses for which it is responsible because the central administration does not provide it with sufficient funds.

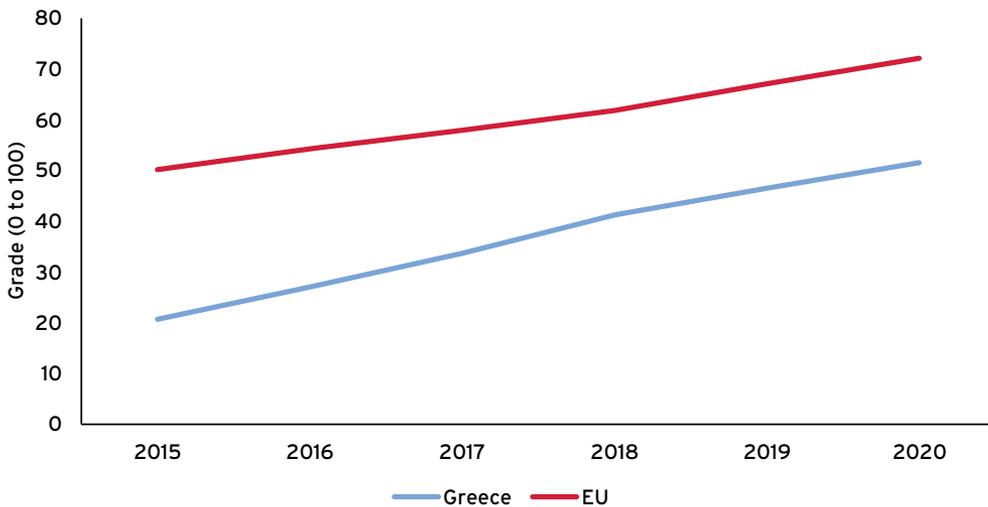
Digitalisation

Greek public administration lags behind its EU peers in terms of digitalisation, as shown in Figure 4.1. Figure 4.3, based on the Digital Economy and Society Index (DESI) also indicates a gap, which is, however, decreasing slowly.

Greece has developed a national digital strategy for its economy, and that strategy also covers its public administration. The strategy envisions, among other things, the consolidation of operational procedures throughout the administration, such as those related to human resource management, procurement and financial management. However, the digitalisation process has several obstacles, some of which are more technical in nature and some that concern incentives and norms.

Technical obstacles include the absence of an integrated and coherent national software architecture, and the absence of common information systems design principles. Related obstacles that pertain more to incentives and norms are the fragmentation of public sector applications in conjunction with the storage and processing of data in isolated silos, and the fact that e-services are often designed to serve the administration rather than the general public.

FIGURE 4.3 DIGITALISATION OF PUBLIC ADMINISTRATION IN GREECE AND THE EU



Source: DESI.

There are also factors that favour digitalisation. These include the emergence of a Greek high-tech industry sector and the presence of specialised and experienced labour in that area.

4.1.3 Policy recommendations

Recruitment, promotions and incentives

The senior positions in the Greek public administration should be given greater institutional power. This would improve the quality of the decisions that are made and facilitate the implementation of performance evaluations at all hierarchical levels. Steps in this direction have been made in recent years, such as the transfer of some responsibilities from ministers to senior administrators. A broader and more comprehensive effort is needed, however.

One way to assign greater institutional power to senior administrators is to lengthen their terms. For example, the terms of senior administrators in ministries could be extended to five years from the current three. To avoid the risk of hiring someone who later proves inadequate, a probationary period of a few months could be introduced, as is done in the European Commission.

An increase in the terms of senior administrators in ministries could be combined with a reduction in the number of political positions. Political positions could be limited to those of Minister and Deputy Minister, with the next position being administrative. That administrative position could be Secretary General, and could be merged with the position of Administrative Secretary General or Director General. In that case, the positions of Secretary General and Administrative Secretary General should be abolished.

One measure that would strengthen senior administrative positions, and improve the functioning of public administration more generally, is to reward mobility in those positions. For example, service as Director in one ministry and then as Director in a different ministry could be recognised as an advantage when a candidate applies to a Director General position. Alternatively, a five-year term in a senior administrative position in one ministry could be set as a ceiling for continuous service in the ministry, after which a candidate should apply to a senior administrative position in another ministry. Such ceilings exist in the European Commission for Director Generals and Deputy Director Generals.

Mobility in senior administrative positions would create a large internal labour market in the public sector, with better career opportunities for more capable public servants. Under the current system, career opportunities exist mainly in the public agency (ministry, etc.) where a public servant works. This (a) creates competition between a public servant and his or her subordinates for a small number of senior positions; (b) generates pressure to create additional senior positions in the agency, and leads to 'inverted pyramids' where there are more supervisors than subordinates; and (c) makes

it more likely that public servants will return to a lower position when their term in a senior position is completed. Mobility in senior administrative positions would eliminate these phenomena. It would also improve coordination between public agencies, as senior administrators in one agency would have experience from other agencies as well.

Strengthening senior administrative positions would ‘unlock’ several other necessary changes. A first change is to make recruitment procedures less formalistic. Recruitment procedures should give more weight to essential qualifications and soft management skills, as well as to the views of the hierarchical superiors of the advertised positions. For the most senior administrative positions in ministries, the views of the Minister or of the Deputy Minister could also be considered formally. This has so far been done informally.

A second change is to roll out performance evaluations throughout the public sector. Evaluations should take place on an annual basis by the supervisor of each employee. They should include specific qualitative and quantitative objectives, and should have tangible consequences for the employees. The evaluation criteria of the employees should be linked to the evaluation criteria of the public agency where they are employed, through the establishment of key performance indicators (KPIs) for each agency. This would help align the incentives and goals of the employees and the agency where they work.

In addition to strengthening senior administrative positions and managing them better, it will be important to recruit specialised mid-level employees capable of supporting a growth agenda. The required skills include international openness, data-driven decision-making, simplification of procedures, digital transformation, and quality services to businesses and the general public. Recruiting such employees requires improvements in recruitment procedures and, above all, better management of the employees belonging to the ‘special scientist’ category.

A broader measure that would improve the public administration is to transfer all human resource management (HRM) – including recruitment, mobility, evaluation and payroll – to ASEP, after its appropriate upgrade. That is, ASEP should be upgraded to an HRM department for the entire public administration, monitoring and coordinating all relevant procedures. Under the current system, the procedures are scattered between ASEP, the Ministry of the Interior and other agencies.

An area of the public administration where improvements to performance evaluations and HRM could proceed more quickly, and in some cases have already been implemented, are independent authorities. This is because (a) senior positions in independent authorities carry greater institutional power than those in other parts of the public administration; and (b) the objectives of each independent authority are clearly defined, which makes it easier to establish KPIs. Implementing organisational improvements in the independent authorities could serve as a pilot for the remainder of the public administration.

Independent authorities

Independent authorities should have stable funding, fixed as percentage of GDP, which should be covered by the state budget if necessary. The funding of an independent authority should depend on the work that it is required to perform. Assessing funding needs thus requires evaluating each authority's work and its importance for the country. Such evaluations should use international comparisons.

Evaluations of independent authorities should be performed by independent committees of experts appointed by Greek and EU institutions. The evaluations should have consequences, positive or negative. Efficiency bonuses should be paid if an independent authority has made good progress towards meeting its KPIs. The bonuses should be distributed to the units within the organisation according to their contribution to meeting the targets. When the performance of an organisational unit has been inadequate, the director of that unit should be formally evaluated, and when performance is particularly poor, the director should be dismissed. When performance of lower-level employees is poor, they should attend a mandatory training programme, and when performance is consistently poor, the employees could be demoted to a lower salary level for a certain period before being evaluated again.

Independent authorities should be given flexibility over recruitment and other HRM functions for their scientific staff and other specialised employees. Such flexibility already exists in some independent authorities such as the Bank of Greece and the Independent Authority for Public Revenue, and similar flexibility could be introduced in other authorities. Based on the experience accumulated from this process, similar practices could be extended to other parts of the public administration. The upgrade of ASEP to an HRM department for the entire public administration, proposed earlier in this section, could be achieved in that manner.

The secondment of officials of independent authorities to other public agencies, such as ministries, is damaging and should be banned. Not only does it divert resources from the independent authority, as it must cover the employee's salary, but it can also adversely affect its independence. Secondments should only take place between independent authorities and have limited duration. Mobility from the authorities to the wider public sector should only take place through job transfers.

The responsibilities of some independent authorities should be more clearly defined so as to limit overlaps of responsibilities. Since overlaps can always arise as the economic and social environment changes, a mechanism must be put in place to deal with them. For example, overlaps could be resolved by a body that meets under the Deputy Prime Minister and includes the chairmen of independent authorities in related areas and the representatives of the relevant ministries.

Production of laws and regulations

The establishment of EAPND is an important step forward. It is also important that EAPND is staffed both by lawyers (to evaluate whether the laws are sound from a legal viewpoint) and by economists (to evaluate the economic effects of the laws). EAPND's current remit is to examine the laws that are to be introduced for voting in Parliament. This should be extended to examining laws that have already been voted, with the aim of simplifying regulations and making them more efficient. Examining the economic effects of laws should cover not only the accounting effects on the budget but also the effects on the economy and the public administration. EAPND's work should include not only laws but also ministerial decisions, at least on a selective basis. To accomplish the above, EAPND should be given more resources and staff.

The establishment of EAPND should be accompanied by general improvements to the legislative process. The preparation of laws by the ministries should be done by specialists who follow general rules and manuals on good legislation. For example, if an article of a law amends an earlier law, the amended law should be published in its entirety so that it is easily accessible to the public. Potential overlaps between laws should be considered in the evaluation process so that they are eliminated when the laws are introduced for voting in Parliament. Finally, laws voted in Parliament should not include amendments of other laws. This practice creates duplication and complexity, and negates the efforts to evaluate, simplify and codify the legislation.

Local government

Overlaps between the responsibilities of central government and local government can be resolved by demarcating responsibilities more clearly and by matching mandates and resources more closely. For example, instead of the Ministry of Education being responsible for the recruitment of teachers, the municipalities for the maintenance of buildings, the Ministry of the Interior for schools' basic operating expenses, and KTYP for purchasing computers, responsibility for all these tasks could be given to the municipalities or to the Ministry of Education. In that way, one entity would be responsible for any problems that arise.

Following the same logic, the resources that the central government provides to a municipality or region should better match that municipality's or region's responsibilities, and should be determined in a more transparent way. For example, resources could be determined by a mathematical formula that considers parameters such as population and income. Alternatively, a municipality could receive a fixed percentage of the revenue from the taxation of all real estate in its territory. This would improve incentives, as the municipality would not be able to blame the central government for lack of funding and would not be able to request more funds if it did not manage its resources efficiently. It would also be easier to compare different municipalities in terms of the efficiency in managing their resources. Similar comments apply to regions.

The role of the central government in such a system is to have broad oversight of how municipalities or regions manage their resources, and to redistribute resources from the richest to the poorest municipalities or regions. Government supervision should address issues pertaining to legality and efficiency. In the existing system, the emphasis is on legality, i.e., whether or not resources are allocated legally. Efficiency should also be considered, i.e., whether or not the use of resources yields substantial economic benefits.

If the above changes are implemented, it will be possible to allocate more responsibilities and resources to local governments, as is done in most other European countries. Decentralisation is desirable as it ensures that decisions are made with better knowledge of local conditions and needs. For example, municipalities or regions could have overall responsibility for managing the schools located in their territory, including recruiting the teachers, as mentioned in Section 4.3. They could likewise have significant responsibilities over matters of spatial planning, as mentioned in Section 4.5. The role of central government in a decentralised system is strategic and supervisory. For example, the Ministry of Education could decide on textbooks and curricula, and the Ministry of Environment and Energy could decide on general guidelines for spatial planning.

Administrative decentralisation can be accompanied by the creation of metropolitan municipalities in Athens and Thessaloniki. This will ensure that the complicated problems faced by the two large cities are addressed at the level of the entire city rather than that at the level of many small municipalities.

Digitalisation

The digitalisation of public administration is important. Digitalisation will bear fruit, however, only if the other reforms mentioned in this section are implemented. For example, if performance incentives in the public administration do not improve and effective performance evaluations are not put in place, then digitalisation efforts may result in the fragmentation of public sector applications and in the use of applications that do not serve the general public. Furthermore, if legislation is not simplified and codified, then it will be difficult to automate administrative processes through the development of information systems.

Digitalisation efforts should be governed by basic principles such as the below.

1. Digital provision of public services by default. Citizens and firms should access public services mainly through digital applications. When this is not possible, they should have access to remote service centres via telephone and e-mail; only in exceptional cases should they have to resort to physical presence in the public service centres.
2. Once-only principle. Citizens and companies should be able to provide their data to the state only once, rather than being asked to provide the same data repeatedly.

3. Interoperability by default. Information systems for public services should operate smoothly across the Single Market, based on the free transfer of data and digital services in the EU.
4. Openness/transparency by default. Data should be shared between public agencies, stakeholders should be involved in the design and provision of services, and citizens and firms should have opportunities to control access to their data and correct it, as well as to monitor administrative procedures concerning them. Citizens and firms should be notified about any access or change concerning their data.
5. Privacy and data protection. Information systems should be designed with privacy considerations in mind. Strong security protocols should be implemented, so that citizens and firms are willing to provide their data.
6. Flexible software development, based on small successive development steps and collaboration between the implementation team and stakeholders.
7. Emphasis on the easy use of services and their availability on a 24/7 basis.

4.2 JUDICIAL SYSTEM

4.2.1 Indicators

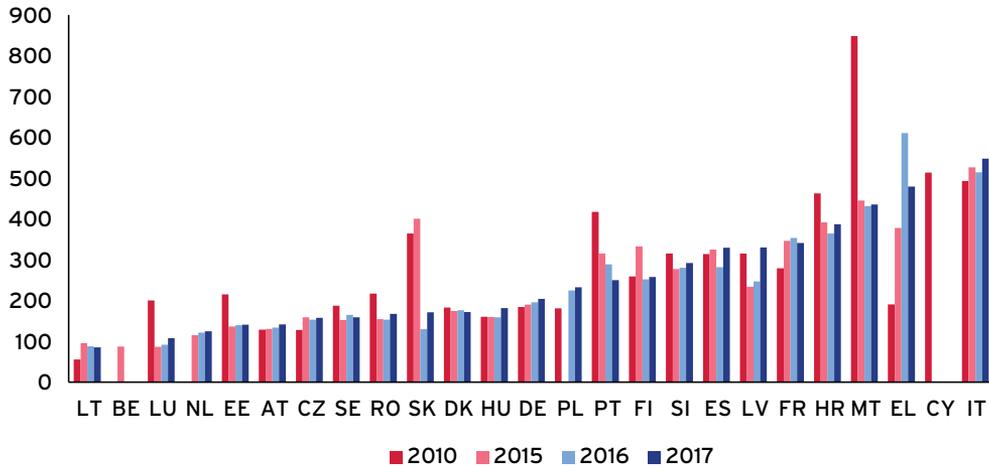
The efficient administration of justice is essential for the economic development of a country and for the provision of equal opportunities to all citizens. At the current juncture, it is also crucial for the absorption of the NextGenerationEU resources, as a large part of these resources are linked to public infrastructure projects that should be delivered within set deadlines.

Greece has made progress on justice indicators over the last decade, but there is still considerable room for improvement. For example, the time needed to resolve a civil court case in the first degree in Greece was the second highest in the EU in 2017, while the corresponding time for administrative courts was the fifth highest (Figure 4.4).

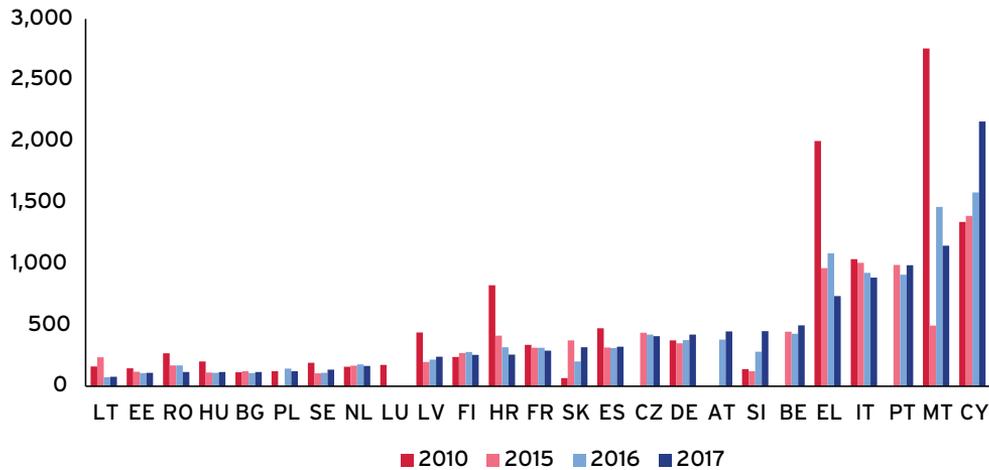
Due to delays in the administration of justice, Greece ranked 146th globally in enforcing contracts according to the World Bank's annual Doing Business survey for 2020. An additional troubling feature is that according to the World Economic Forum (2018), Greek firms' perception of judicial independence is below the European average.

FIGURE 4.4 TIME NEEDED TO RESOLVE A CASE IN FIRST-DEGREE COURTS (IN DAYS)

a) Civil and commercial cases



b) Administrative cases



Note: No data are available for the United Kingdom, Bulgaria (civil and commercial courts), Ireland (civil and commercial courts) and Cyprus (administrative courts).

Source: EU Justice Scoreboard 2019, CEPEJ.

The poor performance depicted in the above indicators is due to issues originating within the justice system as well as to issues outside it. The issues originating outside the justice system pertain to the legislative process and to the public administration. For example, the multiplicity of laws, their overlaps and their complexity give rise to excessive litigation, placing an unnecessary burden on the justice system. Moreover, many disputes could be settled out of court, through negotiation or arbitration, but incentives for out-of-court settlement are weak. This is because of the legislation governing out-of-court settlement and because of the incentives of the public administration in the case of administrative disputes.

Given that the efficiency in administering justice is influenced by the legislative process and the public administration, the implementation of some of the reforms in Section 4.1 would have a positive impact on justice system indicators. This is especially true for the proposals concerning the evaluation and simplification of laws and the reduction of overlaps. This section examines barriers that originate within the justice system and proposes policy measures to remedy them.¹⁸

4.2.2 Barriers

Education, training, evaluations and promotions

After they graduate from law school, Greek judges are trained at the National School of Judges. The level and legal training of graduating judges is high compared to other EU countries. Relative to other countries, however, limited training is provided in economics, accounting and finance. Such training is essential because most court cases involve economic considerations.

After they graduate from the National School of Judges, and throughout their entire career, judges participate in few training activities compared to other EU countries (Figure 4.5). No training activities in digital and administrative skills are reported for Greece, despite their significance in other EU countries (Figure 4.6).

Evaluation and promotion procedures should be improved. Judges are evaluated by other judges at higher hierarchical levels, and the evaluations are based on a sample of rulings chosen by the judges being evaluated. It would be better if the evaluators had access to all rulings. Promotion to senior positions is based on seniority, and managerial qualifications are not considered even for positions that involve administrative aspects, such as head of court.

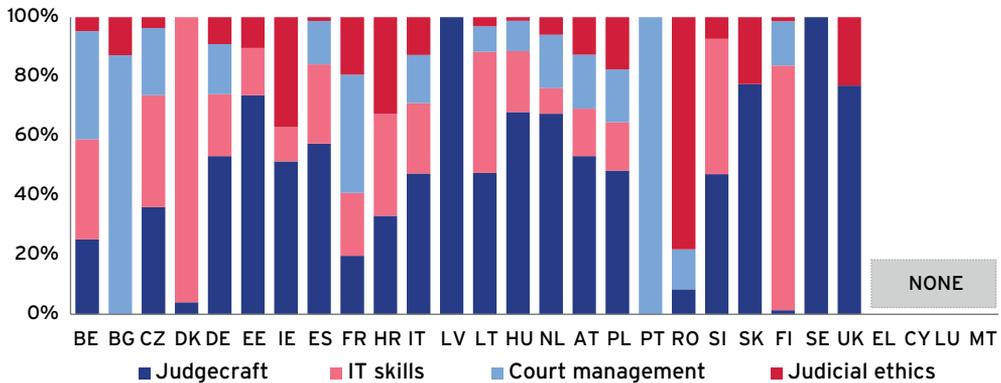
FIGURE 4.5 JUDGES PARTICIPATING IN CONTINUOUS TRAINING ACTIVITIES IN EU LAW OR IN THE LAW OF ANOTHER MEMBER STATE, AS A PERCENTAGE OF TOTAL NUMBER OF JUDGES



Source: EU Justice Scoreboard 2019, European Commission.

¹⁸ Many of the issues covered in this section are extensively analysed in the legal literature. Two references for civil and administrative justice, respectively, are Georgouleas (2018) and Androulakis (2018). Dellis (2020) also considers economic issues.

FIGURE 4.6 SHARE OF CONTINUOUS TRAINING OF JUDGES ON VARIOUS TYPES OF SKILLS, AS A PERCENTAGE OF TOTAL NUMBER OF JUDGES RECEIVING THESE TYPES OF TRAINING



Source: EU Justice Scoreboard 2019, European Commission.

Resources and infrastructure

Delays in the administration of justice are not due to an insufficient number of judges. On the contrary, Greece has more judges per population than the EU average. In 2016, it had 25.8 judges per 100,000 inhabitants, compared to 21 on average in the EU, 24.2 in Germany, 11.5 in Spain, 10.6 in Italy, and 10.4 in France (Council of Europe, 2018). If the comparison includes part-time judges or judges with auxiliary roles (e.g., *Rechtspfleger*), which do not exist in Greece, then Greece is close to the EU average (the EU average rises to 25.1 judges per 100,000 inhabitants).

One factor contributing to judicial delays is insufficient administrative support. For example, while the Council of Europe countries have an average of 3.1 administrative assistants per judge, the ratio in the Council of State (Greece’s Supreme Administrative Court) is around 0.5, i.e., half a clerk per judge (Androulakis, 2015). Insufficient administrative support creates additional workload for judges, who must perform secretarial activities in some cases.

Additional areas where improvements are possible are digitalisation, court management and the geographical distribution of courts. Greece ranks last among the 27 EU countries in terms of information systems usage and digitalisation in courts. Even in those instances where information systems are introduced, they are not used properly because of a lack of qualified staff to support them.

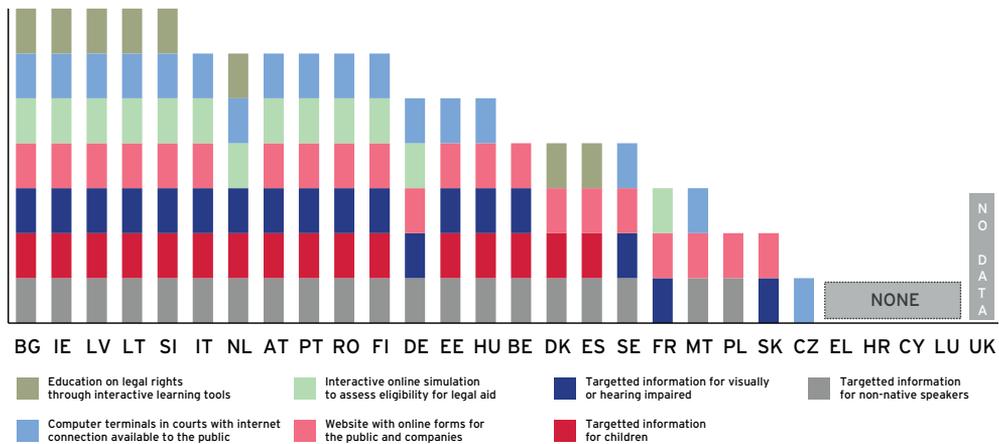
Small courts are managed by judges appointed by seniority, whereas larger courts are managed by judges elected by their colleagues. Management skills and training are not required in these promotions or elections. Consequently, in some cases, judges perform management duties inefficiently.

The geographical distribution of courts is also problematic. Provincial courts are often located in close geographical proximity to each other and should be consolidated into larger units, as the benefits of separate small courts are small relative to the fiscal costs. Those small courts are also often inefficient and underperforming.

Public accessibility to information

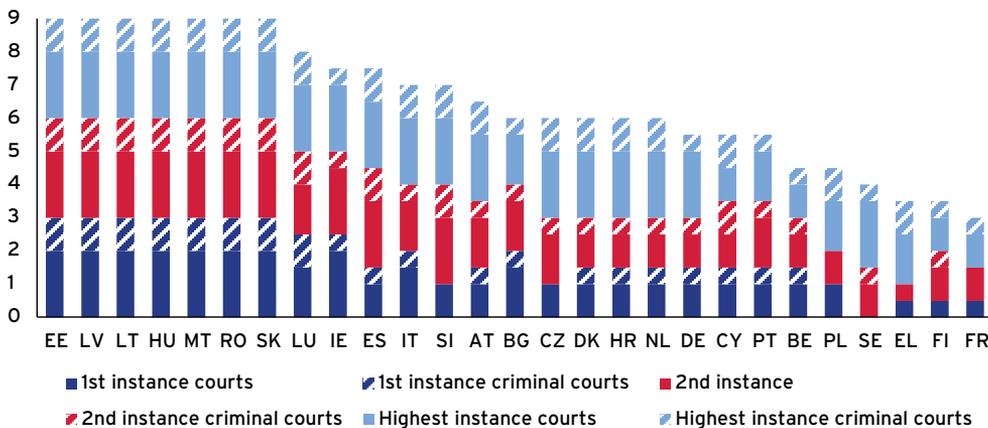
The Greek justice system lags behind its counterparts in other EU countries on initiatives that promote transparency and public accessibility to information. No information about the justice system is accessible to the public online (Figure 4.7). Online access to published court decisions is satisfactory for the supreme courts but limited for lower-level courts (Figure 4.8).

FIGURE 4.7 INFORMATION ABOUT THE JUSTICE SYSTEM ACCESSIBLE TO THE PUBLIC ONLINE



Source: EU Justice Scoreboard 2019, European Commission.

FIGURE 4.8 ONLINE ACCESS BY THE PUBLIC TO PUBLISHED COURT DECISIONS



Source: EU Justice Scoreboard 2019, European Commission.

4.2.3 Policy recommendations

Education, training, evaluations and promotions

The curriculum of the National School of Judges should give greater weight to economics subjects. Judges should combine their legal training with training in economic principles and in the economic analysis of the law. Courses should also be offered in more technical economics subjects such as competition, accounting and finance. Training should be more practical, with more time spent in the courtroom attending trials and other proceedings.

Training, evaluation and promotion procedures should be redesigned to provide judges with more opportunities and incentives for continuous improvement throughout their careers. Moreover, training should include activities that develop digital and management skills.

Performance evaluations should be thorough and apply to all hierarchical levels. Evaluators should have access to all rulings issued by the judges they evaluate. Quantitative characteristics (e.g., average time taken to process cases, rate of decision reversal by the higher court) as well as qualitative characteristics (e.g., case difficulty) should be taken into account. Progression to senior posts that require managerial skills should require evidence of such skills. Alternatively, a training course on managerial skills lasting for a few months could be provided to judges elected to head-of-court positions.

Changes should also be made to the way that the body of evaluators (consisting of supreme court judges) is organised. The term of evaluators is one year, which makes it difficult to develop a common understanding between evaluators and evaluatees about the evaluation criteria. It also makes it difficult for evaluators to monitor the progress that evaluatees make after the evaluation is completed. The latter consideration is particularly important when the entity being evaluated is a court rather than an individual judge. The term of evaluators should be made longer, and the body of evaluators should be made a formal part of the supreme court of the corresponding judicial branch.

The government's involvement in the promotions of supreme court judges could be re-examined. Under the current system, the Council of Ministers appoints about 30 heads and deputy heads of the supreme courts. An alternative option is that candidates for these positions are nominated by the judiciary, and the government or the relevant parliament committee decides among the set of nominated candidates. This issue requires a constitutional amendment.

The collection and comparative analysis of KPIs for all courts in the country can be a useful tool for the evaluation of judges and courts, and for the better allocation of workload both within and across courts. These KPIs can include cases handled per court unit, average time to completion, rate of reversal of decisions at the higher court. The Ministry of Justice's JustStat service could be used for this purpose. JustStat could also produce an annual report with findings resulting from the collection and analysis of KPIs.

Resources and infrastructure

The ratio of administrative assistants to judges should be improved by hiring more assistants. The required qualifications for these posts should be raised. Some steps in this direction have already been taken, and they will reduce the amount of time that judges spend on administrative tasks.

A separate branch of judicial assistants should be set up, so that judges' time is used more efficiently. Judicial assistants exist in many countries, including France (*assistants de justice*), the United Kingdom (judicial assistants) and the United States (judicial clerks). Judicial assistants in those countries support judges with research on past court decisions and other aspects of the law. They are selected from among the best law school graduates. They serve for a few years, and eventually go on to work as lawyers or judges. One way to set up the institution of judicial assistants in Greece is to incentivise judges at lower-level courts to serve part-time and for a few years as judicial assistants at higher-level courts. This will have the added benefit that judges at lower-level courts will gain useful experience for their future career.

The digitalisation of the justice system should continue at a rapid pace. As with the broader public administration, successful digitalisation of the justice system requires not only the acquisition of information systems but also a suitable organisational structure. Information systems should be supported by qualified staff. Their use should be made mandatory, for example, all parties in a court case should file their documents digitally. Digital filing of documents requires the widespread use of electronic signatures. It also requires that the public administration has digital capabilities and that its information systems can interoperate with those of the justice system. Establishing interoperability requires inter-ministerial actions, for example between the Ministry of Justice and the Ministry of Citizen Protection for the transmission of criminal case documents from the Hellenic Police to the prosecutors' offices.

Efficiency gains could also be achieved by redesigning the country's court map. Detailed proposals on this issue exist already (Pikramenos, 2017). Small provincial courts in geographical proximity to each other should be merged into larger units. In most areas of the country there should be one court of first instance per prefecture and one court of appeals per region. Conversely, courts in large cities, which handle a large number of cases, should be divided into smaller units. One such example is the Athens court of first instance.

Additional efficiency gains could be achieved by reducing overlaps of responsibilities between agencies tasked with combating tax evasion and financial crime. The mandates of the Financial Police, the Directorate of Economic Crime Investigation, the Financial Prosecutor, the Audit Centre of the Independent Authority for Public Revenue (ΑΑΔΕ-ΑΑΔΕ) and the Anti-Money Laundering Authority should be redesigned to reduce overlaps and use resources and expertise more efficiently.

Other organisational changes that would contribute to a more efficient administration of justice are the following:

- Use ‘front-loaded’ trials more widely. In a frontloaded trial, the required documents must be filed within a fixed time limit after legal proceedings begin, for example, after a claim is filed with the prosecutor. By contrast, in a ‘back-loaded’ trial, the documents must be filed within a fixed time limit before the trial begins. Faster filing of documents allows the trial to start earlier if circumstances permit.
- Introduce pilot trials in civil and criminal courts, as is currently done for administrative courts.
- Introduce reasonable deadlines for the progression and conclusion of trials.
- Extend the hours during which court documents can be filed.

Specialised courts

Many court cases, such as those involving competition, bankruptcy, and corporate governance, require judges to have specialised knowledge. Such cases can be handled more efficiently in specialised courts. Following best practices in other EU countries (Papaioannou and Karatza, 2017), specialised courts should be staffed by judges with knowledge and training in the respective areas. These judges could reach decisions with the assistance of experts. Financial prosecutors already rely on assistance from tax and banking officials. Judges in specialised courts should have fixed terms to avoid creating silos within the justice system.

Specialised courts have been in operation for decades for issues such as maritime disputes (in Piraeus, by Law 2172/1993) and intellectual property (in Athens, Thessaloniki and Piraeus, by Law 2479/1997). More recently, Law 4700/2020 established specialised courts for energy, communications, and data protection and privacy. The maximum term in most of these courts is four years. Specialised courts should be created in other areas that are economically important and require specialised expertise, such as competition, bankruptcy and corporate governance. The maximum term in specialised courts should exceed four years.

Out-of-court dispute resolution mechanisms

Out-of-court dispute resolution mechanisms can help reduce congestion in the justice system and speed up case resolution. Such mechanisms have been introduced in Greece in recent years. Their use remains limited, however. One of the few areas where out-of-court dispute resolution mechanisms are used extensively lies within administrative justice and concerns tax disputes. The Dispute Resolution Directorate (DRD) of AADE is required to deal with tax disputes before they are brought to administrative courts. Out of 40,570 disputes between taxpayers and AADE in 2015-2019, 32,112 did not end up in court as the DRD decisions were accepted by the taxpayers. Even for tax disputes, however, concerns have been raised about the operation and efficiency of the resolution mechanisms.¹⁹

Out-of-court dispute resolution mechanisms would become more widely used if they were linked more closely with the justice system. For example, if an out-of-court dispute resolution fails and the dispute is referred to the court, the judge should be able to indicate, together with the decision that is made, a range of reasonable settlement options. If the claims submitted by a party in the out-of-court procedure fall outside the range indicated by the judge, then that party could be required to pay a fine or be disproportionately burdened with the costs of the trial.

Incentives could also be given to lawyers to make greater use of out-of-court dispute resolution mechanisms. Under the current system there are strong disincentives, as resolution through the courts entails more procedures and therefore more revenue for the lawyers.

Incentives to use out-of-court dispute resolution mechanisms should also be given to the public administration (for administrative disputes). An out-of-court settlement requires public officials to assume responsibility for the outcome. Under the current system, public officials are reluctant to assume responsibility, for fear of disciplinary proceedings against them or other adverse consequences to their career progression. The incentive is to prolong legal proceedings even if the chances of success are low, as this has no real consequences for them.

One measure that can help link out-of-court dispute resolution mechanisms more tightly with the justice system is to use the courts to validate agreements reached through the out-of-court mechanisms. This would facilitate out-of-court settlements for administrative disputes, as judicial validation would provide assurance that public officials did not act against the public interest. Improvements such as the above would lead to more widespread use of out-of-court dispute resolution mechanisms.

¹⁹ For example, according to Dellis (2020, Chapter 8): "In France, more than 90% of tax disputes are resolved out of court. The transfer of the same institution to Greece (Law 4174/2013, article 63) has been a complete failure: appeals, which never vindicate the taxpayers, nor give them the impression that their case was dealt with 'fairly', burden rather than improve the resolution system; taxpayers end up, if they can afford it, in court".

Public accessibility to information

Online access to published court decisions, which is satisfactory for the supreme courts, should be extended to all levels of administrative, criminal and civil courts. To achieve that goal, it is important to anonymise the judgements.

4.3 EDUCATION

Investment in ‘human capital’, which includes but is not limited to knowledge, skills and learning capabilities, is a crucial driver of a country’s long-run growth. A country can improve its human capital by investing in areas such as healthcare, training, and research and technology. Undoubtedly, however, the most important driver of human capital improvements is education, from birth up to university graduation.

4.3.1 Indicators

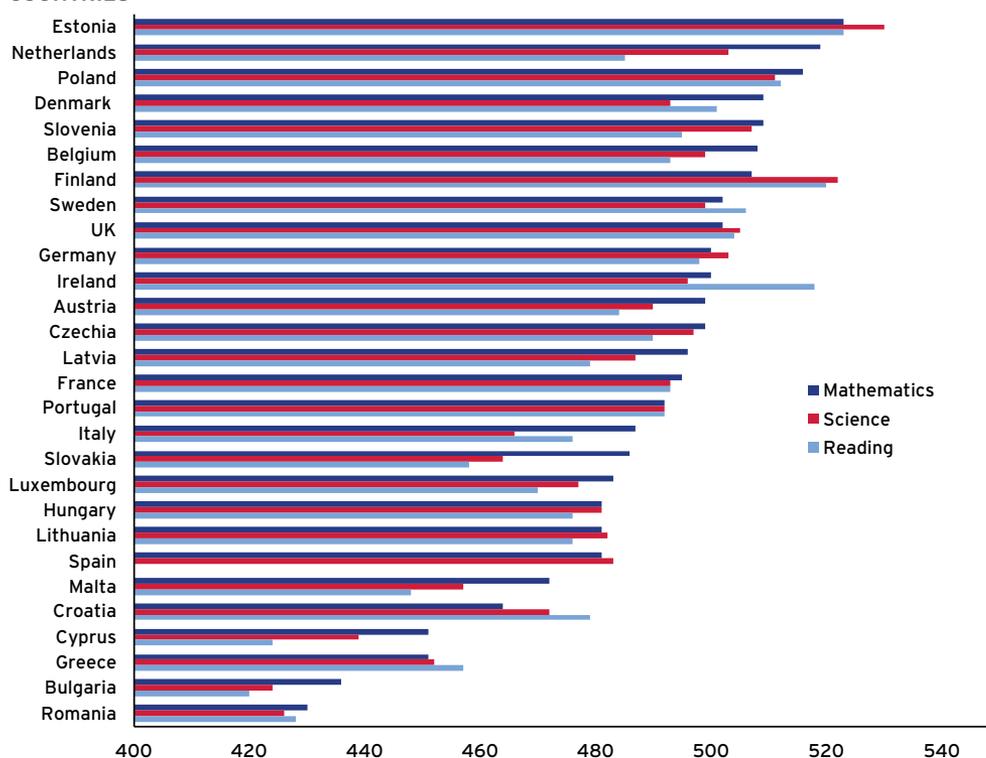
Skills

The performance of Greek students in international tests is disappointing. In the 2018 OECD Programme for International Student Assessment (PISA), which assesses the skills of 15 year-old students in three areas (mathematics, science and reading), Greece ranked significantly lower than the OECD average in all areas, and fourth or fifth worst in the EU (Figure 4.9). The percentages of students in Greece with low performance are significantly higher than the EU averages,²⁰ and the percentages of students with high performance are correspondingly significantly lower. Even more worryingly, there exists a strong correlation between the socio-economic level of parents and the students’ results.

The picture in tertiary education is similar. While there are notable pockets of excellence in Greek universities, the overall performance of the country’s universities is not commensurate with its level of development. In most credible international rankings, no Greek university is included in the 100 best in Europe. In fact, Greek universities often lag behind those of smaller or less developed countries.

20 30.5% versus 21.7% in reading, 35.8% versus 22.4% in mathematics, and 31.7% versus 21.6% in science.

FIGURE 4.9 PISA 2018 SCORES IN MATHEMATICS, SCIENCE AND READING, ACROSS EU COUNTRIES



Source: OECD.

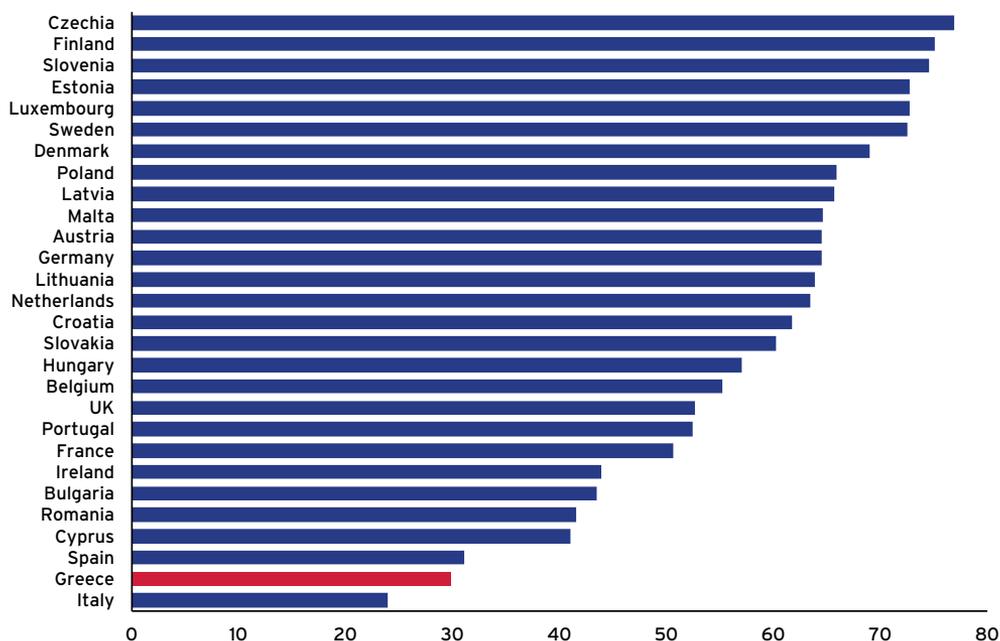
Given the above rankings, it should not come as a surprise that Greeks of working age rank low internationally in terms of skills. In the OECD Programme for the International Assessment of Adult Competencies (PIAAC), which examines literacy, numeracy and problem-solving skills in advanced technological environments for people aged 16-65, Greece ranks 17th out of 19 participating EU member states, with a performance well below the OECD average. Likewise, in the European Skills Index of the European Centre for the Development of Vocational Training (Cedefop), Greece scores 17% in skills matching, compared to an EU average of 66%, and ranks last in the EU. It scores 45% in skills activation and 43% in skills development, compared to EU averages of 79% and 76%, respectively. Its ranking based on the overall index is second to last in the EU (Figure 4.10).

Access

In recent decades, the educational achievements of the population have been steadily improving, although they continue to fall short of EU averages. The percentage of university graduates within the 25-64 age group reached 31.9% in 2019 (compared to 33.2% in the EU), up from 18.1% in 2002. This development can be largely attributed to the massive expansion of tertiary education in the late 1990s and early 2000s. Due to that

expansion, the percentage of university graduates within younger age groups in Greece exceeds the EU average. For example, within the 30-34 age group, despite the significant brain drain from that group during the crisis, the percentage of university graduates in 2019 was 43.1% in Greece, compared to 41.6% in the EU.

FIGURE 4.10 EUROPEAN SKILLS INDEX (ESI), 2020



Source: CEDEFOP.

The school dropout rate in Greece was 4.1% in 2019, one of the lowest in the EU. In recent years, access to preschool education and care has increased. The enrolment rate in preschool education and care facilities for children aged 0-3 years is 40.9%, compared to 35.1% in the EU. The same figure for children between four years and the age when they start compulsory education is 81.5%, compared to 95.4% in the EU.

4.3.2 Barriers

Autonomy and evaluation

The Greek educational system is extremely centralised. All important decisions, as well as many lesser ones, are made centrally. The autonomy of educational units of all levels is extremely limited, especially in primary and secondary education (OECD, 2011a). At the same time, with the partial exception of tertiary education, there is an almost complete lack of performance evaluation of educational units and teachers, as well as a lack of

social accountability of educational units. Related to that, there is a complete lack of performance incentives for educational units and teachers in primary and secondary education. In tertiary education, there is only a weak link between performance in research and teaching, and the allocation of resources.

Resources and infrastructure

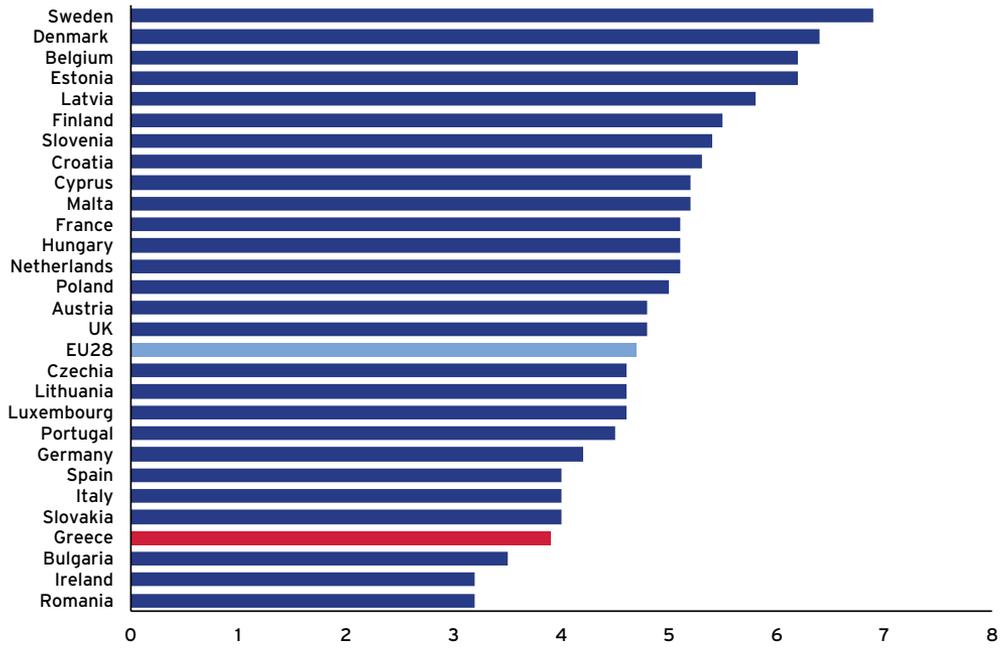
Following European and global trends, Greece has been gradually raising its spending on private and public education as a percentage of GDP. The educational achievements of the population have also been gradually increasing. Almost all spending on education is public. Private spending is directed mainly to preschool education and to private tutoring during primary and especially secondary education. Private spending is also directed to a lesser extent to postgraduate tuition fees, private schools (which educate about 6.5% of primary and secondary school students) and post-secondary non-tertiary education.²¹

Public spending on education as a percentage of GDP was below 3.5% in the mid-2000s and approached 4% in the years before the crisis. It rose further in recent years, although declining in absolute terms due to the faster decline in GDP. It remains consistently lower, however, than the EU average. Public spending on education was 3.9% of GDP in 2018, compared to 4.7% in the EU, placing Greece fourth lowest in the EU (Figure 4.11).

Public under-spending on education is often acknowledged in the public debate, with the debate focusing primarily on tertiary education. Public spending on tertiary education as percentage of GDP, however, is higher in Greece (0.9%) than the EU average (0.7%). Greece's under-spending concerns preschool and primary education (1.3% in Greece versus 1.5% in the EU) and especially secondary education (1.2% in Greece versus 1.8% in the EU) (Figure 4.12). The gap in public spending on secondary education is partly explained by the low participation of students in secondary vocational education. Secondary vocational education entails high spending per student because of laboratories and practical activities.

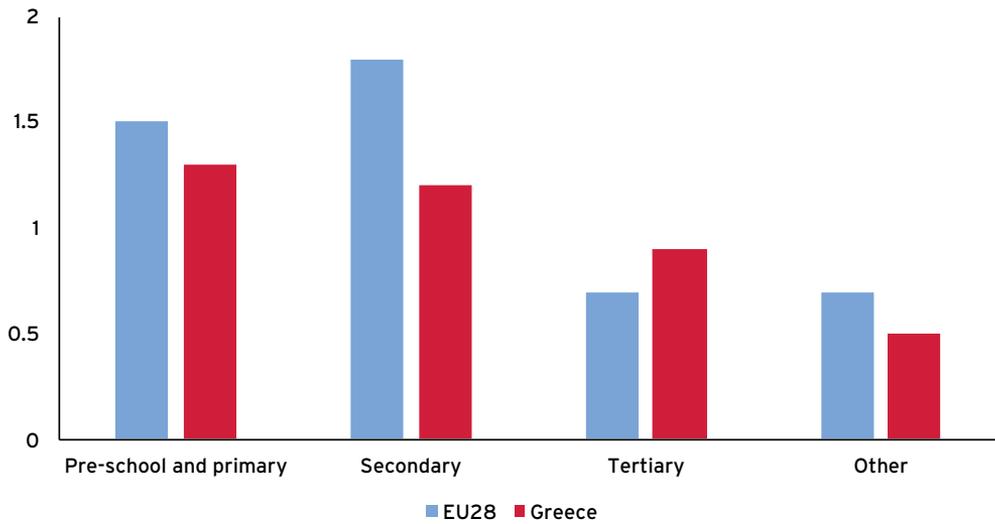
21 Public authorities should monitor spending on education more systematically. This applies to total spending and its breakdown by category.

FIGURE 4.11 PUBLIC SPENDING ON EDUCATION ACROSS EU COUNTRIES, 2018 (% OF GDP)



Source: Eurostat.

FIGURE 4.12 SPENDING IN PUBLIC EDUCATION IN GREECE AND THE EU BY EDUCATION LEVEL, 2018 (% OF GDP)



Source: Eurostat.

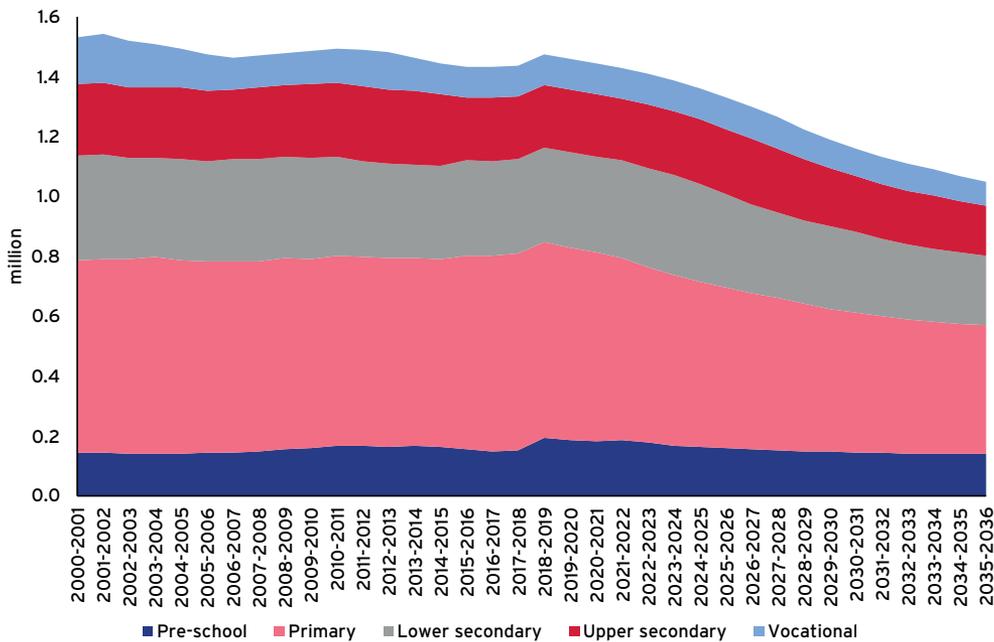
That public spending on tertiary education in Greece is higher than the EU average does not mean that Greek tertiary education is overfunded. On the contrary, data from the OECD's Education at a Glance database for previous years show that the total funding of tertiary education institutions in Greece is below the EU average. This is due to two reasons. First, funding for research in Greek universities is low (in the Eurostat data, as shown in Figure 4.12, public spending on research is not included in public spending on education, even for research taking place in universities). Second, Greek universities lag behind their EU counterparts in attracting private grants and donations.

Public spending on education consists primarily of current items, such as salaries, and to a much lesser extent capital items, such as buildings and laboratories. Over the past decade, spending on education infrastructure declined, resulting in a gap in that area. The gap is particularly significant for digital infrastructure, as the COVID-19 crisis has shown. The crisis also highlighted the need to upgrade the digital skills of teachers and students. Both teachers' basic training in digital skills and their opportunities for lifelong professional development in that area should be supported. One reason why digital skills are low is that the average age of teachers at all levels of education is high, and there is usually a negative correlation between age and digital skills. The high average age of teachers is due to fiscal limitations, which resulted in few permanent teachers having been recruited in recent years, as well as to the recruitment process being not examination-based but instead emphasising formal qualifications and seniority.

Despite mergers of educational units during the crisis years, average class size remains small, especially in primary education. This is partly due to the country's geography: schools on small islands and in isolated mountainous areas have few students. Small schools generally do not produce satisfactory educational outcomes. In addition, before the crisis, the cost per hour of teacher-student contact in Greece was one of the highest in the OECD. This was not due to high salaries of teachers, but to (a) the small average class size in Greek primary and secondary education, even in the major cities, and (b) the relatively low number of teaching hours of Greek teachers compared to their EU colleagues.

The cost per hour of teacher-student contact could increase further in the near future because the number of students is expected to decrease due to the decrease in births and the emigration that has occurred in recent years. The total number of students is estimated to drop from 1.48 million in 2008 to about 1.05 million by 2035 (Figure 4.13). This amounts to 423,300 fewer students, a drop of 29.2%.

FIGURE 4.13 EVOLUTION OF THE NUMBER OF PRIMARY AND SECONDARY SCHOOL PUPILS, 2000-2035



Source: IOBE (2018b).

Link with the labour market

Between two-thirds and three-quarters of all students in upper-secondary (high school) education take courses preparing them for the university entrance exams. Upper secondary education is underperforming, however, especially in the last two years of high school. This is because students focus their efforts on private tutoring outside of school to prepare them for the university entrance exams. Because of the way high school courses are structured, students who do not succeed in the university entrance exams are left without the necessary skills and qualifications to enter the labour market. Moreover, vocational education is generally low-quality and accompanied by a ‘failure stigma’. Many of the subjects that are taught have little to do with the skills that are in high demand in the labour market.

University courses often prepare for employment in the public sector, including education itself. A significant number of graduates remain unemployed for a long period after graduation, or are underemployed, or emigrate. Emigration is often driven by the oversupply of graduates in the Greek labour market even in sectors where demand, skills and the cost of studies are high, such as medicine and engineering. At the same time, skill shortages are significant, especially in the energy and the information and communication technology sectors. These shortages occur despite high youth unemployment rates (39.9% among those aged 15-24 compared to 16.1% in the EU, and 28.5% among those aged 25-29 compared to 10% in the EU in 2018) and low employment

rates of graduates of all educational levels. In addition, many university students delay their studies or drop out. In recent years, the number of students studying in postgraduate programmes increased significantly. These programmes, however, are often oriented towards careers in the public sector.

The recent abolition of technological educational institutes (TEIs) and their integration into universities has limited the differentiation of tertiary education institutions and their ability to respond to the different and changing labour-market needs, especially in the area of technology applications. The vertical internal organisation of universities (by departments) does not favour the development of interdisciplinary programmes of study and student mobility.

The research productivity of Greek tertiary education institutions is satisfactory judging by the number of publications and impact indicators (Sahini et al., 2018). The connection with the economy is inadequate, however. The commercial usage of the research that is developed and the transfer of technology in the economy are limited. So is innovative entrepreneurship within universities.

Participation in lifelong learning lags far below EU averages and is still in its infancy. This makes it difficult to upgrade workers' skills – especially digital skills – and to make workers more adaptable to changing economic conditions.

4.3.3 Policy recommendations

There is ample scope to improve education policies, so that investment in human capital can become more productive and better contribute to the country's long-term development. Some of the reforms that we next propose concern all levels of the education system, while others concern specific levels.²²

Autonomy and evaluation

Primary and secondary education

As mentioned above, the autonomy of schools in Greece is extremely limited. Some responsibilities could be transferred from the central administration to the schools, giving principals and teachers flexibility to adapt the operation of each school to local needs and opportunities (OECD, 2018a, p. 161). Other responsibilities could be delegated to local governments. For example, local governments could be made responsible of recruiting and managing teachers and support staff for the schools – provided that sufficient employment security is given to those affected. Decentralisation at the municipal or the regional level would result in more timely staffing and better operation

22 Many of the proposals presented here are further developed in Tsakloglou et al. (2016), Vettas (2017) and IOBE (2017a, 2018a, 2018b).

of the schools. It would also free up the central services of the Ministry of Education from day-to-day management of schools, allowing them to focus on more strategic tasks such as the planning of educational curricula and the response to ever-changing educational needs.

A transfer of responsibilities from the central administration to the schools should be instituted together with internal and external evaluations of the schools. Evaluations should consider educational outputs, such as student performance and admission to tertiary education institutions, as well as inputs, such as improvements over previous evaluations and challenges specific to each school. Evaluations should be a continuous process, organised and coordinated by a central independent body, and aimed at improving the performance of individual schools and of the education system as a whole. They should be associated with positive and with negative incentives. The weaknesses of underperforming schools should be addressed with targeted and comprehensive interventions (smaller class sizes, remedial teaching, teacher training, special training programmes, etc). The current procedures for disbursement of state funds to schools should be reviewed and linked to the achievement of educational goals.

The results of school evaluations should be made public and presented in comparative form, while always taking into account the inputs to the educational process. This would strengthen the role of social accountability and improve the access of parents and students to information. Big data and open data technologies offer new possibilities in that area, and should be used.

Evaluations should pertain not only to individual schools and staff, but also to the structures and functions of the education system as a whole. The latter form of assessment could lead to the creation of stronger and more effective educational units. In that context, promotion procedures within the education system's central administration should become more meritocratic and depoliticised, perhaps through the involvement of ASEP. The weight given to objective and quantitative criteria should be reduced, while that of substantive qualitative criteria should be raised.

Emphasis should also be given to the quality of teachers, which research suggests is the main driver of the quality of the education that is provided. Teacher quality is not solely determined by their formal degrees but also by the quality of their basic education and their incentives and opportunities for continuous development. It is thus necessary to restructure teachers' basic education and continuous development opportunities, and strengthen the incentives to become a teacher. This requires better selection procedures at entry, higher salaries linked to performance and professional development, and lifelong education programmes that can be physical or virtual. It is particularly important to restructure the basic education of secondary school teachers by introducing a second cycle of studies which would result in a certificate of pedagogical and didactic competence. That certificate could be provided by Schools of Education within universities. These schools should be evaluated based on their educational outcomes.

Tertiary education

Universities should be given greater autonomy on matters such as internal organisation, resource management, curriculum design, admissions criteria, number of admits, and so on. Autonomy and organisational flexibility should be instituted in parallel with stronger social accountability of university administrations. Funding of universities should be determined based on transparent criteria. The criteria can include objective needs, such as number of students, subjects taught, and educational infrastructure, as well as specific targets for each institution. Funding should be agreed as part of multi-year contracts between universities and the Ministry of Education. The strategic planning capabilities of universities should be strengthened, and universities should be given some flexibility to set out their objectives and be evaluated based on them. University Councils, with increased participation by external members and with significant responsibilities in strategic planning and in the selection of Rectors and Deans, could play an important role in this process. They could also help better connect universities with the labour market and with international developments in higher education.

Alongside with changes in autonomy, evaluation and governance, a strategy is needed to support research and teaching centres of excellence within universities. Such a strategy would raise the profile of Greek universities within Europe and globally. It would also strengthen their position within innovation ecosystems, which are necessary to promote innovation and productivity growth within the Greek economy. In addition to supporting groups and individuals who excel in research and teaching, it is important to encourage Greek scientists who have distinguished themselves abroad to return to Greece, and to attract distinguished foreign scientists to Greek universities, for shorter or longer periods (months or years). Making visiting professorships feasible and attractive would be useful in that regard.

Resources and infrastructure

Expansion of preschool education and care

Extensive research shows that well-designed preschool education and care policies have high economic returns. It is therefore vital to invest in that area, despite derogatory references made in the public debate about preschool education and care as ‘parking of children’. Well-designed policies require improving infrastructure and equipment; improving the basic education and continuous development opportunities of childminders and kindergarten teachers – probably based on a new university-level curriculum; and expanding the participation of children and infants in preschool education and care institutions. These actions would facilitate the participation of parents (primarily women) in the labour force, raising family incomes. Section 5.3 proposes a comprehensive child development programme, which serves the dual purpose of promoting preschool education and care, and improving female participation in the labour force.

Expansion of all-day schools

The opportunity to attend all-day schools should be offered to all students in primary and secondary education. After each day's lessons are completed, underperforming students could have the option to attend remedial courses, and students with special interests – for example, in mathematics, robotics, arts, and the environment – could have the option of participating in special study groups. All-day schools would facilitate the participation of parents in the labour force, raising family incomes. They would also provide integrated learning opportunities for children. To facilitate parents' participation in the labour force, schools could also offer opportunities for children during the summer holidays, which could combine play and sports activities with educational activities in the areas mentioned above.

Modernisation of school curricula

Current school curricula emphasise rote learning. They should instead cultivate knowledge, skills, critical thinking and values (OECD, 2018a, p. 110). Because school curricula and educational materials are usually developed using EU funds, they are not systematically evaluated or improved after they are developed. Problems that arise at the development stage are thus not addressed, and the educational material is often perceived as low-quality. It is therefore important to put in place systems that continuously evaluate and improve school curricula and educational materials.

Shift towards modern vocational education

Efforts should be made to upgrade significantly upper secondary (ΕΠΑΛ-EPAL) and post-secondary (IEK) vocational education and make it more attractive to students. The Ministry of Education should work closely with social partners and local communities for that purpose. Policy measures could include the upgrade of school curricula and infrastructure; the establishment of a network of model vocational high schools; the support and expansion of apprenticeships in EPAL; the expansion of the network of IEK; and the reform of the regulatory framework for the operation of EPAL and primarily of IEK to strengthen the role of the social partners in the design of vocational education and training (e.g., selection of specialties, design of curricula and learning outcomes). An additional policy measure would be to establish a National Baccalaureate granted based on examination results in a larger number (7-9) of elective courses. This would strengthen the knowledge and skills not only of those who continue in higher education but also of those who enter the labour market after completing their secondary education. While small class sizes could restrain the number of options available to students, the problem could be addressed by changing the curricula of neighbouring schools and providing students with a greater choice of schools.

Flexibility and student-centred learning in tertiary education

Because of the upcoming rapid demographic and technological changes, the map of tertiary education institutions and of their curricula should be redrawn. There should be more streams and positions in subjects where a significant increase in labour market demand is expected in the coming years. Conversely, positions in subjects with an expected excess supply of graduates should be gradually reduced. These changes could be made more easily if universities had greater autonomy and flexibility, and if the main academic units within them were the schools (which cover a wider range of related subjects) rather than the departments (which are more specialised). Organising universities around schools rather than departments, which would imply in particular that students are admitted to schools, would enable students to better tailor their courses to their interests and to move more easily between programmes. These changes could be combined with the establishment of joint study programmes between Greek and foreign universities, both at the undergraduate and at the postgraduate level.

Centres of excellence in tertiary education could produce innovations in teaching and student-centered learning, and catalyse improvements in teaching across the entire Greek university sector. In a similar spirit, teaching support centres in universities could contribute, following international best practices, to the improvements that are needed in university teaching, which include the use of new technologies.

For the above improvements to happen, it is important to raise the teacher-student ratio in specific courses and in the universities overall. This could be achieved by hiring more teachers, by restructuring the curricula and specific courses, and by introducing incentives and disincentives for the timely completion of university studies. The introduction of a re-enrolment fee could be considered for those who extend their studies beyond the statutory completion period.

Digital skills for everyone

Digital skills for teachers and students should be upgraded at all educational levels. The same applies to the digital infrastructure of educational units. New courses emphasising digital skills should be introduced, and changes should be made in the way that existing courses are taught. The digital upgrade could be made part of a broader effort to upgrade the STEM (science, technology, engineering, mathematics) skills of students at all educational levels. STEM skills are necessary in the current technological environment, and Greek students lag significantly behind in them.

Upgrading digital skills requires the continuous training of teachers at all educational levels in new technologies. It also requires the frequent review of curricula at all educational levels, with the aim to develop new skills and abilities for the students. It will also be necessary to increase the fraction of educational material that is digital, and to support the development of open educational resources such as electronic books and university textbooks. In addition, the access of educational institutions of all levels

to fast internet (fibre optics/5G) and their endowment with the necessary equipment (computer rooms, desktops/laptops, interactive whiteboards, etc.) would contribute to the overall upgrade of the digital skills and to the reduction of the associated inequalities (the 'digital divide').

Upgrades to educational infrastructure

During the crisis years, the infrastructure and equipment of many institutions at all educational levels were not renewed or even adequately maintained. Efforts should be made to better maintain and upgrade infrastructure and equipment, such as buildings, classrooms, workshops, furniture, libraries, gyms, and so on. New architectural specifications for educational institutions at all levels to meet modern educational needs and pedagogical principles would contribute to that goal. New specifications for school equipment (desks, chairs, etc) could also contribute to the same goal. Funding a comprehensive programme to upgrade schools of all levels is an important priority.

Rationalisation of resources

Public spending on education should rise in the coming years towards the EU average, with an emphasis on increasing spending on preschool education. At the same time, there is room for savings in certain areas.

In primary and secondary education, the teacher-student ratio should drop towards the EU average. This could be accomplished by increasing contact and working hours for teachers, changing the duration of classes and school breaks, and increasing class size (by increasing the minimum number of students per class). In addition, given the expected rapid drop of the student population, mergers of small schools into larger units should be promoted. This would economise on current and capital spending. It would also facilitate the provision of a larger variety of courses for students, especially in secondary education.

In tertiary education, the integration of TEIs in universities was not accompanied by the necessary consolidation of educational units: schools and departments remained dispersed across many different cities and towns. Reducing fragmentation and consolidating educational units would economise on spending. It would also improve students' academic experience and development, and broaden their education choices. A consolidation programme would also speed up the necessary adaptation of the university system to the impending demographic shrinkage, the main effects of which are expected to hit from 2027 onwards.

Reducing educational inequalities

In recent decades, many immigrant families have settled in Greece and this trend is likely to continue. For various reasons, many immigrant children have not been well integrated into the Greek education system. Well-designed policies to support immigrant children in their education could have positive effects on social cohesion and on the economy.

It would be desirable to establish an Educational Inequality Observatory within the Institute for Educational Policy, which would make policy recommendations to the Ministry of Education on reducing inequalities in student performance. The work of such an institution would be facilitated if the ‘exam question bank’ is extended to all school years, to ensure that learning outcomes are comparable nationally and over time. The network of model schools should be expanded, and such units should be also established in less developed areas of the country. The institutional framework for the provision of educational support to underperforming students should be reformed so that efforts to reduce educational inequalities can be organised more efficiently.

Policies to reduce inequalities are also needed in tertiary education. Student care facilities should be expanded and upgraded, and their management should be entrusted to universities. The facilities should be managed under a special private-law regime, allowing universities to earn some revenue and improve the quality of the services they provide to students. Government spending on student care (food, housing, books, etc.) should be rationalised. For example, students can be given a choice between printed, electronic and even used books. An interest-free loan mechanism with favourable repayment terms (students repay after joining the labour market and if their income exceeds a certain level of income, without any involvement of banks) could be introduced to cover the cost of living during university.

Internationalising universities

Universities’ ability to attract foreign fee-paying students will increase their financial autonomy while also creating a multicultural environment that will benefit all students. Making universities more international would have two important additional effects. First, it would better connect Greece with its academic and business diaspora, which is a valuable and underutilised resource. Second, it would position Greece as a local centre in the wider region, as talented and ambitious young men and women – from the Balkans, Central and Eastern Europe, Russia, the Middle East, North Africa, Turkey, and Cyprus at an initial stage, and from all over the world (especially China, India, the United States and Canada) at a later stage – would be able to study in Greece and have the opportunity to integrate into its economic and social fabric, with significant geopolitical benefits.

A comprehensive long-term strategy is needed to internationalise Greek universities and make them more competitive globally. In addition to establishing foreign-language undergraduate and postgraduate programmes, by possibly collaborating with foreign universities, Greek universities should fully adopt the principles of the European Higher Education Area to enhance the international recognition of the degrees they provide. University studies should be organised according to the 3-5-8 rule, and the procedures of academic and professional recognition of degrees should change taking into account the European framework for the recognition of professional qualifications. The ratification

of international conventions for the recognition of degrees (the Lisbon Convention) and the promotion of bilateral academic recognition agreements with other countries would contribute to the international recognition of Greek universities and their ability to attract foreign students.

Greek universities should aim to attract 100,000 foreign students by 2030. The establishment of foreign-language undergraduate and postgraduate programmes would help achieve that goal, but it will also be necessary to make the programmes offered in the Greek language open to foreign students (foreign- and Greek-language programmes should be open to both foreign and Greek students). Foreign students in Greek-language programmes could be offered accelerated courses to learn Greek before they begin their studies, or they could be taught in English in their first year of studies while also taking courses to learn Greek.

New technologies integrating distance learning in undergraduate and postgraduate programmes would also help with internationalisation. For example, Greek universities could offer online courses taught by professors in foreign universities, or they could organise massive open online courses (MOOCs) for foreigners or expatriates abroad. Additional measures that should be put in place include support services for foreign students (e.g., admission procedures, residence permits, housing), scholarships and other incentives (e.g., student loans), and the promotion of Greek universities in other countries, especially those where the demand for higher education exceeds local supply (e.g. China, India).

Links with the labour market

Internships

Universities would become better connected with the labour market if they reorient themselves away from preparing graduates for employment in the public sector, especially its education segment, to preparing them for employment in the private sector. Universities should offer a large variety of study programmes on applications of science and technology in the workplace. This is especially important after the abolition of TEIs. Universities, or even the schools within them, could specialise into those that organise study programmes in applications of science and technology (Universities/Schools of Applications of Science and Technology) and those with a more theoretical orientation.

Universities/Schools of Applications could offer three-year study programmes with compulsory internships in firms, working closely with firms especially in dynamic sectors of the economy (manufacturing, food, energy, tourism, IT, green economy, etc.). These study programmes could also offer a 'second chance' to university students who have dropped out of their current programme due to lack of interest, and who would like to change their professional orientation. There are many such students: the dropout rate from university is almost 30%, and many students do not complete their studies by the statutory completion period due to lack of interest.

Incentives to improve the application programmes could be provided by the state. For example, social security contributions could be subsidised for firms that continue to employ students after the end of their internship. Moreover, universities whose graduates find jobs with higher wages or more related to the studies could be given additional funds and support.

Funding of research projects by firms

Firms could collaborate with universities to fund specific research projects, whose results could be used by the firms. Remuneration for these projects could be pre-agreed with the universities and the researchers. Universities' Technology Transfer Offices can play an important role in this process. Regular calls for research programmes, especially at the doctoral and postdoctoral level, could be instituted and will help stem the 'brain drain'. This would benefit the universities and raise economic growth in the long run.

In addition to encouraging applied research, funding and incentives should be provided for basic research. State funds available to universities should be made contingent on research output. Moreover, an agency should be set up to allocate state funds earmarked for basic research based on merit. These issues are analysed in more depth in Chapter 5.4.

Expansion of lifelong learning programmes in universities

An important part of lifelong learning of employees and the general population in many countries is undertaken within universities. After all, the fraction of graduates in the total workforce and population has increased significantly in recent decades. Their upskilling and reskilling require expanding the role of universities in lifelong learning. This expansion has already started in Greece and is expected to continue in the coming years. There is significant scope for mutually beneficial collaboration in that area between universities and firms.

Graduates' access to university lifelong learning programmes should be supported, especially for the self-employed and those working in small and medium-sized firms. Interest-free loans with favourable repayment terms can facilitate access.

4.4 HEALTHCARE

The main goal of a healthcare system is to meet a population's needs across the entire care spectrum, from prevention to treatment to rehabilitation. A well-functioning healthcare system contributes significantly to the population's welfare.

The role of healthcare systems and the healthcare sector more generally (which includes the production of medical and pharmaceutical goods) is becoming increasingly important as life expectancy rises and science makes rapid progress. On the spending side, healthcare systems should target efficiently the services they provide. On the production side, the healthcare sector can attract significant investment as well as research and development. These could lead to sizeable exports and to import substitution.

The COVID-19 pandemic put the healthcare sector in the spotlight. It highlighted the need to protect public health and to safeguard the adequacy of medicines, supplies and infrastructure. It also highlighted the need to promote research and development of new vaccines, as well as diagnostic exams and treatments. The pandemic also created significant opportunities for the Greek healthcare sector, mainly for exporting firms.

The Greek healthcare system employs many doctors, a large fraction of whom have extensive expertise in their field of specialisation. Access to the healthcare system is relatively open. The quality of the system is uneven, however, and incentives should improve for all parties involved. A large share of spending in healthcare is paid out-of-pocket by households, formally or informally, and is not covered by public or private insurance. While spending in healthcare declined significantly during the decade of the economic crisis (after having risen sharply before the crisis), its structure should improve, and the same holds for the structure of the healthcare system in general. Otherwise, the incentives currently in place will lead to a further drop in quality and rise in costs.

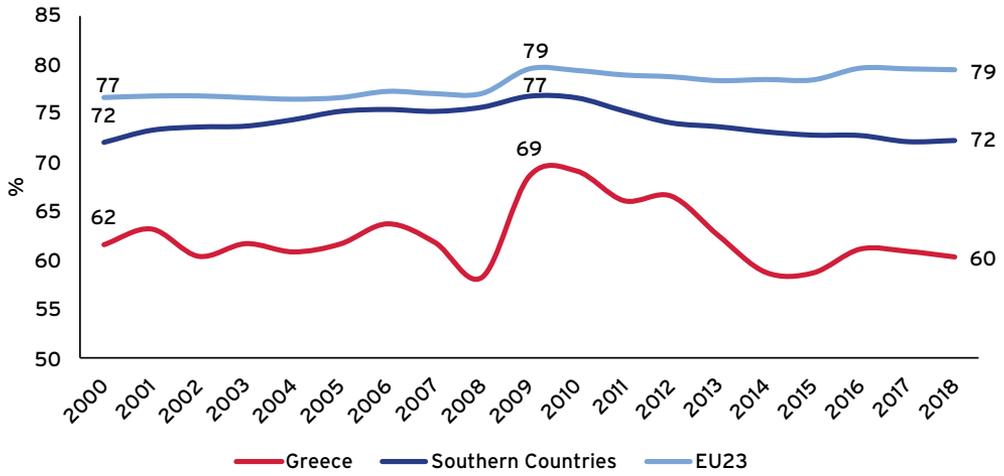
4.4.1 Indicators

Public and private spending

The Greek healthcare system differs from most European ones in its public-versus-private spending mix (Figure 4.14). The share of public spending (taxation and social insurance) is relatively low (60%). The share of private spending is correspondingly high (40%).

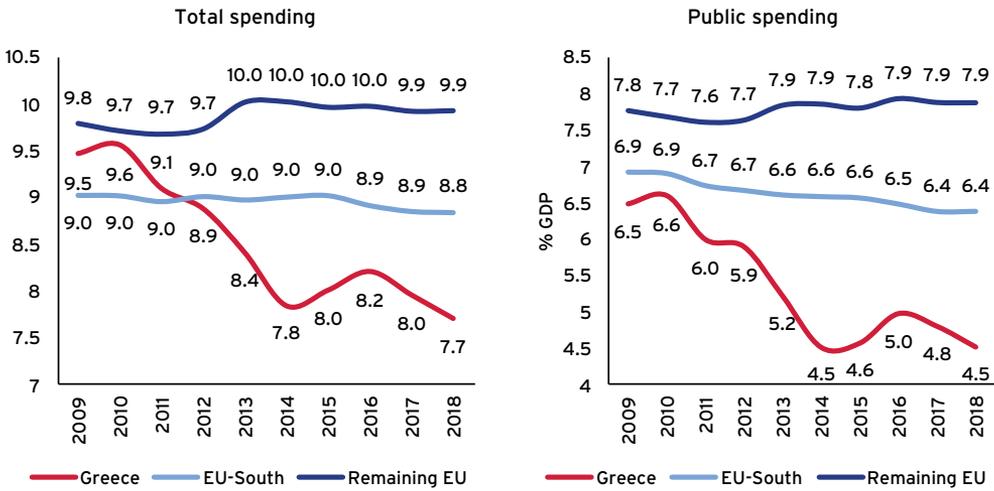
The crisis of the previous decade significantly reduced public spending in healthcare. Total spending in healthcare (public and private) was 7.7% of GDP in 2018 compared to 9.9% in the EU. Public spending was 4.5% compared to 7.9% in the EU (Figure 4.15). Total spending in healthcare per capita in Greece was €1,327 in 2018, down from €2,027 in 2009 – a drop of 34.5%. Public spending per capita was €779 in 2018, having dropped by 43.9% from its 2009 level.

FIGURE 4.14 PUBLIC SPENDING IN HEALTHCARE IN GREECE THE EU23 AND SOUTHERN EUROPEAN COUNTRIES (% OF TOTAL)



Note: Southern countries = Italy, Spain, Portugal.
 Source: OECD Health Statistics, 2019; data processing by IOBE.

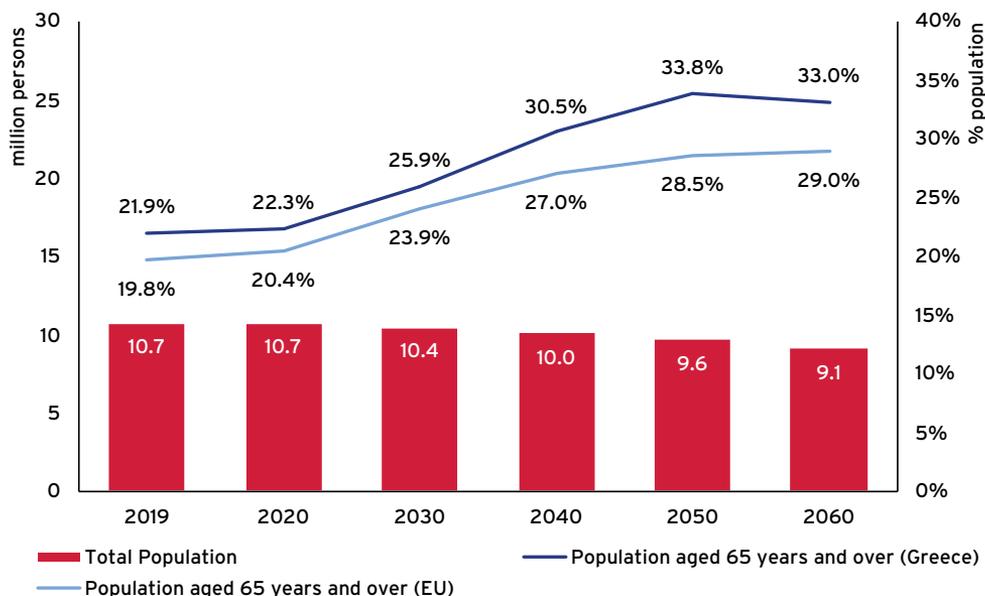
FIGURE 4.15 SPENDING IN HEALTHCARE IN GREECE THE EU23 AND SOUTHERN EUROPEAN COUNTRIES (% OF GDP)



Note: Southern countries = Italy, Spain, Portugal. EU23 does not include Bulgaria, Croatia, Cyprus, Romania and Malta, for which data are unavailable.
 Sources: Health Accounts System (HBS), ELSTAT 2019; Eurostat, OECD Health Statistics 2019; data processing by IOBE.

The Greek healthcare system faces additional challenges in the medium term (SEV, 2020). These include the negative growth of the population (deaths exceed births), population ageing (21.9% of the population were aged 65 or over in 2018, and this is projected to rise to 36.5% in 2050), the increase in life expectancy (81.4 years in Greece in 2017, higher than the EU average of 80.9 years), and the increase in the number of patients suffering from severe or chronic illnesses. Other European countries face similar pressures (Figure 4.16).

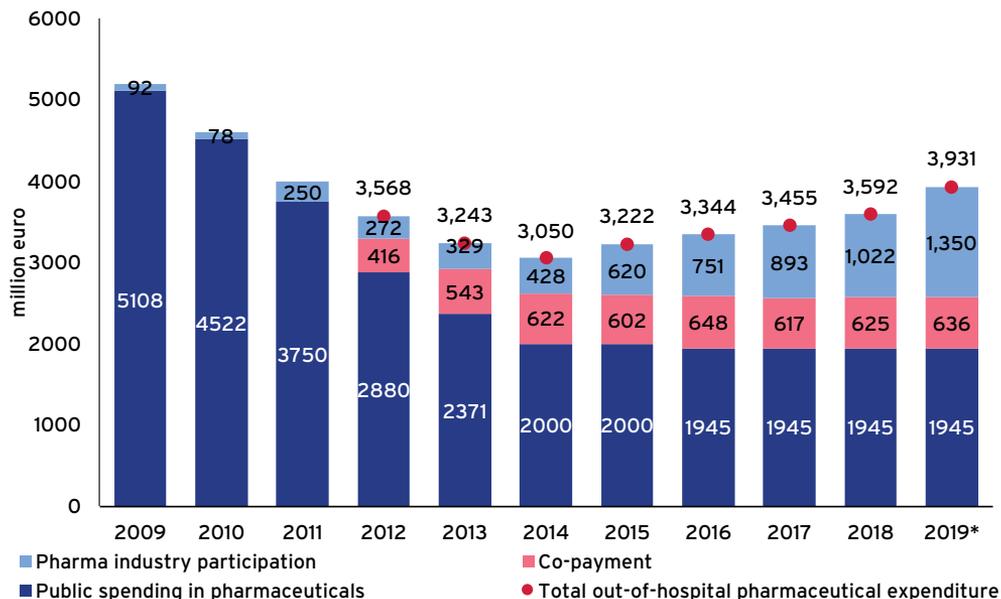
FIGURE 4.16 POPULATION OVER 65 IN GREECE AND THE EU (% OF TOTAL POPULATION)



Source: Eurostat, Population Projections 2019; data processing by IOBE.

During the crisis decade, public spending in pharmaceuticals declined sharply: public out-of-hospital spending in pharmaceuticals dropped by 62%. A large fraction of the cost was passed on to patients, as well as to the pharmaceutical industry through clawback-and-rebates mechanisms. Public in-hospital spending in pharmaceuticals experienced a similar large drop. Figure 4.17 describes some of these trends. As we explain later in this chapter, the current system is not sustainable and requires prompt readjustment.

FIGURE 4.17 TOTAL PUBLIC AND PRIVATE OUT-OF-HOSPITAL SPENDING IN PHARMACEUTICALS



Note: No data on patient participation are available for 2009-2011. Although pharmaceutical companies sell at producer prices, the clawback is calculated at retail prices. For 2019, clawback and rebates are estimates.

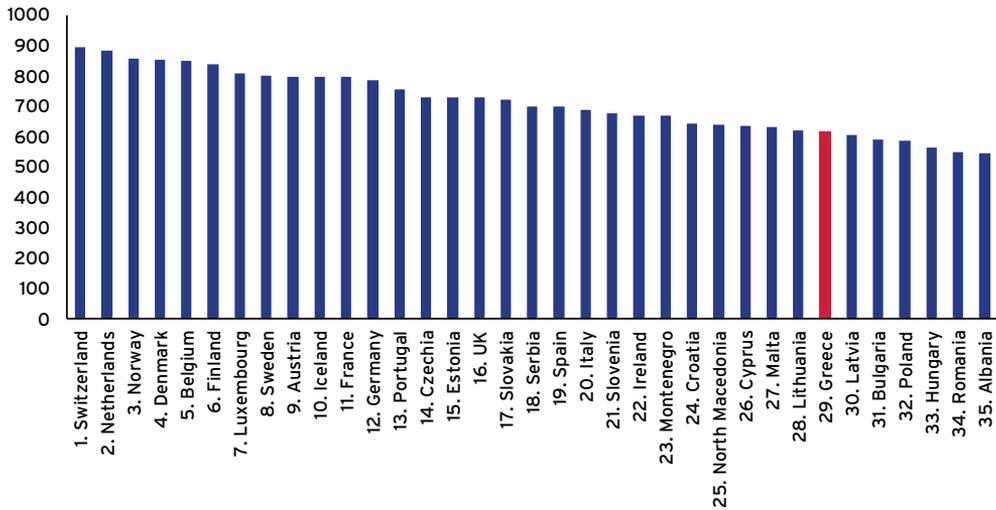
Source: EOPPY, Budget Reports; SFEE; data processing by IOBE.

Operational characteristics

According to the Euro Health Consumer Index (ECHI), which evaluates healthcare systems in 35 countries, Greece ranked 29th in 2018 with 615 points (1,000 points being the highest score), down from 22nd in 2012 (Figure 4.18). It scored highly in the areas of immediate access to doctors, reduced deaths due to strokes, child immunisation, reduced incidence of hypertension, and moderate alcohol consumption. It earned low scores in the areas of information and patient rights, family doctors, waiting lists for cancer patients, transplants, under-the-table payments, smoking, lack of exercise, road accident mortality, delayed introduction of new drugs, and high consumption of antibiotics (Health Consumer Powerhouse, 2018).

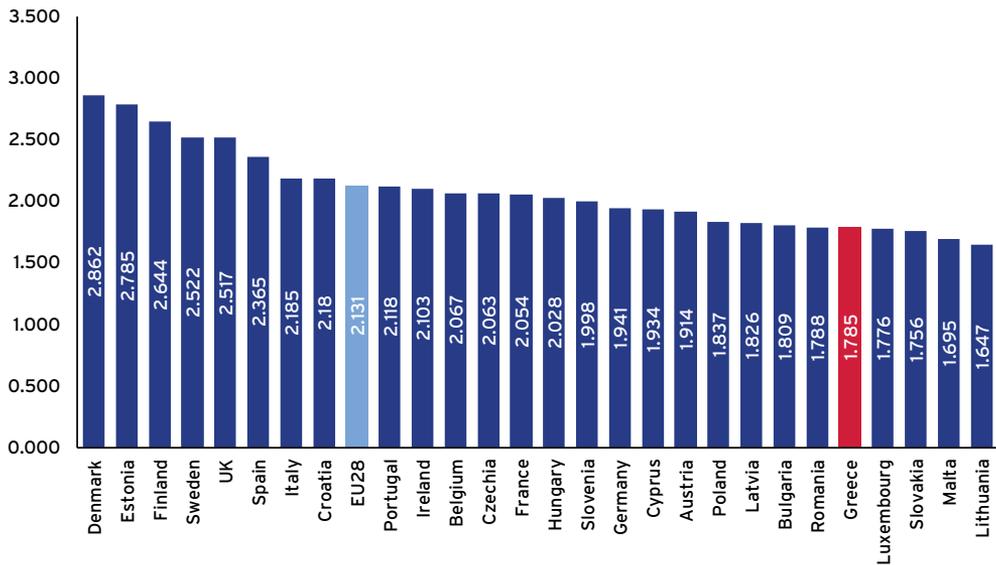
A 2018 European Commission study (from DG Connect) that focuses on the adoption and use of digital technology (e-Health) by general practitioners (GPs) in primary healthcare (eHealth adoption Index) provides useful additional information on the performance of the Greek healthcare system (European Commission, 2018c). The study examines performance in four areas: (a) the use of electronic health records (EHRs), (b) the adoption of a health information exchange, (c) the adoption of tele-medicine, and (d) the adoption of personal health records. Based on the performance in each area, a comprehensive index for the adoption of digital healthcare is created. Greece ranks 23rd within 27 EU countries, with 1,785 points (Figure 4.19).

FIGURE 4.18 EVALUATION OF HEALTH SYSTEMS IN 35 EUROPEAN COUNTRIES, 2018



Source: Euro Health Consumer Index (ECHI).

FIGURE 4.19 ADOPTION AND USE OF DIGITAL TECHNOLOGY (E-HEALTH) BY GPs IN 27 EU COUNTRIES



Source: European Commission.

Pharmaceuticals are an important industry sector of the Greek economy. Its production is sizeable and concerns mainly generic medicines (approximately €1 billion in 2018). Its added value was €560 million, or 3.4% of manufacturing, in 2017. Its exports are on an upward trajectory (total of €1.9 billion in 2019, including parallel exports). It employs a significant number of workers (approximately 21,200 in 2019), many of whom are highly skilled (60.6% of workers are university graduates, and approximately 800

highly specialised scientists are employed in R&D departments). The industry's R&D expenditure in 2017 (€51 million) corresponded to 5% of total R&D expenditure in Greece, and the share of pharmaceutical patents in Greece is higher than the EU average (IOBE and SFEE, 2020). The pharmaceutical market in Greece: Facts and Figures 2019. The Greek pharmaceutical sector faces challenges pertaining to international competition and to the readjustment of production and distribution networks.

4.4.2 Barriers

The Greek healthcare system has significant pathologies, pertaining primarily to the misallocation of physical and human resources, and to a lesser extent to insufficient financing and staffing. The main problems are:

- **Lack of mechanisms to monitor and evaluate performance.** Greece does not produce internationally comparable data covering key dimensions of performance in healthcare, such as avoidable hospitalisations and in-hospital mortality for certain diseases (OECD and European Observatory for Healthcare Systems and Health Policies, 2019).
- **Shortages and misallocation of medical personnel.** Greece differs from other EU countries in the composition of its medical personnel. It has the largest number of doctors per inhabitant (6.1 per 1,000 inhabitants) and the smallest number of nurses (3.4 per 1,000 inhabitants) in the EU (2018 data). The distribution of medical personnel across healthcare units is also uneven. There is a chronic concentration of doctors in large cities such as Athens and Thessaloniki, and doctor shortages in rural areas. During the crisis decade, many doctors and nurses emigrated (Zilidis et al., 2015).
- **Lack of an organised primary healthcare (PHC) system.** PHC is fragmented: it is provided through health centres in rural areas, and through the National Primary Healthcare Network (ΠΕΔΥ) units and Local Health Units (ToMY) in urban areas. In urban areas, many private practitioners also operate. Services integrated in municipalities and other organisations have also been developed. A model on the basis of which all PHC services and providers can coexist and cooperate has not been developed yet. PHC services lack institutionalised and certified interconnections with secondary and tertiary healthcare, with mental healthcare and with public healthcare. Referrals take place without protocols and information flows are usually one-way only (Dianeosis, 2020).
- **Lack of out-of-hospital care** (home-based care, one-day clinics, rehabilitation centres, units for patients with chronic ailments). Long-term care entails the provision of healthcare and social services to individuals who, due to physical or mental disabilities, need help from others to perform basic routines. These individuals should have access to continuous care through post-hospital services,

such as long-term care, palliative care, rehabilitation and home-based care. Through these services, patients would not take up hospital beds, which can then be allocated to others with urgent needs. This is an important problem currently (Dianeosis, 2020).

- **Limited use of e-health and adoption of digital technologies.** Greece lags behind in the use of new technologies such as digital patient medical records, treatment protocols, patient registries, and telemedicine, teleconsultation and telemonitoring services (SEV and Deloitte, 2020). The e-prescription system that has been implemented is an important step forward.
- **Large shadow economy and informal payments.** Informal payments for healthcare are estimated to approximately one fourth of total out-of-pocket payments. They jeopardise access and equity in healthcare. According to a recent WHO study, most informal payments are made by patients who want to ensure faster or better care, or result from demands by doctors and lack of knowledge of patient rights, especially by patients who are poorer or reside in rural areas (WHO Regional Office for Europe, 2018).
- **Composition and monitoring of spending in pharmaceuticals.** During the crisis decade, public out-of-hospital spending in pharmaceuticals dropped by 62%. The cost was passed on to patients, as well as to the pharmaceutical industry through clawback-and-rebates mechanisms. Based on 2019 data, out-of-hospital spending in pharmaceuticals reached €3.9 billion, with the contribution of the pharmaceutical industry estimated at €1.35 billion and the contribution of patients estimated at €636 million. The contribution of the pharmaceutical industry to in-hospital spending is even higher: in-hospital spending is estimated at just above €1 billion, and the contribution of the pharmaceutical industry is estimated at 48%. Cutting down on public spending in pharmaceuticals during the fiscal adjustment programmes was sensible and contributed significantly to the overall fiscal consolidation. Under the current system, however, incentives are distorted: because spending is cut uniformly (horizontally) across the board, there is less pressure to reduce spending in a more targeted manner. In particular, drugs are often prescribed unnecessarily, incentives for greater use of generics are weak (Greece lags significantly behind the EU in that area), and new therapies that tend to be costlier but more effective are discouraged (IOBE and SFEE, 2020).
- **Barriers to investment in the pharmaceutical sector.** Firms may be hesitant to invest in the pharmaceutical sector because of frequent changes to its regulatory and legislative framework. The business environment is not sufficiently favourable. In particular, there are no financial incentives for R&D, and no systematic collaboration between research centres and universities with the pharmaceutical industry.

4.4.3 Policy recommendations

The healthcare sector should be radically restructured so that it can develop better and fulfil its social role more successfully. Priority should be given to the system of monitoring and evaluating medical actions and spending, as this is an area where Greece lags significantly behind other EU countries. Public hospitals do not function efficiently, and are also overburdened due to the inadequacies in the areas of disease prevention and primary healthcare. Hospitals should enjoy more autonomy and operate more transparently. Wasteful spending in pharmaceuticals has been reduced, but in an unsustainable manner, and changes are needed to the relevant rules. The pharmaceutical sector can attract larger-scale activities in R&D and clinical trials. The main priorities for restructuring the Greek healthcare system are:

Modernise and upgrade the hospitals

- Make public hospitals more autonomous administratively and financially. Public hospitals should enter into arm's-length service provision contracts with the National Organization for the Provision of Health Services (EOPYY).
- Strengthen the system of monitoring and evaluating hospitals and other healthcare units.²³
- Rationalise public procurement of pharmaceuticals and medical supplies.
- Rationalise the allocation of doctors and nurses in hospitals and health centres across the country. Provide incentives to doctors to staff health units in islands and remote areas where needs are high.
- Improve the cooperation between the public and the private healthcare sector via, for example, service provision contracts with private clinics, contracts for managing or leasing medical equipment, and concession contracts.

Strengthen primary healthcare (PHC)

- Establish a comprehensive and interconnected PHC system. The system should cover healthcare needs across the population in a universal and equitable manner. It should promote good health and disease prevention, so that patient visits in hospitals can be reduced.
- Direct more funding to the areas of disease prevention and immunisation.

23 The implementation of a diagnosis-related group (DRG) system is an important step in this direction.

Digitalise the healthcare sector

- Establish a system of patients' electronic health records as a matter of priority. EHRs will facilitate patients' access to the healthcare system, improve transparency, and will be beneficial to diagnosis and emergency care procedures.
- Smart health and smart hospitals (cost reduction and efficiency optimisation).
- Telemedicine (patient care using information and communications technology). Remote diagnosis services for emergencies.
- Expand the e-prescription system in hospitals.
- Upgrade digital systems in hospitals and other healthcare units. Improve the sharing of health information between the ICT systems of all healthcare units in the country (public and private).
- Develop a hospital e-procurement system. Digitalising procurement procedures, especially in public hospitals, would render the system more transparent, monitorable and efficient.
- Use large databases and real world evidence data (for targeting and provision of individualized products and medicines).

Pharmaceutical policy: Incentives for investment and R&D

- Pricing, evaluation, negotiation, prescription, and production strategies should aim at ensuring that patients can access innovative drugs and therapies.
- Improve the market share of generics by providing incentives to all parties involved in the decision chain. The market share of generics should increase gradually but steadily over time. Prices should decrease, possibly through dynamic pricing policies that incorporate incentives.
- Rationalise spending in pharmaceuticals, with incentives such as joint participation of the parties involved or a ceiling on the parties' share of the cost. Implement protocols for drug prescription. Such protocols are the only sustainable solution to lower spending.
- Link clawbacks and rebates to measures of innovation, R&D, investment and clinical trials undertaken by firms.
- Provide tax incentives to support production and R&D investments in the pharmaceutical sector (IOBE and PEF 2020).
- Provide incentives for the development of clinical research, pharmaceutical innovation and drug licensing.

- Facilitate the cooperation of universities and research centres with the pharmaceutical sector for carrying out clinical trials. This would be beneficial for patients, for the pharmaceutical sector and for public revenue.

4.5 SPATIAL PLANNING

Sound spatial planning and land registry systems contribute significantly to a country's economic growth and its ability to protect its natural environment. Ambiguity over land ownership and land usage deters firms from investing as they risk court disputes over the land they have acquired or their right to develop the land as they intended. Ambiguity also jeopardises the natural environment, as land risks being developed in an unstructured manner and industrial or tourist developments can take place in environmentally sensitive areas.

4.5.1 Indicators

Greece lags significantly behind other European countries on spatial planning and land registry systems. It ranked 156th out of 187 countries in the Registering Property index in the 2020 World Bank Doing Business Report. The Registering Property index measures the complexity of the procedures required to purchase land, and the quality of the land management and land registry systems.

An additional indication of Greece's backwardness on spatial planning is that land uses have been defined for less than half of the country's territory. In 2016, General Zoning Plans (ΓΠΣ-GPS) or Open City Spatial and Residential Organization Plans (SHOOAP) had been approved for only 16% of the country's municipalities. Such plans were being prepared for 31% of municipalities, while for the remaining 53% the procedure had not even started.²⁴ By contrast, most Western European countries have defined land uses for their entire territory.

GPSs, and more recently Local Zoning Plans (TPS), define which areas are residential (with an existing or a foreseen residential development), which areas are earmarked for business use (industrial parks, etc), which areas are protected (building activity is restricted or even prohibited – e.g., forest areas), and which areas can accommodate a combination of activities (so that land uses can be rationally distributed and interconnected). Without spatial planning, residential and business development can take place in an unstructured manner, for example residential development in areas that might otherwise be characterised as protected, or business development in areas

24 The data come from a study by Vezyriannidou cited at <https://www.kathimerini.gr/economy/local/888402/choris-poleodomiko-schediasmo-i-misi-ellada/> (in Greek)

that might otherwise be characterised as residential or protected. In 2012, 66% of Greek firms were located in areas where land uses had not yet been defined, 21% were located in residential areas, and only 13% were located in areas earmarked for business use (KEE, 2019).

Spatial planning in Greece suffers from additional problems besides the lack of GPSs for a large part of the country. In areas where GPSs have been approved, planning for future residential needs has often been unrealistic. Furthermore, in areas with approved GPSs, the completion of follow-up urban planning studies takes place at such a slow pace that studies only rarely reach the approval stage.

Registering land is also problematic. Greece is the only country in the EU not to have a national land registry for its whole territory. There is also no forest registry (forest maps) for the whole territory. Both the national land registry and the forest registry are being prepared, and significant progress has been achieved in some areas.

The lack of a comprehensive land registry is closely related to the lack of comprehensive spatial planning. For example, it is easier to define an area as a forest when it belongs to the state than when its ownership is disputed between the state and private individuals.

Greece's problems with spatial planning and land registry systems have historical origins. They are also difficult to solve. When, for example, an area is defined as protected, land in that area declines in value, triggering protests by landowners. The problems have persisted over time, with negative consequences for economic growth and environmental protection. Ambiguity about land uses and property rights also provides fertile ground for corruption within the public agencies dealing with these issues.

Spatial planning in Greece focuses primarily on resolving problems bequeathed from the past. For example, some spatial planning laws enacted during the crisis decade concerned the legalisation of buildings without permits that were constructed over past decades. The existence of such buildings, or even of entire settlements, is also a major reason why the preparation of forest maps is taking so long. Dealing with these problems diverts time and resources away from planning ahead to address new challenges for cities and rural areas. Such challenges include climate change, natural disasters and natural resource management.

4.5.2 Barriers and policy recommendations

The completion of the land registry and of the forest registry in the next few years should be an important policy priority. The land registry should be interconnected and interoperable with other services related to real estate property, such as transfers, leases, taxation, licensing, public utilities, environmental audits and the provision of public data.

An equally important priority should be to define land uses across the entire country. The preparation and approval of TPSs should move ahead rapidly.

In the short term, and until all TPSs are approved, unregulated construction should be kept in check. Legislative initiatives to limit construction to only within designated areas are important in that regard. Emphasis should also be given to completing and approving existing urban planning studies, especially in areas where residential pressures are significant.

Legislative initiatives to limit construction to within designated areas could be accompanied by positive incentives. For example, firms choose not to locate in some industrial or business parks because the infrastructure that is offered is low-quality or the rents are high. More attention should be paid to these factors (in addition to the negative incentives to build outside designated areas), so that locating within industrial or business parks becomes a more attractive option for firms.

The preparation of TPSs requires the participation of local governments. Municipalities should have a say in the definition of land uses in their area, as they know the local needs and conditions better. The preparation of TPSs should be undertaken by municipalities themselves, with the central administration providing directions to ensure that the TPSs are compatible with each other and with national strategies, and regional governments providing more specialised directions. This model is being followed, with minor variations, in many European countries including France and the United Kingdom.

While Greece has adopted a similar model, its operation in practice has been problematic. Many municipalities do not have the technical know-how and the funds required to prepare TPSs. They are also under pressure from landowners who may be affected by changes in land uses. The limited progress achieved in preparing TPSs is largely due to these factors (Vezyriannidou and Lalenis, 2018).

The central administration should recognise the importance of preparing TPSs for the entire country and should accelerate the process as follows. First, it should strengthen the municipalities' abilities and incentives to draft TPSs, by offering them more resources and know-how. This issue is related to the broader issue of administrative decentralisation, taken up in Section 4.1. The central government could further improve incentives by offering bonuses to municipalities that complete the preparation of TPSs more quickly. Public consultation procedures in the preparation of TPSs should also become more substantive and occur at early stages of the process.

The central administration could accelerate the preparation of TPSs by also performing its strategic and coordinating role better. It should set clear rules and directions for spatial planning that do not change frequently, as has been the case until now. Rules and directions could be codified in user-friendly manuals. The central administration should also set out a single methodology and standards for drafting TPSs. It should monitor the preparation process closely, so that delays are minimised.

Most of the above conditions are not fulfilled currently. For example, legislation on spatial planning and urban planning has been modified at least four times over the last decade, and legislation on forests has been modified five times. The problems of legal complexity are analysed in more depth in Section 4.1, where policy proposals are presented.

The strategic role of the central administration should include high-level planning. For example, rules and directions for drafting TPSs by municipalities with a developed tourism sector should be compatible with strategic directions for the development of the country's tourism sector. As noted in Section 6.2, such directions are generally absent.

An instrument for spatial planning that is increasingly being used are Special Zoning Plans (EPSs), which pertain to a specific investment project. The approval of an investment project through an EPS offers security to the investing firm as it protects it from future court disputes, and contributes to the rational management of land uses in the region where the project is located. The compatibility between EPSs and TPSs should be ensured with specific directions and guidelines, so that continuous and re-emerging contradictions between plans are avoided. EPSs are a useful tool for attracting investment, but they cannot by themselves replace the integrated land planning inherent in TPSs. They should be used as a solution applied only to important investments and in selected areas. The conditions for planning through EPSs should be specified more thoroughly.

Access of citizens and firms to spatial planning and environmental data is inadequate. Access should be made easier, and all data made available should be originating from scientific studies. This would facilitate the execution of investment projects by firms and individuals (e.g., residential purchases). For example, a firm would be able to prepare an environmental impact assessment study more easily if the required data were available on a public website. Furthermore, such a study would be approved faster by the public administration, without legal risks.

The issue of inadequate public access to spatial planning and environmental data is related to that of inadequate public consultation procedures. Public consultations on spatial planning and environmental matters often amount to only uploading a plan on various websites, without adequately justifying the proposed measures and without providing sufficient information to the public, including making available the comments that are submitted. Establishing open and meaningful consultation procedures would enhance public oversight on environmental matters, providing a counterweight to powerful business interests.

A final important issue concerns environmental inspections. Inspections for compliance with environmental legislation ensure that the natural environment is protected and that laws apply equally to all individuals and firms. Violations of environmental legislation are commonplace in Greece, as evidenced by the country's many convictions by European

bodies. Ambiguity over land uses is one important reason why environmental violations are commonplace. At the same time, compliance mechanisms should become stronger. The Environmental Inspectorate, founded in 2001, should be given more resources and greater institutional independence.

The Environmental Inspectorate, renamed as the Body of Inspectors and Auditors of the Ministry of Environment and Energy, should no longer be an internal agency within the Ministry. It should become an independent authority and absorb the regional inspectorates. Independent authorities in charge of environmental protection and compliance exist in most European countries. In the United Kingdom, for example, the Environment Agency has approximately 10,600 employees. In Greece, by contrast, 17 inspectors were employed in 2015 at the Environmental Inspectorate at the Ministry of Environment and Energy, and an additional 224 employees were at the regional inspectorates.²⁵ Due to understaffing, the number of environmental inspections has dropped sharply over the past decade. The Environmental Inspectorate has also been downgraded from a special to an ordinary administrative unit within the Ministry of Environment and Energy, and does not have the power to impose sanctions. The imbalance between the resources and power of the Environmental Inspectorate on the one hand, and the importance of the tasks that it must perform on the other, especially during a period when environmental issues are at the forefront globally, is striking.

4.6 TAXATION

4.6.1 Indicators

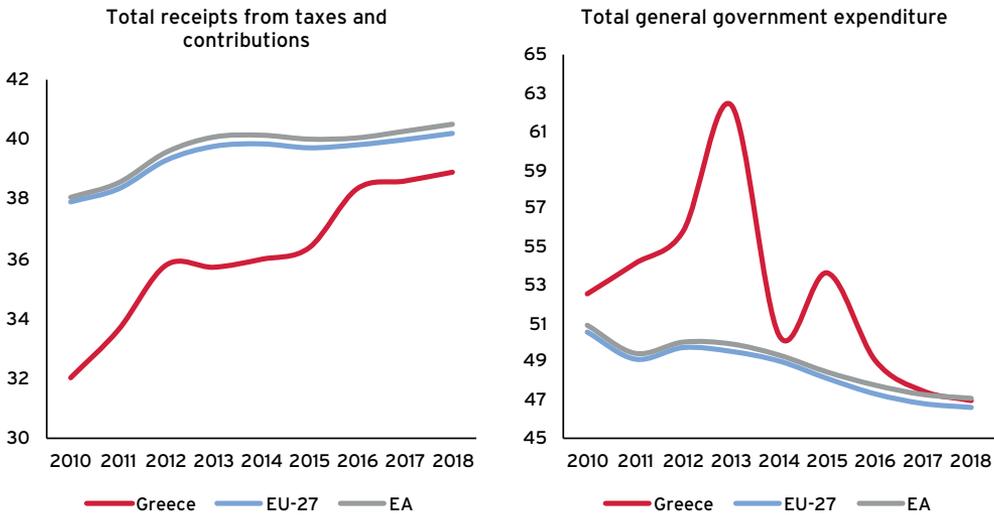
Aiming to achieve fiscal balance, public revenue from taxes and levies gradually increased from 32% in 2010 to 38.9% of GDP (according to the latest data from the European Commission for 2018). This corresponds approximately to the average of the euro area economies (40.5%; see Figure 4.20 and Table 4.1).²⁶ General government expenditure decreased to 46.9% of GDP in 2018 from 52.5% in 2009 (the euro area average was 47% of GDP).

Compared to the euro area average, Greece lags behind in direct tax revenue (10.2% versus 13.3% of GDP) but has disproportionately high revenue from indirect taxes (17.1% versus 9.9% of GDP). The tax rates are higher in labour (indirect tax rate 43.2% versus 38.6%), real estate and energy products (Table 4.1).

25 Data on the United Kingdom are available at <https://www.gov.uk/government/organisations/environment-agency/about>. The actual number of inspectors is smaller than 10,600 as the Environment Agency performs additional tasks to inspections.

26 The latest (2019) Eurostat data for total revenue from taxes and contributions (which are not available in detail for each category) are slightly different.

FIGURE 4.20 REVENUE FROM TAXES & CONTRIBUTIONS AND GENERAL GOVERNMENT EXPENDITURE, 2010-2018 (% OF GDP)



Source: European Commission, DG Taxation.

TABLE 4.1 TAXES AND CONTRIBUTIONS(% OF GDP)

	Greece	Euro area average	Euro area ranking	Reference year
Total taxes and contributions	38.9%	40.5%	8th	2018
Direct taxes	10.2%	13.3%	11th	2018
Indirect taxes	17.1%	9.9%	1st	2018
Social security contributions	11.6%	14.1%	12th	2018
Real estate taxes (recurrent)	2.6%	1.3%	2nd	2018

Source: European Commission - DG Taxation

4.6.2 Barriers

Informal economy and tax evasion

The tax revenue structure reflects and reproduces chronic difficulties of the Greek economy: a large informal economy (‘shadow economy’), a high number of self-employed persons, low productivity and value added, high dependence on consumption, and a low percentage of economically active population. The high marginal tax rates on labour (for higher pay) are the result of an attempt to raise revenue from a small tax base. This perpetuates the problem by causing disincentives for participation in the formal economy. As a result, despite such high tax rates, the corresponding revenue is low.

TABLE 4.2 INDIRECT TAX RATES

	Greece	Euro area average	Euro area ranking	Reference year
Consumption taxes	17.6%	16.8%	14th	2018
Labour taxes	43.2%	38.6%	2nd (Slovakia was 1st)	2018
Taxes on energy products (€ per tonne of oil equivalent)	335.4	271.5	2nd (Italy was 1st)	2018

Source: European Commission, DG Taxation.

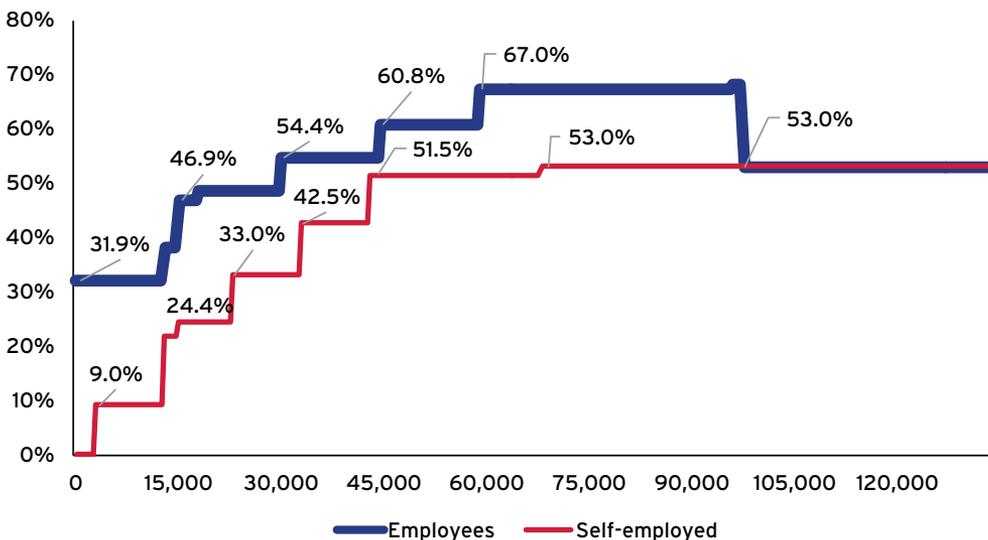
Although the direct tax revenue is propped up significantly by the property tax (ENFIA), it is much lower than in the rest of the euro area, which is an indication of a high rate of undeclared income and tax evasion. The complexity of the tax system contributes to tax evasion, despite the efforts at simplification made over the last decade. The people's trust in the tax system and administration remains low.

Tax evasion extends to indirect taxes. Many services that carry a higher rate of VAT are supplied in the informal economy and are not recorded. Greece has the second highest VAT gap in the EU, at 33.6% of the total tax liability (VAT total tax liability).

Excessive taxation of labour

The income tax base is limited and overly focused on salaried work, which results in the tax burden being disproportionately large for a small part of the population. Figure 4.21 shows the marginal burden on labour from taxes and levies, including the solidarity levy, as a function of the total wage bill.

FIGURE 4.21 MARGINAL RATE OF TAXES AND CONTRIBUTIONS



Source: Research team calculations.

Marginal rates are high and the schedule is very progressive – starting at 31.9% for salaried workers, with middle incomes being taxed on the margin at 46.9%. The overall burden is higher for salaried work than for non-salaried work.

Indicatively, an employee who receives a net salary of €1,000 per month (i.e., €14,000 euros per year, including the usual two bonus months) costs approximately €23,000 per year to their employer. Granting the employee a net increase of €1,000 per year costs approximately €2,000 (with the remaining €1,000 going to the government). An employee who receives a net salary of €2,500 per month (i.e., €35,000 euros per year) costs €76,000 per year to the employer, and a net increase of €1,000 to this employee increases overall employer costs by €3,000.

The excessive tax burden on salaried work, especially in the middle-income range, likely has a negative impact on international competitiveness, on the retention of skilled labour in the country, and on the incentives for formal work. Employers have difficulty attracting highly skilled workers, as the costs of offering a net wage that is internationally competitive are very high. To achieve high growth rates, however, the country needs jobs in high-skilled sectors and related investments. In addition to the tax burden and the resulting high wage costs, the competitiveness of the manufacturing industry is further undermined by the relatively high energy costs, which are also affected by the tax structure.

4.6.3 Policy recommendations

General directions

In the medium term, the ability to reduce the total tax burden will depend on how public expenditures develop as well as on the targets for primary budget surpluses required to service public debt. These are due to be renegotiated over the coming years, under pre-agreed rules with the creditors. An additional factor is the net inflow of structural funds from the EU for the period following 2021. Section 4.9 presents proposals for attaining fiscal balance, including mild primary surpluses in the medium term, a reduction of public revenue and expenditure, and their restructuring.

In the short term, the margin for tax revenue reductions is relatively small. Although there is potential for streamlining the costs of public administration and public sector services mainly through the faster adoption of digital technologies, and significant inflow of new resources are expected from the EU, the state of public finances and the immediate needs of the public health crisis severely limit the room for manoeuvre.

By contrast, it is both feasible and urgent to restructure the composition of government revenue of taxes, so as to mitigate the distortions that limit the growth prospects of the economy. Given the current tax and social security system, as well as the structure of the Greek economy, top priority should be given to alleviating the burden on salaried work. A disproportionately large part of employment involves self-employment, informal

sectors of the economy and low-income tax-exempt work, while the burden of taxes and contributions on all but the lowest salaried income is extremely high. The cost of this distortion is significant because the informal sector is generally not export-oriented (except in the case of tourism or related trade services) and at the same time it traps a significant part of the workforce in low-productivity jobs, starving the more dynamic and export-oriented sectors of human resources.

Given the immediate importance of reducing the tax burden on labour, a reduction in taxes on consumption (VAT in particular) and property should not be a priority. The shift of the relative burden of taxation from labour to consumption should be accompanied by an increase in the support for vulnerable households. This could be achieved through benefits for low-wage workers (such as tax credits) as well as through a guaranteed but taxable minimum income. Relevant proposals are presented in Section 4.8.

Real estate taxes need to be streamlined, consolidated and gradually decentralised. The abolition of the 'supplementary tax' for private property owners would reduce severe distortions and enhance the real estate market. It is important to have a credible and independent authority to determine the fair values of real estate. It will be crucial to align these values with market values, as the current system creates large distortions.

Special environmental taxes could gradually represent a higher share of the revenue mix. The imposition of new excise taxes on fossil fuels is not considered appropriate, however, as these taxes are already high in Greece compared to the European average. Given the large burden of existing taxes, it is important that environmental taxes replace existing taxes in a transparent way or are reimbursed to taxpayers as a clear reduction in income tax. In this way, incentives to consume more environmentally friendly products would be enhanced, without an additional tax burden on households and businesses.

An important condition for maintaining tax revenues at the necessary level while boosting productive activity is to expand the tax base. The proper use of electronic transactions and other means that enhance transparency and motivate households and businesses to move to the formal rather than the informal economy would contribute to this. Targeted policies of reduced tax rates for those who comply could be applied to activities that show overall high levels of tax evasion, to limit the competitive tax advantage of those operating in the informal economy.

The rise in electronic payments has contributed to the rise in VAT receipts (Hondroyiannis and Papaoikonomou, 2017; Danchev et al., 2020). However, there is still considerable room for improvement as Greece remains very low in the ranking based on the value of card transactions as a percentage of private consumption (fourth lowest in the EU with 18.4%, compared to an EU average of 36.7% in 2018, based on data from the ECB). The current framework could be strengthened with positive incentives (i.e., by rewarding those who transact electronically) and targeted (i.e., to professions and markets where tax evasion is prevalent). If well designed, such incentives could have significant positive effects on parts of the economy that currently pay few taxes (despite

the high real incomes).²⁷ The positive effect on revenue mainly relates to VAT but also to income tax, because of the resulting increased income declarations and, to a lesser extent, social security contributions. At the same time, audits of taxpayers (ex-post, through sampling) should become better targeted and more effective.

One factor that makes it difficult to locate taxable income is the proliferation of services conducted through digital platforms (the ‘gig economy’). This is a growing problem for tax authorities worldwide. In addition to coordinating rules and policies at the EU level, Greece’s tax authorities must maintain a high level of technology and know-how to avoid further erosion of the tax base.

The expansion of the tax base requires a slow and persistent process of transformation of the Greek economy from informal to formal activities. However, the tax burden on labour must be reduced quickly to strengthen formal employment and openness. The boosting of openness and the curbing of the informal economy in favour of the formal economy are interconnected goals that could systematically support each other in the coming years.

Finally, the stability of the tax (and social security) system in the long run is particularly important, as uncertainty discourages medium- and long-term investment in physical and human capital. Frequent changes and the complexity of the rules act as barriers to attracting new businesses and to the growth of existing ones.

Specific interventions

We recommend the following set of direct and specific interventions aimed at a fairer, more productive and development-friendly distribution of the tax burden on households and businesses:

1. Further simplification of tax rates and income tax brackets. Convergence to the euro area average (adjusted to average incomes). Harmonisation of income tax and social security brackets so that income from work does not face both high tax rates and high social security contributions.
2. Continued effort to simplify the tax system, with the introduction of a dedicated office (following the example of the United Kingdom’s Office for Tax Simplification).
3. Uniform tax treatment of incomes from different sources to the fullest extent possible, to preserve the progressiveness of the tax scale.
4. Gradual transfer of ENFIA to the local level, with corresponding adjustment of transfers from the central government to the local authorities, and abolition of the supplementary property tax for individuals.

27 Relevant proposals exist in IOBE (2015; 2018c).

5. Boost of household savings with incentives for medium- and long-term investments through the Greek capital market and special investments.
6. More favourable tax treatment of business investment in mechanical equipment by shortening the ten-year tax amortisation of the current system (e.g., with accelerated depreciation within three years).
7. Removal of disincentives for the growth of small and medium-sized enterprises within the country.
8. Fixed tax framework for businesses. A ten-year non-deterioration clause of the tax framework for new investments. Introduction of a procedure for advance tax ruling through a single point of contact with the tax authority for new businesses and investments.
9. Examine the possibility of imposing environmental taxes on imports (a carbon border tax) from countries that have not adopted appropriate environmental measures, in the context of the relevant decision-making process at the EU level. Contain the tax burden of energy costs for industry (through taxes, fees, and regulated charges) at levels comparable to other EU countries.
10. Stricter and more intensive control measures to reduce the smuggling of fuel and tobacco products, by procuring appropriate equipment and know-how.
11. Enhance incentives to shrink the informal economy through rewards and targeted use of electronic payments.

4.7 SOCIAL SECURITY SYSTEM

The role that the social security system played in the dynamics leading to the crisis of the previous decade emphatically highlighted its critical importance to the country's growth prospects. The ageing population is putting further pressure on public finances, through the corresponding benefits that have to be paid. The social security system requires radical reform so that it is consistent with the demographic trends, ensuring at the same time the medium-term adequacy of pensions as well as fiscal balance. The social security system should be a growth lever and not a barrier and should support the incomes of both pensioners and workers. The funded element will need to play a central role in this direction and will be a basic part of the response to demographic pressures.

4.7.1 Indicators

The interventions to the social security system in the last decade have significantly improved its long-term sustainability. However, problems in terms of its structure remain, with a high burden on labour, low returns and limited funded options. The current structure of the social security system poses significant counterincentives for labour, savings and investments. These counterincentives will become stronger over time due to the deteriorating demographic trends.

Pension spending in Greece remains exceptionally high as a share of GDP (16.5% compared to the euro area average of 13.2%), with the country occupying the highest position in the euro area despite the successive cuts and changes introduced in the social security system since 2010. The high level of state subsidies for pensions (10.1% of GDP in 2018, versus an EU average of 3.1%) also places a burden on public finances. Combined with the high wage expenditure of the central government (11.7% versus 9.9% on average in the euro area), this means that the Greek state ends up spending the highest share of GDP (28.4%) on wages and pensions in the euro area (against 23.1% on average; see Table 4.3). The uneven distribution of expenditures results in the underfinancing of critical areas such as health, education and public investment.

TABLE 4.3 EXPENDITURE AS A PERCENTAGE OF GDP

	Greece	Euro area average	Euro area ranking	Reference year
Total expenditure	46.30%	47.10%	6th	2019
Pension spending	16.50%	13.20%	1st	2017
General government spending on salaries	11.70%	9.90%	5th	2019
Pensions and wage spending	28.40%	23.10%	1st	2017

Source: Eurostat

In this context, adjustment policies adopted in recent years have aimed at gradually decreasing pension spending as a share of GDP and at decreasing state budget subsidies as a share of its total spending. It is important that the country maintains this course in the next decade, so that public pension and wage spending as a share of GDP gradually decreases, converging to the euro area average and partly closing the gap. In this context, special attention should be drawn to the risks stemming from the current pandemic crisis and its effect on GDP trends.

4.7.2 Policy recommendations

The country's expected rapid population ageing will lead to a large increase in the dependency ratio of pensioners to the economically active population. If the social security system remains, as currently, a fully pay-as-you-go system (pensions are covered by the contributions of the active population and the state budget) and given the limited

possibilities for public borrowing, then the level of pensions should constantly decrease in relation to the level of wages, or the level of contributions and taxes should constantly increase. Increases in contributions and taxes would further decrease incentives for formal labour and would be an obstacle for productivity increases and for the economy's prospects in the global markets. Likewise, a reduction in pensions for future generations would be socially unfair and painful. It would also generate counterincentives for official labour as the payment of contributions will lead to a lower pension amount.

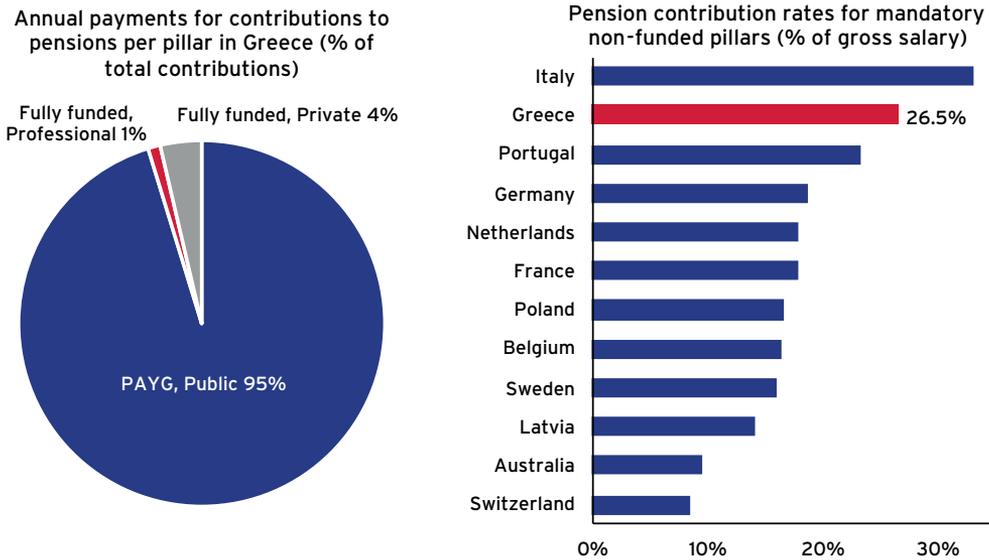
To mitigate these problems, the system's funded pillars should be strengthened so that a share of pension spending is covered by accumulated savings. It is desirable that the funded pillars act in a complementary manner to the main pillar, having a secondary but critical role. The main benefit from the shift to a partially funded system is the strengthening of incentives for additional and official employment and for household savings. Households have stronger incentives to supply labour when they are in better control of their savings and when they can anticipate a higher pension resulting from higher contributions during their work life. There are also benefits in terms of higher diversification of risk and therefore higher level of pension security over time.

The transition to a partially funded system is, of course, not a Greek innovation; on the contrary, it would bring Greece closer to the average social security system in Europe. Currently, funded pensions receive approximately just 5% of the total pension contributions in Greece (Figure 4.22). Correspondingly, total assets of funded pension schemes in Greece are close to 1% of GDP, as opposed to 50% on average for the OECD. Furthermore, the current level of mandatory contributions for main and supplementary pensions in the public distributional pillar (26.5%) is amongst the highest in Europe (Figure 4.22) and 8 percentage points higher than the OECD average.

The gradual diversion of these contributions to funded pensions schemes would have a beneficial effect on domestic savings and investments, as observed in countries with more balanced pension systems. It is estimated that a social security reform combined with targeted tax incentives for investments in the domestic capital market, based on EU best practices, would generate new investment reserves of up to €99 billion within 40 years. Strengthening savings and investments in this manner would lead to a mean annual increase in real GDP by €6.9 billion and 81,000 additional (full-time equivalent) jobs during the next 40 years (IOBE, 2019a).

The strengthening of the system's funded pillars requires a reduction in the burden from contributions directed to the distributional pillar (main and supplementary pension). Towards this direction, the current supplementary pension should be replaced by a fully funded component. Given the delay in the development of a funded pillar in the country, the supplementary pension system reform should move ahead very quickly and with an adequately wide implementation range (indicatively, for all new employees but also on a voluntary basis for older insured persons or alternatively for workers who do not exceed a certain number of years required in order to retire).

FIGURE 4.22 SHARE OF PENSION CONTRIBUTIONS BY DISTRIBUTIVE PILLAR, 2018



Sources: ELETEA, EAEE, National Actuarial Authority, OECD, National Statistical Authorities.

The reform of occupational and private insurance is particularly important and complementary to the aforementioned reform. Since the establishment and operation of occupational funds (of Law 3029/2002), the number of workers and professionals participating in occupational schemes is very limited. Besides some regulatory obstacles, a relevant significant factor was the high level of public system benefits prior to the crisis, and then the financial distress during the crisis. At the same time, the relatively more adverse tax treatment of group and individual pension programmes offered by the insurance sector poses significant obstacles to workers to secure higher pensions through this route. The need to broaden occupational and private insurance, through the establishment of wider enrolment possibilities in open occupational funds and the abolition of distortions stemming from the different tax treatment of group and individual insurance products, is urgent. In parallel to these changes, it is necessary to establish a uniform, effective and strict supervisory framework, following the model implemented in many other EU countries. The second and third pillars should be institutionally safeguarded, so that the conditions for their sound and dynamic development are fulfilled and they can meet the challenges resulting from their upgraded role as complementary pension system pillars.

The strengthening of the funded pillars will generate a funding gap, since a share of the workers' contributions will be used to cover their future pensions and not the benefits of current pensioners. The funding gap stemming from the universal transition towards a funded supplementary pension system,²⁸ without a reduction in pension benefits and

28 From the first day and for all workers without exception.

without considering positive GDP effects, is estimated at 1.3% of GDP in the first year of implementation, receding to below 0.3% of GDP over the next 40 years (IOBE, 2019a). The positive development dynamic that will result from the reduction in the non-wage labour cost and the accumulation of savings in the funded pillar will reduce the funding gap. For the coverage of the gap, solutions implemented in other countries can also be examined, such as the use of funds from privatisations and the issuance of special bonds. In any case, the funds that would be utilised would not be lost as, depending on the operational form of the new supplementary insurance scheme, the future pension obligations of the state would proportionately decrease or assets stemming from the insured persons' contributions would accumulate. It is also of critical importance that pension spending remains under control and that there is a decreasing trend in terms of both pension spending as a share of GDP as well as of the relevant financing originating from the state budget.

An issue that needs particular attention as far as pension expenditure is concerned is early retirement. This is a burden not only in terms of government spending but also in terms of economic activity, as it discourages labour market participation. The low participation rate of women over 55 can be explained, amongst other factors, by the option until recently offered to mothers of minors to retire at a young age with fewer than 20 years of social security contributions. While these rules have gradually changed since 2010, it is still possible for women to retire early if, by 2015, they had reached the required age threshold and had (limited) years of social security. Based on the changes introduced in recent years, it is expected that by 2022, early retirement options will have been abolished and a general retirement age of 67 will be in effect (or 62 with 40 years of contributions). Given the country's adverse demographic trends, exceptions to these universal rules should not be re-introduced.

It is noteworthy that even with the full transformation of the current supplementary pension system to a funded scheme, the main bulk of the pension system (almost 80% of the total) remains distributional in nature. This way, the transition cost remains manageable, while households' employment and saving incentives improve over time and a better mix is achieved in terms of the participation of the pension pillars in addressing the risks of the social security system.

In parallel to the introduction of the funded pillars, interventions in the distributional pillar are proposed so that the reciprocity and the transparency of the system increase. These interventions include:

1. Reduction in the maximum income threshold (insurable earnings ceiling) used as the base for proportional social security contributions for salaried employees, so that it converges with the EU average.

2. Replacement of the health contributions proportional to income with a flat rate or a system of few classes, as is currently in effect for self-employed workers. Alternatively, the current framework of proportional contributions could be retained but with an even lower ceiling for insurable earnings. The relevant gap could be covered by general tax revenues.
3. Readjustment of the calculation rules for contributory pensions in such a way that they are actuarially fair and better linked to the age of retirement.
4. Streamlining of the rules for the recognition of notional years of insurance.
5. Acceleration of the operational merger of the relevant systems in the social security funds, so that the issuance of pension applications takes place much faster and with automatic procedures and there is at the same time a continuous flow of information regarding workers' insurance status during their working life.

4.8 SOCIAL PROTECTION

4.8.1 Barriers

Organisation and management

The organisation and management of the social welfare system is problematic. One issue is that the system is comprised of many diverse benefits (unemployment benefit, disability benefit, guaranteed minimum income, housing benefit, heating subsidy, transportation subsidy, etc.), the management of which takes place in a fragmented manner even after the digitalisation of relevant procedures. A separate digital platform corresponds to every benefit, and they rarely interoperate at the information exchange level. This renders the inclusion of beneficiaries in the benefit programmes complex. It also renders the public audit procedures (i.e. the cross-checking of whether beneficiaries are eligible) difficult. The same applies to system evaluation, that is, whether the benefits cover the needs of vulnerable population groups.

Another problem, which is associated with the complexity of the system, is that some benefits overlap with each other, as they target the coverage of similar needs, but the criteria for different groups of individuals differ, creating inequities.²⁹

Employment incentives

The existing system does not provide adequate incentives for formal employment. For example, the payment of the Guaranteed Minimum Income (GMI), as well as of other benefits, is abruptly interrupted when income exceeds a certain threshold. (The threshold for the GMI is calculated based on family structure, and amounts to €2,400 per annum for a single-person household or €4,200 per annum for a couple with one child or for a

²⁹ For example, according to the existing system, an insured person over 67 years old can apply for the Housing Benefit and receive the amount of €70 in the case of single-person households, while an uninsured person over 65 years old can be eligible for the Benefit of Housing Assistance, which, depending on the rent amount, can reach €362.

single-parent family with two children). It is therefore often more attractive for GMI beneficiaries to keep their family income just below the threshold, either by not seeking further employment or by working additional hours informally, than to seek additional formal employment. This problem also exists in other countries, but it is particularly important in countries such as Greece where tax evasion and self-employment levels are high.

Support for persons with disabilities

A particularly high priority should be given to the support of persons with disabilities (PWDs) and their more complete integration in economic life. The EU and all its member states have committed to the improvement of the social and economic status of persons with disabilities and are signatory parties to the United Nations Convention on the Rights of Persons with Disabilities (UN CRPD). This important treaty was enacted in the EU in January 2011 and was the basis for the European Disability Strategy 2010-2020. There is a big gap in this area in Greece, despite efforts in recent years towards alignment with the European framework. Of course, the adequate support of PWDs is important on its own, constituting the state's obligation in the context of the principle of equitable treatment of all citizens. In addition, their closer integration in the economy can have a significant positive effect overall for the country and is also a prerequisite for the improved social integration of PWDs, as employment is a crucial factor towards this goal.

According to the National Observatory for Disability (2017), approximately 10% of the general population in Greece are estimated to be persons with disabilities.³⁰ In the productive ages between 20-64 years, it is estimated that 889,389 persons face some degree of disability, of which 359,244 have some severe limitation.

Greece lags behind in terms of state expenditure in support of PWDs. In the category "Sickness and Disability", it spends almost €2.8 billion, or 1.5% of GDP, compared to 2.7% of GDP in the EU on average.³¹ The most significant lag, however, is recorded in the areas of institutions and infrastructures that hinder the inclusion of PWDs in economic activities.

The employment rate of persons with severe disability in the 20-64 age group is at the extremely low level of 24.2%, which is 33.4 percentage points below the rate for the population without disability (57.6%) and 46 percentage points below the national target for employment in the Europe 2020 strategy. When those declaring that they are "unsuitable for work due to disability" are deducted from the total number of persons with serious disabilities aged 20-64, the employment rate of the category is just

30 According to the European Commission, the share of the EU population with some form of disability may be close to 20%.

31 Source: Eurostat.

31.8%. In general, from a wider perspective of analysing the relevant data, there is an employment gap between the share of employed persons with a severe disability and the corresponding employment rate for the population without disability, especially in younger productive ages.

More specifically, problems are observed with respect to accessibility (indicatively, only a small share of school and other educational buildings have adequate ramps and toilets for persons with mobility issues, access to mass transportation is difficult, very few pavements fulfil the relevant standards, and guides for assisting persons with vision impairment on the streets are installed incorrectly), with respect to the limited implementation of laws and institutional deficiencies (such as in employment procedures and the ineffective targeting in the healthcare system, where emphasis is given to the disability certification procedures instead of prevention and rehabilitation benefits) and with respect to early dropout from education and training.

4.8.2 Policy recommendations

Organisation and management

The benefit system should be radically simplified. For example, most benefits could be unified into a single one except those that have complex eligibility criteria, such as unemployment insurance, the disability benefit and a housing benefit for vulnerable debtors (Section 5.1). This unified benefit should be available to those with low household income even if working, and it should be designed in a way that either increases, or at least does not greatly decrease, work incentives. Income should be calculated based on household composition (e.g., number of children) and there should be a particular targeting of families with larger needs, such as mothers or fathers without a partner.

The structure of benefits as well as of their relationship to total household income and wealth should be made by a committee with access to individual-level survey data as well as administrative data from tax declarations.

The management of benefits should take place in a unified manner, through a single digital access portal where records are kept for every individual. The system could possibly be merged with the tax administration, managed by the tax authorities, as benefits and taxation are interrelated – they are transfers either from or to the state. In this case, all necessary eligibility criteria would be included in the individual's tax declaration, without a further application being required for the benefit. At the next step, the tax authorities would be paying the benefit, considering the tax data of the remaining members of the household. The payment of the benefit could take place every month, with the final amount determined in the final tax declaration.

Employment incentives

The design of a benefit system is hampered by the problem of verifying incomes. It is important to safeguard the system from exploitation by ineligible individuals and to ensure that it does not generate significant incentives to conceal income and for informal (undeclared) labour.

The first issue that arises is the role of the objective indicators of income (ownership of luxury cars, housing, etc.). The proper targeting of benefits should require validation of the financial status (income and wealth) of households based on such indicators, which have been used to assess income in Greece. Given the level of tax evasion in the country, we recommend the use of such broad indicators as an element for assessing benefit eligibility.

The introduction of such income indicators has the disadvantage of increasing bureaucracy and generating counterincentives for savings if the indicators also include wealth assets. The indicators should be chosen accounting for such counterincentives, but also designed to exclude obviously ineligible individuals or households. The system should also take into account the extent to which assets held by the household are liquid in practice. If they are not liquid, they should not count as a criterion for eligibility, or appropriate allowances need to be made.

The second issue is the role of the GMI. As mentioned earlier, the design of the GMI, as well as of other benefits, creates counterincentives for formal employment as payment is abruptly discontinued when income exceeds a threshold. To enhance formal employment incentives, the GMI should decline gradually as earnings increase.

The GMI could also be combined with a negative income tax system for low-wage workers. Negative tax rates for low-wage workers are implemented in countries such as the United States and the United Kingdom. For example, in the US Earning Income Tax Credit (EITC) system, depending on family composition, a worker receives up to a 40% subsidy on earnings below a certain threshold. After a range of earnings where the benefit remains unchanged, it is gradually reduced by 30 cents for each dollar of income, until it is fully eliminated. The negative taxation for low wages is an in-work benefit (an employee benefit, or EB). The system subsidises the employment of low-wage earners, and funds it by imposing a tax rate on the slightly higher income groups. The EB should be higher for families with children.

The addition of the EB to the GMI, in combination with the more gradual withdrawal of the GMI, would generate strong incentives for formal employment. Persons not working and not receiving any other income would receive the GMI. If they started working, then they would receive the GMI, as well as the EB, up to a maximum threshold. Any increase of the income above this threshold would result in the gradual reduction of the total benefit, until it is eliminated. The GMI and the EB could be integrated into a single benefit and be paid based on income assessment for tax purposes.

If the EB is introduced, then it should be paid only for formally declared salaried employment so that it partially offsets the existing counterincentives against salaried employment, but also because income from salaried employment is easier to verify. It should also be effective only in the private sector, and its level should increase based on the number of children. Regarding couples, it is appropriate that it depends on the earnings of both partners, and it should be required that both are formally declared salaried workers. This way, any possibilities of taking advantage of the system will be reduced, incentives for female labour market participation will increase, the wage discrimination against women will be offset and, finally, salaried employment will be boosted compared to self-employment.

The parameters in a system combining the GMI with the EB (GMI level, subsidy rate, maximum total benefit, percentage of gradual reduction) should be defined so that the cost of the system remains feasible. The more gradual withdrawal of the GMI, as well as the addition of the EB, will create strong employment incentives but will increase the cost of the system. However, the cost could remain within feasible levels through the rationalisation of the remaining benefits and their unification with the GMI and the EB.

Support for persons with disability

Policy measures that would more broadly improve the transparency and efficiency of the public sector and the labour market are expected to benefit vulnerable groups, like PWDs, even more than the general population. However, targeted actions are also required in order to correct specific distortions in areas such as education, professional training, employment, digital interconnection and accessibility. As a general direction, it is important that the relevant policies follow the 'social model' for disability, which also requires changes in the broader context so that it considers the special needs of persons with disabilities.

There is an urgent need to promote interventions in four main directions and to fund relevant actions wherever necessary. The first is improved targeting of benefits and other supportive measures that act as necessary 'passive' forms of support. The second is access to modern education and training programmes that will ultimately also facilitate employment in high value jobs, as 'active' policies. The third is improvement of the infrastructure for natural and digital access. The fourth is the implementation of laws against discrimination and for the provision of equal opportunities.

4.9 FISCAL BALANCE

Over the last decade, consolidation policies have turned budget deficits into surpluses. The recession caused by the COVID-19 pandemic, however, led to a budget deficit again. The policy of primary surpluses should be maintained in the future, but the surpluses should be small. At the same time, revenue and expenditure should both be gradually reduced as a percentage of (an increasing) GDP, and their composition should be changed to enhance the growth prospects of the economy.

4.9.1 Structural features of public finances and medium-term objectives before the health crisis

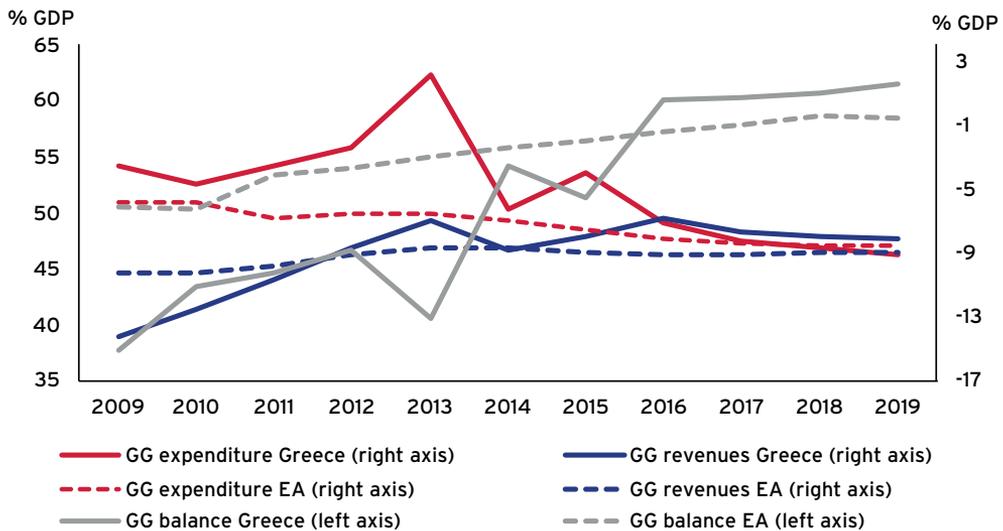
The period 2009-2019 marked a large fiscal adjustment of 16.6 percentage points of GDP (Figure 4.23). The improvement of the general government balance met the targets set in the three Economic Adjustment Programs (EAPs). Furthermore, from 2016 to 2019 there was a budget surplus.

Fiscal discipline has a positive impact on the credibility of economic policy, which is a key condition for the development of an economy in the medium term. Moreover, in Greece, the continued achievement of small fiscal surpluses, insofar as they do not have a deterrent effect on growth, is necessary for public debt to be manageable. Despite the great improvement in the fiscal balance, government debt, as a percentage of GDP, remains very high (Figure 1.5) and is projected to further increase in 2020, due to the deterioration of public finances and the severe recession caused by the COVID-19 pandemic.

Stability of the fiscal consolidation is just as important since it is closely linked to its sustainability. The stability of the fiscal adjustment is inherently dependent on its composition as it critically affects the growth of the economy (IMF, 1995). In the case of Greece, the consolidation was made using a different mix compared to the one initially planned, i.e., mainly with an increase in public revenue and to a lesser extent with a reduction of public expenditure (IMF, 2017). A sharp increase in public revenue in a process of fiscal adjustment usually comes from increases in tax rates. These put pressure on the profits and disposable income of businesses and households respectively, thus having a deterrent effect on employment and growth. These developments also affect the consolidation process.

Approximately 56% (or 9 percentage points of GDP) of the fiscal adjustment came from revenue growth and the remaining 44% (7.1% of GDP) from a reduction in public expenditure (Figure 4.23). As a result, fiscal revenue in Greece has exceeded the euro area average since 2012 (except for 2014), while domestic public expenditure remained at a slightly higher level than in the euro area until 2017.

FIGURE 4.23 REVENUE, EXPENDITURE AND GENERAL GOVERNMENT BALANCE FOR GREECE AND THE EURO AREA, 2009-2019



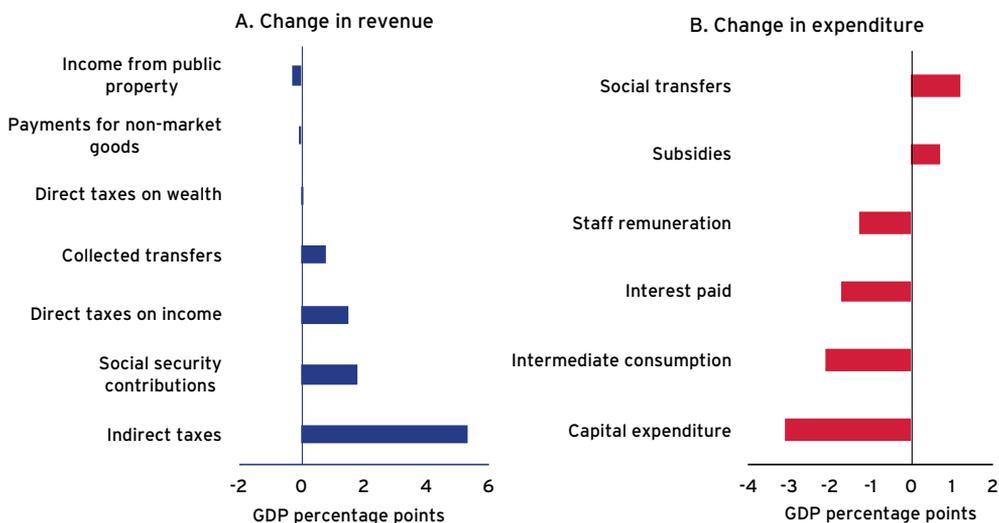
Source: Government statistics, Eurostat.

On the revenue side, 59% (5.3% of GDP) of the adjustment came from higher indirect taxes and 20% (1.8% of GDP) from an increase in social security contributions. The adjustment from higher direct taxation on businesses and households reached 1.5% of GDP (Figure 4.24, panel A). The large increase in public revenue thus came from higher indirect taxation, social security contributions and, more broadly, the tax burden on households and businesses. Revenue from other sources, such as transfers (mainly EU resources) and the management of public property, either increased slightly or declined (Figure 4.24, panel A).

On the expenditure side, most of the adjustment (43.1%, or 3.1 percentage points of GDP) came from lower investment expenditure, i.e., from the Public Investment Programme (PIP). Next in line are the reduction in intermediate consumption (29.2%, or 2.1% of GDP) and interest payments (23.6%, or 1.7% of GDP). Staff pay adjustments contributed 1.3% of GDP. In contrast, spending on social benefits, which includes pensions, increased by 1.2% of GDP, so did not contribute to the fiscal consolidation.

Overall, the reduction of public operating expenses (public consumption, staff remuneration, other current spending) reached 3.5% of GDP and was slightly higher than the cut in investment grants (3.1 percentage points of GDP). Proportionally, however, the latter category decreased much more from 2009 than the former (52.5% versus 16.1%). In addition, capital expenditure can clearly contribute more to the multiannual, rapid growth that the Greek economy needs.

FIGURE 4.24 CONTRIBUTION OF KEY REVENUE AND EXPENDITURE CATEGORIES TO FISCAL CONSOLIDATION 2010-2018



Source: Government statistics, Eurostat.

Regarding the medium-term fiscal targets, the central premise on which the baseline scenario of the Medium-Term Fiscal Strategy Framework (MTFSF) was based was the commitment under the EU enhanced surveillance to achieve a primary surplus for the general government of 3.5% of GDP by 2022. In addition, the preparation of the MTFSF is based on (i) updated evaluations of recent revenue and expenditure interventions, (ii) knowledge or sound estimates of variations that are particularly likely to occur in the coming years (alternative scenarios), and (iii) the non-planning of new fiscal interventions from 2020-2024.

Under these assumptions, the total expenditure of the state budget was expected to increase slightly in 2021-2024, up from €56.0 billion in 2020 to €57.8 billion (+3.1%). Most of the increase (75.6%) was projected to result from an increase in general government expenditure. The rest would be mainly due to higher spending in ministries related to the economic recovery effort, for investment and employment support (Ministries of Infrastructure and Transport, Development and Investment, Labour and Social Affairs).

The fiscal stimulus measures implemented in 2020 to tackle the health crisis have inevitably changed the planning of the MTFSF, nevertheless it gives an overview of the medium-term fiscal priorities. In this context, based on the February 2020 assumptions, the MTFSF aimed at a slight increase in expenditure from 2021-2024, which would have come mainly from the increase of other expenditures. Combined with keeping the benefits to employees unchanged, the operating costs of the state budget would have increased. There was no emphasis on public investment, despite the decline in previous years. Transfers would have been slightly reduced, maintaining their high ratio to GDP.

4.9.2 Policy recommendations

Based on the evolution of the fiscal balance in the last decade and the need to support a shift in the production model and to boost the growth prospects of the economy, we make the following recommendations on the set of fiscal policy priorities:

- Systematic primary surpluses contribute to public debt sustainability and the credibility of fiscal policy. The public debt trend should remain on a slight downward trajectory in the medium term.
- Budget surpluses in the long run must be small and realistic. The target should have a degree of flexibility to not adversely affect the growth trajectory.
- Public expenditure and tax revenue should increase at a lower rate than GDP in the medium term.
- The mix of public spending and taxes needs to be reordered in a way that supports the growth model of the economy.
- On the expenditure side, it is necessary to enhance the Public Investment Programme, especially in sectors with a strong growth impact. There is also a need to change priorities for employment in the public sector.
- On the revenue side, it is necessary to expand the tax base so that the tax burden can be more equitably distributed. This could be achieved through targeted incentives for electronic payments and an increase in environmental taxes, among other measures. Social security and salaried work are overburdened, so some of the tax burden should be redistributed elsewhere.
- The European recovery support measures have created fiscal space for the member states. It is crucial that Greece uses this space effectively to achieve a high growth multiplier.

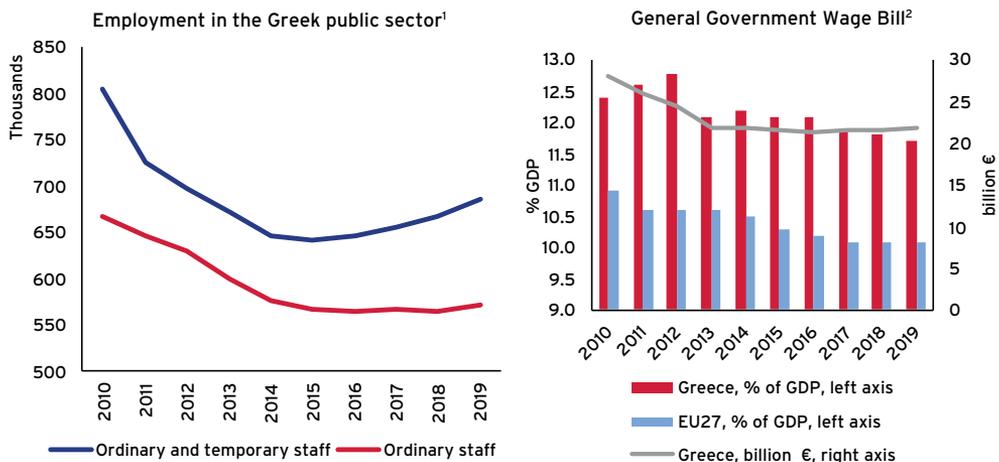
Systematic primary fiscal surpluses are required to ensure the credibility of fiscal policy and the sustainability of public debt. The surpluses should be relatively small and realistic, to avoid stifling the growth potential of the economy. Based on the international experience and the characteristics of the Greek economy, the surpluses should be in the range of 1-1.5% of GDP.

Public spending should grow at a lower rate than GDP in the medium term. This would allow a medium-term reduction of the tax burden as a percentage of GDP, which would contribute to the growth dynamics of the economy (in combination with the proposed structural reforms).

The public expenditure mix should be improved. For example, it is important to implement the already legislated gradual de-escalation of pension benefits as a percentage of GDP, as well as the already planned reduction of the state budget subsidy to pensions as a percentage of its total expenditure. In addition, it is necessary to take advantage of new technologies and accelerate the digital transformation in the public sector, a development that would allow the rationalisation of wage spending by reducing general operating costs and the need for recruitment in positions with recurring bureaucratic responsibilities. It is also important to enhance the Public Investment Programme (PIP) in a way that complements and further utilises the opportunities and funding projects arising from the National Strategic Reference Framework (NSRF) and the European Recovery Fund. Furthermore, it is necessary to increase expenditure on the healthcare system (from the budget, thus covering the loss of revenue from the proposed reduction of health contributions for salaried workers) and to improve the structure of preschool education and post-school training.

Figure 4.25 shows the evolution of employment and wage spending in the public sector in Greece in 2010-2019. Employment in the public sector decreased cumulatively by approximately 20% from 2010-2015, mainly through fiscal measures such as the rule of one hire for every five departures. However, the share of those employed in the narrow public sector out of total domestic employment decreased only slightly in that period and stood at approximately 20% in 2019. After 2015, public employment gradually increased, mainly through the recruitment of temporary staff. Respectively, the salary expenditure of the general government in Greece decreased cumulatively by 24% in 2010-2015 and by 1.1 percentage point of GDP cumulatively in 2012-2019, yet it remains higher than most European countries in relation to GDP.

FIGURE 4.25 PUBLIC SECTOR EMPLOYMENT AND WAGE BILL



Note: The data do not include employment in private legal entities of the wider public sector and are not expressed in full-time equivalents

Sources: 1 Census database of the Ministry of Interior, research team analysis. 2 Eurostat.

Wage spending in the Greek public sector is higher than the EU average. This fact, combined with the upcoming digital transformation, highlights an opportunity to save resources. A convergence of Greece to the EU average would bring annual fiscal benefits of 1.6 percentage points of GDP. This should not be achieved through horizontal cuts to the number or civil servants or reductions in their wages, but through a targeted redistribution, taking advantage of extended departures due to planned retirement. In terms of remuneration, fiscally neutral changes to the single payroll could be considered in the direction of a less compressed pay scale that would be linked to job descriptions and better reward of skilled staff. In terms of employees, future recruitment could give reduced priority to having many general duty administrators and increased priority to having fewer workers, skilled in new technologies. At the sectoral level, because of demographic trends and shortcomings in some public services, there is significant room for improvement with appropriate targeting. Specifically, it is appropriate to plan for a slowdown in recruitment and a reduced number of primary and secondary teachers, as the number of students is expected to fall significantly. That said, the recruitment of preschool teachers and healthcare staff should accelerate to meet the increased demand.

Budgetary savings could increase from the gradual reduction of the share of public pension expenditure, which is systematically higher than the EU average on an annual basis, by at least 4% of GDP. The gradual reduction should be achieved through GDP growth, following the existing mechanism for freezing pensions until 2022 and then adjusting them based on inflation and GDP, or a similar mechanism.³² The structural reform of social security proposed in Section 4.7 (gradual conversion of the supplementary pension to a fully funded scheme) would contribute to GDP growth in the medium term as it would increase the incentives for formal employment, savings and investment. The financial gap for the transition to a funded supplementary pension is manageable.

In addition, it is appropriate to focus on PIP expenditure, given its significant reduction in the last decade, which is having a significant multiplier effect on growth. A positive development is the introduction of a five-year National Development Programme. This aims to highlight the priorities of the PIP, ensure continued action and the timely implementation of reforms, and the monitoring of the results. The priorities of the PIP that stand out are 'smart' and 'green' growth, investment in human resources, and enhancement of social cohesion and exports. At the same time, it is crucial to ensure the readiness of the mechanism for the absorption of new EU funds in the context of recovery measures, to immediately start the implementation of infrastructure projects and the

32 As of 1 January 2023, pensions will increase based on a rate resulting from the average of the annual rate of change of GDP and the General Consumer Price Index (GCPI) of the previous year, with the maximum being the rate of change of the GCPI (N. 4387/2016, Par.4, Article 14).

mobilisation of resources in sectors with a multiplier effect on the growth perspective of the economy. Regarding transfer payments, it is important to increase social protection mainly by raising the efficiency of the resources involved. This process could increase the availability of resources for other social needs, such as the protection of public health.³³

Faster digitisation of the public sector would facilitate the monitoring and evaluation of the allocation of public expenditure and the effective management of human resources. In addition, it would free up resources, as it limits sources of corruption and promotes a culture of digital payments, which have a beneficial effect on tax compliance.

In addition to the tax policy proposals outlined in Chapter 4.7 (reduction of the burden on labour, simplification and stability of the tax system, etc.), revenue could also be raised from further use of public property, which might have multiplier benefits for the growth prospects of the economy. After all, this revenue did not increase during the period of the economic adjustment programmes.

These guidelines can serve as the general framework for fiscal policy in the next decade. Of course, the exact implementation will depend on several factors, such as broader fiscal policy in the EU. In the first half of the decade, EU support programmes and favourable debt service requirements are expected to create fiscal space, while in the second half good growth momentum could lead to higher incomes if the economy has improved in the next few years.

Finally, within the narrow framework of the fiscal 'space' that Greece will have in the long run, a critical factor is fiscal credibility. Credibility allows flexibility of fiscal policy in times of economic crisis and at the same time increases the effectiveness of fiscal tools with respect to the intended effects on the real economy. To reinforce credibility, it is important that at least two conditions are met. The first is that any political leadership is called upon to pursue fiscal policy based not only on short-term but also medium- to long-term results. In this regard, the supporting role of independent institutions such as the Budget Council and the Budget Office of the Parliament is crucial. Second, it is necessary to improve tax compliance. Crucial for this is the role of the state itself, which is called upon to provide a high level of services in a socially just way and to convince the public that their resources are being used effectively.

33 This report does not assess the level of national security-related expenditure, as in the field of defence.

CHAPTER 5

Barriers and policy recommendations: Markets

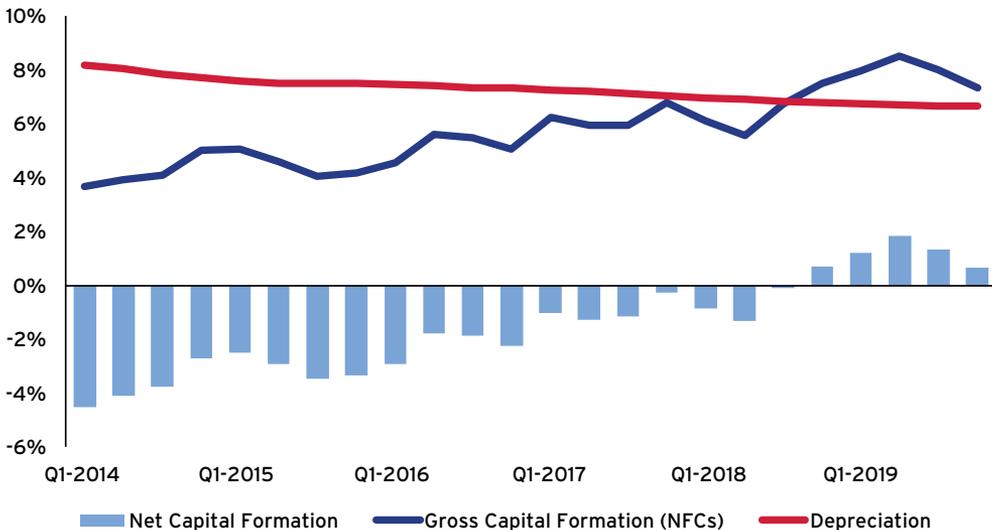
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5.1 FINANCING

Chapter 1 documents that corporate investment as percentage of GDP is significantly lower in Greece than the EU average (Figure 1.11). The gap was present before the crisis, and became larger during the crisis decade due to the drop in investment-to-GDP in Greece.

During 2016-19, investment-to-GDP was gradually recovering towards its pre-crisis level. As shown in Figure 5.1, net capital formation in the corporate sector became positive in 2019, i.e., corporate investment exceeded the depreciation of capital in place.³⁴ This gradual recovery was interrupted in 2020 by the pandemic, and net capital formation became negative again. Even if the pandemic turns out to be short-lived, it will take many years for the cumulative formation of new capital to exceed the cumulative depreciation of capital in place that took place during the crisis decade.

FIGURE 5.1 GROSS AND NET CAPITAL FORMATION IN THE CORPORATE SECTOR (% OF GDP)



Note: The figures are calculated in annual terms, summing their prices over the four most recent quarterly periods.

Source: ELSTAT and Bank of Greece.

34 In contrast to Figure 1.1, Figure 5.1 includes changes in inventories into investment.

An important reason for which corporate investment is low in Greece is poor access to finance – both bond finance and especially equity finance. Poor access to finance hampers the growth of small and medium-sized firms (SMEs). Conversely, the small size of Greek firms renders them financially constrained, preventing the formation of a critical mass of large firms and the development of liquid capital markets. This vicious cycle can be broken with interventions in the financial system and in the economy more broadly.

The poor access to finance for Greek firms and the lack of liquid capital markets are reflected in the returns that Greek households earn on their savings. Compared to the EU average, Greek households hold more of their savings in real estate instead of financial and insurance products, which generally provide greater liquidity and diversification. Furthermore, compared to the EU average, a larger share of financial assets are held in bank accounts, which provide lower returns than other investment products such as bonds, shares and mutual funds. These comparisons are derived from household surveys but are also implied from the relatively small size of the insurance and investment sectors in Greece.³⁵ Deepening the Greek financial system will increase the returns for households and thus encourage saving, which has been low in recent decades.

5.1.1 Indicators

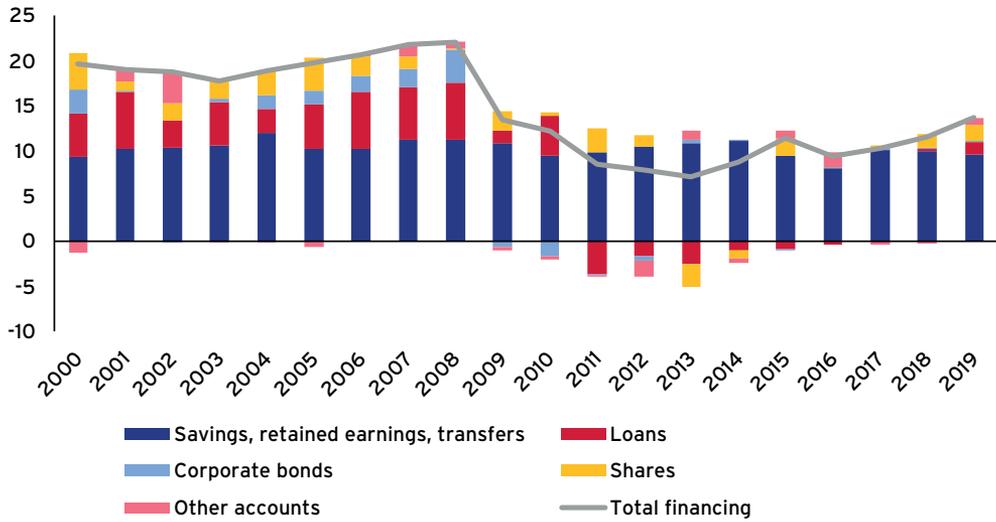
Figure 5.2 shows the financing sources of Greek non-financial corporations. Financing from internal sources, such as savings and retained earnings, has remained stable as a percentage of GDP since 2000. Financing from external sources, such as loans and shares, was almost equal to financing from internal sources in the pre-crisis period of 2000-08 but was close to zero in 2010-19, with a small recovery in 2018-19. During the crisis, Greek firms relied almost exclusively on internal funds.

Poor access to external finance is shown in a number of indicators. Greek firms pay significantly more to borrow from banks compared to other euro area countries. The average lending rate for large Greek firms in 2018 was 3.81%, compared to only 1.93% in Portugal (OECD, 2018b). Greek small and medium-sized enterprises (SMEs) suffer not only from higher interest rates compared to other countries, but also from lower credit provision. Figure 5.3 shows that compared to those in other euro area countries, Greek SMEs are more reluctant to apply for bank loans and more likely to have their loan applications rejected. The difference between Greece and the other countries in Figure 5.3 is partly due to the small size of Greek SMEs and their orientation towards the domestic market. The difference is too large, however, to be explained only by these characteristics.

35 Comparisons are based on data from the Household Finances and Consumption Survey conducted by the European Central Bank. A detailed presentation and analysis of the data can be found in Haliassos et al. (2017).

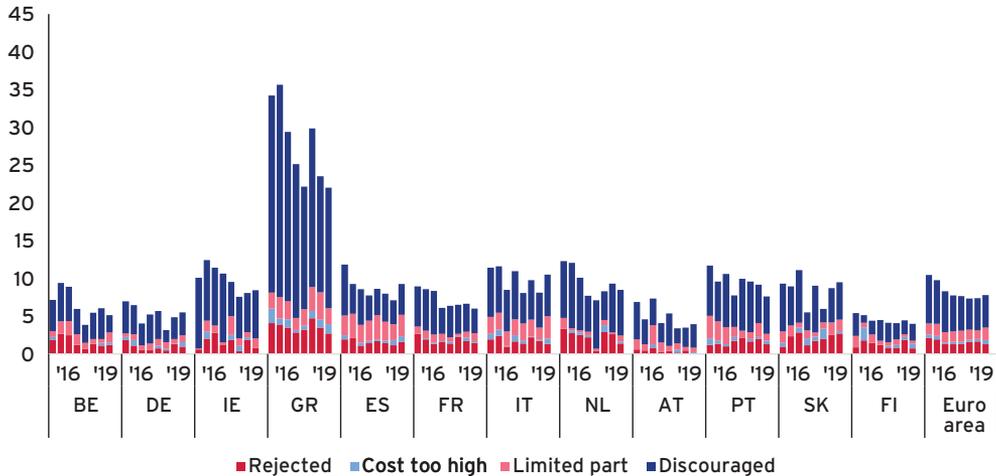
The above indicators concern bank lending. Banks are the main source of external finance for Greek firms. This is shown in Figure 5.2 (“loans” series) for the pre-crisis period, when external finance was important. The sharp drop in external finance during the crisis is largely due to the large decline in bank lending.

FIGURE 5.2 FINANCING SOURCES OF NON-FINANCIAL CORPORATIONS (% OF GDP)



Source: Bank of Greece.

FIGURE 5.3 SME ACCESS TO BANK LENDING



Note: Percentage of respondents who had difficulties in obtaining a bank loan in the previous six months.

Source: ECB Survey on the Access to Finance of Enterprises in the Euro Area, 2020.

An additional indicator of poor access to finance is the limited role that capital markets, as well as venture capital (VC) funds (investing in high-tech start-ups) and private equity (PE) funds (investing in non-listed firms), play in financing Greek firms. The limited role of capital markets, VC funds and PE funds indicates poor access to equity finance, and by extension, poor access to finance. Indeed, since firms must maintain their overall leverage (debt-to-equity ratio) below a threshold, substituting equity finance by bank lending is costly.

The limited role of capital markets in financing Greek firms is reflected in the capitalisation of the Athens Stock Exchange (ATHEX), which in 2018 stood at 18% of GDP, compared to 26% in Austria and Portugal, 51% in Israel, 59% in Belgium, and 53% in the EU.³⁶ Comparisons of daily trading volumes yield a similar picture. Also worrying is that large Greek firms abandon ATHEX to be listed on foreign stock exchanges, where they can raise capital more cheaply. This makes the ATHEX less attractive for investors, increasing the cost of capital for the remaining firms.

Involvement by VC and PE funds in SME financing in Greece is also small compared to other EU countries. VC investment was 0.013% of GDP in Greece in 2019, compared to 0.019% in Portugal, 0.020% in Austria, 0.081% in Belgium, 0.064% in the Netherlands and 0.060% in the EU. Investment by growth equity (GE) funds (investing in SMEs with good growth prospects) was 0.032% in Greece, compared to 0.040% in Portugal, 0.022% in Austria, 0.093% in Belgium, 0.088% in the Netherlands and 0.092% in the EU (Invest Europe, 2020).

5.1.2 Barriers

Banks and lending

Borrowing costs are high for Greek firms because of a combination of factors. The most important factor is non-performing loans. Measured in terms of non-performing exposure (NPE), they account for about 40% of bank loans – the highest share in the euro area (followed by Cyprus with 35%). Shares are significantly lower in the other countries. Non-performing loans discourage new lending to firms – either new lending does not take place at all, or it takes place at high interest rates.³⁷

The negative relationship between non-performing loans and new lending can be understood as follows. The true value of non-performing loans is much lower than the book value at which the loans are entered on banks' balance sheets. The book value of loans declines towards their true value over time, for example through write-offs, sales or securitisations. This generates bank losses, which in turn generate new capital needs. At the same time, raising new capital harms existing shareholders because of

³⁶ Source: World Bank ("Market capitalization of listed domestic companies as % of GDP").

³⁷ For an analysis of non-performing loans, the capital needs that they generate, and the challenges faced by the Greek banking system, see Hardouvelis (2020).

debt overhang.³⁸ Thus, banks are averse to raising new capital. With a low capitalisation ratio and no new capital, banks cannot offer new loans. This is in any case prohibited by the minimum capital requirement regulations imposed by the Single Supervisory Mechanism (SSM) and the Bank of Greece. Banks' inability to offer new loans hurts SMEs the most because they have the highest credit risk and are least able to find alternative sources of finance.

Banks' aversion to raising new capital not only limits new lending but also creates perverse incentives to keep highly indebted non-viable firms ('zombies') alive. Indeed, liquidating those firms' assets forces banks to realise losses on their balance sheets, whereas leaving the firms in operation does not imply such an obligation. The share of over-indebted firms was 26% in 2016, representing around 28% of total lending.³⁹

A second factor contributing to high borrowing costs for Greek firms is the relatively high operating costs of Greek banks, which are passed on to firms in the form of high interest rates or fees. Banks' operating costs are high because they have not digitised many of their operations, they are overstaffed and employ some inactive personnel, and so on. Efforts by banks in recent years to reduce their operating costs have rendered this factor less important.

A third factor is the high borrowing costs of Greek banks in international markets. This is partly due to Greece being viewed as a high-risk country compared to most other euro area countries. It is also due to non-performing loans. The high amount of these loans (40% of total loans), combined with a significant part of bank equity having the form of future tax relief (deferred tax assets are 60% of bank equity), creates uncertainty in international markets as to whether banks have sufficient capital and future revenues to cover future losses from non-performing loans. Recent actions by the ECB allowed banks to borrow at low interest rates even with low-quality collateral. This reduced the borrowing costs of Greek banks, and thus the importance of this third factor.

The fourth and final factor is the inefficiency of bankruptcy procedures and the lack of credit market transparency. Liquidating a firm's assets is an inefficient and lengthy procedure. This often means creditors prefer to reach an agreement with shareholders on restructuring the firm even when liquidation would direct resources to more productive firms. Restructuring is also a lengthy procedure, which often reduces the value of a firm.

38 Debt overhang is that new equity issues make the existing debts of banks (and firms more generally) safer, thus increasing their value. The value increase benefits the banks' creditors (bondholders, depositors). It cannot come at the expense of the new shareholders, otherwise they would not invest in the new equity issues. Consequently, the value increase comes at the expense of existing shareholders.

39 The data come from a PwC study that examines companies with revenues above €10 million (PwC, 2019). The total number of these companies is 2,817, with 745 classified as 'zombie' or 'almost zombie' based on their financial resilience and size.

Out of the 3,500 largest Greek firms that have experienced problems since the beginning of the crisis, only around 100 have opted for restructuring (Article 106 of the Bankruptcy Code). The bankruptcy law that has recently been voted (the Debt Settlement and Second Opportunity Code) greatly improves liquidation and restructuring procedures.

In a transparent credit market, banks know whether the assets of one borrower are pledged as collateral to another lender. That information is not easily available for collateral other than real estate. Information on a borrower's other loan obligations is also incomplete, creating information asymmetries between banks and borrowers.

Inefficiencies in bankruptcy procedures are passed on from banks to firms through higher interest rates and other loan conditions. The same applies to inefficiencies arising from lack of credit market transparency.

Capital markets

That capital markets, as well as investment vehicles such as VC and PE funds, play a limited role in the financing of Greek firms is due to a combination of factors.

An important factor is the low quality of accounting data that Greek firms provide to investors. This in turn is related to the low overall quality of corporate governance in Greece.

Corporate governance is the set of rules that determine how a company operates and protects the interests of those connected to it, such as employees, creditors, shareholders, and so on. Important elements of corporate governance are the composition of the company's board of directors, especially the role of independent members, and the internal audit process.

Although there exist laws promoting sound corporate governance in Greece, their implementation is problematic. Independent members of a company's board of directors often have close relationships with the company's management. Management often intervenes in the internal audit process, compromising its independence and reliability. As a result, firms' accounting data are not sufficiently reliable, and the interests of minority shareholders and creditors are not sufficiently protected. Holding equity in Greek firms thus becomes unattractive, resulting in the limited role of capital markets, VC funds and PE funds.⁴⁰

Weaknesses in corporate governance are more pronounced in small firms and family firms. This is because those firms' main shareholders often have close relationships with management. Also, any equity investment in those firms is small – in small firms because of their size, and in family firms because the fraction of shares available to the public (free float) is small. The gain from a small investment is not sufficient to amortize

40 For an analysis of the problems with corporate governance in Greece, see Grant Thornton (2011). The Bank of Greece also refers to this issue (e.g., Bank of Greece, 2018).

the cost of gathering information or of participating in governance, for example, through the appointment of independent members to the Board. Therefore, small firms and family firms have higher costs of equity. This creates a vicious cycle, where poor access to finance reinforces a company's tendency to remain small or family-owned, and conversely these characteristics of Greek firms imply poor access to finance.

Improving corporate governance requires more robust financial supervision and regulation. In Greece, systemic banks are supervised by the SSM, smaller banks and the insurance sector are supervised by the Bank of Greece, and capital markets and investment funds (e.g., mutual funds) are supervised by the Hellenic Capital Market Commission (HCMC). One of the roles of the HCMC is to ensure that listed firms publish correct accounting data and do not engage in any forms of market abuse. The low quality of accounting data and corporate governance in general shows that the HCMC supervision should be made more robust. Additional evidence supporting this conclusion is the large proportion of listed firms in ATHEX that are traded under supervision or are suspended: out of the 172 listed firms, 43 are in that category.

Weaknesses in corporate governance and transparency also exist within mutual funds. These weaknesses have led to investigations and fines by the HCMC. Household confidence in mutual funds and related investment products remains low: mutual fund assets in Greece were 4.7% of GDP in 2019, compared with 11.1% in Portugal, 48.7% in Austria, 35% in Belgium, 116.9% in the Netherlands, and 107.8% in the EU.⁴¹ Mutual fund assets did not become low because of the crisis; they were 4.3% of GDP in 2010, so even lower than in 2019. Lack of investor confidence in capital markets is one of the main factors hindering the development of mutual funds and capital markets in Greece.

A new law on corporate governance (4706/2020) aims to address some of the above problems. As with the new bankruptcy law, implementation will be crucial.

5.1.3 Policy recommendations

Banks

Non-performing loans are the banks' main problem and the source of many other problems, for example, lending to zombie firms and not to new firms. One strategy is to solve the problem gradually, over a horizon of three to five years, by using annual (pre-provision) profits to increase provisions every year, and securitising or selling non-performing loans. The capital needs that may arise from this strategy would be met in the future, possibly under better economic conditions. Under this strategy, the immediate needs for new funds are smaller, but existing problems are prolonged.

41 The data are derived from the annual reports of the European Fund and Asset Management Association.

A second strategy, which we view as superior, is to tackle the problem more directly, either by setting up a 'bad bank' and transferring of all non-performing loans to it, or by securitising or selling non-performing loans of individual banks at a large scale. In both cases, the new owners of the loans have no incentives to keep non-viable firms in operation because loans are entered in their balance sheets at their true value. Banks would face new capital needs, however, precisely because they would transfer the loans to the new owners at their true value.⁴²

The bad bank solution has significant advantages. Coordination between creditors is facilitated as all non-performing loans from the same firm are consolidated within one owner (the bad bank). Because of its size, the bad bank may also be better placed to recover unpaid amounts. The Bank of Greece is working on a proposal for a bad bank, recognising the advantages of this solution.

The bad bank solution also has some drawbacks. The creation of the bad bank may require lengthy negotiations, especially because each bank is at a different starting point with respect to provisions. During that period, the process of resolving non-performing loans may slow down. Banks have also designed and implemented their own solutions (e.g., securitisations), which have been approved by the SSM, and reversing these solutions may be costly.

An alternative solution is that each bank independently accelerates the resolution of its portfolio of non-performing loans through securitisations and sales. Under this solution, the government in consultation with the SSM should accelerate the current three-year programme that has been approved by the SSM and is based on the 'Hercules programme', and set a binding target that non-performing loans should be reduced to a single digit by the end of 2021 (possibly with some provision for an extension if the pandemic continues in 2021). Moreover, a bonus/malus system should be introduced by the government and the SSM based on whether banks meet their non-performing loan targets or lend to 'zombie' firms. Such a system could be based, for example, on more favourable capital requirements or tax treatment for banks that exceed their targets.

The COVID-19 pandemic is likely to create new non-performing loans, exacerbating the banks' problems and accelerating the need to implement one of the above solutions. A large increase in non-performing loans may make the solution of the 'bad bank' superior, as the benefits of that solution increase with the scale of the problem. Solutions along these lines are being considered by other European countries and by the European Central Bank.

42 Based on recent securitisations, for every €1 billion of non-performing loans that are securitised, €200 million of additional provisions, and thus of new capital, are needed. (That would happen if, for example, the proceeds from the securitization are €300 million and the provisions are €500 million, i.e., the bank foresees a loss of €500 million instead of €700 million relative to the book value of €1 billion.) Provisioning needs are higher for sales of non-performing loans.

Bankruptcy law

Bankruptcy procedures for firms and households should become faster and more efficient. The bankruptcy law that has recently been voted is an important step in that direction.

On corporate bankruptcy, the new law speeds up procedures that have been unnecessarily time-consuming. For example, liquidating a firm's assets can now be done in parallel to verifying the creditors' claims, rather than after verification. Liquidation is also becoming faster and more transparent. An equally important innovation is the out-of-court settlement mechanism, which stipulates that if firms and creditors agree on a lower debt burden, then claims by the state can be reduced automatically. The out-of-court settlement mechanism will benefit in particular SMEs, for which the cost of debt restructuring is prohibitive. The automatic reduction of state claims is important as the state does not have the same flexibility as creditors to negotiate a reduction of its claims. As a result, debts to the state often delay the restructuring of viable firms, reducing their value and damaging their creditors and the state itself.

On household bankruptcy, the new law introduces an integrated bankruptcy framework that has been absent so far. The out-of-court settlement mechanism is also introduced for households. To prevent abuse of this mechanism, the new law stipulates that when a debtor uses the mechanism, the creditors can access information about all of the debtor's assets. Bankruptcy fully discharges debtors from their debts within a period of a few years, and is accompanied by the liquidation of the debtors' assets. Debt discharge reintegrates debtors into the production process, incentivising them to generate new income. Debtors are allowed to continue living in their primary residence, provided that they pay a rent to the new owner. They have the right to repurchase their primary residence after 12 years. Under the new law, the state no longer supports debtors with measures such as foreclosure moratoria, which create a burden for the creditors and ultimately increase borrowing costs. The state can instead support the poorest debtors more directly and efficiently, through a housing benefit.

The housing benefit could be paid not only after a household has declared bankruptcy and the house has been repossessed by the lender (and rented by the household), but also before bankruptcy for a limited period of time after the debtor has fallen in arrears (e.g., one year). This could prevent some bankruptcy cases.

The new bankruptcy law is likely to accelerate the resolution of non-performing loans. Its implementation will be successful, however, only if the time taken for court decisions on bankruptcy applications by firms and individuals is reduced. It is also important that the non-payment culture that has developed over the past decade subsides, and that debtors do not abuse any delays in the implementation of the law.

Efforts should also be made to render the credit market more transparent. The creation of a unified digital collateral registry would be an important step in that direction. Moreover, while a credit registry exists (*Teiresias*), it could include more information. Any changes in transparency should be compatible with personal data protection, following best international practices.

Financial supervision

Strengthening capital market supervision should be an important policy priority. It would have beneficial effects on the quality of corporate governance, the development of capital markets, and the cost of firms' equity.

There are two approaches to strengthening capital market supervision. One is to maintain the current structure, under which the HCMC is responsible for capital-markets supervision and the Bank of Greece and the SSM are responsible for the banks, and give more resources and institutional independence to the HCMC. The case for strengthening the HCMC follows from a simple comparison with the Bank of Greece. Both supervisors are independent authorities under Greek law. However, the independence of the Bank of Greece is guaranteed by the Eurosystem, while an equivalent European institution does not exist for the HCMC. Therefore, state-provided guarantees of independence for the HCMC are particularly important. The Bank of Greece also has more resources than the HCMC, as well as more flexibility in recruitment procedures. The HCMC employs 130 people and the Bank of Greece over 3,000.

The second approach to strengthening capital markets supervision is to change its current structure, following international best practices. Over the past decades, many countries have reorganised financial supervision based on a new division of responsibilities. Instead of dividing supervisory responsibilities into those that pertain to banks and to capital markets, responsibilities are divided into those that pertain to solvency of financial institutions (solvency/prudential regulation) and to investor protection (conduct/consumer protection regulation). The two supervisory bodies under the new structure operate either as separate organisations or as separate departments within the same organisation. Each body supervises all financial institutions (banks, insurance companies, investment companies, etc.) and capital markets. This new 'twin peaks' supervisory structure has been adopted in many countries. Two separate organisations exist, for example, in the United Kingdom (where responsibilities pertaining to solvency have been allocated to the Prudential Regulation Authority and responsibilities related to investor protection to the Financial Conduct Authority), Belgium and the Netherlands. Two separate departments within the same organisation exist, for example, in Denmark, Ireland and Sweden.

The twin peaks structure accounts for the complexity of modern financial institutions. Many banks do not confine themselves to traditional deposit-taking and lending but offer other products as well, such as investments and insurance. Conversely, many investment companies are increasingly offering banking products. Dividing supervisory

responsibilities into those pertaining to banks and to capital markets makes it difficult to supervise such institutions. Another advantage of the twin peaks structure is that a supervisor focused on solvency may not pay sufficient attention to investor protection. For example, the supervisor may not impose a fine on a financial institution that has mis-sold a product because this might create solvency problems. Introducing a supervisor with an investor protection mandate ensures that investor protection is not neglected.⁴³

A twin peaks system could be implemented in Greece by allocating investor protection responsibilities to the HCMC. The HCMC would thus be given an expanded role, overseeing a wide range of financial institutions and all listed enterprises in the ATHEX. The HCMC could continue to operate as a separate organization or become a separate department within the Bank of Greece in charge of investor protection. Under either scenario, it would be even more important to provide the HCMC with more resources and institutional independence.

A revamped HCMC with a broad investor-protection mandate could undertake actions to improve financial literacy, i.e., familiarising households with key financial and asset management concepts. Greece lags behind most other European countries in financial literacy (Klapper et al., 2014). The low financial literacy of Greek households is partly due to the underdevelopment of the Greek financial system, especially its insurance and investments sectors. Low financial literacy in turn hinders the development of those sectors.

One could argue that the current structure of financial supervision in Greece should remain as it is because it meets the current needs. The small size of the HCMC relative to the Bank of Greece reflects the facts that capital markets in Greece are small and financial intermediation is done mainly through banks. The division of supervisory responsibilities across banks and capital markets is effective as Greek banks are mainly focused on traditional deposit-taking and lending, while investment firms are small.

The above argument is static and does not account for the desirable state towards which the Greek financial system should evolve. Capital markets should develop and become more liquid so that Greek firms can access equity capital more cheaply. The introduction of a funded pillar in the social security system, as proposed in Section 4.7 of this report, would provide a boost to capital markets, but these must function well to handle the increased activity. In parallel, Greek banks should enrich their operating model with non-traditional activities, following international trends. Financial supervision should be designed to facilitate the evolution of the financial system in that direction.

43 The advantages of the twin peaks system are presented in more detail in IMF (2011) and Schoenmaker and Veron (2017).

Legislation is also needed to incentivise sound corporate governance. Corporate governance rules should ensure that a firm's board of directors is independent of the firm's management. Greater emphasis should also be placed on external audit mechanisms (statutory auditors) and the supervision of these mechanisms by the state. The new law on corporate governance (4706/2020) contains important provisions: it introduces strict restrictions on the appointment of the independent members of a company's board of directors, on audit mechanisms, and so on. Some of these restrictions may be too strict, but the general direction is sound.⁴⁴ The new law should be accompanied by enhanced financial supervision so that its provisions do not add to firms' regulatory burden without yielding meaningful improvements.

Stock exchange

ATHEX should become a larger and more liquid market so that firms' cost of equity capital is reduced. In addition to the changes in financial supervision and corporate governance mentioned above, the following measures can be useful.

Tax incentives could be introduced for firms to list on ATHEX and existing disincentives could be removed. Under the current system, firms wishing to raise equity capital must pay a tax of 1% on the capital raised. This tax should be abolished. Firms that list on ATHEX should instead be given favourable tax treatment, for example, a lower tax rate on profits for the first five years after their initial public offering. The listing process could also be facilitated, for example, the cost of preparing the documents to list on the exchange could be subsidised.

The tax incentives would help Greek firms to grow and meet the transparency criteria required to list on ATHEX. A favourable tax treatment for firms that list on ATHEX is justified by the existence of disincentives that keep firms small. It is also justified by the economies of scale that exist in capital markets: a market with more listed firms attracts more investors, benefitting all firms.

Tax incentives could also be given to households that invest in firms listed on ATHEX. Such incentives exist in countries such as the United Kingdom, France and Italy, and should only be given for long-term investments. In European countries, such incentives support firms or investments with a technological or green orientation, while non-listed SMEs are supported through listed investment funds that invest in them.

⁴⁴ Even stricter restrictions apply to Greek banks, where independent members of the board of directors with important responsibilities can essentially be only non-Greek citizens. These restrictions were imposed because of the above-mentioned problems in corporate governance, and should be lifted when the problems are resolved.

Another measure that would benefit ATHEX is to convert the social security system from a pay-as-you-go system to a mixture of pay-as-you-go and funded. As described in Section 4.7 of this report, the introduction of the funded component would reduce the tax burden on labour, thus supporting production and exports. An additional and important beneficial effect is that savings would increase, and so would the demand for investment products.

The above measures will be effective only if they are combined with stronger financial supervision and corporate governance.

State contribution to financing

In Greece and other European countries, the state uses public funds to facilitate firms' access to finance. These funds are channelled to firms through subsidised loans provided by private banks, or through equity participation by VC and GE funds in which the state holds a majority or a minority stake. These schemes can play an important role in the development of the Greek economy.

State participation is managed by the Hellenic Development Bank (EAT, formerly ETEAN) and the Hellenic Development Bank for Investment (EATE, formerly TANEQ). Some programmes, such as the Equifund, are managed by the European Investment Fund (EIF). The state and European bodies decide on the amount of funds that these institutions can manage. These institutions, in turn, determine the structure of state assistance (e.g., the level of the interest rate subsidy and the scope of the loan guarantees).

A key question is whether state participation in financing private firms constitutes a good use of public funds. In other words, could it be better for the state to not subsidise firms' financing and instead use the resources to create a favourable institutional environment in which the market provides all of the financing? A similar question concerns direct subsidies granted by the state to enterprises through various 'development laws'. Should the state decide which firms need financial assistance, or should it instead create a favourable institutional environment in which the market decides which firms will grow? State participation in the financing of private firms may be useful if the following two conditions are met.

The first condition, which may suffice on its own to justify state participation, is that a firm's investment project generates important positive externalities for the economy as a whole, i.e., positive effects on other firms or households that the investing firm cannot appropriate. In that case, the financing that the firm can raise privately does not reflect the social benefit that its project will generate. An example of a positive externality is a successful innovation contributing to the development of an innovation ecosystem which is beneficial for other firms as well. The first condition holds also in the reverse direction: public participation in financing should be avoided for firms that generate negative externalities for the economy (e.g., a negative environmental footprint).

The second condition, which generally does not suffice on its own to justify state participation but can strengthen the case for participation when used jointly with the first condition, is that parts of the financial system are not sufficiently developed. For example, in the absence of liquid capital markets and a surrounding financing ecosystem (financial analysts, fund managers, etc.), it is difficult for firms, especially new ones, to raise equity. In that case, state participation through VC and GE funds may be useful and may lead to the development of liquid capital markets in the long term.

State participation in the financing of private enterprises also carries risks. The state may direct public funds to investment projects that the market can finance and that do not generate positive externalities for the economy. In that case, public funds are wasted. Another risk is that a firm is unduly favoured over its competitors, distorting market competition. State participation should therefore be examined carefully to determine whether the conditions set out above are met.

The first condition is more likely to be met for firms that produce innovative products or employ innovative production methods, and that contribute significantly to the development of new ecosystems or sectors. State subsidies should generally focus on those types of firms.

The second condition is more likely to be met for equity investments, given the small size of Greek capital markets relative to banks. It is also more likely to be met for investments by small firms. State participation should therefore generally focus on VC and GE funds such as the Equifund. The state's participation via bank loans is useful as well currently because of the high share of non-performing loans held by the banks, which hampers financing to SMEs, and because of the pandemic. State participation via bank loans should emphasise loan guarantees rather than subsidised interest rates, as guarantees reduce the risk taken by banks and thus increase their incentives to lend. Under both debt and equity financing, however, private investors should share with the state the risk that returns are low. This ensures that the state participates in worthy investment projects. The returns earned by the state will naturally be lower than those earned by private investors, as the rationale for the state's participation is that some socially worthy projects yield private returns that are not sufficiently attractive to private investors.

State funding programmes should be transparent. Investment projects should be analysed carefully, and a thorough justification for state funding should be provided based on the two conditions set out above. State participation should be justified based on these conditions and not because funds happen to be available. The institutions that manage the state's participation should carry out studies of different industry sectors to determine whether or not the conditions are met, so that future participation programmes are well targeted.⁴⁵

45 For an analysis of this issue and of the best practices of development banks more generally, see Fernandez-Arias et al. (2019).

5.2 FIRMS AND COMPETITION

Healthy competition in a country's market for products and services is beneficial for that country's international competitiveness and welfare. Competition incentivises firms to improve their production processes so that they can offer higher quality products and services at lower prices. This benefits consumers and raises social welfare. It also raises economy-wide productivity, improving the country's international competitiveness.

Competition raises productivity at the firm level, as firms operating in a more competitive environment are typically managed better. Competition also improves productivity at the industry-sector level, as more productive firms enter the market and gain market share at the expense of less productive ones. Competition within an industry sector improves economy-wide productivity if the goods produced by the sector are inputs to other sectors, as lower prices in the competitive sector translate to lower input costs in the other sectors. Examples include energy, telecommunications and transportation.

A large number of empirical studies find that competition has beneficial effects on productivity and international competitiveness. The studies compare markets for different products, or different firms in the same market (OECD, 2013, 2014). The findings concern not only Western countries, but also Japan, South Korea and developing economies.

More intense competition lowers profits for individual firms as well as for firms collectively at the industry-sector level. High profits in non-competitive markets, however, often result from selling low-quality products at high prices and from suppressing superior options for consumers. The negative impact of competition on profits in an industry sector is dominated by the positive impact of lower prices for consumers and for the firms that use the sector's good as an input, and by the positive impact on sector- and economy-wide productivity. In the medium term, the main effect of more intense competition is higher productivity, more innovation and improved export performance.⁴⁶

Competition is not sufficiently intense in most sectors of the Greek economy. To a large extent, this is due to the complex and inefficient regulatory environment, which impedes entry of new firms. Inefficient regulation also raises the costs of incumbent firms, lowering their international competitiveness. Because, however, incumbent firms can adapt to the complex regulatory environment better than prospective entrants, especially foreign firms, domestic incumbent firms face low competitive pressure. The end result is relatively closed markets, where many firms are not competitive on the global stage but achieve sizeable profit margins domestically.

46 Besley et al. (2021) find that more intense competition lowers profit margins in sectors producing non-tradeable goods, while the opposite happens in sectors producing tradeable goods.

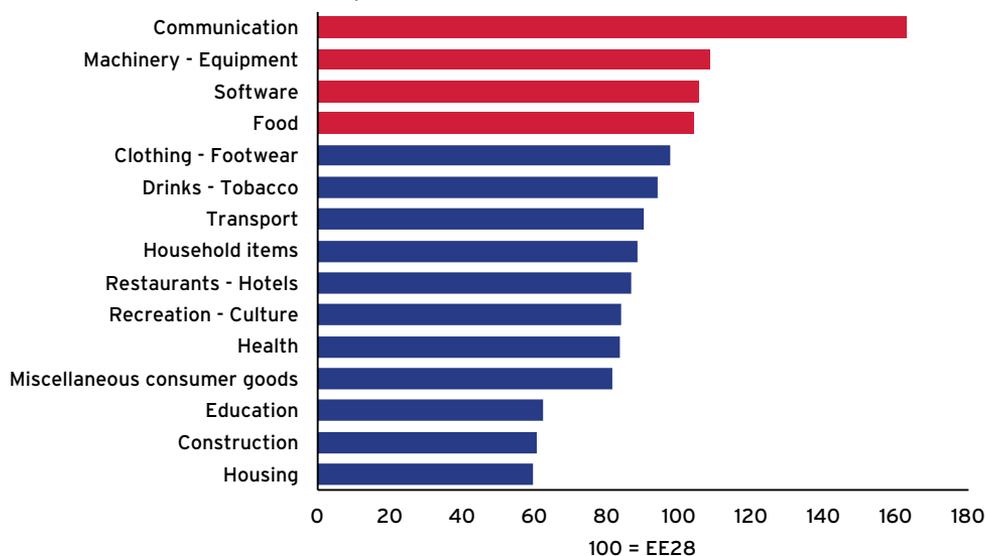
Improving the institutional and regulatory framework in Greece, by implementing the policies proposed in this report, would yield significant economic benefits. It would reduce costs for domestic firms, allowing them to become more competitive internationally and improve their export performance. It would also render competition in the domestic economy more intense, as it would facilitate the entry of new firms and the growth of incumbent ones.

5.2.1 Indicators

Measuring competition intensity in an economy is challenging. The market for each product or service has distinct characteristics (such as production costs, consumer demand, tax treatment, innovation content, and other product characteristics), making generalisations difficult. Nevertheless, the Greek economy's low productivity and international competitiveness are strong indirect indicators that competition in the domestic market is not sufficiently intense.

Indicators on the intensity of competition at the product-group level can be derived by comparing price levels, in the context of purchasing power parity calculations. With the caveat that price comparisons may concern slightly different goods and thus should be interpreted with caution, prices for telecommunication services in Greece are considerably higher than the EU27 average (by 63.1% in 2019), as are prices for machinery and equipment (by 8.6%), software (by 5.7%) and food (by 4.3%) (Figure 5.4). When comparing prices across narrower product groups, prices are high for several basic food types.

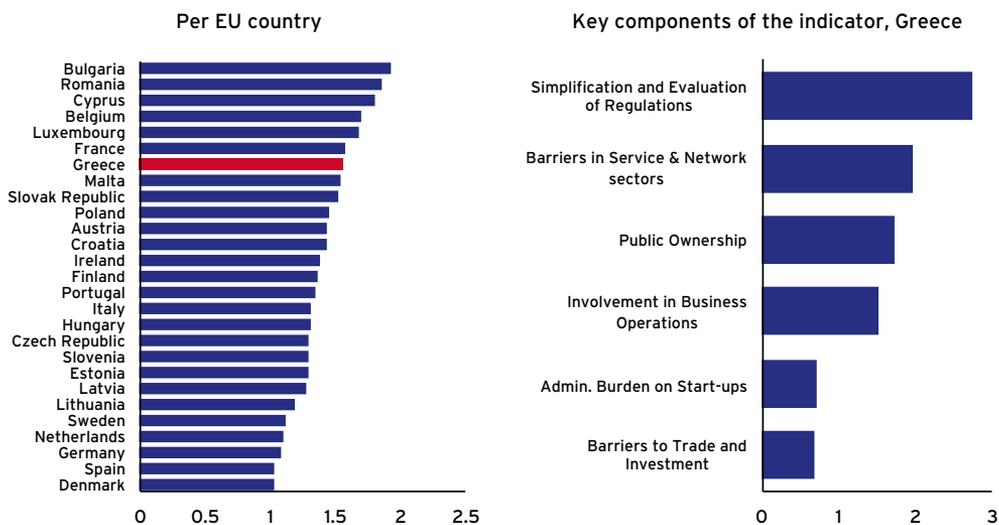
FIGURE 5.4 PRICE LEVEL INDICES, 2019 (EU28=100)



Source: Eurostat.

Additional indicators that suggest that competition in Greece is not sufficiently intense are the OECD Product Market Regulation (PMR) index and its components. The PMR index, published every five years, measures the quality of regulations in product markets and the extent to which these regulations restrict entry and competition. The index also measures barriers to entrepreneurship and investment, and the extent of state control in the economy. This index paints the same picture of competition intensity in the Greek economy as the previous indicators: heavy regulation in product markets, tight state control, and significant barriers to entrepreneurship. Greece ranked seventh from bottom among the 27 EU countries in 2018. Greece performs worse when it comes to sub-indices measuring procedures to evaluate and simplify regulations (with influence by special-interest groups being particularly problematic), barriers to competition in services and networks, and the scope of activities of state-owned firms (Figure 5.5).

FIGURE 5.5 PRODUCT MARKET REGULATION INDEX, 2018



Source: OECD.

5.2.2 Barriers and policy recommendations

As pointed out elsewhere in this report, many industry sectors in Greece are dominated by a large number of small firms rather than a few large competitors. Although a large number of firms in a market fosters competition, there are important problems with fragmentation. Small firms often operate inefficiently, have limited access to finance, and their investment is low. Moreover, major aspects of their operations and production processes, and the demand they serve, are dictated by regulations, which generally reduce competition. Other industry sectors are dominated by an oligopoly of larger firms. Even in those sectors, the regulatory framework impedes firms' efficient operation, while also erecting barriers to entry for new firms.

Regulatory framework

Excessive and inefficient regulations in many markets in Greece have created a heavy regulatory burden for firms, increasing their production costs and rendering competition less intense.

A 2011 OECD report found that 3,430 new laws were enacted over the period 1980-2010, alongside 20,580 presidential decrees, 114,905 ministerial decisions, 24,010 regional government decisions and 8,575 municipal decisions (OECD, 2011b). In total, there were 171,500 new regulations, implying an average of 5,716 new regulations annually, or 477 monthly. Even when regional government and municipal decisions are excluded, the average annual number of new regulations is 4,630, or 386 monthly. A comparative study across OECD countries (OECD, 2009) found that during the period 1997-2007, the number of new laws in Greece increased significantly and that the country ranked higher than every other OECD country in the number of new secondary regulations (ministerial decrees, etc.).

New regulations are often prepared without a proper assessment of whether they are necessary or commensurate with the problem they intend to address, and without a proper impact assessment. This issue is analysed further in Section 4.1, which also notes that the recent creation of the Committee Evaluating the Quality of the Law-Preparation Process is a positive development.

Related to the problem of poor regulatory quality is the high cost that firms incur to ensure that they comply with the regulations. The cost is high because there is a large number of regulations issued by many different agencies, and because most regulations are not available electronically but only in old printed documents. The large number of regulations and the lack of their availability in electronic form make it difficult to monitor compliance, both *ex ante* and *ex post*.

Competition policy

In parallel with the problem of excessive and inefficient regulations, there is also a problem of poor enforcement of essential regulations, such as competition law and sector-specific regulations. The enforcement of such regulations is weak, causing anti-competitive practices to become prevalent in many sectors.

Greece's public agency in charge of overseeing competition across the economy is the Hellenic Competition Commission (HCC), an independent authority. Additional independent authorities oversee competition in specific industry sectors, such as the Hellenic Telecommunications and Post Commission, the Regulatory Authority for Energy, and regulatory authorities in transportation. While the independence of these authorities is legally established, important additional measures are needed so that they operate more efficiently and reach the level of independence that the Bank of Greece has. These measures include stable funding for each authority, fixed as a percentage of GDP or

a related index and covered by the state budget if needed; greater flexibility in managing human resources; and credible procedures to set targets and evaluate performance. These issues are discussed in greater detail and for all independent authorities in Section 4.1 of this report. For the competition authorities more specifically, their responsibilities should be defined more clearly to minimise overlaps.

The HCC should be supported with more funding and personnel, including specialised scientific consultants. This will make it more efficient (reducing the time required from spotting anti-competitive practices to issuing a ruling) and will facilitate its role as an advocate promoting competition culture and outreach activities to that end. The efficient operation of the HCC is crucial to fight anti-competitive practices, especially by powerful firms. These practices include coordination among firms and abuses of their dominant position. They weaken competition, with detrimental effects for consumers and the entire economy.

Corporate management

Competition in domestic markets and the international competitiveness of the Greek economy are also harmed by the antiquated corporate management model adopted by many Greek firms. Greece scores last among OECD and EU countries in the World Management Survey index, a composite index that evaluates 18 managerial practices, along three dimensions: target management, monitoring management, and incentives management.

Data from the Global Talent Competitiveness Index (2017), which is based on a different methodology, paint a similar picture. Greece ranks low on management professionalism (89th among 118 countries), linking rewards to productivity (90th), and career progress of employees (79th). Reforms fostering sound corporate governance and internal audit processes are urgently needed as well. This issue is taken up in Section 5.1.

5.2.3 Privatisations

The privatisation programme that has been implemented over the past decades has had important beneficial effects on the productivity of the assets that were privatised and of the economy as a whole. One example is the spectacular increase in container traffic at the port of Piraeus after COSCO group acquired it in 2008 and changed the management model.⁴⁷ Traffic grew from 1.4 million twenty-foot equivalent units (TEUs) in 2007 to 5.7 million TEUs in 2019. As a result, Piraeus ranked first in the Mediterranean and fourth in Europe in terms of traffic, up from 17th in Europe in 2007.

⁴⁷ In November 2008 the Greek government signed a concession agreement with the firm Piraeus Container Station S.A. (ΣΕΠ ΑΕ), which is a subsidiary of COSCO Pacific Limited, for the exclusive use of the new container station of Piraeus port, which includes Docks II and III on the east side of the port, for 35 years. In 2016, the firm Cosco Group (Hong Kong) Limited, a member of COSCO group, bought a majority of shares (51%) from the Greek government.

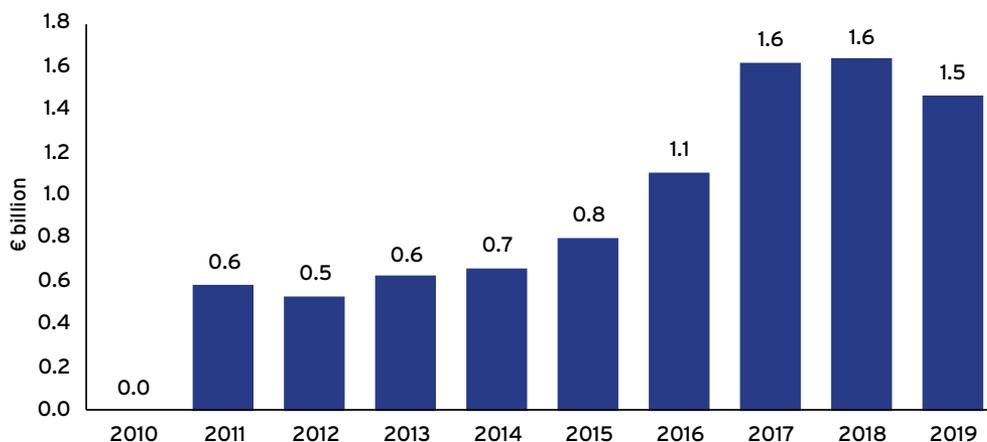
Privatisations can boost productivity because the privatised assets are managed better and because new investments related to these assets are made. Privatisation agreements often include commitments that buyers will make a series of new investments after acquiring the assets. New capital injections from investors can help modernise productive infrastructure in a period when such improvements may not be possible under public ownership. One example is the concession of 14 regional airports to Fraport Greece in 2017. Investments by Fraport in those airports were expected to exceed €460 million by the end of 2020 (IOBE, 2020a). A comparable investment programme to upgrade the infrastructure and connectivity of the regional airports that remained under the management of the Civil Aviation Authority would not have been possible.

Privatisations and investments related to them could catalyse growth across many sectors of the economy. The modernisation of airports and marinas in Greece could greatly enhance the country's tourism product. Investment projects in privatised regional ports could boost transportation activity and manufacturing in the surrounding areas. Real estate assets that are currently idle, such as the Hellenikon area in Athens, could become commercial, business and artistic hubs for visitors and residents. Moreover, privatisations of some assets require or support the development of innovative solutions that raise the value of the assets, and could subsequently be extended to other assets in the economy.

Privatisations generate revenue for the Greek state, from the amounts paid when the assets are sold, from annual fees that are part of concession agreements, and from higher taxes and social security contributions due to the pick-up of economic activity associated with the privatised assets. These revenues create fiscal space that would otherwise have to be created by higher taxes or spending cuts. The privatisation programme is estimated to have boosted Greek GDP by €1 billion annually on average during 2011-2019 (Figure 5.6) due to the fiscal space that it created and the investment in the privatised assets.

The privatisation programme is ongoing. Important assets held by the Hellenic Republic Asset Development Fund (HRADF) have been privatised while other assets, including infrastructure, real estate and firms, are still to be privatised. Privatisation deals in progress include infrastructure assets such as regional ports, marinas, the Egnatia motorway and an underground storage facility for natural gas; real estate assets such as the Hellenikon coastal area in Athens, the golf course at Afantos in Rhodes and the former construction sites at Antirrio in Western Greece; and state-owned firms such as the Athens International Airport and the firms DEPA Trade and DEPA Infrastructure that deal with natural gas trading and transportation, respectively. Other privatisation deals are currently at the planning stages, such as the concession of Attiki Odos motorway in Athens; the sale of the state's equity stakes in the Public Power Corporation, Hellenic Petroleum, the EYDAP and EYATH water suppliers; and other deals including sales of marinas, ports, hot-spring facilities and real estate.

FIGURE 5.6 INCREASE OF REAL ANNUAL GREEK GDP DUE TO THE PRIVATISATION PROGRAMME COMPARED TO THE ESTIMATED LEVEL OF GDP HAD THE PROGRAMME NOT BEEN IMPLEMENTED (BASELINE SCENARIO - REFERENCE YEAR 2010)



Source: IOBE (2020a).

The privatisation programme should continue with greater intensity and with emphasis on important sectors of the economy such as tourism and energy. The positive effects from upgrading infrastructure and using it more efficiently would raise the growth rate of the Greek economy in the next decade. Improved growth prospects of the Greek economy would in turn raise asset values and the expected revenue from privatisations. The privatisation programme could be expanded to cover more public assets, while ensuring that the government can use privatisation revenue for more immediate purposes.

5.2.4 State-owned enterprises

State-owned enterprises (SOEs) play an important role in the Greek economy, as they operate in industry sectors producing essential goods for firms and households. Due to mismanagement, poor incentives and political interference over the past decades, many SOEs are inefficient and burden the public finances.

In an effort to improve the management of SOEs and of state property more generally, the Hellenic Corporation of Assets and Participations (HCAP) was created in May 2016 (Law 4389/2016) and the state's equity stakes in important SOEs were transferred to it in January 2018. HCAP holds a large portfolio of assets, including infrastructure, real estate and corporate equity. It aims to manage these assets more efficiently, to preserve and increase their value, to improve the quality of the services they supply, and to contribute to the reduction of Greek public debt by generating revenue for the state. HCAP has three direct subsidiaries – HRADF, the Hellenic Public Properties Company and the Hellenic Financial Stability Fund – as well as additional subsidiaries. Through these subsidiaries, it holds majority or minority equity stakes in SOEs and other firms (Table 5.1).

TABLE 5.1 DIRECT AND OTHER SUBSIDIARIES OF HCAP, ALONG WITH THE RESPECTIVE SHARE OF STOCK OWNED BY HCAP

Direct subsidiaries	Share of stock
Hellenic Republic Asset Development Fund (HRADF)	100%
Public Properties Company (ETAD)	100%
Hellenic Financial Stability Fund (HFSF)	100%
Other subsidiaries	Share of stock
Athens Urban Transport Organization S.A. (OASA)	100%
GAIAOSE S.A.	100%
TIF HELEXPO S.A.	100%
Central Markets and Fishery Organization S.A.	100%
Thessaloniki Main Market S.A.	100%
Corinth Canal S.A.	100%
Hellenic Post S.A. (ELTA)	90%
Hellenic Saltworks S.A.	55.19%
Athens Water Supply and Sewerage Company S.A.	50%+1 share
Thessaloniki Water Supply and Sewerage Company S.A.	50%+1 share
ETVA Industrial Parks S.A.	35%
Public Power Corporation S.A. (PPC)	34.12%
Athens International Airport S.A.	25%
Folli Follie S.A.	0.96%

Source: HCAP.

The privatisation programme mentioned in Section 5.2.3 covers only assets owned by HRADF, but could be expanded to include additional assets owned by HCAP. For instance, the state's equity stakes in banks, held by the Hellenic Financial Stability Fund, should gradually be sold to private investors. The same applies to equity stakes in some SOEs.

The SOEs held by HCAP are mainly in energy, water supply and sewage, urban public transportation, and postal services. These firms could boost the growth prospects of the Greek economy in the next decade through new investments (whether they are privatised or not) and improvements in their management practices, which would improve their performance and reduce their dependence on public subsidies. Investments by these firms planned for the next few years include the expansion of water supply and sewage networks, the upgrade of buildings and other facilities in the central markets of Athens and Thessaloniki, the purchase of new and environmentally friendly buses for transport in major cities, the upgrade of the Thessaloniki International Fair site, the development of industrial parks and logistics centres, and digital initiatives to modernise public firms.

HCAP has implemented important organisational improvements for the SOEs that it controls. These include introducing performance evaluation processes for board members, creating audit committees staffed by accounting and audit experts, creating internal audit departments, developing regulatory compliance procedures, developing business plans, strengthening corporate governance, and implementing a unified framework to measure and monitor efficiency using KPIs. Similar improvements should be implemented in all SOEs not controlled by HCAP. These include military industries, such as the Hellenic Aerospace Industry and Hellenic Defence Systems, the railways firm OSE, and the public broadcaster ERT, all of which are controlled by the respective ministries.

In parallel to improving the management and operations of SOEs, the government could consider privatising some of them. To that end, clear rules should be established to determine which firms should remain under state control, and clear principles and standards should be established for the state to exercise its control. SOEs operating in competitive markets are generally good candidates for privatisation. By contrast, for SOEs that are natural monopolies, state control may be preferable, depending also on some institutional factors (Vickers and Yarrow, 1991). In any case, the SOEs that remain under state control should keep improving their economic efficiency, which is also important for public finances.

5.3 LABOUR MARKET

The Greek labour market is characterised by low productivity and low participation rates. There is room for intervention on both issues through (a) improving the skills of the workforce (employed and unemployed), and (b) increasing the participation rate of under-represented population groups (women, young people, and older people).

The COVID-19 pandemic has made these reforms even more urgent, as the pace of automation is expected to accelerate, requiring the retraining of the workforce in, inter alia, digital skills as well as higher mobility between the economic sectors.

5.3.1 Barriers

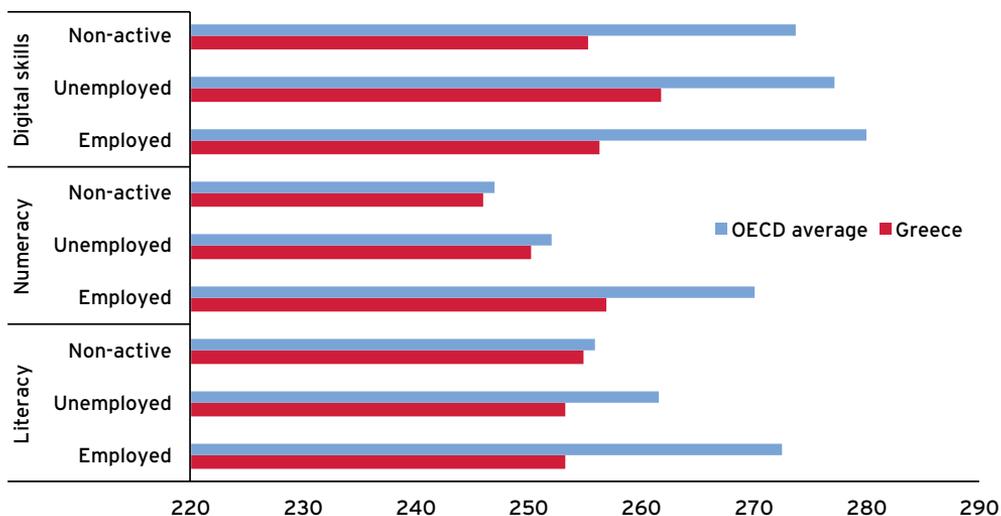
Productivity and skills

As shown in Chapter 1, the business model in Greece is characterised by a higher presence of small enterprises and sole proprietorships with low productivity. An additional possible cause of low productivity is the lack of appropriate skills as well as limited job mobility, which, although higher than before the ten-year economic crisis, is still low.

In terms of lack of skills, the data show that despite the high percentage of higher education graduates in the population, these graduates lack the necessary skills for the labour market. The PIAAC survey reveals that compared to other OECD countries, Greece's population is characterised by low levels of language, numerical and digital

skills, as well as a lack of skills needed to solve problems in an advanced technological environment (Figure 5.7). This can be attributed to the inefficiency of the education system, to the limited provision of general and specific training by businesses, and to the emigration of highly skilled individuals.

FIGURE 5.7 LANGUAGE, NUMERACY, AND DIGITAL SKILLS OF THE ECONOMICALLY ACTIVE AND NON-ECONOMICALLY ACTIVE POPULATION, 2015



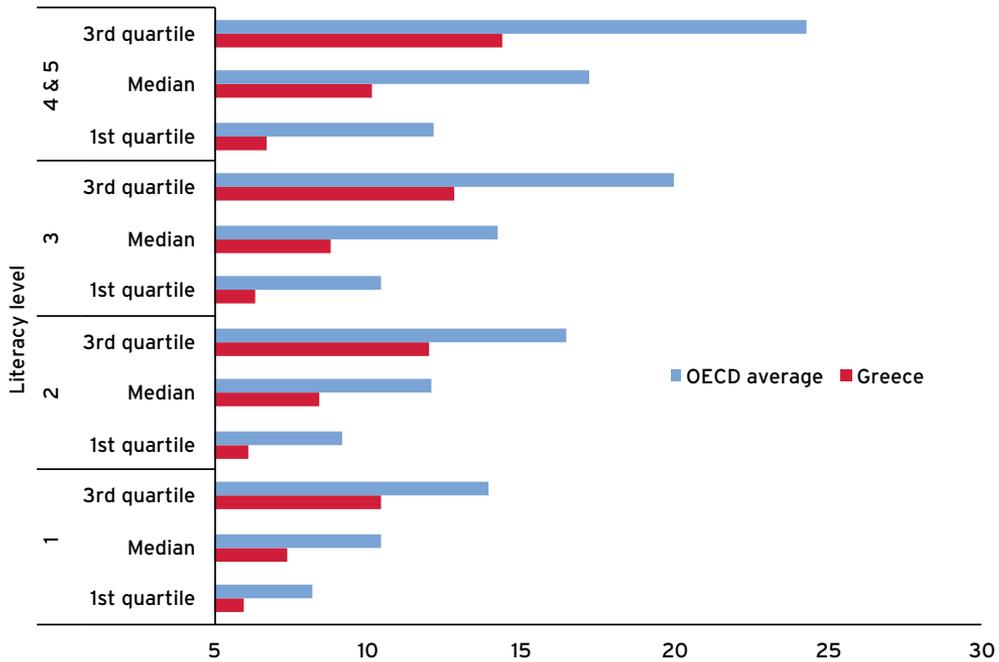
Note: Skills are assessed on a scale between 0 and 500.

Source: OECD (2019).

The results of the PIAAC survey also show that the skill levels of people in and out of the labour market do not differ significantly and, in addition, there are insufficient incentives to acquire skills, as the difference of wages between people with different skill levels is small compared to the OECD average (Figure 5.8).

The survey also reveals that a higher percentage of Greece's population is over-educated than in all of the other survey countries. Approximately 28% of the employees in Greece have a higher skill level than that needed in their job. The corresponding percentage in the OECD is 8%. These figures reflect the lack of investment and the absence of jobs in export-oriented companies. That said, there is also some under-education, as approximately 7% of employees have fewer skills than those required for their job. Thus, despite the high unemployment rate that still characterises the Greek economy, there is a shortage of skilled people, especially in the manufacturing sector.

FIGURE 5.8 BREAKDOWN OF HOURLY RATES BY LEVEL OF LANGUAGE SKILLS, 2015 (US DOLLARS PER HOUR, ADJUSTED IN PURCHASING POWER PARITY TERMS)



Source: OECD (2019).

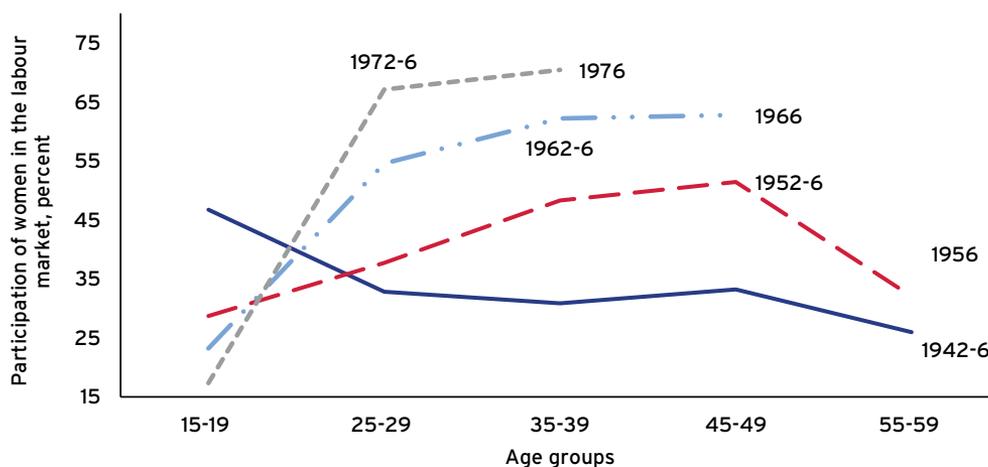
Barriers to women's participation

Labour market participation is lower than the EU average, with particularly low participation rates for women, young people and older people (see Section 1.1). The discrepancy in women's participation can be attributed to cohort effects (the lower participation rate of women in Greece in older generations) and early retirement. Figure 5.9 illustrates these two observations by showing the labour market participation rates for different cohorts (those born between 1942-46, 1952-56, 1962-66 and 1972-76). For the more recent cohorts, the participation rates are higher (except for the 15-19 age group, since over time more people are becoming educated), while for each cohort we observe a decline in the participation rate from 45-49 to 55-59 years. This decline is very sharp for the cohort that includes women aged 55-59 in 2011 and probably reflects early retirement induced by the financial crisis.

One obstacle faced by women in their participation in the labour market is the lack of affordable and high-quality childcare, as well as the lack of high-quality care for the elderly. In 2016, approximately 15% of low- and middle-income households reported that they would like to use more organised childcare services but do not have the financial means to do so. Over 50% of women aged 30-39 are not looking for work because they are caring for young children or dependent adults or for other family or personal reasons. The corresponding percentage for men of the same age is 7%.

The employment rate in Greece is approximately 13 percentage points lower than in the EU15, with the difference at 8 percentage points for men and 17 percentage points for women. Among women, the largest deviation is recorded for the 50-59 age group. What is more important, however, is that there is a difference between Greece and the EU15 in all age groups and the difference between the participation rate and the employment rate is greatest for the 25-54 age group.

FIGURE 5.9 WOMEN'S LABOUR MARKET PARTICIPATION RATE BY AGE GROUP AND YEAR OF BIRTH



Source: ELSTAT, Census data 1961-2011 (accessed 23 June 2020).

The difference in the employment rates between men and women probably reflects the low employment prospects for women of this age group who want to participate in the labour market, as employers are reluctant to hire women of childbearing age. Table 5.2 presents the employment rates of women in Greece in 2017 by age and marital status. The data suggest that married women aged 30-34 are subject to significant 'penalties', while a smaller penalty exists for the 35-39 age group. Over the age of 55, unmarried women perform better than married women in terms of the employment rate, but unmarried women over the age of 55 represent a rather small group of people.

Table 5.3 compares the employment rate of married women without children with that of married women with children to reveal that the real penalty results from having children.

Finally, even though in more recent generations women have a higher level of education than men, men occupy proportionately more managerial positions. Only 27% (average across the 2011-18 period) of managerial positions are held by women even though the share of women in the total number of employees is 42%. The gap in women's professional development can be seen from the fact that only 1.8% of women are in managerial positions compared to 3.1% of men.

TABLE 5.2 EMPLOYMENT RATE OF WOMEN BY AGE GROUP AND MARITAL STATUS, 2017

Age group	Unmarried	Married/ in cohabitation	Widowed or divorced
25-29	50.0	38.9	54.3
30-34	58.9	49.5	66.9
35-39	61.3	57.6	69.2
40-44	53.1	59.2	66.6
45-49	60.8	58.4	68.7
50-54	61.1	50.8	51.8
55-59	48.0	34.9	38.4
60-64	28.8	20.2	14.7

Source: ELSTAT, Labour Force Survey 2017.

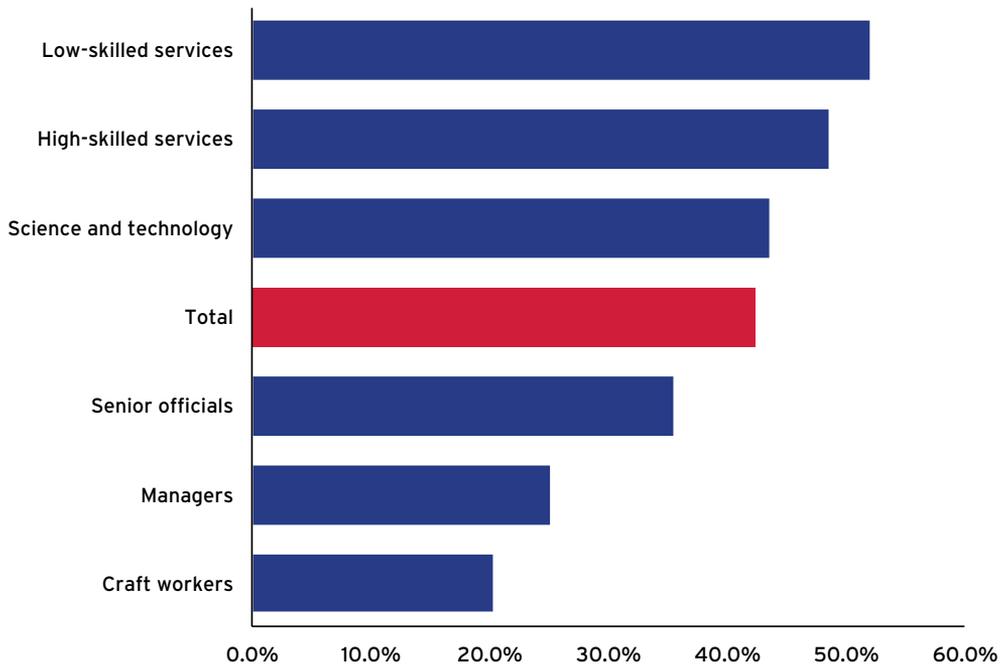
TABLE 5.3 EMPLOYMENT RATE OF MARRIED WOMEN BY AGE GROUP AND DEPENDING ON THE PRESENCE OR ABSENCE OF CHILDREN, 2017

Age group	No children	With children
25-29	53.7	38.1
30-34	59.8	48.8
35-39	66.6	57.3
40-44	67.2	58.9
45-49	56.2	58.5
50-54	54.5	50.4
55-59	39.2	34.3
60-64	23.1	19.6

Source: ELSTAT, Labour Force Survey 2017.

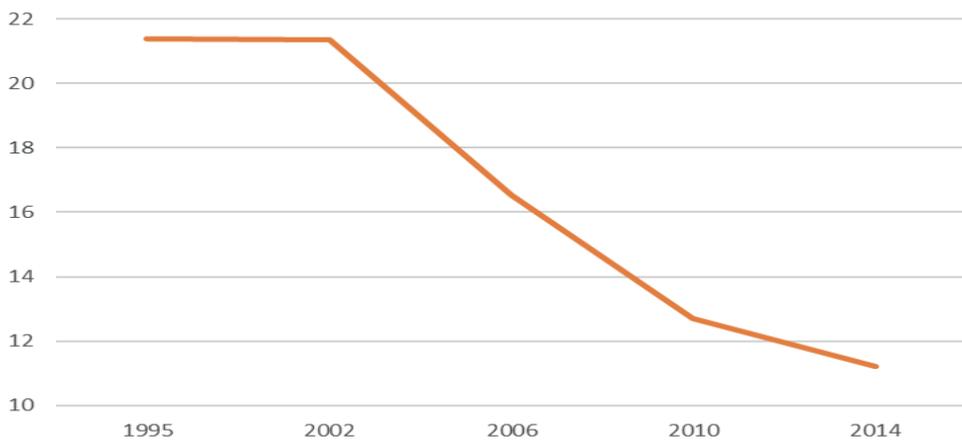
The fact that in some occupations the proportion of female employees is much higher than in the overall economy, while in other occupations the opposite is true, is evidence of labour market segregation in jobs for men and jobs for women. As shown in Figure 5.10, the former group consists of occupations with lower wages and less favourable professional prospects than those of the latter group. However, even within the same occupations and with similar qualifications, women are paid significantly less than men, though the pay gap has decreased over time (Figure 5.11).

FIGURE 5.10 SHARE OF WOMEN IN EACH TYPE OF OCCUPATION (PRIVATE SECTOR EMPLOYEES AGED 40-67)



Source: ELSTAT, Human Capital Research, 1Q:2019.

FIGURE 5.11 PAY GAP BETWEEN MEN AND WOMEN (PERCENT)



Note: Education, age, years worked in the specific occupation, economic activity sector and occupational category are held constant.

Source: Estimates based on data from the Enterprise Compensation Structure Survey, 1995-2014.

Informal labour market

The size of the informal economy in Greece is significant (there are estimates that in 2010 the informal economy accounted for 25% of GDP). Production that is not recorded in the official national accounts and inputs used for production that do not appear in the official accounts are part of the shadow economy. Non-registration of employment occurs when individuals work as self-employed or individuals work as employees without declaring their employment. By doing this, both they and their employers avoid paying social security contributions. Also unregistered with the social security institutions are family members helping small family businesses who are not legally obliged to pay contributions. During the ten-year economic crisis of the Greek economy, informal work seems to have increased. Informal work results in unprotected employees, businesses facing unfair competition and loss in public revenues.

Characteristic of the extent of undeclared work is the fact that, according to data from the Labour Force Survey of ELSTAT, about 4% of employees in the private sector reported that they were not insured in 2016. This percentage reaches 7.3% for people working in companies with fewer than ten employees.

The informal economy is a major impediment to growth. First, companies in the grey area of the economy do not grow, do not invest systematically in new technologies and do not focus on exports because their goal is to maintain a low profile. In fact, the initial structure of these businesses is as small family businesses without a developmental goal. One way to understand the consequences of businesses operating in the grey area of the economy is to think that these businesses are trapping resources that would alternatively be allocated to the formal economy in export-oriented businesses.

Of course, the above does not constitute the complete picture, since companies that (seemingly) belong to the formal sector hire staff that are not registered. Furthermore, the informal economy can take many forms, and so an estimate based on self-reports does not include people who do not declare all or part of their income or many of those who work in small family businesses.

The companies themselves state that the two main reasons that prevent them from complying with legal hiring practices are:

- a. the size of the tax wedge, i.e., the large gap between the labour costs for the employer and the disposable income of the employee; and
- b. indirect administrative burdens (payment of an accountant to complete ERGANI forms, cost of time spent on bureaucratic procedures, etc.).

Understandably, these obstacles are more serious for smaller businesses. But beyond these formal obstacles, the possibility of tax evasion and avoidance of regulation effectively subsidises the informal economy.

Dealing with the informal economy is not simple. It must be the result of (a) a combination of fewer and better regulations; (b) a restructuring of the tax system to remove disincentives, such as the preferential treatment of the self-employed; and (c) the systematic application of tax legislation. Proposals in this direction are presented in other sections of the report.

5.3.2 Policy recommendations

Training

In modern economies, the acquisition of skills takes place throughout a person's life. The success of continuous skill acquisition depends on the existence of solid foundations acquired by the education system. There is now strong evidence that training works best for people who already have relatively higher 'academic' achievement. In other words, training cannot be seen as a simple 'remedial' activity for people who have previously received insufficient education, but as a complement to previous investment in education. Providing high-quality education at all levels, starting from preschool, is therefore crucial.

The complementarity of the various education and training cycles is now known, and there have been several failed remedial training programmes in developed countries, such as Sweden, France, the United Kingdom, and the United States. It is difficult to find remedial training programmes whose benefits are justified by the costs. Below is a plan that has worked well in practice. Key factors in this plan are the design of incentives for both employees and training providers and the substantive accreditation of the training provided and of its providers themselves.

Training before entering the labour market

Trainees need to have plenty of options and sufficient information about the skills they can acquire. However, the acquisition of certain skills, such as digital skills, should be mandatory as these are essential in a modern economy. The data show that the percentage of people with basic or higher than basic digital skills in Greece is below the EU average. Given the speed with which automation is spreading, it is recommended that digital skills training be provided before individuals enter the labour market. Training in these skills should start in school. There should also be adult training programmes linked to the labour market.

We propose the following policy recommendations:

1. Restructuring of the school curriculum to include digital skills training in all six years of secondary education, if not earlier. Like any foreign language, computational thinking must be taught systematically from an early age. Skills must be assessed, both theoretically and practically, and students must demonstrate their ability to solve problems using information technology. The IT curriculum must evolve with technology and be a central part of the curriculum and not just an auxiliary marginalised course.
2. In higher education, more universities should offer degrees in Computer Science or Software Technology and include internships with companies.
3. IT training should be widely available to all people regardless of their educational background. It is important to cooperate with companies active in the IT sector to organise training programmes that will fill the skills gaps. Again, providing opportunities for internships is crucial. One way to increase demand for these skills is by providing incentives for digital skills training. For example, telecommunications providers could agree to offer free data as a reward for those completing digital skills certification.

Training for the unemployed

Unemployed people are more likely to lack the skills required in the job market. Moreover, the skill level of these individuals has a high variance. A properly designed training programme should take this into account.

The Manpower Employment Organization (OAED) should actively assist the unemployed in their job search for six months. People who have not found a job after six months should be invited to participate in appropriately targeted training programmes. Those who wish to be trained before searching for a job should also have this option.

We propose the following basic parameters for the organisation of the training:

1. The training is conducted by private training centres capable of offering high-quality training in a range of subjects, including car mechanics, hospitality, various personal services (e.g., hairdressing) and IT technicians. OAED is responsible for the accreditation of these training centres.
2. The programme combines six months of theoretical training in an area of the trainee's choice, followed by an internship in the market that the training centre would find for the trainee. The training must be substantial and lead to specific skills that can be certified.

3. The training is financed from public funds. The reimbursement of the training centres for the services provided would depend on the completion by the trainee of different stages of the process. Hence, an amount would be paid by OAED after the confirmed completion and certification, further compensation would be paid for the placement in an internship and its completion, even further compensation would be paid for finding a job, and finally a bonus would be paid in case the trainee retains his/her position for six months.
4. The unemployed also receive an amount from the government to cover their living expenses during the training period. During the internship, the unemployed are paid the minimum wage by the government. The company providing the internship would not pay anything for the services of the trainees but would be obliged to integrate the trainees in the company's operations based on their qualifications. The companies would be monitored by OAED.
5. As training centres are paid based on results, the centres should assess whether trainees can respond to the programme and select those they believe can succeed. Those who are not accepted should attend a support programme to improve their employment skills (social skills, interview technique, presentation, consistency, etc.). Indeed, improving social skills has been shown to have significant effects for those on the margins of the labour market. Although social skills should be part of any vocational training programme, they are particularly important for the groups with the lowest skills. The support programmes should be organised by the government. Upon completion, the participants should also be placed in internships. If this is not possible, they should be offered a volunteering option.

An important element of this plan are the eligibility criteria for participation in vocational programmes. Such programmes should not only target the unemployed but should also include, for example, low-income people (i.e., with incomes below a certain threshold).

Upgrading of OAED

To carry out this plan successfully, OAED needs to be upgraded. It currently has a limited number of employees and it has difficulty fulfilling its mediating role between the unemployed and employers. Employers do not trust applicants coming from OAED and the unemployed do not trust employers looking for candidates through OAED. Better profiling of the unemployed and attracting larger companies for recruitment through OAED could improve the process.

We recommend a reorganisation of OAED in the following directions:

1. **Unemployment registration:** OAED checks whether the unemployed meet the requirements for the unemployment benefit. Given the improvement of digital governance, this project would not use many resources of OAED.

2. **Job search assistance in the initial unemployment period:** OAED should provide advice to jobseekers and employer–employee matching services. The coordination of OAED with the employers is important. It should also provide seminars on interview techniques and CV writing.
3. **Accreditation of training centres:** OAED, in coordination with employer representatives, should be responsible for providing accreditation of private training centres where the unemployed and employees are trained. OAED should also provide guidance on existing training needs, again in consultation with the private sector.
4. **Monitoring of the companies where internships take place:** Monitoring, by OAED, must be thorough and should ensure the timely payment of the companies.
5. **Streamlining of passive labour market policies:** During the ten-year economic crisis, emphasis was placed on passive policies. Although there was no immediate increase in unemployment benefits, the registered unemployed could benefit from several subsidies. These measures were necessary to address the financial difficulties of those who lost their jobs. However, these policies were not accompanied by active policies, such as those proposed above, to bring the unemployed into the labour market. In addition, it is crucial to ensure that the structure of the benefit system does not act as a disincentive to work.
6. **Redesigning unemployment benefits:** Provided that active employment policies are enhanced and therefore those who lose their jobs are directly supported in job search, we propose that the way unemployment benefits are determined changes. Unemployment benefits should substantially support the unemployed, reduce the social costs of redundancies, and increase the incentives to declare real wages when the individual is employed by reducing evasion of taxes and contributions. We recommend that the unemployment benefit is not fixed and linked to the minimum wage but linked to previous wages of the unemployed person. This is necessary, especially in a labour market with higher mobility. We propose that the unemployment benefit be set at 55% of the average monthly salary of the unemployed in the previous three years, with a maximum benefit of €1,200 (the level of the average monthly salary of the fully employed in January 2020, according to data from the National Social Security Agency (EFKA)). The duration of the increased allowance should be six months instead of the current twelve months, and it should be paid on condition that the unemployed person is actively looking for work or participating in training programmes. If after the six months, despite active efforts to find a job, someone remains unemployed, they should receive the unemployment benefit at the current level, i.e., at 55% of the minimum wage for a period of up to six months or until finding a job, if this happens earlier. Unemployment benefit financing could come from OAED reserves.

Employee training

In a globalised world with rapidly emerging new technologies, employees must be allowed to upgrade their skills through retraining. Employee training can be organised either by employers or by the employees themselves. When organised by employers, the training can take place on or off their premises.

Employer-provided training is considered important to improve productivity and maintain flexibility in an ever-evolving labour market. However, companies do not have the incentive to provide the training they need. This is because they run the risk that after paying for the cost of training, employees will leave them for other companies. Employees, then again, may be reluctant to agree to pay cuts to fund their training. As in the case of the unemployed, the employee training system should be based on the private sector and designed with the right incentives.

The current state-subsidised training programmes do not seem to be effective as companies find them too bureaucratic. Although in the current programmes the trainers must be accredited and there are certain conditions to ensure a minimum quality, they are not attractive to either employers or to employees as the topics covered are very theoretical.

Training initiated by employees is also limited. This is because the employees themselves are not willing to pay for their training, as the return on investment is uncertain. Employees can be motivated if they only bear part of the costs and benefit from the higher returns after training (e.g., productivity bonuses or a company profit-sharing programme with its staff).

To address the main obstacle to in-company training, the state should subsidise employers who organise or provide training that leads to tangible, market-certified and proven skills. The nature and scope of the training should be agreed between employers and employees without any restrictions from the state.

Gender equality and maternity/paternity leave

The low employment rates of women compared to the EU average, their under-representation in high-quality jobs (Figure 5.10) and the wage gap with men (Figure 5.11) are indications that employers discriminate against women and that they are not making full use of their potential in the labour market. In addition to the social injustice that this entails, there is also an economic cost: a significant part of the country's productive potential remains untapped.

Inequality of opportunity for women in the labour market can be addressed through several measures. The government could demonstrate the measures it takes (fiscal, health policy, etc.) in promoting gender equality, as other governments do in the context of so-called 'gender budgeting'. The government should also promote the concept of social responsibility in businesses, which should support women during childbearing,

considering this period as part of a normal career of their employees and not as an obstacle to their progress. Such behaviour on the part of companies would enhance employee loyalty, with significant long-term business benefits. The government could use a systematic and extensive campaign to communicate this message.

The government could also set certain conditions to ensure women's participation in companies that supply the public sector. For example, a condition for entrusting a state procurement to a company could be that women in that company occupy at least a minimum percentage of positions at each level of the professional hierarchy. This change might be abrupt, and companies should be given a reasonable amount of time to adjust, but the message should be clear: public suppliers must ensure equal opportunities for women.

A review of maternity leave laws is also required (maternity leave, special six-month leave after maternity leave, childcare leave). The reform must have the following objectives:

1. Transfer the payroll costs of maternity leave from companies to the state so as to reduce disincentives for hiring women. The current system effectively punishes (i.e., imposes costs on) companies for hiring women of childbearing age. Removing this disincentive must be a priority.
2. A paternity leave system like that for women to enhance the participation of men in the upbringing of their children, so that the labour market treats both genders equally. For this to have any effect, a father's leave must not be transferrable to the mother. Until usual practices change, the government should consider providing incentives for men to take leave, making it mandatory. Adopting this measure in the public sector would make it 'common practice'.
3. Flexibility from the state regarding the start and end dates of maternity leave. Restrictions and differences between the sexes regarding the upbringing of children and the labour market need to be eliminated.

Furthermore, maternity leave benefits in the public sector are more generous than those offered in the private sector, and they need to be equalised. By offering more benefits, the public sector unfairly competes with the private sector and effectively uses taxpayers' money to deprive the private sector of human resources.

Finally, the proposed private sector paternity leave should be extended to the public sector. In other words, all the regulations governing maternity/paternity leave should be identical in the private and public sectors.

Childcare and early childhood education

One of the main obstacles that women face to their participation and development in the labour market is the lack of availability of childcare, especially high-quality childcare. Given the limited availability of childcare facilities and considering the social conventions that place women in charge of child-rearing, women are often forced to

leave their jobs until their children start school. In addition to the career limitations from this practice, its expectation pushes women into lower-quality jobs with fewer development opportunities even before they have children. The lack of adequate support infrastructure for childcare, as well as the inadequate parental leave system, are largely responsible for the gender gaps in employment rates, careers and pay.

It is now well understood that success in adulthood requires investing in childhood from a very early age. We also know that children's development is positively correlated to their parents' income, and therefore children from lower socioeconomic backgrounds accumulate gaps which in turn lead to worse academic performance and inferior results in the labour market. Although we are not aware of any studies conducted in the context of Greece, studies in other countries, ranging from the richest (the United States) to some of the poorest, have come to this conclusion. It is therefore essential to create a quality childcare system that is available to all. This would improve the education and later development of children and also help reduce the gender pay gap.

"A head start in life" – a comprehensive child development programme

It is crucial to establish a childcare and development programme that offers services from the second trimester of pregnancy until the start of primary school. All services would be provided free of charge and would cover pregnancy support, mental health, breastfeeding and socio-mental stimulation of the child.

Mothers should be able to leave their child in a childcare facility from the end of maternity leave onward during working hours. The facility would offer nutrition, child play and stimulation through a special programme for the development of early childhood by trained childcare assistants. Providing this service would improve children's cognitive development and enable women to work. The service should be offered regardless of whether the women work or not. Childcare facilities should provide age-appropriate activities, starting with cognitive and language tasks at an early age and extending to pre-maths, maths and reading instruction programmes, to help children become better prepared to integrate into the school environment. The programme should follow a specific curriculum and include regular information to parents ensuring the expansion of pedagogical activities at home. Finally, a system of supervision, continuous training and support of the educators should be created.

Care for the elderly

Lack of long-term care services from both the public and the private sector, as well as the low quality of available facilities, result in families taking on the care of their most vulnerable members. This arrangement has costs for those caring for the elderly in terms of professional development and creates disincentives for the participation of informal caregivers in the labour market. When early retirement was available, the financial cost of this care might not have been as high. With the elimination of the early retirement

paths, however, the option of informal care has become more difficult. Besides, early retirement cannot be the solution to this important social problem faced by many countries around the world. The solution must be the expansion of social and medical insurance.

Many people need long-term care in their old age due to chronic health problems that usually do not require hospitalisation. In the United States, for example, long-term care is offered to the poor in residential care centres as part of the medical care they are entitled to under Medicaid. Everyone else can be insured. This system has not generated the desired results as there is limited insurance coverage and people in their old age often have to rely on their family or need to liquidate their assets (e.g., sell their house) to fund their care.

Family support for the elderly in need of long-term care may not always be available, it may be insufficient, or it may unduly restrict other family members, putting them in financial difficulties.

A solution for long-term care for the elderly could be a compulsory insurance plan. The programme could include a minimum basic benefit, which will be financed by an amount that will be paid by the entire population and will cover basic but decent long-term care in an appropriate centre. An important condition is that appropriate medical examinations are conducted of each person to determine whether they are eligible for this service. The programme would also be able to have in its basic coverage the option for private care at a centre that the individuals and their families choose. Individuals who choose their own centre would pay part of the cost, with the rest covered by the state. The level of the state subsidy would be fixed and would correspond to the cost of the public centres.

The premiums would be collected along with social security contributions and would be deposited in a trust fund which the state would not be able to use for other purposes. The trust would have the obligation to invest the funds by distributing them among several private fund managers, together with the private pension funds.

To avoid burdening the state budget in the transitional period, the system could begin with people who are now under 30, with a premium that would lead to full funding of the programme. Also, the insurance should be granted to those who will have participated in the fund for at least 20 years. To discourage informal work, the system could only be offered to those with formal employment.

The programme has a redistributive character, as it would provide care for all with at least 20-year participation, while the contributions would be proportional to income. Also, since there is a correlation between health and wealth, the system would be more extensively used by lower-income individuals.

Modernisation of labour market institutions

1. **Anti-discrimination law:** Gender equality and, more generally, the fight against discrimination based on sex, race, nationality, sexual orientation and age must be explicitly enshrined in law and strictly enforced.
2. **Streamlining of reporting obligations by companies:** Existing regulations to prevent exploitation of employees by employers have led to several bureaucratic obligations for employers. These obligations are sometimes impossible to fulfil (e.g., prior notice for overtime work to cover emergencies). Such obligations need to be simplified and streamlined; otherwise, they lead either to a restriction of business activity or to the expansion of 'illegal' practices and informal work.
3. **Streamlining the use and cost of overtime:** Flexibility in the use of overtime is important for economic activity. The cost of overtime should be aligned with that in other EU member states.
4. **Reduction of the tax wedge:** It is expected that such a move could reveal undeclared employment and therefore offset at least part of the lost government revenue. (The issue is discussed in more detail in Sections 4.6 and 4.7, which deal with taxation and the insurance system).
5. **Labour force adjustment:** Restrictions on a company's ability to change the size of its workforce discourage job creation and prevent redeployment to successful and growing sectors and companies. Ensuring health and safety regulations, as well as preventing discrimination, is of utmost importance, as is protecting workers from unfair layoffs.
6. The government should try to enhance **social dialogue between employers' and workers' organisations**, but also with society. Only in this way, and after an exchange of views with a focus on the future, will it be possible to cultivate trust between the social partners. Trust cannot be imposed; it will result from repeated consultation between the two sides. Otherwise, all disputes run the risk of being resolved through legal means, which in practice leads to the defence of the weakest party, regardless of the long-term benefits to both parties.

Minimum wage

The existence of a minimum wage is important because it moderates the bargaining power of employers and helps fight poverty. A minimum wage also creates a common perception of the acceptable level of wages in the economy in general. But if the minimum wage is too high, it can increase unemployment by excluding people with low skills from the job market. The unemployed are the big losers in this case, as the chances of finding a job diminish. The minimum wage should therefore be set in an economically rational way, considering the interests of both the employed and the unemployed.

The changes enacted in 2014, according to which the minimum wage is set by the state rather than through negotiations between workers' and employers' organisations, must be maintained. The role of the state is crucial; it must ensure that the interests of the unemployed are represented in the negotiations. At the same time, however, to reduce the chance of short-termism in policy, the following changes are proposed in the process of setting the minimum wage:

1. The minimum wage should be decided by a Board of Experts for a three-year term (so that it does not necessarily coincide with the political cycle of a government). Board members should be distinguished personalities (academics, etc.) who have knowledge of economic and social issues, and do not represent interest groups. These members should be provided with resources and should have access to specific studies and data (e.g., from ELSTAT, the Bank of Greece, the Centre of Planning and Economic Research (KEPE) and other public or private bodies). The board should publish an annual report proposing the level of the minimum wage, substantiating their proposal with real data.
2. The government should consider the proposal binding. It should, however, have the right to change the minimum wage by publishing an adequate justification for deviating from the board's proposal.
3. There should be no formal link between the level of the minimum wage and any other transfers from the state, allowances, pensions, and so on. In other words, no other amount should be linked to the level of the minimum wage.

5.4 INNOVATION

The continuous integration of innovative methods into the production process is a critical factor for economic growth, especially in the long term. Greece lags significantly in innovation compared to many other European countries.

5.4.1 Indicators

There are three widely accepted indicators of a country's innovation environment: (1) Pillar 12 of the Global Competitiveness Index (GCI) of the World Economic Forum; (2) the Global Innovation Index published since 2007 by Cornell University, INSEAD and the World Intellectual Property Organization (WIPO); and (3) the Summary Innovation Index of the European Innovation Scoreboard (EIS), summarising the performance of EU countries. The Global Innovation Index is the most specialised indicator, but its coverage and results are quite similar to those of the World Economic Forum and the EU ranking.

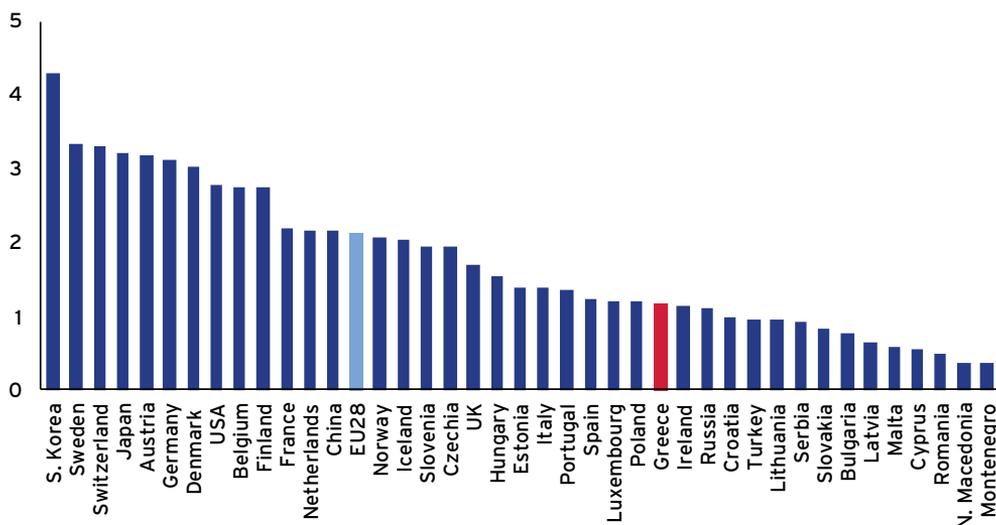
All indicators emphasise the importance of innovation enablers, which encourage businesses and universities to create added value through innovation. These factors include, among others, the quality of institutions; the implementation of laws; the quality of human capital; digital, energy and other infrastructure; access to equity; corporate expenditure on research and development; patent filings; employment in knowledge-intensive industries; exports of high-tech products; the quality of universities and research institutions; university-industry cooperation; and public procurement of high-tech products. The correlation between the indicators is generally high (over 90%).

Overall, Greece ranks 41st in the Global Innovation Index and 57th in the Global Competitiveness Index out of 129 and 140 countries, respectively. Among the EU member states, only Croatia comes after Greece in both indices. The other five Southern EU members are in positions 27 to 32 in the Global Innovation Index. Greece needs to reach this level in the short run, as a first step towards becoming an innovative economy.

In Figure 5.12, European countries are ranked in terms of their total R&D expenditure. In Figure 5.13, countries are compared based on the breakdown of R&D expenditure by sector. Greece scores low on both criteria, and especially on the second.

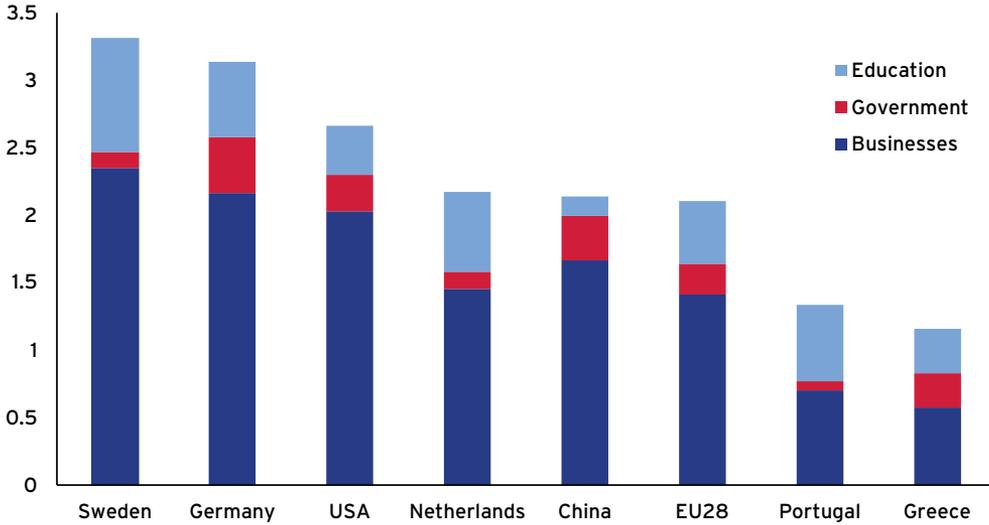
Contemporary innovation trends are associated with digital technologies. They bring fundamental changes in the operation of businesses and the public sector, comparable to the great discoveries of the past, such as steam power, electricity and the internal combustion engine. Given Greece's low innovation performance, it is not surprising that it lags significantly behind other EU countries in the Digital Economy and Society Index 2020.

FIGURE 5.12 TOTAL R&D EXPENDITURE AS A PERCENTAGE OF GDP, 2018



Source: Eurostat.

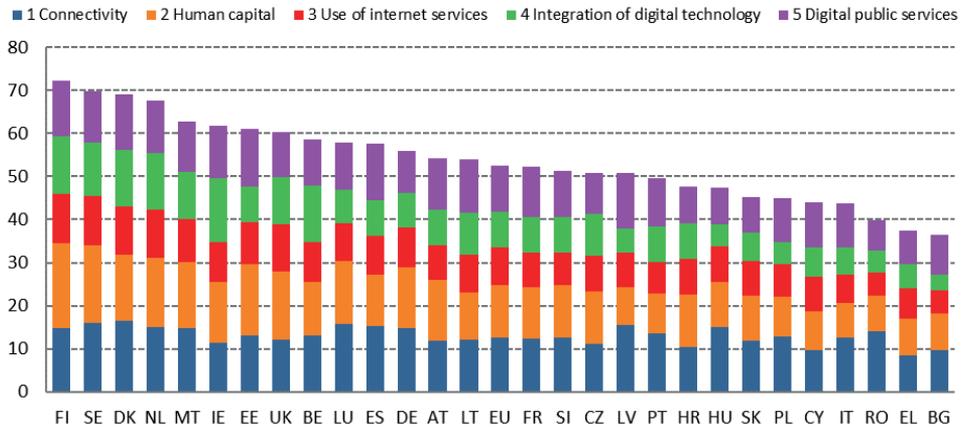
FIGURE 5.13 R&D EXPENDITURE BY SECTOR AS A PERCENTAGE OF GDP, 2018



Source: Eurostat.

DESI includes a five-pillar analysis: broadband connectivity, the digital skills of human capital, the use of online services, the digitalisation of businesses and digital public services. Greece ranks second from bottom among the 28 EU countries (Figure 5.14). The gap appears to be more substantial in the areas of infrastructure (i.e., connectivity, digital public services and digital skills) and less so in the use of online services and the integration of digital technology by businesses. Although there is convergence with the EU average in digital public services, there is unfortunately a divergence in the (interlinked) areas of digital skills and the integration of digital technology by businesses.

FIGURE 5.14 DIGITAL ECONOMY AND SOCIETY INDEX (DESI), 2020



Source: European Commission.

5.4.1 Barriers and policy recommendations

Introduction

Innovative enterprises grow only within wider sets of firms, organisations and executives, where new knowledge, intellectual property, services, products and capital are produced and disseminated.

An ecosystem of research and innovation includes five major categories of actors interacting with each other:

- Universities and other research institutes for fundamental and applied research ('research organisations')
- Technology transfer mechanisms from research bodies to innovation enterprises or user organisations
- Enterprises producing innovative products and services ('innovation enterprises')
- Organisations and businesses that improve their processes and products by using third-party innovations or in-house innovations ('user organisations')
- People with knowledge and skills that populate or provide services to the above

Having sufficient actors in all categories and strong interactions between them is essential for the sustainability and success of the ecosystem. This is demonstrated by the success of Silicon Valley in the United States and other places where innovative enterprises with a global reach are being developed, such as Tel Aviv, Boston, Berlin and Stockholm. In the above regions, many businesses engage in cutting-edge research and cooperate with high-level universities. The existence of many innovative enterprises and specialised personnel in the same area accelerates the production of knowledge, since senior staff exchange ideas and the more experienced staff train young ones. Universities located in the region ensure a continuous flow of new ideas and talented new recruits to businesses. Collaboration is also beneficial for universities as they attract better students, research funds, and so on. The interactions described above are known as economies of agglomeration and are particularly essential for research and innovation ecosystems.

In Greece, none of the five categories of actors reaches the required level for an internationally competitive ecosystem. Innovation enterprises (there are few, but their number is increasing), applied research (with relatively better performance in European programmes) and human capital (in terms of talent and education, but not experience) are at a comparatively better level. By contrast, technology transfer mechanisms, fundamental research (in terms of radical and far-reaching discoveries) and user organisations (the public sector does not introduce innovation quickly, and in the private sector there are very few businesses that can become early users of new technologies) are in a disadvantageous position.

Next, we present rigidities and policy recommendations regarding the first four categories. The fifth category – the workforce – will be positively affected by the tax proposals in part C. Enhancing their skills is the subject of Section 4.5.

A. Research organisations (research institutes and universities)

The research community in Greece performs relatively well in applied research funded by the EU's competitive programmes (such as Horizon). However, it does not significantly fuel innovation in local firms. This gap can be filled by the appropriate technology transfer mechanisms presented in the next section (B) and the measures to support innovation enterprises (Section C).

Still, an effective innovation ecosystem demands more than just applied research. Fundamental research is also needed, especially on deep technology or science-based innovation. Moreover, this type of innovation will gradually become more valuable over the next decade, while the innovation of internet business models and related tools that do not result from scientific laboratories will likely decelerate.

The scientific knowledge that fuels global innovation is produced, with few exceptions, in high-quality laboratories with excellent scientists, proper organisation and stable, adequate funding. The most valuable and radical results do not usually come from programmes with predetermined objectives but from scientific research and discovery that unexpectedly opens the way to practical problems.

Scientific teams of this level serve, among others, the educational mission of research institutions and universities because they act as islands of excellence for students of all levels and postdoctoral researchers. Fundamental research is carried out, and should be carried out, within universities, while independent research institutes should employ many postgraduate and postdoctoral students who produce a substantial part of the work.

The independence of researchers, especially the youngest, from the central administration of their institutions should be strengthened. The proposals for external evaluation and selective funding presented below can contribute to this direction.

Due to its size and economic conditions, Greece should concentrate resources on selected scientific fields in which it can develop a few platforms with global reach that simultaneously serve educational, scientific and economic purposes. The fields must be set after evaluating the potential of the domestic scientific force (people and organisations). Life and computer sciences are fields where, in principle, suitable conditions seem to exist.

Greece's current funding and organisation framework does not facilitate fundamental research and the relevant required quality level. Most of the funding is provided for short-term projects, and is usually linked to predefined implementation objectives (when it comes from EU programmes). Research organisations (research centres,

universities, laboratories) rarely carry out long-term planning and are not evaluated in an adequate, rigorous and fair manner. The Hellenic Foundation for Research & Innovation (HFRI), founded in 2016, has made a positive contribution to this direction because it funds fundamental research, and the evaluation of research proposals is conducted in a relatively meritocratic way. However, the need for longer-term funding, strategic priorities and systematic evaluation of research entities remains.

Proposal A.1: Evaluation of entities

Organise an evaluation of the research entities funded by public funds (research institutes and universities) within the next few months, with a completion horizon of up to two years, prioritising the institutions that already absorb significant funds. The evaluators should be independent (Greek and foreign) internationally recognised experts, as is the case in the best research centres around the world. This process would identify the thematic areas and groups that have the best growth prospects.

Proposal A.2: Funding

A fund of €500 million should be allocated for basic research, in addition to the regular expenditure currently covered. This amount should be granted to specific teams of researchers over four years and would be spent over a period of eight to nine years. After completion, there would be new corresponding funding so that the flow of research financing is continuous.

The teams would be selected through a rigorous evaluation process by independent evaluators. Teams from all scientific fields could be selected based on their own proposals (bottom-up), but proportionately more resources will be given to the priority areas (top-down). The teams would have a horizon of four to five years to explore research questions in their scientific field, without strictly predetermined goals, according to the standards of the European Research Council (ERC) grants. Among the 30,000 researchers currently employed in research institutes and universities, it is estimated that about 5% to 8% could be included in this fund.

Revenues from the use of the generated intellectual property could supplement the public funding at a later stage. However, for significant revenue streams at least five years must elapse, while the technology transfer mechanisms presented in Section B should also work well.

Proposal A.3: National Science Organisation

Establish a new organisation to coordinate the funding and evaluation of research. The main objective is to create an entity that will support research in the long term, with a solid strategy in terms of priorities, coordinating research funding in universities and research centres. All the country's research activities supported by the state budget should be under the mandate of this organisation.

The essential principles/objectives are:

- Continuous, regular funding of research projects
- Leadership/coordination of research protected from transient political interference
- Meritocracy in evaluation
- Strategic planning at the national level
- Ability of the country to respond rapidly to new opportunities and needs that arise

In greater detail:

- Establish a new National Science Organisation (NSO), which incorporates parts of the services of the General Secretariat for Research and Technology (GSRT) (those related to the supervision, funding and evaluation of research, but not innovation) and the HFRI. Alternatively, the HFRI remains a separate legal entity under the supervision of the NSO. The legal framework and NSO's budget should enable the recruitment of sufficient administrative and scientific staff and facilitate the allocation of tasks and studies to special advisers.
- Set up a framework for the appointment of the Board of Directors of the organisation with strict meritocratic criteria and without conflict of interest. To limit the possibility of political interference in the Board's composition, the members' term of office should have a set duration that does not end simultaneously for all, or their selection should be delegated to an independent international committee.
- Establish key services within the NSO for the better functioning of the research domain.
- Proposals from the government or ministries for strategic/emblematic research actions should be submitted to the evaluation division of the NSO and evaluated in this context.
- Each year, there should be specific regular deadlines for funding research projects in all research areas, with research proposals written in English.
- The NSO would plan its strategy yearly, with the support of an international advisory body, and submit it for evaluation to the National Council for Research, Technology and Innovation (NCRTI).

The NSO would have the following initial budget structure:

- Current GSRT budget for research
- Current HFRI budget

- New funding line for fundamental research, in line with proposal A.2 above

The current budget of all research centres subsidised by the state budget by all ministries

Budget of all strategic/emblematic research actions of all ministries

B. Technology transfer mechanisms

Transfer of technology or scientific knowledge from research organisations to innovation enterprises (or to user organisations) occurs in the following forms:

- **Intellectual property (IP)**, developed in a research organisation and initially belonging to this organisation, is transferred to a company so that it incorporates it into its products. The IP can be a patent, software or a trade secret. The transfer may relate to full ownership or the grant of exploitation rights, against a related price.
- 4. **Spin-offs** are start-ups established as an initiative of the research organisation or a group of its researchers. They develop and offer innovative products that incorporate intellectual property developed in the research organisation.
- 5. **Industrial research**, that is, research projects commissioned by companies (or public entities) from laboratories of research organisations, in order to use the results in the production of the funder.
- 6. **Consulting services**, from personnel of the research organisation to businesses or user organisations.

In strong innovation ecosystems, the intellectual property of research institutions supports many small and large enterprises. At the same time, it generates significant revenues for the original owners, while several researchers establish spin-offs or are associated with them. In Greece, only consulting services have been developed; the other three forms are almost non-existent.

The Greek research system has weaknesses and rigidities that do not allow the good practices followed in other countries to simply be copied. Therefore, a special working group should review the current situation in greater detail and propose a series of institutional changes. The working group might be the Sectoral Scientific Council (SSC) for Civil Technology Transfer, which has recently been established with the initiative of NCRTI. The following proposals are indicative.

Proposal B.1: Reformation and strengthening of technology transfer offices (TTOs)

The main activity of TTOs should be the development and commercial exploitation of the intellectual property of research organisations (research institutions and universities). A secondary function is to help set up spin-offs and, perhaps, to support the implementation of industrial research programmes.

However, today's TTOs do not accomplish their primary purpose, partly because researchers are not interested in creating IP of commercially usable quality. TTOs also lack the appropriate staff and resources.

The patents available from domestic research institutions are negligible and of low value. The situation in algorithms and special know-how (which, however, cannot be patented) seems to be better. For some types of start-ups, this shortage is crucial – essentially, in all 'deep tech'.

Central public funding is proposed for TTOs that would operate actively to develop IP, contrary to what has been happening so far. They would look for interesting research results and design, file and renew patents. No more than five TTOs are needed across the country, which would conclude agreements with universities and research institutes. The new TTOs may result from partnerships of entities, with transfer of currently employed staff, or they may be established anew.

The indicative size of public funding (for all technology transfer activities) is €20 million yearly (for salaries, offices, consultancy costs and patenting costs). The indicative size of complementary activity (in some sectors: validation studies, prototyping and certification) is €10 million yearly.

Part of this public funding (indicatively, 50%) should be given as a financing tool with private co-investors to form small funds for technology transfer and proof of concept projects. The reasoning is that the experience and knowledge within the public sector are not sufficient to successfully exploit intellectual property, and a considerably risky development effort is required to bring about the first significant results. At a later stage (indicatively, after five years), public TTOs may be able to carry out all the necessary tasks for research commercialisation.

Proposal B.2: Strengthening and facilitating industrial research in research organisations

The ability to finance and commission research projects of private companies (e.g., pharmaceutical companies, biotech, technology firms) at universities or other research institutions can significantly support the research community and create many new job opportunities. However, the current procedures hinder such collaborations, as each company has to reach an agreement with universities or research centres, which are subject to public sector rules on management of funds, leading to delays and rigidities that essentially prevent collaboration. The problems relate to the requirement to publish tenders for procuring materials or machinery, the need to adapt the payroll of public sector researchers, and generally having a framework that hampers project success and, by extension, the competitiveness of universities and research institutions to attract and absorb such investments.

An additional problem is the dispersion of specialisations in different universities and research institutions. In an era of interdisciplinarity, it is not easy to create partnerships between private companies and more than one research institution and university.

Proposal: Funding by private entities should not be included in the Special Account for Research Funds (ELKE), and the management of financing should be carried out with private law arrangements, with flexibility similar to private companies. This purpose may be served by the companies developing and managing the university property (which are private limited liability companies), provided that they are adequately staffed. Alternatively, a national private law entity could be established, operating on behalf of research institutes and universities and managing agreements and financing coming from private companies on behalf of research organisations. Such a contract research organisation of public interest would be a one-stop shop for agreements with private companies on R&D projects, representing research institutes and universities that use its services.

C. Innovation enterprises

We distinguish these into start-ups, medium-sized domestic enterprises and units of multinational companies. All three types have developed in Greece in recent years compared to the past, but they are still weak in comparison to most other European countries.

C.1 Start-ups

Conditions for growth, what exists and what is missing

Aspiring entrepreneurs/founders: There are quite a few, but those with previous experience as entrepreneurs or personnel are missing as the country's technology industry is relatively recent. However, there is great potential among Greeks living abroad.

Personnel: There are many educated and skilled engineers and scientists, but they lack experience. Experienced personnel are missing. Some specialities have a shortage (especially software engineers) even of young employees, as demand has increased significantly in the last five years. By contrast, there is a great supply of experienced workers in life sciences, chemical engineers and mechanical engineers. Greek migrants in Europe are also interested in returning to work in these specialities. Personnel with experience in sales are notably lacking.

Early adopters: Few businesses and organisations will try the innovative products of start-ups before they are established, which acts as a barrier to the development of start-ups for certain products. For digital products that appeal to many small users (small businesses or consumers), the distance from early adopters of other countries is not a deterrent. For material products, distance is an obstacle due to transportation costs,

repairs, and so on. Proximity is a major advantage for any product targeted at large organisations that requires testing, adaptations and collective decisions for its use. Public administration, banks and infrastructure networks are generally reluctant to adopt new solutions, even on pilot terms.

Financing: Start-ups need equity, not debt. Internationally, the usual sources of financing are founders' savings, so-called 'business angels' and venture capital. VCs are specialised by stage of development and by type of technology or market (e.g., marketplaces, software-as-service, biotech). The various grants for research and innovation constitute a complementary source, but they are not suitable unless own funds suffice for the company to survive without the grants.

Savings in Greece are at a very low level. Some families can support a new founder for a while, but cannot pay the wages of other employees. Business angels are very few, even though some wealthy families have the financial standing for this role. Often, the time and cost of developing a new product or patent exceed the initial forecasts. If there is no continuity in funding, the initial investment is lost, along with the unfinished project that could be of great value. Hence, there should be sufficient VC funds that specialise in the early stages of development.

Currently, VC funds are adequate because six new funds began operating in 2018, with mixed public-private funding (Equifund). But, as of the end of 2020, they will not suffice unless new capital comes in. Existing funding is aimed only at the early stages of development, but this is not a major problem since successful start-ups can obtain the next round of funding from European or US funds when they grow and have a steady flow of customers. However, this changes the ownership status and can lead companies to migrate to other countries.

Intellectual property: The patents available from domestic research institutions are insignificant and of low value. The situation in algorithms and special know-how (which, however, cannot be patented) seems to be better. This shortage is crucial for certain kinds of start-ups – essentially in all 'deep tech'.

Policy recommendations

C.1.1 Experienced personnel: The most immediate solution is the repatriation of Greek migrants and attracting foreigners. A considerably lower tax is needed on skilled employment (indicatively, with an annual gross income of €30,000-150,000) as well as a general policy to improve the quality of life (especially for families with children). There is a relevant proposal on the tax issue in the section on "General fiscal incentives for innovation enterprises".

C.1.2 Proof of concept: Potential early adopters in the public sector (local authorities, ministries), in banks and infrastructure networks should accept and test proposals of start-ups, which can be achieved through a combination of political decisions and incentives.

C.1.3 Financing:

- a. Tax incentives for business angels (recently legislated).
- b. Public participation in VC funds (following the Equifund model) in a way that allows no time gaps, with an indicative size of *€400 million every three years* (combined with €100 million in private participation), starting in 2021. After 2025, this capital would partially start to be recycled. Perhaps then there will be the possibility of having purely private funds if the funds of EquiFund achieve high returns.

Pension funds constitute an essential source of resources for VC around the world. Thus, we propose that the regulatory framework for Greek pension funds is amended so that they can invest a small percentage of their assets (less than 5%) in alternative assets, including VC.

C.1.4 Intellectual property and technology transfer: The policy recommendations are presented in Section B.

C.1.5 Big data: This is a vital resource for innovation companies in all fields where artificial intelligence is applied. In Greece, large data sets could be created in life sciences, in the operations of cities and in agriculture (at least), and there could be legislation that facilitates and mandates the collection of data and their dissemination to researchers and businesses.

C.1.6 Limiting the impact of failure: A critical social impediment for aspiring founders of innovative enterprises is the fear of failure and the economic, legal and social consequences that it brings. The majority of tech start-ups worldwide fail within a few years because innovation involves much uncertainty. Therefore, regulations are needed that limit the legal and financial costs for the founders of failed businesses, such as the new bankruptcy law under public consultation. At the same time, a series of information activities would be useful to change social perceptions about business bankruptcy.

C.2 Medium-sized domestic innovation enterprises (50-500 employees)

Current situation

There are very few such enterprises because of the gap in the start-up system (where they come from). But even for these few existing firms, there is room for further growth. The aim is to have them grow mainly in Greece (in workforce terms) and not search for countries with better cost-productivity ratios. Those that also involve the production of materials should expand their production from Greece.

Policy recommendations

C.2.1 Personnel: Similar case to start-ups. Non-wage labour costs are an even more critical obstacle; they lose personnel that migrate because of this issue. A relevant proposal is made in the section on “General fiscal incentives for innovation enterprises”.

C.2.2 Infrastructure and public administration: In their size class, it is very important to achieve operating cost savings (much more so than for start-ups). Therefore, adequate digital infrastructure, good transport services (for those with physical products) and light compliance paperwork (as in industry overall) are needed.

C.3 Multinational enterprises

Current situation

A small number of multinational companies have research centres and/or production of high-tech products in Greece, targeting the international market. Their number can potentially increase, especially for activities that do not require industrial facilities. Three paths can be followed: (a) acquisition of a domestic business and then expansion (e.g. Beat); (b) expansion of the domestic subsidiary that sells or provides services to a research and development centre (e.g., Nokia, Accenture); (c) greenfield installation (e.g., Pfizer AI unit, Tesla). The first route depends on the availability of domestic businesses. The other two rely on the availability of people and/or research laboratories with significant experience.

Policy recommendations

C.3.1 Personnel: Similar recommendations apply as in the previous categories, with a little more emphasis on the issues of migrant Greeks and the quality of life.

C.3.2 Taxation: Research and development centres mainly serve the parent company's international activity and not the Greek market ('shared service centres'). This allows them to have special tax treatment, according to Law 89. They could benefit, similarly to start-ups that do not generate profit, from the general tax incentives described below.

C.3.3 Research results and intellectual property: For intellectual property, the same recommendations apply as in the case of start-ups. However, to establish a multinational subsidiary based on the performance of domestic research, the requirements for the research quality are higher. The research needs to be ground-breaking and of very high potential importance. Usually, such discoveries result from curiosity-driven research. This links the NSO proposal and the recommendation for long-term research funding with the development of innovation in the country.

C.4 General fiscal incentives for innovation enterprises

For all the above categories of enterprises (start-ups, medium-sized and multinational), the following are proposed:

Recommendation C.4.1: Offsetting R&D spending by employer contributions

The current tax regime for companies that produce innovative products and intellectual property and employ highly qualified personnel is much less favourable than in many other European countries. The substantially high tax and social security contribution rates on middle and high incomes from labour are compensated with reductions only for those enterprises that declare significant profits and at the same time have significant R&D expenditures.

However, most innovation companies in Greece do not generate significant operating profits, and this is not expected to change any time soon. Start-ups globally are not, as a rule, profitable. Many fail before they reach the right size, but without them, there is no innovation ecosystem. Others succeed, but their business plan may envisage losses or low profitability for five or ten years. Meanwhile, the R&D centres of multinational companies, which Greece also needs to attract, legally declare meagre profits in the country where they are located because they operate as intra-group service providers. In contrast, high profits are recorded in the country of final sales, or the country hosting the company headquarters.

For this reason, the 200% deduction for R&D expenditure established by Law 4172/2013 is not likely to be an effective incentive for most of the innovation ecosystem.

Recommendations: Allow the tax benefit resulting from deducting scientific and technological research costs to be offset by employer contributions.

In particular, we recommend:

1. Businesses that fall within the scope of the provisions of Article 22A of Law 4172/2013, as in force, should be allowed to offset amounts that are paid in the form of employer contributions to EFKA and other social security funds by an amount corresponding to a percentage of the annually certified costs of scientific and technological research. This option would be granted as an alternative to the higher deduction from gross income, which is established by the above article.
2. The offsetting would take the form of credit in the company account in EFKA or other social security funds against future employer contributions and always until the exhaustion of the recognised amount. In no case would a transfer of any excess amount to the company be envisaged.
3. The employer contributions subsidised by any national or European programme would be excluded from the contributions by which the above amount is offset.
4. For income tax, the offset amount would not constitute income. At the same time, the employer contributions cost would be deducted from the gross income of the enterprise without a reduction by the offset amount.

With the introduction of the offsetting of employer contributions, businesses without profits could receive the same benefit as profitable businesses, reducing the resulting cost per employee and making Greece more attractive for transferring research activity from other countries. It should be noted that similar offsets apply in Italy, Norway, Ireland, Belgium and the Netherlands.

Recommendation C.4.2: Improve the tax incentive to utilise intellectual property

Broaden and strengthen the tax incentive for utilising patents to include IP in general and tax the resulting profits at a lower rate. Today, the profits declared in Greece relating to IP are negligible. The main reason is that no significant IP is produced in the country. In addition, there is no favourable tax treatment of the relevant profits, as is the case in at least six EU member states (Belgium, the Netherlands, Italy, Spain, Ireland, Poland), where the tax rate ranges from 4.4% to 12%

In the near future, in line with the OECD framework on base erosion and profit shifting (BEPS), the favourable tax treatment of IP profits will likely only be allowed if there are expenditures related to its development and maintenance in the same country. If this takes place, businesses will move their IP tax residence to where the R&D centres are located. Therefore, if Greece wants to attract R&D activities, it should also become attractive to IP.

In particular, our recommendations are:

1. Expand the scope and include intellectual property assets that are functionally equivalent to patents, i.e., they are legally protected (e.g. software, but not trademarks).
2. The tax relief should apply for as long as the innovation/patent generates revenue.
3. Strengthen the tax incentive and instead of deferred tax, tax more favourably the profits of a company linked to authorised IP assets. Thus, for example, a company's profits from the sale of products which used an authorised IP asset developed by the company should be taxed at a rate lower by 50%, for those tax years that the products generate revenue, regardless of the location and ownership of the company's production facilities. The same regime should apply to profits derived from the provision of services when it relates to the exploitation of authorised IP assets of the company.

With the proposed intervention, Greek legislation would align with the framework in Italy, the Netherlands and Belgium. Furthermore, reducing IP exploitation costs would strengthen important industries that utilise IP, such as the pharmaceutical industry, software companies and the creative industries.

D. Organisations-users of innovation

Current situation

'User organisations' refers to all organisations and businesses that improve their processes and products using third-party or internal innovations. Today, the public sector is changing very slowly while the private sector, as evidenced in international surveys, introduces innovations on a continuous basis. Nevertheless, these are usually belated adaptations of what their competitors and counterparts in the more developed economies have already introduced. Thus, the challenge is to accelerate the pace of integration and adaptation of innovation across the economy and the state.

If this takes place, quality and productivity will be improved in user organisations. In addition, a significant boost will be given to those who produce innovation in Greece or offer innovation adaptation services.

Policy recommendations

D.1 Incentives for investment and staffing: Innovation is introduced either by purchasing equipment and services or hiring and promoting people. For investment there are tax incentives, while for recruitment there are tax disincentives (excessively high income tax), which need to change.

D.2 Management strategy: In the state and in the part of the economy where management is appointed by the state, there needs to be a clear direction for faster investment in new processes and technologies that either increase productivity or improve the user experience. The quality and speed of introducing innovations should be included in the evaluation of each administration.

E. Innovation hubs

As mentioned in the introduction to Section 4.10.2, innovating firms benefit significantly from economies of agglomeration. When many similar units are close, people exchange ideas, younger recruits are trained by more experienced staff, and businesses and people have more opportunities than in any other case. These advantages were born spontaneously in some cities around top universities or very large industries.

In other areas where this has not occurred, a policy tool that would accelerate agglomeration economies is to create 'innovation hubs' where research companies can reserve space and establish themselves, interacting with like-minded companies. Hubs should have good and cheap spaces for offices and laboratories, easy access from residential areas, good telecommunications infrastructure, and services such as 'business accelerators'. It is important that start-ups coexist with units of large and/or multinational companies. It is also beneficial to be located near university faculties, research institutes or research hospitals.

Proposal E.1: The planned technology park on Piraeus Street in Athens seems to fulfil the spatial conditions to succeed as an innovation hub. The appropriate support services and targeted incentives for establishing successful businesses that will act as magnets should also be designed.

Proposal E.2: The planned international technology centre Thess INTEC, next to Thessaloniki airport, is based on preparatory work already done with private enterprises, large and small, that are interested in relocating to clusters, and can become a good hub of collaborative research and development of industry.

Proposal E.3: The existing scientific and technological parks (at NCSR Demokritos, in eastern Thessaloniki, in Patras) have unexploited potential, but they need a more flexible operating regime and upgraded support services.

Proposal E.4: 'Innovation clusters' constitute a specific form of innovation hubs. In this case, only enterprises targeting the same market (e.g., space technology) or with a similar scientific background (e.g., molecular biology) and R&D branches of their potential customers are co-located. When a critical mass of scientists, engineers and entrepreneurs appears in some field, it is worth boosting the clusters as well.

5.5 INFRASTRUCTURE AND LOGISTICS

Being at a crossroads of trade routes and with a strong shipping sector, Greece has the potential to become a global trade hub. Its transport infrastructure and logistics services are, however, underdeveloped.⁴⁸ The spectacular rise in container traffic through the Piraeus Port Authority (PPA) shows that improvements in the country's infrastructure and in their management model can generate large gains. Improvements in infrastructure can also smooth regional inequalities within the country.

5.5.1 Indicators

Greece has about 2,000 km of modern motorways, a railway network of similar length, 130 ports and 67 airports, 12 of which are international. According to the EU Transport Scoreboard (based on data from the World Economic Forum for 2018-2019), the quality of roads in Greece stands at around the EU average (Figure 5.15). The same is true for the quality of maritime and air transport services, while the quality of train services is below the EU average.

⁴⁸ Logistics (supply chain management) include planning, organizing, managing, executing and monitoring the flow of materials, goods and information from the producer/supplier to the intermediate or final consumer. Many of these activities are done internally within manufacturing or trading firms. Activities that are done externally and are recorded as distinct economic activities (third party logistics - 3PL), include freight transport services, classified within Section H 'Transport and storage' of the Statistical Classification of Economic Activities (STS 08 - NACE Rev. 2).

5.5.2 Barriers

Greece's transport infrastructure and logistics services must be developed further to support economic growth and regional convergence. The road network is extensive and has relatively few bottlenecks. The main weaknesses are instead that infrastructure maintenance is inadequate and not sustainable economically; the rail network is limited in terms of its geographical coverage and functionality; the port infrastructure is outdated; different modes of transport are not well connected; and logistics services are fragmented.

Motorway network

The motorway network has a total length of about 2,000 km and is dense by European standards. For example, Germany, with a population about eight times larger than Greece's, has 13,000 km of motorways (*Autobahn*), and France and Britain, with populations about six times larger than Greece's, have 12,000 km. Greece's motorway network has recently been expanded, with new motorways built in Western and Northern Greece. Moreover, hundreds of kilometres of new motorways are currently being planned or built.

While the new projects have significantly improved the road network, there is still room for improvement. The density of the network remains low in some parts of the country, such as the eastern, southern and western coasts of the Peloponnese, the eastern part of Thrace, and parts of Epirus and central Greece. Road access to many border crossings is of low quality. Access to motorways is of uneven quality, and some parts of the road network are dangerous due to poor signposting or abrupt changes in road width. The maintenance of national and departmental roads is inadequate. According to traffic forecasting models, bottlenecks in the road network may increase in the medium term if additional works are not carried out (Hellenic Republic, 2019).

Railroad network

Greece's geography makes it difficult to develop a viable railroad network. Railroad connections to Bulgaria and North Macedonia are poor, and to Albania and Turkey practically non-existent. Many parts of the country, such as western mainland Greece and most of the Peloponnese, have limited or no railroad connections (Hellenic Republic, 2019).

Passenger train services are generally of low quality: the rolling stock is old, services are infrequent and often delayed, information provision to passengers is inadequate, and so on. This is in spite of the high cost of maintaining and operating the network during the past decades. The poor maintenance of the network and the large number of road crossings limit the speed of trains and create safety hazards. Quality is higher for the main rail corridor of Patras-Athens-Thessaloniki.

The connection between the rail network and other transport infrastructure and major production units is inadequate. Only three ports (Alexandroupolis, Thessaloniki and Piraeus) are connected to the rail network. Greece's competitiveness as a trade hub depends critically on the ease of moving cargo from trains to ports and vice-versa.

Ports

Greece has 130 ports, two of which are managed by private firms – the Port of Thessaloniki (ThPA) and the Port of Piraeus (PPA) – and ten of which are structured as limited liability firms undergoing privatisation. In ThPA and PPA, significant investment is taking place and activity is picking up. The increase in activity is hindered, however, by the ports' limited connectivity with other forms of transport and by outdated customs procedures.

The remaining ports are operating inefficiently due to low levels of investment and poor management structures. Municipalities often treat ports as a source of revenue but do not expend resources to maintain them and improve their infrastructure. As a result, most ports have inadequate reception equipment, cargo ramps and road connections, as well as problems with sea waves. Capacity utilisation is low even in the ten regional ports that are structured as limited liability firms – for example, in the ports of Heraklion, Lavrio, Patras and Eleusina, capacity utilisation for general cargo ranges between 2.0% and 15.4% (HRADE, 2019).

Building and maintaining public infrastructure

There are two main approaches to building and maintaining public infrastructure. The first and most widespread ('conventional') approach is for a public project to be put out to tender and allocated to the firm that offers the lowest cost, with the firm paid gradually during the construction of the project. The maintenance of the project after construction is finished is done via tendering as well, but separately. The second approach is through a public-private partnership (PPP). In a typical PPP, a public project is put out to tender, but payment to the construction firm is made over a 10- to 20-year horizon after construction is finished, and is based on how the project performs on pre-agreed dimensions. For example, if cracks develop on a road, then the firm that built the road will receive a lower payment. The firm also often undertakes to maintain the road during the repayment period. In both the implementation and the maintenance stage, the infrastructure can remain public and the government can determine any charges to users (e.g., tolls).

PPPs have important advantages over the conventional approach. The construction firm has strong incentives to deliver a high-quality project, as any failures within a 10- to 20-year horizon lead to lower payments. The firm also has stronger incentives to deliver the project on time, as payments start after the project's delivery.

International experience shows that the advantages of PPPs hold not only in theory but also in practice. For example, a 2002 study from the UK examined 50 large infrastructure projects with a value of more than £40 million, 39 of which were carried out conventionally and the rest through PPPs (Mott McDonald, 2002). Conventional projects had a 47% cost overrun, whereas for PPPs the overrun was only 1%. The estimated construction time for conventional projects was exceeded by 17%, while construction time for PPPs was about 1% faster than planned. Recent studies from the UK and Australia reach similar conclusions (National Audit Office, 2003; Raisbeck et al., 2010). The savings through PPPs in these countries are estimated to be at least 10% of the construction cost of a project.

PPPs involve contractual complexity as a list of performance dimensions must be agreed between the state and the construction firm, and these dimensions must be monitored over time. The complexity limits the use of PPPs to medium- and large-scale projects. However, many small-scale projects can be consolidated to form a PPP project. For example, while the construction of one school building is impractical to organize as a PPP, the construction of many school buildings can be packaged into a PPP.

Greece has developed a modern legislative framework for PPPs, which stipulates that projects are tendered based on the public sector's substantive requirements and not on non-essential specifications. For example, the state may require a low-cost and failure-free road, without specifying the composition of the asphalt. This allows more firms to tender, increasing competition. The framework's successful implementation is evidenced by Greece ranking second out of 81 countries by the Global Infrastructure Hub (a G20 body) in "Procurement of PPPs", and third out of 135 countries in the same ranking by the World Bank.

The legislative framework for conventional projects is instead complicated. An important difference with PPPs is that conventional projects are tendered based on technical specifications rather than the state's substantive requirements. The complexity of the legal framework means that competition is less intense and the state's costs may be higher.

In recent years, construction firms have often offered high discounts when tendering for public projects. This does not necessarily imply more intense competition and lower costs for the state, as quality may be poor, maintenance and operating costs may be high, and works may not finish on time. As mentioned above, PPPs address these issues better.

The problems with the legislative framework for conventional projects are revealed in international rankings. In the same rankings in which Greece comes second out of 81 countries for PPPs, it comes 53rd in the category "Procurement of Infrastructure". An additional problem of tendering public projects using the conventional approach rather than PPPs is that maintenance requires additional tenders and contracts (which increases the state's costs).

Public infrastructure management

There are multiple public agencies involved in the management of public infrastructure, and the allocation of responsibilities across them is often unclear. This hinders the development of long-term strategies and the implementation of investment programmes. There are also delays in staffing new regulatory agencies.

Logistics

Logistics services are concentrated geographically but are fragmented in their operations. Organised freight centres, common in other countries, are lacking. Deficiencies in spatial planning and the definition of land uses are partly responsible for the problem, as the conditions for obtaining building permits are often unclear. Because the logistics sector is fragmented, firms carry out many of their logistics activities internally, outsourcing little to third-party providers. The underdevelopment of the logistics sector and the lack of connections between different modes of infrastructure explain the low penetration of multi-modal transportation (i.e., the use of different modes to transport the same cargo).

The legislative framework governing logistics services is fragmented, with many amendments in scattered bills. Some issues are over-regulated, while for others there are regulatory gaps. The lack of codification of regulations, the overlaps in administrative responsibilities across public agencies and the various unnecessary requirements that firms must meet discourage new entrants.

For example, severe restrictions hindering entry into the road freight transport sector were in place until recently, and some inefficiencies still remain. There exist a large number of haulers with an obsolete fleet of low-capacity and polluting vehicles. They compete solely on a cost basis, do a lot of empty mileage and have limited access to finance. As a result, the share of low-emission vehicles is growing more slowly in Greece than in most other EU countries (Hellenic Republic, 2019).

5.5.3 Policy recommendations

Investment priorities

Investment priorities for infrastructure include completing the main railroad network, improving access by rail and motorway to border crossings, upgrading the export ports and enhancing multi-modality.

The recently completed high-speed rail between Attica and Thessaloniki could be extended southwest to Patras and north to the border crossings into North Macedonia and Bulgaria. This would make the Patras-Attica-Thessaloniki (ΠΑΘΕ-PATHE) axis, with its extension to Greece's northern borders, a competitive gateway for the supply of goods to southeastern Europe and even parts of northern Europe. Achieving that goal

would require improvements in logistics, in interconnections between different modes of transport, and in operations of border checkpoints to reduce the transit time of goods. Border checks should be better coordinated with neighbour countries. In the case of rail services, better coordination is needed to ensure availability of staff and locomotives.

In addition to the PATHE axis, improvements to transport infrastructure are needed throughout the country to enhance mobility, access and regional convergence. Priorities include the vertical axes of the Egnatia motorway towards the northern borders; the connection between the A1 and A8 motorways; the road connections Lamia-Amfissa-Antirrio and Kalamata-Pylos; the Southern Road Axis of Crete; new railway connections (Thriasio-Thebes, Kastoria-Florina-northern borders; new Port of Kavala-Xanthi, Almyros-Volos, Koropi-Lavrio, AIA-Rafina, Thessaloniki-Edessa); the upgrade of existing rail links and the development of organised freight centres (Thriasio, Thessaloniki, Patras, Larissa-Volos, Igoumenitsa and Alexandroupolis).

Strategic planning and investment priorities

Identifying investment priorities such as the above should be done via a strategic planning process. Strategic planning for infrastructure at the national level results in better planning and sequencing of projects. It also provides more certainty to construction firms, as they can have more information to carry out their own strategic planning. We present below international best practices in strategic planning for infrastructure. We also outline an innovative methodology to calculate the economic impact of new transport infrastructure, and apply it to the Greek transport network.

Best international practices

The OECD has developed a ten-point framework for sound management of a national infrastructure programme (OECD, 2017). According to that framework, an infrastructure programme should be based on a *national long-term strategic vision* that identifies the necessary investments and determines their sequencing. Strategic planning and management of a national infrastructure programme should be carried out by specialised agencies. In the United Kingdom, for example, there are two such agencies, with complementary responsibilities.

- The **Infrastructure and Projects Authority** is responsible for the timely and cost-effective implementation of infrastructure and other projects which are prioritised by the government, and for reporting regularly on the progress with these projects. It has commercial and financing capabilities. It provides specialised support to the government on issues pertaining to project finance. It also guides and coordinates the government's efforts to work with the construction industry to accelerate project implementation and reduce construction and maintenance costs.

- The **National Infrastructure Commission** is responsible for evaluating future infrastructure needs and for providing expert and independent analysis on pressing issues and challenges concerning infrastructure. Its responsibilities include evaluating infrastructure needs over a 30-year horizon and identifying priorities. It formulates a long-term vision and recommendations, to which the government, which makes the ultimate decisions, must formally respond.

Besides the requirement that a national infrastructure programme is planned and monitored by specialised agencies, the OECD sets out the following requirements: (a) appropriate tools and procedures that link the allocation of public funds to the infrastructure programme; (b) consistency between the infrastructure programme and spatial planning and land use; (c) criteria to determine the priority, acceptance and financing of projects; and (d) criteria to ensure operational value for money, such as cost-benefit analysis and cash flow estimates over the life cycle of a project.

Methodology and conclusions for the Greek transport network

The economic impact of new transport infrastructure can be assessed using an economic geography model. Such a model can identify how new infrastructure, or improvements to existing infrastructure, would affect economic activity, exports and regional convergence.

The model presented in this report uses detailed geographical data (e.g., the roads and ports in Figure 5.16) and trade data by region to measure transport costs under the existing infrastructure. It also uses wage and labour force data by region or municipality and by economic sector to measure the productivity and comparative advantage of each region.⁴⁹ Based on the above data, the model determines the benefits of existing and new motorways and of upgrading the exporting ports.

Benefits of motorways completed up to 2017

Construction of Greek motorways started in the mid-1980s, with the first section delivered in 1990 and smaller or larger sections delivered in subsequent years (Figure 5.17). Table 5.4 includes some of the major sections of the motorway system and their categorisation in the model.

The benefits of motorways are calculated under the assumption that motorways increase transport speeds (in line with the official limits), and provide access to new areas if built away from existing roads.

⁴⁹ This section contains a brief outline of the model and its conclusions for the Greek transport network. A more detailed presentation is available at arkolakis.com/greekeconomy. Panagiotis Skartados contributed valuable research assistance on the model and analysis presented in this section.

TABLE 5.4 MAJOR SECTIONS OF THE GREEK MOTORWAY SYSTEM

Axis	Km	Progress	Model categorisation (and in Figure 5.17)
Athens-Thessaloniki-Evzoni	550	Completed in 2017 (almost all sections)	Completed before 2017 (almost all sections)
Egnatia Odos	670	Completed in 2014	Completed before 2017
Ionia Odos	417	217 kms in 2017	New motorway
Athens-Patras	205	Completed in 2017	Completed before 2017
Central Peloponnese	155	Completed in 2016	Completed before 2017
Northern Road Axis of Crete	310	Under tender	New motorway

FIGURE 5.17 MOTORWAYS AND NATIONAL ROADS COMPLETED, UNDER CONSTRUCTION OR PLANNED IN GREECE IN 2017



Note: Motorways completed by 2017 are in yellow, motorways completed more recently or in the planning stage are in purple, and national roads are in green.

Source: <https://www.openstreetmap.org> and calculations by the research team.

According to the model, the motorways completed by 2017, with a length of about 1,600 km (as shown in Figure 5.17 in yellow), raised GDP by €4 billion per year (2017 prices) and raised the export-to-GDP ratio by about half a percentage point (by facilitating the transport of goods to border crossings and exporting ports). The economic benefits are large since the motorways completed by 2017 upgraded transport between the three largest cities in Greece (Patras, Athens and Thessaloniki). These three cities generate most of the domestic trade and production.

Measuring construction costs of motorways is challenging because road sections are delivered incrementally and the terrain is heterogeneous. The average cost of construction does not exceed €10 million per km.⁵⁰ To convert the one-off construction cost into an annual cost so that it is comparable to the annual benefit, we must use an annual interest rate and adjust for depreciation and maintenance. Using an upper bound of 5% for the interest rate, and assuming an annual maintenance cost of 0.5 million per km, the annual cost of motorways does not exceed €1 million per km. It is therefore significantly lower than the estimated benefits, which are €2.5 million per km (= €4 billion/1,600 km).⁵¹

Benefits of new motorways

The motorways that have been completed more recently or that are being planned are those beyond the main Patras-Athens-Thessaloniki-Egnatia Odos axis. Motorways such as the Ionian Road, the first section of which was recently completed, and the Northern Road Axis of Crete, which has not yet been put out to tender, have emerged as key investments to decentralise economic activity and boost regional growth. We calculated the impact of a network totalling 1,280 km (as shown in Figure 5.17 in dotted purple lines).

According to the model, new motorways contribute €1.5 billion per year to GDP growth (2017 prices). The benefit per kilometre is €1.17 million (= €1.5 billion/1,280 km). This is considerably lower than for the main motorways, but still exceeds the cost.

The contribution of the new motorways to GDP growth is lower than that of the main motorways because the latter connect the largest cities in Greece. Yet, the new motorways contribute significantly to GDP growth in municipalities away from the main cities, mitigating regional disparities. According to the model, the extended network would lead to a large increase in GDP in the municipalities of Western Greece, Crete and the northernmost municipalities of Macedonia (Figure 5.18). For several municipalities (over 15% of the total), real GDP would increase by more than 1%.

The new motorways would cause population movements across regions. The connection of Northern Greece with the rest of Greece by two more motorways – the motorway of Central Greece and the Ionian Road – would improve access to these regions. Improved trade due to the new motorways leading to border crossings would also facilitate access to international markets. The model predicts that dozens of municipalities in Macedonia, Epirus and Thrace would experience population growth of more than 2%.

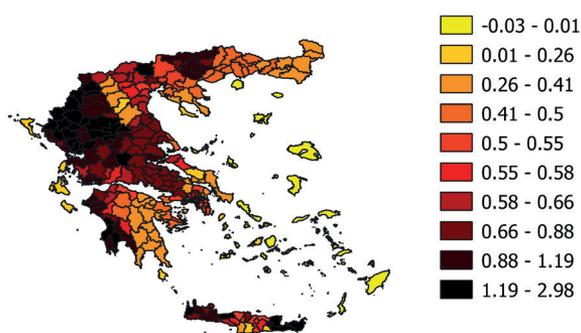
50 <https://www.tovima.gr/2009/12/05/finance/poso-kostizei-ena-xilometro-dromoy-stin-ellada-kai-poso-stin-eyrwpi/> (in Greek)

51 The cost of motorway maintenance in the United States is \$50 billion for 80,000 km of network, i.e., \$0.625 million per km. The cost is probably higher than in Greece due to the more intensive use of the road network in the United States and the extreme weather events that lead to rapid deterioration of the network.

Benefits from upgrading the exporting ports

Investments in the country's exporting ports would improve their infrastructure, reducing export and import costs. We calculate the benefits of upgrading the eight major exporting ports, shown in Figure 5.16, by assuming that the cost of exports and imports would drop by 20%. We assume that the cost reduction would pertain not only to exports of products made in Greece and imports of products to be consumed in Greece, but also to trade in products that are not domestically produced or consumed but transit through Greece. According to the model, upgrading the eight major exporting ports would add about half a billion euros per year (2017 prices) to GDP growth. Income growth would be particularly high in the municipalities of Crete and those near Patras and Piraeus.

FIGURE 5.18 INCREASE IN REAL GDP IN 2017 BY MUNICIPALITY



Note: GDP growth in percentage points due to motorways completed after 2017 or in the planning stage, as shown by the dashed purple lines in Figure 5.17. Municipalities are divided into deciles based on total impact.

Building and maintaining public infrastructure

PPPs should be adopted more widely when building and maintaining public infrastructure and public projects more generally. Based on the experience of countries such as the United Kingdom and Australia, the savings through PPPs would be 10% or larger. Given that public projects with a total cost of €1-2 billion meet the conditions to go into PPPs annually, the annual fiscal savings would be at least €100-200 million.

The legislative framework for conventional projects should be amended, incorporating the positive elements of its PPP counterpart. To the extent possible, public projects should be put out to tender based on the public sector's substantive requirements in terms of quality and efficient operation, and not based on non-essential specifications. The substantive requirements should be defined precisely, to minimise future disputes. Project budgets should be well justified by the authorities tendering the projects.

Bids should be evaluated not only based on cost, but also based on criteria such as completion time and guaranteed maintenance horizon. Projects should be monitored during all stages.

A specialised agency within the central administration should support all planning, tendering and monitoring procedures, in line with international best practices. That agency would provide the necessary expertise, standardise technical specifications and procedures, issue best practice manuals, and so on.

National infrastructure planning could incorporate the 'unsolicited proposals' model, whereby the private sector proposes and finances infrastructure projects with innovative features. The role of the public sector in this model is to ensure transparency, check whether the private sector's proposals are consistent with economic and social needs, and create competitive conditions for their implementation (such as specifications and pricing) if the proposed projects provide value for money. The 'unsolicited proposals' model can provide flexibility and speed in project design but does not negate the need for overall public planning, which should be playing the main and leading role.

Managing public infrastructure

The management of public infrastructure should be improved by introducing more effective forms of governance. Overlaps in responsibilities across public agencies should be minimised. Privatisation should be considered for public infrastructures whose management requires specialisation and investment. In such cases, the public sector could receive a share of the profits and supervise through independent regulatory authorities.

Greece's exporting ports fall into that category. Privatisations currently underway for ten of these ports will increase productivity and attract new investment. The entry of strategic investors can lead to better management and more proactive search for business opportunities. New investment could be used to modernise port infrastructure, especially mechanical equipment and information systems for faster cargo control and approval. Such systems could also be implemented at the country's land borders.

Logistics

Measures to enhance the efficiency and competitiveness of logistics services include (Hellenic Republic, 2019):

- **Modernise the legislative framework, licensing procedures and spatial planning related to logistics.** The definitions of logistics establishments and occupations should be modernised and outdated provisions and regulations should be removed, based on international standards. Removing legal ambiguities over the conditions for hiring lorries with or without a driver, which favours the use of commercial private vehicles, will encourage outsourcing. Regulatory issues concerning the logistics sector should be codified into a single legal framework. It is also desirable to establish a one-stop shop system for individual and firm licensing procedures, equipment registers, land use permits and other arrangements for the establishment and operation of transport companies and freight centres. The legal framework for the development of freight centres should

be reviewed, encouraging private investment schemes and PPPs. Warehouse building conditions (such as their volume and height) should be harmonised with international standards. Finally, simplifying the licensing for the creation of urban freight centres will facilitate intra-urban distribution with new smaller vehicles that are more environmentally friendly.

- **Encourage mergers and other cooperative legal forms in the transport and logistics sector.** The efficient management of vehicle fleets and their renewal, given environmental objectives and technological developments, requires that companies in the sector are sufficiently large. This could be achieved through mergers or other cooperative legal forms. Partnerships within the sector could be encouraged by the development of a freight trading platform (wholesale market for transport services) at the regional and national level, in which transport providers and customers would participate. Such a platform would rationalise the use of the transport fleet and reduce empty runs.
- **Support, develop and implement intelligent transport systems (ITSs) in all transport sectors.** ITS actions include indicative end-user information systems (with electronic signage, radio information and mobile applications), management systems (automated implementation of traffic scenarios, incident management, alternative routes, fleet and freight management, etc.) and innovation systems (such as transmission and information exchange standards to enable the operation of connected and autonomous vehicles).
- **Create an integrated database at the national level for road transport services,** by reviewing the typology and data collection procedures, with the aim of producing standardised and automated analyses and KPIs and improving decision-making. The rapid implementation of electronic transactions throughout the transport cycle is essential in that regard, linking transport documents (such as consignment notes, bills of lading, and special certificates) with invoices and controls. Road infrastructure development and maintenance could be improved by creating road infrastructure databases and road management systems (RMSs) at the regional and national level, and ensuring their interoperability.

5.6 ENERGY

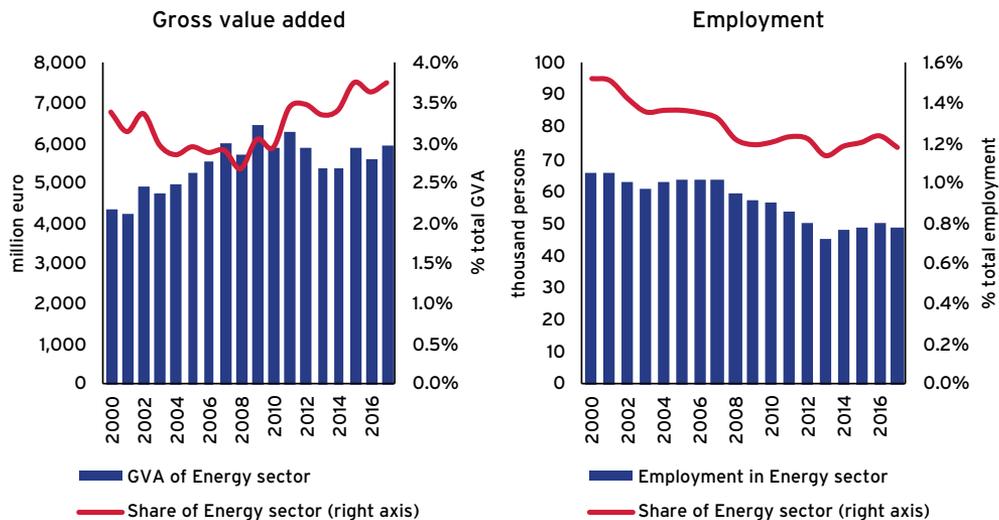
The cost of energy, as well as the adequacy and reliability of energy supply, are important determinants of a country's international competitiveness. An additional reason why the energy sector is important is its role in the transition to a zero-carbon economy.

The Greek energy sector has long-standing problems, which affect the rest of the economy. These problems should be addressed so that the Greek economy can transition to strong and sustainable growth, while meeting environmental and social targets.

5.6.1 Indicators

The gross value added (GVA) of the energy sector was 3.8% of GDP in 2019. The sector employs 50,000 people (1.2% of the country's workforce) and supports additional employment in activities indirectly linked to the energy sector (Figure 5.19).

FIGURE 5.19 GROSS VALUE ADDED AND EMPLOYMENT IN THE ENERGY SECTOR, 2000-2017



Source: Eurostat.

Greece's dependence on energy imports (oil and gas) contributes to its current account deficit. The trade deficit in energy products remains high despite the recent growth of Greek petroleum exports. That deficit was €4.3 billion in 2019.

Greece has the highest average wholesale price of electricity within the EU (€63.9/MWh in 2019), according to European Commission data. Natural gas import prices are significantly higher than the EU average (by 15% for pipeline gas in the fourth quarter of 2019), and so are natural gas prices for industrial users (€38.5/MWh in Greece in 2019, compared to €36.9/MWh in the EU). Greece had the third highest price of unleaded gasoline among EU countries in 2019. It had the seventh highest price of diesel oil, marginally higher than the EU average.

The high cost of petroleum products stems partly from high taxes. The revenue from excise taxes on energy products in Greece was 2.9% of GDP in 2018, compared to 1.9% in the EU. That revenue amounted to €4.28 billion in 2019.

5.6.2 Barriers

Energy dependence and efficiency

Greece's dependence on energy imports remains high, especially for oil and gas. The economy's energy intensity has been declining in recent years but remains high. Additional efforts are needed to achieve energy efficiency targets.

Competition in the electricity market

The electricity market is highly concentrated and not sufficiently competitive. The cost of electricity in the wholesale market is high and the connection to the retail market is weak, partly because of the large regulatory charges on electricity bills.

Until recently, the lack of competition in the electricity market was due to entrants' lack of access to low-cost primary sources of energy, such as lignite and hydroelectric. Regulatory measures were put in place to rectify this. The incumbent firm Public Power Corporation (PPC) was asked to reduce its share in the retail market and auction part of its lignite production (NOME auctions). These arrangements stimulated competition in the retail market and reduced PPC's market share, but caused significant losses to PPC. The NOME auctions were abolished in the autumn of 2019 after failed attempts to sell some of PPC's lignite plants and mines. The sale of lignite plants was hindered by the worsening economics of lignite electricity production, which together with environmental considerations led to the decision to decommission all lignite plants by 2028.

Energy infrastructure

Some of the country's energy infrastructure is incompatible with the desired transition to net zero GHG emissions. The connections between the electricity grid in the mainland and the islands are incomplete and energy losses are large, although losses are partly mitigated by the growth in decentralised production. That growth is necessary to take advantage of renewable energy sources (RES) and decommission polluting power plants in the islands.

The deployment of smart electricity grids and smart meters has been delayed. These instruments will render the system more flexible, while also enabling consumers to use energy more efficiently and respond to demand surges elsewhere in the system. The delays are partly due to the inability of the distribution network operator to make the required investments, which are, however, necessary for the penetration of RES, the development of electromobility, the storage of energy, demand management, and the provision of new services.

The natural gas network does not cover the whole country. The domestic gas market is developing quickly, however, and consumers have been allowed to change their gas supplier since 2018. Demand in the natural gas market comes primarily from the electricity generation sector. The gas retail market is underdeveloped and lags behind the EU average in terms of connected households.

5.6.3 Challenges and prospects

National energy policy is largely dictated by the EU energy and climate policy. The EU is committed to reducing GHG emissions to net zero by 2050. European energy policy currently focuses on accelerating the integration of the European energy market and the decarbonisation of the economy. Decarbonisation efforts are coordinated with policies on research, innovation, competitiveness and consumer protection.

These considerations are reflected in the National Energy and Climate Plan (NECP) of Greece, which sets ambitious targets towards a competitive energy system with low GHG emissions, and significant energy savings and RES penetration. Meeting these targets involves economic, regulatory and technological challenges. It requires constant monitoring and the implementation of multiple policy measures and incentives. Once the necessary investments are in place, the energy sector can become an important part of the new growth model for Greece, attracting capital, improving the balance of payments and strengthening the economy's competitiveness.

The profound transformation of the Greek energy sector that is required to achieve climate neutrality by 2050 will require significant investments in the coming years to improve energy efficiency, further develop RES, further develop energy network infrastructure to facilitate the development of RES, and ensure a fair transition of lignite-dependent areas. The investments, which will be funded from public and private sources, will stimulate economic growth, improve productivity in the energy sector, facilitate innovative activities, reduce the environmental footprint of the energy sector and increase choice for consumers of energy. These investments have become all the more important during the COVID-19 pandemic as they can ease the recession and speed up the recovery.

The planned investments will not only transform the country's energy sector and stimulate economic growth, but will also provide energy to firms and households in a reliable manner and at affordable prices. This is necessary for the competitiveness of several sectors, especially manufacturing, and for high living standards. To meet these goals, technological choices made during the energy transition must carefully weigh costs and prospects, sufficient competition in energy markets must be ensured, and regulation in the energy sector must provide incentives to raise productivity and promote innovation so that the cost of developing network infrastructure, which is ultimately borne by energy consumers, is minimised.

The hydrocarbon exploration and exploitation sector can improve the Greek economy's growth prospects by generating revenue for the Greek state and creating skilled jobs. Developing an ecosystem of activities around that sector is not inconsistent with decarbonising the economy since the transition to net zero will take decades, during which time the country will remain dependent on fossil fuels. Besides confirming the existence of exploitable hydrocarbon fields, it is important to ensure that the environmental impact of hydrocarbon exploitation remains under constant and full control.

5.6.4 Policy proposals

Strengthening competition in the electricity market

The electricity market must become more competitive, with sufficient liquidity and supervision, so that electricity costs can be reduced. The transition to the target model should be completed and the Hellenic Energy Exchange should be linked to the regional wholesale markets. Regulatory charges and energy costs must be rationalised by taking advantage of the development of new markets (futures, intraday and balancing). Measures that can reduce energy costs for manufacturing firms (such as compensation for indirect emissions and load interruptibility) must be fully explored, while complying with the EU regulatory framework. The development of the new market for capacity, with demand-side participation, represents a move in that direction. The independence of the Regulatory Authority for Energy should be enhanced through increased administrative flexibility.

Energy transition and integration of RES into market mechanisms

After the transition to the target model is completed, and the RES support mechanism expires at the end of 2020, careful forward planning is needed. The momentum on new capacity installation should be maintained without over-committing to support RES investments, given that returns on these investments could be recoverable in the medium term through market mechanisms. The viability and liquidity of the mechanism for providing operational support to RES power plants should also be ensured.

Upgrading energy infrastructure

Transmission, distribution and storage projects in the electricity and gas networks should be the main priorities for infrastructure. Increasing the capacity of electricity and gas interconnections with neighbouring countries, together with coupling the respective wholesale markets, will strengthen competition in the domestic market. Towards that goal, it is also desirable to introduce financial incentives on regulatory network charges. Energy networks should also be digitised and upgraded (i.e., smart grids), as this will improve energy efficiency and provide flexibility to the electricity system.

Improving energy efficiency

Improving energy efficiency is necessary for the transition to net zero. Energy efficiency improvements should be supported by incentives for residential and commercial buildings and by exemplary public sector actions for public buildings. Additional priorities are the use of RES to meet heating and cooling needs, and the promotion of energy efficiency contracts with providers of energy services.

Mitigation of social impacts

Actions to protect the environment and mitigate climate change should not conflict with social goals. Energy poverty should be addressed as a matter of priority, with measures such as larger subsidies to poorer households for energy efficiency projects. Tolerating non-payment of electricity bills is not a good social policy – a high recovery rate on electricity bills should be ensured and be accompanied by targeted measures against energy poverty. A fair transition of lignite-dependent areas is also an important priority, through strategic actions and financial schemes.

Research, development and innovation

The process of energy transition gives rise to opportunities for developing innovative solutions and products. A framework for R&D could be designed in the energy sector, emphasising the development of innovative energy saving technologies, smart grids and energy storage.

Sectoral priorities and interventions

This chapter examines key sectors and industries of the Greek economy, and the challenges that they are facing. It also presents relevant policy recommendations that aim to eliminate barriers that hold back growth in these sectors. The ‘horizontal’ recommendations presented in Chapters 4 and 5 are related to the total economy, and would therefore have a beneficial effect on all areas of activity. The ‘vertical’ recommendations presented in this chapter are more specialised interventions which, together with the horizontal ones, would enhance the growth prospects in key areas of the economy, as priorities may vary across sectors.

6.1 MANUFACTURING

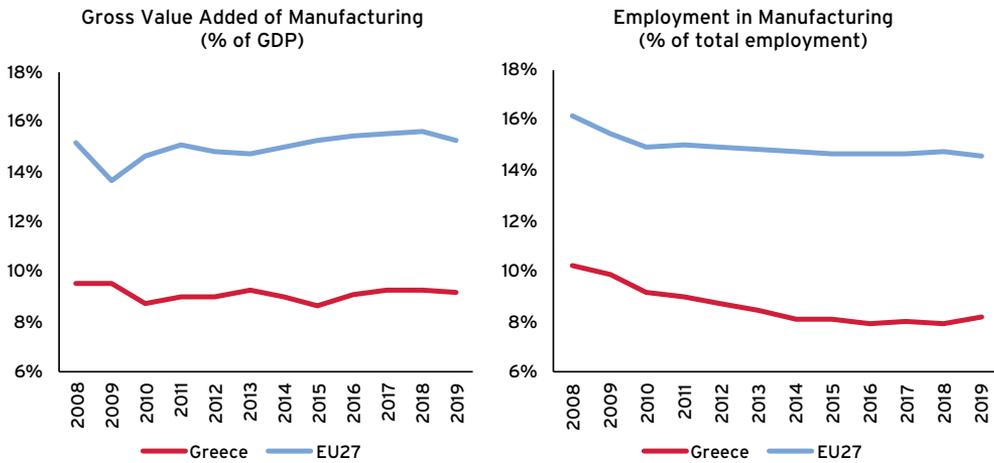
Manufacturing is one of the most important sectors in an economy, significantly affecting its growth prospects, degree of openness, innovation and interconnection with technology. Greece lags behind other European countries in terms of the size of its manufacturing sector, even though Europe itself ranks low compared to other economies. However, the growth potential for the Greek manufacturing industry is significant. Achieving this growth would also be in line with the EU's policy of reversing the de-industrialization trend that has been taking place in recent years in Europe.

6.1.1 Indicators

In 2008-2019, the GVA of manufacturing in Greece accounted for 9.1% of GDP, compared to an average of 15.1% in the EU (Figure 6.1). The share of employment in the manufacturing industry was also significantly below the EU average. In 2008-2019, only 8.6% of employees in Greece worked in the manufacturing industry, compared to an average of 15% in the EU.

Fixed capital formation in manufacturing during 2008-2017 accounted on average for 15% of the sector's GVA, reaching €2.7 billion (Figure 6.2). Investments in machinery and equipment, which constitute the core of productive investments, accounted on average for 7% of its GVA in 2008-2017.⁵² The rate of investment in machinery and equipment in Greece is significantly lower than that in Spain and Portugal.

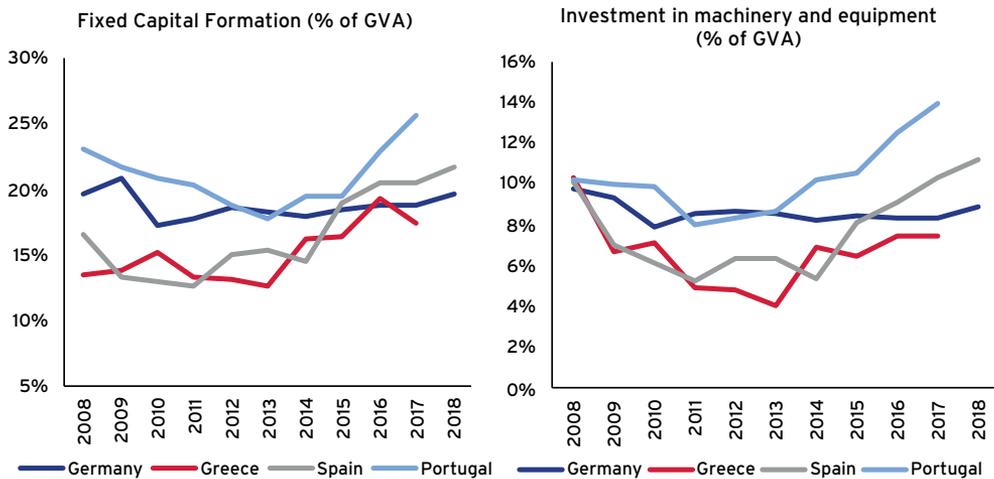
FIGURE 6.1 CONTRIBUTION OF THE MANUFACTURING SECTOR TO ECONOMIC ACTIVITY AND EMPLOYMENT



Note: Data are calculated using the EU NACE classification. Manufacturing consists of the activities in sector C.

Source: Eurostat.

FIGURE 6.2 INVESTMENT ACTIVITY IN THE MANUFACTURING SECTOR



Source: Eurostat.

The gap between Greece and other European countries in terms of the size of manufacturing is also reflected in the exports of the sector. Greek exports of manufactured products in 2019 accounted for 9.2% of GDP, while the average percentage for nine countries comparable in population to Greece (Austria, Belgium, Bulgaria, Denmark, the Netherlands, Hungary, Portugal, Sweden, and the Czech Republic) was 38.2%.⁵³

⁵³ These figures are calculated using the Standard International Trade Classification for trade in goods. Industrial products correspond to categories 5, 6, 7 and 8. The value of exports also takes into account the value of intermediate products used in the production process, whereas the value of intermediate products is not included in the GVA.

Despite its small size, manufacturing in Greece has shown significant export dynamics. For example, in 2013-2019, the Greek exports of manufactured products achieved an annual growth of 6.7%, while the average for the nine comparable countries was 4.9%. Taking into consideration its small size as well as the export dynamics of the sector that have developed even during the crisis, we can remain optimistic about its future potential, provided that the appropriate supportive policies are implemented.

6.1.2 Challenges and prospects

The current gaps in productive investments and in the contribution of manufacturing to domestic economic activity are due to various barriers that negatively affect the competitiveness of the industry. Overcoming these barriers would provide the opportunity to strengthen domestic manufacturing activity. The gaps are also driven by the fact that the manufacturing industry requires investment with a medium- and long-term horizon in order to grow, and therefore a relatively stable and coherent economic environment. In addition, significant opportunities for the industry arise from its technological modernisation, the strengthening of its innovation and the more intense participation of domestic manufacturing in global value chains.

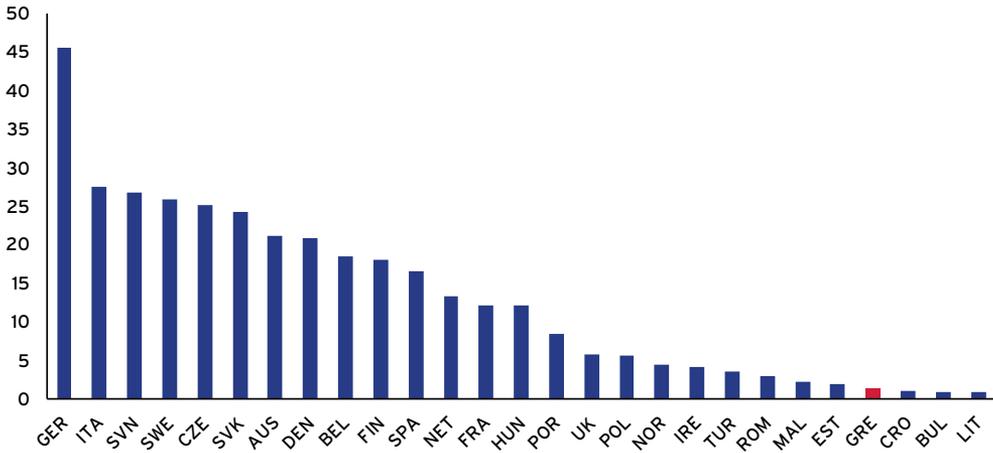
The Fourth Industrial Revolution

The main goal of the Fourth Industrial Revolution is to make manufacturing faster and more efficient, through the automation of production processes and analysis of big data (European Commission, 2018d). The rate of automation and the use of information systems in the manufacturing industry is growing rapidly globally.

The Greek manufacturing industry must follow international developments, investing in modern technologies, advanced information systems and automated procedures. Automation in Greece is at a very low level compared to international or European averages, as shown in Figure 6.3, which indicates the number of robots per 10,000 employees. The figure concerns all Greek businesses, but the data for manufacturing show a similar gap.

The digital modernisation of manufacturing firms requires not only physical capital investments, but also a new structure and operating system, as well as human capital with appropriate skills. It also requires a long-term strategy from the state, focusing on the digitalisation of public services, the improvement of network infrastructures, the development of a digital innovation hub, and the improvement of the regulatory framework.

FIGURE 6.3 ROBOTS PER 10,000 WORKERS IN THE WHOLE ECONOMY



Source: International Federation of Robotics.

Research and development (R&D)

Global competition in all sectors of the economy, and particularly in manufacturing, demands a reduction in production costs through the introduction of advanced technologies, and the development of innovative high-quality products. Success in these areas requires R&D activities. However, R&D spending in Greece is low compared to other European countries. For example, in 2018, the R&D spending of Greek firms accounted for 0.57% of GDP, compared to 1.41% on average in the EU (Figure 5.13, Section 5.4).

The development of innovative practices and products requires skilled and specialised human capital. This could be facilitated by linking the manufacturing industry with the scientific community, as well as by foreign direct investments in high-tech areas that will attract specialised human capital. Funding and incentives are of critical importance for the development of R&D activities.

Global value chains

The development of cooperative relationships through the participation of domestic manufacturing firms in global value chains contributes to the acquisition of specialised knowledge and know-how while enhancing potential for innovation, especially for smaller firms. In addition, international cooperative relationships of strategic importance for manufacturing firms can trigger investment in cross-border projects with high added value for the country, while increasing the international competitiveness of domestic manufacturing.

Indicatively, the following Greek manufacturing sectors are distinguished for their strong prospects:⁵⁴

- **Mining and quarrying:** The sector has strong export orientation and a clear competitive advantage in specific market segments. Greece has significant reserves of mineral raw materials, such as marble, perlite, bentonite, bauxite and other ores. It remains a challenge to achieve greater vertical integration and specialisation of the production processes that utilise domestic raw materials, so as to maximise the added value produced domestically through this economic activity.
- **Agri-food value chain:** Greek yoghurt and feta cheese have gained significant international recognition, and there are other products that may gain similar recognition (such as mastic from Chios and olive oil produced in specific locations in the country). Greek agricultural products can be differentiated from the competition based on qualitative and local characteristics (e.g., food with bioactive ingredients) or environmentally friendly production methods (e.g., mild non-thermal processing methods), but the relatively small arable area, the small size of agricultural holdings in rural areas and the small scale of production limit the ability of the domestic sector to compete internationally in terms of production volume. The agri-food sector is analysed in more detail in Section 6.3.
- **Pharmaceuticals:** The sector participates in global value chains, mainly in the final stage of production in countries outside the EU, and has a high comparative advantage index. It is among the Greek manufacturing sectors with the highest expenditures proportionally in R&D activities.
- **Basic metals:** The sector is involved in production value chains, both in the EU and outside, mainly in initial production stages. Regarding the aluminium sector in particular, its advantages include the availability of domestic raw materials and the positive environmental characteristics of the products (full recyclable material), while its main weakness is its high energy intensity.
- **Sectors under reform:** Traditional manufacturing sectors of the Greek economy – such as textiles, building materials, and shipbuilding and repair – shrank during the crisis, but the necessary conditions for a gradual return to positive growth rates are in place. A precondition for this is to remove the barriers that limit their competitiveness. In textiles, the high quality of the raw material (cotton) and the positive dynamics in specialised products of higher technological content positively affect the prospects of the sector. In building materials, the positive prospects for recovery of the construction sector in the country create conditions for a gradual restoration of activity, while the need for energy upgrade of the building stock

54 Relevant sources are IOBE (2017b, 2019b, 2019c). Analysis for sectors with high growth prospects is also included in Waelbroeck-Rocha et al. (2018).

creates very important opportunities for the firms that offer innovative building materials. Finally, the country's strong position in international shipping, the increased traffic in Greek ports after their privatisation and the know-how in specific market segments (such as the production of marine equipment,⁵⁵ yacht construction and repair of submarines or other high-tech boats, where there is significant international demand) support the sector's prospects. This advantage could be conditionally extended to the manufacture of equipment for aircraft and other technologically related industries where there is high global demand.

- **Emerging sectors:** Positive prospects exist in sectors with strong momentum across Europe, driven by the transition to a digital, zero GHG emissions economy. The sectors that are expected to be significantly strengthened in Europe, and under certain conditions in Greece, include wind technology, energy storage systems, environmental industry, electromobility and high-tech manufacturing. High-tech firms linked to cutting-edge research can successfully compete for market segments of international demand in these sectors, even if, by international standards, they are not large.

6.1.3 Policy recommendations

Research and development (R&D)

Section 5.4 presents a comprehensive strategy for strengthening innovation in Greece. Recommendations that are important for manufacturing in particular are:

- Tax deductions for the purchase or replacement of equipment and for the construction or renovation of a building to be used for R&D activities.
- Offsetting R&D expenditures with social security contributions.
- Tax deductions on profits from R&D and intellectual property activities.
- Public participation in the financing of innovative firms and in the development of R&D networks between manufacturing firms and the scientific community.

Fostering innovation requires a skilled workforce. The issue of training and the connection between the education system and firms is discussed in Section 4.3 (education), Section 5.3 (the labour market) and Section 5.4 (innovation). Important recommendations for the manufacturing industry are:

- Facilitation of cooperation between firms and universities to support funding research activities.

55 An indicative study is IOBE (2020b).

- Better interconnection among universities offering applied studies and businesses. Internships for students in the workplace. Incentives for firms and universities related to the successful employment of students in firms.
- Assessing the needs of the manufacturing industry in the short and long term and integrating them into the planning for professional education and training of human capital.

Tax depreciation

Greece has one of the most unfavourable tax depreciation regimes among the OECD countries for fixed capital investment in machinery and equipment, with the depreciation rate being one of the lowest in the EU (IOBE, 2019b). During the financial crisis, many countries adopted methods for faster depreciation. In contrast, since 2013 Greece has reduced the tax depreciation rate, extending the depreciation period to ten years (Law 4172/2013). This regulation impedes investment, especially in a continuously changing environment with high financing costs, as businesses experience lack of liquidity in the critical period after the investment has been implemented (SEV, 2019).

We recommend the following regulatory interventions to mitigate the problem:

- Introduce a five-year option for over-depreciation of new investments, depending on the type of equipment, in all sectors.
- Introduce accelerated depreciation methods, with the right to choose the depreciation method.
- Introduce the possibility to adjust tax depreciation rates and to select between tax and accounting (IFRS) depreciation rates.

It is estimated that the declining balance method of depreciation with an annual rate of 48% could lead to a boost in annual GDP, accounting on average for €280 million in the first three years of its implementation. In terms of employment, the overall impact is estimated at an average of 6,740 additional full-time jobs over the first three years.⁵⁶

Energy costs

Over the past five years, wholesale electricity prices in Greece have been up to 40% higher than the European average.⁵⁷ In addition, the energy intensity of manufacturing in Greece is higher than the EU average (IOBE, 2019b). To mitigate the high energy costs, the following actions are proposed, which are discussed in more detail in Section 5.6:

- Full implementation of the target model, with as few regulatory constraints on the market as possible.

⁵⁶ Assuming that 75% of the additional liquidity is directed to new investments during the three-year period (IOBE, 2019).

⁵⁷ Source: Quarterly Reports on European Electricity Markets (2015-2019), European Commission DG Energy.

- Strengthening of interconnections with neighbouring countries so that the coupling of the Greek electricity market becomes operational in practice, for full participation in the single electricity market.
- Operation of demand response market mechanisms.
- Review of all regulated charges, streamlining them and introducing EU-accepted tools to reduce or offset them for manufacturing.
- Establishment of an effective CO₂ cost compensation mechanism, fully implementing the relevant EU guidelines.

It is estimated that a 10% reduction of energy costs in the energy-intensive manufacturing sectors in Greece would lead to an increase in GDP of about €600 million, boosting employment by about 12,000 jobs (IOBE, 2019b).

Licensing and spatial planning

The chronic weaknesses in spatial planning in Greece have led to scattered local development, with a large percentage of production facilities located outside of industrial parks. As mentioned in Section 4.5, 66% of the Greek businesses were located in non-organised areas in 2012, 21% in residential areas, and only 13% in industrial zones.

The establishment of facilities outside industrial parks is due to a combination of factors. In some business or industrial parks, infrastructure is inadequate and the fees are high. Some firms own land located outside industrial areas, and therefore the opportunity cost of acquiring land within organised areas is higher. Finally, as there is no strong environmental control regime in the country, firms located outside of organised areas may have lower costs of complying with environmental legislation.

At the same time, however, firms established outside of organised areas may experience licensing and legal problems related to land use, as well as lack of access to infrastructure. Therefore, both cases entail problems.

Improving licensing and establishment procedures would reduce the operating costs for Greek manufacturing firms, while also contributing to better environmental protection. Incentives should be introduced for establishment within organised areas, for both new and existing firms. At the same time, provisions should be laid down for the upgrade of informal industrial concentrations (which are located outside the organised zones). Recommendations focused on this are:

- Upgrade the infrastructure of all organised receptors. Ensure adequacy and quality of interconnections with networks such as gas, electricity, water supply/drainage, telecommunications. Reduce establishment fees.
- Complete the local urban plans (which, among other things, set the planning of industrial areas).

- Ensure the adequacy of industrial land for the development of new investments through the revision of the Special Spatial Planning Framework for Industry.
- Improve licensing procedures, while strengthening environmental controls. The new environmental law envisages the simplification of environmental permits (Law 4685/2020).
- Develop comprehensive plans to consolidate informal industrial concentrations and create modern business parks.

6.2 TOURISM

The rich cultural heritage, extensive coastline and natural environment are the comparative advantages that make Greece one of the world's major tourist destinations. Tourism mobilises a wide range of economic activities (accommodation, travel agencies, transport, food services, primary sector, cultural events, trade, construction), while contributing to the development of local communities. As a result, it is one of the key sectors of the Greek economy, with a significant contribution to the country's GDP and employment. However, policy measures are required to address the challenges and structural weaknesses of the domestic tourism sector, and thus to maintain and strengthen its economic contribution.

6.2.1 Indicators

According to the World Travel and Tourism Council (WTTC), Greek tourism contributed 20.8% of the country's GDP in 2019 (or €39 billion). The employment related to Greek tourism products is estimated at 946,000 people (21.7% of all employees).⁵⁸

International tourism receipts reached 9.7% of GDP in 2019 (€18.2 billion, Figure 6.4), from 4.3% of GDP in 2010. These receipts account for 22% of the total exports and receipts in the current account, and 45% of the total receipts from services.

In terms of arrivals, including cruises, foreign visitors amounted to 34 million in 2019. Based on UN World Tourism Organization (UNWTO) data for 2019, Greece ranks 13th in terms of international arrivals.

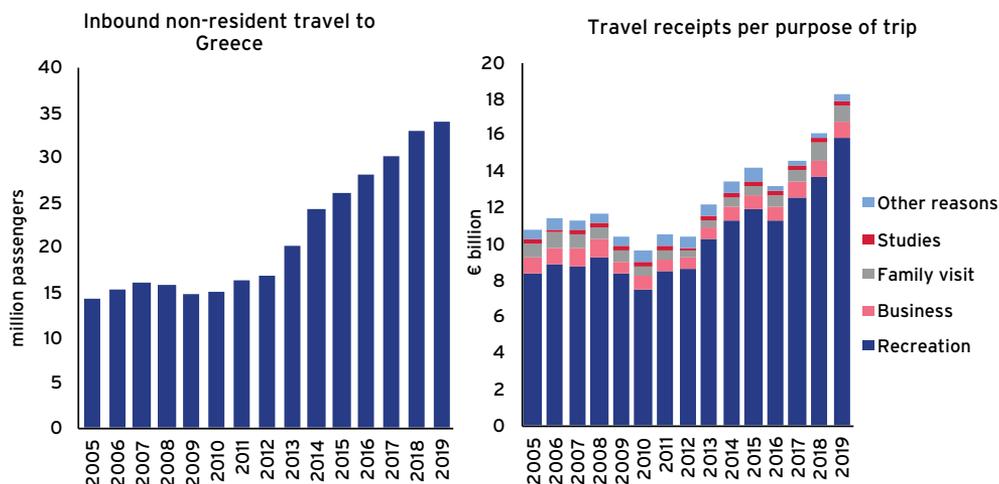
58 <https://wtcc.org/research/economic-impact>

6.2.2 Challenges and prospects

Enrichment of the tourism products

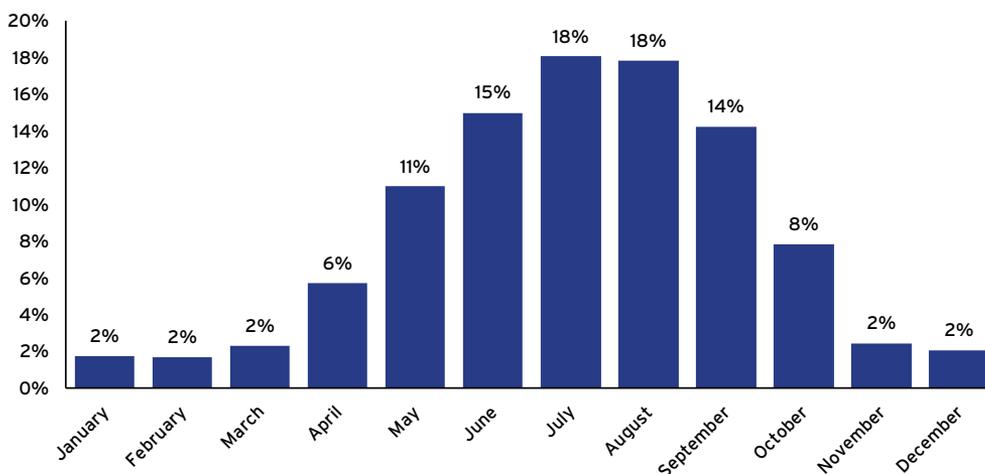
Greek tourism is focused on the ‘sun and sea’ product, which is the most important tourism product worldwide. More than half of foreign arrivals in the country take place between July and September each year (Figure 6.5). Greece is the third most popular destination in the world for the ‘sun and sea’ product.

FIGURE 6.4 INBOUND NON-RESIDENT TRAVEL TO GREECE AND TRAVEL RECEIPTS



Source: Bank of Greece.

FIGURE 6.5 COMPOSITION OF INTERNATIONAL ARRIVALS AT THE COUNTRY'S MAIN AIRPORTS BY MONTH, 2019



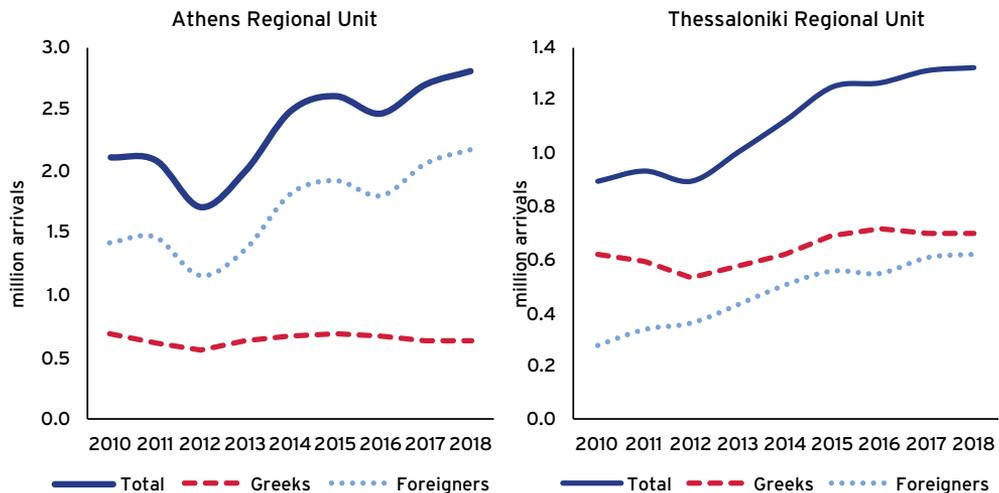
Source: INSETE.

The tourism products of Greece should be further enriched and upgraded. There is considerable room for strengthening the other main products (such as cultural, urban, nautical and conference tourism) and complementary products (such as agrotourism, ecotourism, gastronomy, wellness, sports, senior citizens). Alternative tourism products are targeted at niche – but also smaller – market segments that are less seasonal. Their strategic development could extend the tourist season. In addition, complementary products enrich the visitor experience and could, under certain conditions, lead to higher per capita tourism expenditure.

City break tourism had a strong momentum before the pandemic outbreak. In 2018, hotel arrivals in the Athens region reached 2.16 million, 52% more than in 2010, while they more than doubled in Thessaloniki in the same period (619,600 in 2018, up from 275,400) (Figure 6.6). This rise does not necessarily reflect the significant growth of the short-term rental market (Airbnb type) that has also been observed in recent years. Key barriers to the development of ‘city break’ tourism are deficiencies (compared to competing destinations) in terms of cleanliness, urban planning (lack of greenery) and road infrastructure, relatively limited range of leisure activities and shopping options (such as fashion and luxury goods), as well as, in some cases, insufficient access to and organisation of museums and archaeological sites.

Closely linked to city break tourism is cultural and religious tourism. Despite the country’s rich cultural heritage, Greece is not among the top ten worldwide destinations for cultural and religious tourism. In visitor surveys, Greece ranks highly on the promotion of classical culture, but there is a need to develop a wider portfolio of cultural products (such as Byzantine, modern and contemporary Greek culture) and to upgrade the presentation of cultural resources by enhancing signage, storytelling and the use of digital technology.

FIGURE 6.6 HOTEL ARRIVALS IN ATHENS AND THESSALONIKI



Source: ELSTAT.

The country's position in the ranking of nautical tourism (cruise and yachting) destinations is better. According to INSETE data, nautical tourism trips increased by 27% between 2015 and 2019, and the country now ranks ninth in the global ranking of nautical tourism destinations. In order to further develop nautical tourism, it is necessary to upgrade the country's ports and the services that they offer, as well as develop targeted promotions. Especially in the cruise industry, the main objective should be to increase the number of companies that choose Greek ports as their home port.

Tourism for meetings, incentives, conferences and exhibitions (MICE) could also be further developed, under certain conditions, as it is closely linked with other forms of tourism (such as city break, wellness, cultural and gastronomic tourism). Although major international trade fairs are organised in the country (TIF, Posidonia), the size and development of Greek conference tourism are low compared to other European countries. A prerequisite for its growth is the development of the appropriate high-capacity infrastructure that can attract more and bigger international exhibitions and conferences.

Complementary tourism products have a lot of potential for development. Wellness tourism is a good example of such a product. While modern hotels specialising in wellness services have been developed in Greece, many natural thermal springs remain idle or under-utilised. Similar room for development exists in agrotourism, ecotourism and sports tourism, products that attract younger tourists seeking personalised experiences, authenticity and respect for the environment, as well as in second-home tourism primarily for older travellers. An important characteristic for the development of these products is to ensure strict compliance with environmental protection and sustainability standards.

Interconnection with the rest of the economy

The high visitor flows do not translate sufficiently into demand for Greek products once these visitors have returned to their countries of origin. In this context, it is desirable to introduce incentives for offering local products to visitors and promoting domestic brands at points of consumption, while limiting the availability of non-packaged products. For example, certification programmes could be set up for restaurants offering local products, an established practice in regions of Italy. Regarding handcrafted products, an important initiative at the European level is the registration and certification of non-agricultural products based on the place of origin. Crafts such as silversmithing, jewellery and ceramics have relatively high growth potential, since they can take advantage of tourism and offer high-value products based on their link with the Greek cultural heritage. More broadly, there is a need for better cooperation between public and private sector stakeholders in developing and implementing a national brand communication strategy that is not limited to a specific product or service.

Spatial planning and sustainability

The development of many seaside tourism facilities since the 1970s has taken place in areas outside urban and settlement plans, without spatial planning but with general provisions of the so-called 'off-plan settlement'. Unregulated construction of accommodation units, residences and other facilities in these areas has been carried out in an uncontrolled manner. The result in many cases has been negative for these developments, for the quality of the country's tourist products, and for the natural environment. Spatial planning should therefore be extended to all parts of the country, with priority given to those with strong development potential, through the completion of local urban plans (LUPs).

In parallel with the completion of spatial planning, clear strategic guidelines for tourism development should be established. These developments should be in line with the LUP rules and guidelines. A rational strategy should protect tourism areas from phenomena of saturation and deterioration of the tourist products. Overtourism phenomena are already occurring in iconic areas such as Mykonos and Santorini, but also in foreign destinations such as Venice. There are also risks of saturation and deterioration of the tourism products in other regions of the country, while some other areas that could be of interest for tourism remain unexploited.

Climate change

Climate change may have significant consequences for the tourism sector. The main sources of uncertainty relate to the consequences of global warming, but also to the increased frequency of extreme weather events. Demand for summer holiday products may be negatively affected, as summers in the Mediterranean may become too hot for many visitors, while the weather in their Northern European countries of origin might improve. However, conditions in Greece may improve in the months outside the summer peak, thus facilitating a reduction in seasonality. On the public works side, there is an increased need for coastal erosion protection, the creation and management of waterways and national park protection and management.

Response to the COVID-19 pandemic

The impact of the COVID-19 pandemic poses a very significant challenge for the tourism sector. According to the Airports Council International (ACI World), international airport passengers in 2020 are expected to be 4.6 billion fewer than in the previous year (-40%). For Greece, inbound tourism revenues according to SETE are expected to be 75-80% lower in 2020 compared to 2019, as the share of visitors arriving by air from countries with relatively higher average expenditure is high.

Destinations that are familiar and perform well in ensuring health, safety and hygiene standards have an enhanced competitive advantage. Therefore, increased investment in technologies and facilities that enhance the health and safety of visitors is deemed essential. Accelerating digital transformation in the tourism sector is also necessary, for example via services such as contactless check-in and check-out and digital menus within mobile applications.

6.2.3 Policy recommendations

Infrastructure

Enriching and upgrading the Greek tourism products requires coordinated actions by both private and public bodies. Many necessary actions concern the upgrade of infrastructure, mainly in transport but also in energy, water supply, waste management, and so on. The infrastructure upgrade can make a significant contribution to the growth prospects of the tourism sector and to the quality of life of the permanent residents. The main actions in this direction are:

- **Air transport:** The concession of the 14 regional airports to Fraport Greece has led to their significant upgrade. Similar projects (such as runway renovations, construction of new terminals and renovating the interior and exterior of the buildings) are necessary for the regional airports that have remained under the administration of the Civil Aviation Authority. In addition, in the aviation sector, it would be appropriate to assess the possibility of new waterways and seaplane services, which would allow the connection of the country's islands with additional means of transport. Finally, investments should be made in air traffic control so that it can cope with peak traffic once the COVID pandemic subsides.
- **Ports and marinas:** The majority of Greek ports have inadequate reception facilities and face problems with sea currents, while quite a few are not suitable for cruise ship berthing.
- **Road network:** The maintenance and the development of the road network remain significant activities for the competitiveness of the tourism products, especially considering the upward trend of tourist flows from the neighbouring Balkan countries through land borders and the development prospects of mainland destinations. The necessary actions include the upgrade of road signage, security and the stations at the country's land borders.

- **Urban transport:** The completion of the direct connection between Athens International Airport and the port of Piraeus, the completion of the metro line in Thessaloniki and its interconnection with the city's airport, in addition to improving residential mobility, would increase the speed and effectiveness of visitor transit in the country's two largest urban centres. Accessibility to destinations (attractions, monuments and exhibition sites) located outside metropolitan areas should also be improved.
- **Transport interconnection:** The ports of Rafina and Lavrio offer shorter travel times to popular Aegean destinations, but their interconnection with the rest of the transport network (suburban railway, metro, road network) is insufficient and needs to be strengthened.
- **Utility infrastructure:** The completion of the connection of the electricity distribution networks of the country's islands with the mainland system is necessary to ensure energy adequacy and security in popular destinations in the country. Other necessary actions include infrastructure works that allow the development and operation of tourist facilities with zero energy footprint and works that ensure water supply adequacy. Further investment is needed for the management of liquid and solid waste and, more generally, for the implementation of circular economy principles (reduction of consumption, re-use and recycling) and for civil protection works. Reduction of visual pollution, with targeted interventions such as placing cables underground in traditional settlements, is also important.
- **Museums and archaeological sites:** Museums and archaeological sites should have extended opening hours, especially during the summer period. Their infrastructure – physical and especially digital – should also be improved.
- **Conference centres:** A prerequisite for the development of conference tourism is the creation of appropriate large-capacity infrastructure that can attract more and bigger international exhibitions and conferences. In this context, flagship projects would be the redevelopment of the Thessaloniki International Exhibition Centre and the creation of a metropolitan convention centre in Athens (the only European metropolis that does not have a modern conference centre).

Promotion and branding

A second set of actions concerns the promotion of tourism products. This also requires coordinated actions by private and public entities. Sectoral and public bodies play a crucial role, as tourism and related activities (such as handicrafts) involve a large number of very small and medium-sized enterprises, which individually have limited promotion and marketing capabilities.

In general, the focus should be on the development and implementation of a national brand communication strategy. The way the Greek tourism product is defined and presented to the international markets is of paramount importance.

Specific tourism products require specific actions. For example, the 'sun and sea' product requires targeted communication and promotion, especially in long-haul destinations such as the United States, Australia and Canada, as well as in emerging markets such as China, Russia and South Korea, where Greece ranks relatively low among popular destinations. For city break tourism, promotional activities are needed in markets that are within a four hour flight away. Cultural tourism requires actions to attract visitors from China, the market with the highest demand for this product, as well as actions to enhance the competitiveness of Greek handicrafts (such as product certification/labelling, digital promotion, promotion of small business partnerships and strengthening the intersectoral links with culture and education).

Spatial planning and sustainability

The rapid completion of spatial planning in the country's touristic areas is essential for the sustainability of Greek tourism in the long term. Planning should place particular emphasis on the protection of the national natural and cultural capital, since its value determines the value of the tourism product itself. The scale of development should be commensurate with the size and opportunities that each region offers.

Spatial planning processes should address issues of carrying capacity, sustainability and empowerment of local communities. These issues are not adequately addressed in current planning and licensing processes. Furthermore, activities in traditional settlements and the restructuring of abandoned settlements should also be encouraged and supported.

Large-scale developments and facilities such as the integrated tourism development areas (ITDAs) and tourist residential complexes can be a useful tool for extending the tourist season, as they create a permanent relationship between buyers and the dwelling. However, their use should be compatible with land availability and the landscape. For example, such developments should be avoided on small islands (including most of the Cyclades islands) or other small-scale landscapes with particular residential or cultural interest.

Destination management

The effective management, operation and promotion of tourism destinations through multiple media and platforms is crucial and could greatly benefit permanent residents. The same applies to local products, services and businesses. Particular emphasis should be placed on the potential of using digital media to cluster products and create attractive bundles.

The development of a governance framework that facilitates the cooperation among various local and regional bodies is important for the effective management and operation of tourism destinations.

Digital transformation

The evolution of digital technology enables integrated actions aimed at improving the digital travel experience, creating a unified travel ecosystem and improving digital security.

The visitor experience can be improved with a multitude of new digital tools. Mobile apps and AI tools allow the creation of connected destinations, where useful information and services such as reservations, tickets (for museums, archaeological sites, concerts, public transport, etc.) and catalogues are readily available, with in-app payment options. Augmented reality tools and modern interactive applications for guiding visitors in museums and archaeological sites can significantly improve the visitor experience. The use of the ‘internet of things’ in accommodation establishments offers the possibility of ultra-personalisation of the amenities and services that a room can offer.

A tool that is particularly important during the pandemic period is a digital traveller identity, which incorporates all the necessary information for the authorities, such as passport, visas, travel history, antibody or vaccination certificates and medical history. This digital identity, combined with biometric verification, would allow for a touch-free travel experience. For its implementation, sensitive data should be safeguarded and each service should only have access to the necessary information.

Furthermore, the effective monitoring and management of tourist data from different sources (airports, airlines, ferry companies, hotels, attractions operators) is essential. Through applications that can manage a large volume of open access big data, stakeholders and businesses would be able to directly monitor tourists’ intention to visit the country, their satisfaction with various elements of the Greek tourism product, and how the country ranks compared to other destinations. This would allow them to identify more effectively the necessary areas for improvement, as well as to target more effectively their advertising and promotion efforts.

Human resources

Tourism service quality is closely linked to the professional competence of both employees and management of tourism enterprises as well as of public sector stakeholders. Similar to manufacturing, vocational training and interconnection between the education system and businesses is crucial. The following proposals are important for the improvement of human resources in tourism:

- **Modernisation of the existing tourism curricula at all levels of education** (tertiary, post-secondary and lifelong learning). This requires the upgrade of infrastructure, but also the knowledge and skills of teaching staff, as well as cooperation with tourism businesses to involve prominent tourism professionals in the educational process. In this context, consideration could be given to upgrading ASTE into a high-quality, possibly ‘English-speaking’, international-level tourism academy, offering further training and specialisation possibilities.
- **Strengthening vocational training, internships, and apprenticeships.** Training should be tailored to fit the specific needs of enterprises, sectors and regions. Setting up joint training networks, with the help of public bodies and sectoral associations, to ensure that small and micro-enterprises have access to vocational training, internships and apprenticeships is also desirable.
- **Training of public servants.** Due to the special role of public bodies in the development and operation of Greek tourism, it is necessary to institute training of the personnel involved in the planning and implementation of tourism policies at all levels of public administration (central government, regions, municipalities).

6.3 AGRI-FOOD SECTOR

The primary sector⁵⁹ and the agri-food production sector⁶⁰ are of strategic importance for a country since, besides their economic activity, they contribute to the food security of the population, enhance regional development and play an important role in maintaining the quality of the natural environment. In many regions, they are the main economic activity for a large part of the population. Finally, culinary tradition is a key component of a region's cultural identity and heritage, with significant implications for its ability to promote local products in international markets.

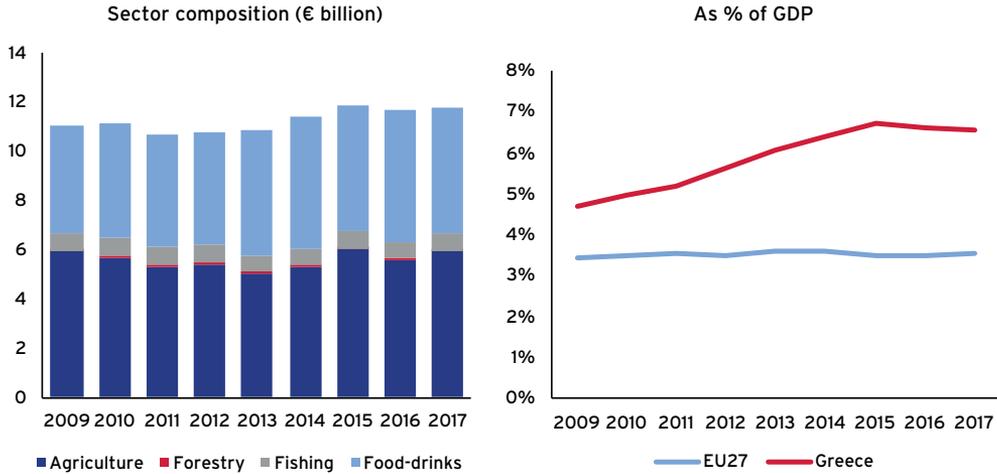
6.3.1 Indicators

The agri-food sector is of great importance for the Greek economy. In 2017, the value added produced by the primary sector and the food and beverages industry was 6.6% of GDP (€11.8 billion), compared to 3.5% on average in the EU, and having increased from 4.9% of GDP in 2010 (Figure 6.7). Almost 50% comes from the agricultural sector, while the share of manufacturing activities accounts for 43.6%, with the remaining share coming from fishing (5.9%) and forestry (0.6%).

⁵⁹ Section A (Agriculture, Forestry and Fishing) of NACE Rev. 2.

⁶⁰ On the production side, it includes the NACE Rev. 2 divisions 01 (Crop and animal production, hunting and related service activities), 03 (Fishing and aquaculture), 10 (Manufacture of food products) and 11 (Manufacture of beverages). The following NACE Rev. 2 classes are excluded: 01.15 (Growing of tobacco), 01.43 (Raising of horses and other equines), 01.44 (Raising of camels and camelids), 01.49 (Raising of other animals) and 01.70 (Hunting, trapping and related service activities).

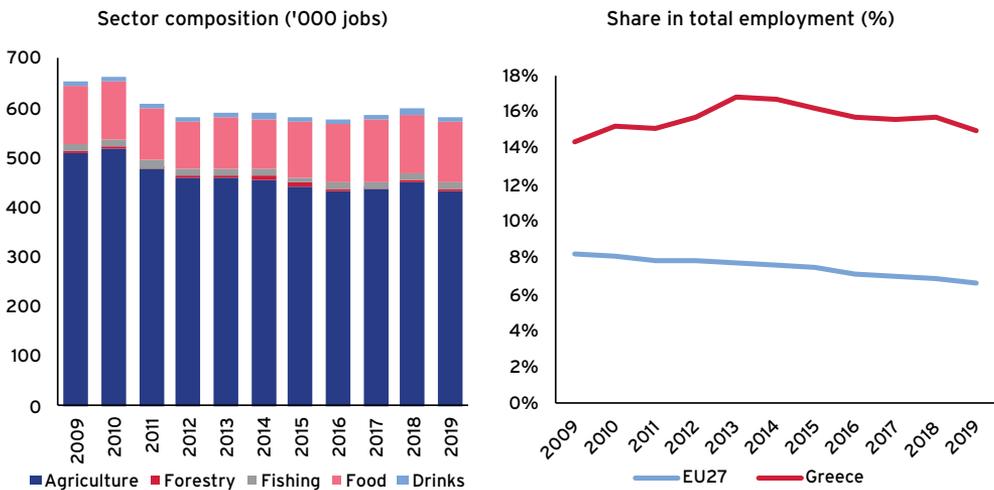
FIGURE 6.7 VALUE ADDED IN THE PRIMARY SECTOR AND THE FOOD-AND-DRINK INDUSTRY



Source: Eurostat.

In terms of employment, the share of employees in the primary sector and in the food and beverages industry is estimated at 14.9% of total employment in 2019 (583,000 people), compared to 6.6% on average in the EU (Figure 6.8). The share was particularly high during the years when unemployment peaked in the country (16.8% in 2013), indicating the resilience of the sector to fluctuations in the economic cycle. About 74% of employment in the wider sector (432,000 people) is related to agriculture, while the food industry employs 20.5% of the workforce (120,000 people).

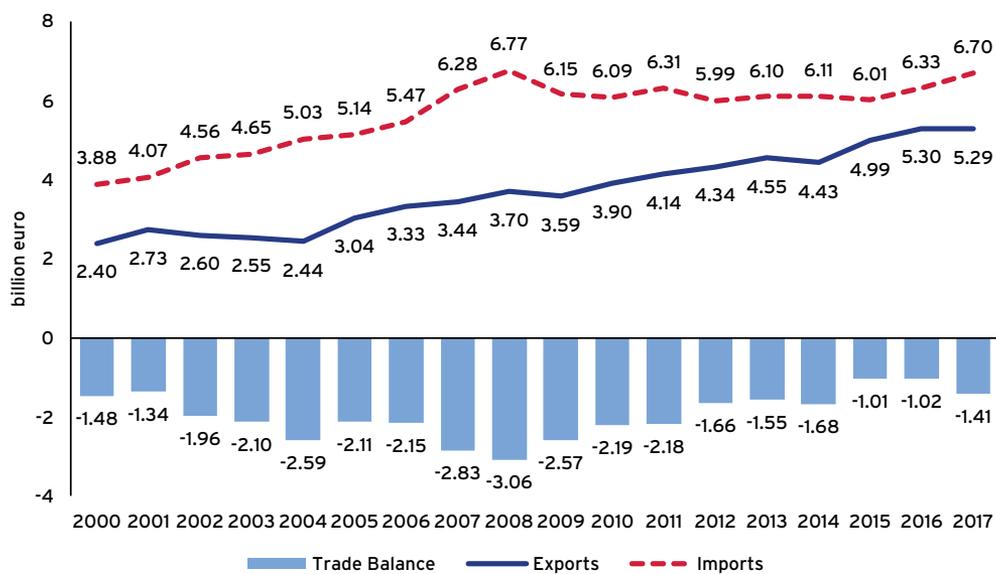
FIGURE 6.8 EMPLOYMENT IN THE PRIMARY SECTOR AND THE FOOD-AND-DRINK INDUSTRY



Source: Eurostat.

Regarding international trade, the agri-food sector runs a deficit (Figure 6.9). During the crisis, however, the deficit was significantly reduced to €1.4 billion in 2017 from €3.1 billion in 2008, as imports of agri-food products remained stable at €6.0-6.7 billion, while exports continued to increase (from €3.7 billion to €5.3 billion).

FIGURE 6.9 FOREIGN TRADE IN AGRI-FOOD PRODUCTS, 2000-2017



Source: Eurostat.

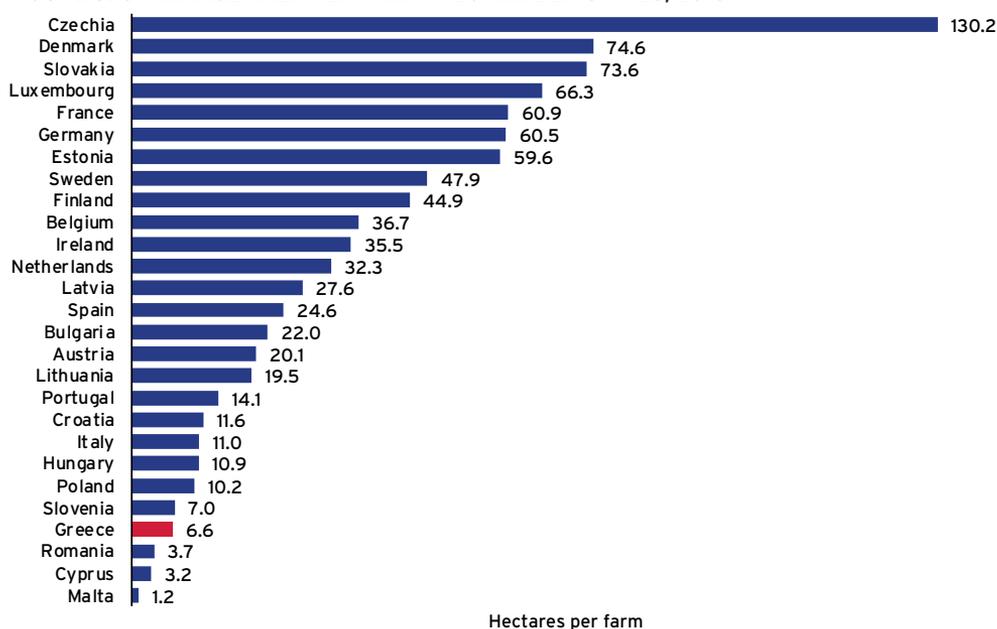
6.3.2 Challenges and prospects

Greece has significant comparative advantages in the agri-food sector that are based on the diversity of the land and the consequent variety of agricultural species, the favourable conditions of the natural environment in the lowlands of the country, the quality and nutritional value of a relatively wide range of agricultural products (olives, grapes, legumes, citrus fruits, etc.) and the internationally recognised dietary traditions. These advantages have not been sufficiently exploited due to significant and chronic structural weaknesses. The main weaknesses include small and fragmented farm holdings, low productivity, inefficient organisation, low uptake of new technologies and equipment, insufficient professional training, a low level of R&D, high dependence on subsidies, and a lack of branding and promotion of Greek agri-food products (Maniatis, 2020).

Small size of agricultural holdings

The average size of agricultural holdings in Greece is 6.6 hectares (Figure 6.10). Based on this indicator, Greece is in fourth lowest position in the EU, above two island countries (Malta and Cyprus) and Romania. The small size of holdings in the country is due to its special landscape, the lack of sufficient spatial organisation and the prevalence of traditional patterns of inheritance and ownership that lead to extremely small agricultural lots.

FIGURE 6.10 AVERAGE AREA PER FARM IN EU MEMBER STATES, 2016



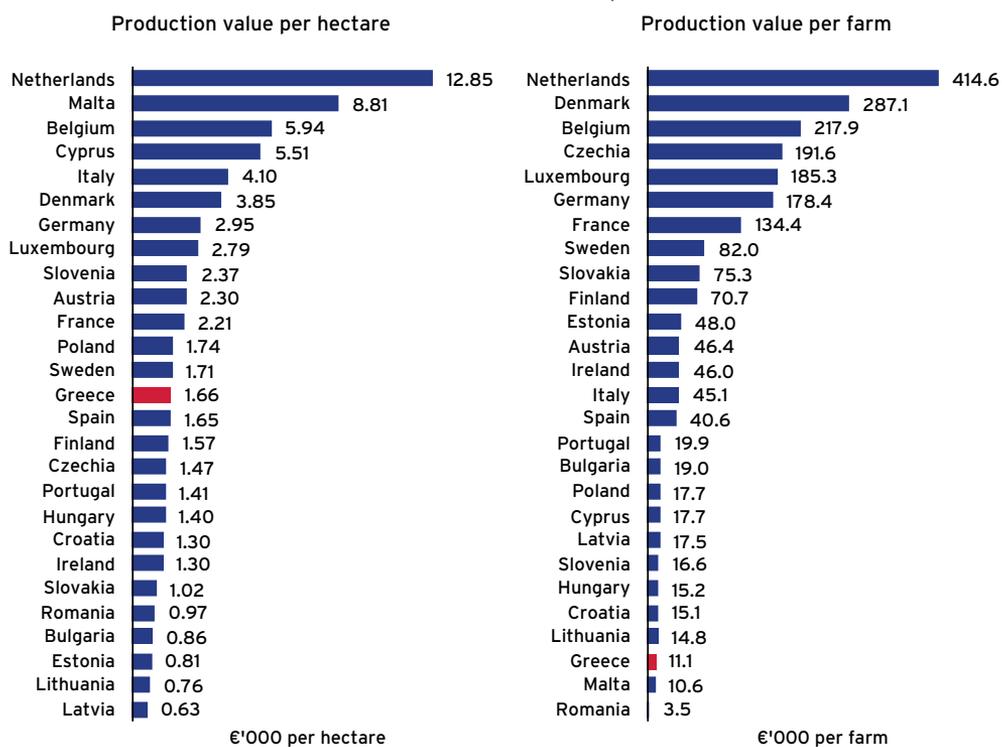
Source: Eurostat.

Low productivity

The small size of holdings leads to insufficient mechanisation, low uptake of new technologies and low productivity. More specifically, the annual agricultural production value per hectare reaches €1,700 in Greece. Based on this indicator, Greece is in the middle of the EU ranking (Figure 6.11), with a significant gap to the leading countries such as the Netherlands (€12,900). However, the production value per holding is extremely low (only €11,100 compared to €415,000 in the Netherlands, €287,000 in Denmark and €218,000 in Belgium) due to the fragmented structure of holdings, with the country placed in the third lowest position in the EU above Romania and Malta.

As a result of this low productivity per holding, the share of farms in which at least 50% of production is directed to self-consumption (semi-subsistence farming) reaches 16.0%. This proportion of semi-subsistence farms is low compared to Eastern European countries and similar to that of other Southern European countries, but it is high compared to Northern and Western European countries, where most production is intended for commercial use in almost all agricultural holdings.

FIGURE 6.11 PRODUCTIVITY OF AGRICULTURAL HOLDINGS, 2016

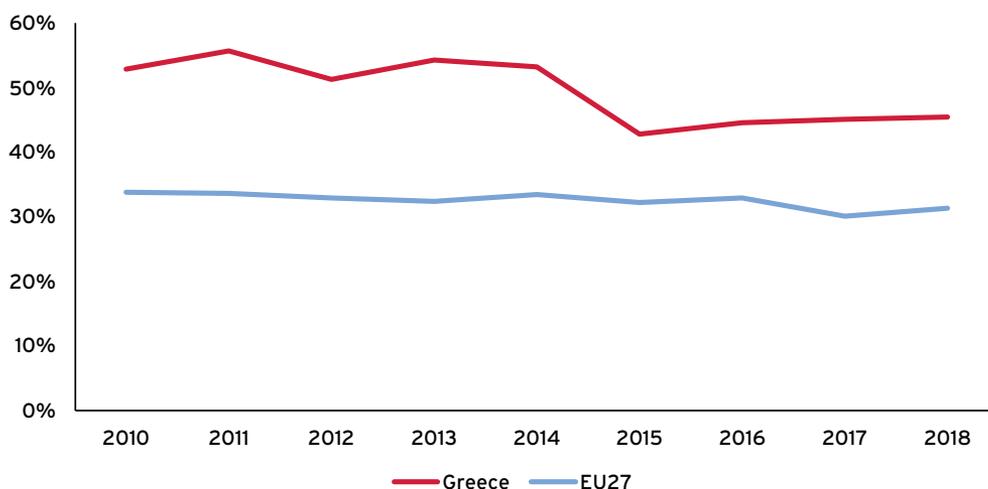


Source: Eurostat.

Dependence on subsidies

Low productivity also results in very low income from production activities for rural households and an increased need to support holdings with subsidies. Specifically, subsidies for agricultural production in Greece reached €2.4 billion in 2019, while capital transfers to the agricultural sector amounted to €135 million in 2018. The ratio of the sum of capital and operating aid to the value added produced by the agricultural sector in 2018 reached 45.4%, compared to 31.2% in the EU (Figure 6.12). The high reliance on subsidies, combined with the fact that they come mainly from EU funds, is a significant structural weakness of the domestic sector, especially considering the 'external convergence' strategy in the new Common Agricultural Policy (CAP), based on which the funds for countries such as Greece that receive higher subsidies per hectare will decrease over time.

FIGURE 6.12 CAPITAL TRANSFERS AND PRODUCTION SUBSIDIES AS A SHARE OF GROSS VALUE ADDED IN THE AGRICULTURAL SECTOR



Source: Eurostat.

Other structural weaknesses

Other main structural weaknesses are related to:

- **Low uptake of new technologies and equipment.** The small size of holdings results in inadequate mechanisation. R&D expenditure in the agricultural sector is limited to €11 per hectare, compared to €33 in Europe and €19 globally (National Bank of Greece, 2015).
- **Insufficient professional training and unfavourable demographics.** The agricultural sector is failing to attract enough young people to its workforce. The percentage of young people aged 15-29 employed in the primary sector fell to 8% in 2017 from 10% in 2008, and the percentage of people aged 30-44 decreased over the same period to 28% from 32%. As a result of ageing and the vocational training deficiencies in the country, data from the fourth quarter of 2018 show that 39.1% of people employed in the agricultural sector in Greece had completed only primary education (compared to 10.1% in the overall economy) and 20.6% had completed only secondary education (compared to 8.7% in total) (Maniatis, 2020). The percentage of farmers who had attended some professional training amounted to 5.5%, compared to 20.2% in the EU (Karantininis, 2020). The relatively high age and the low level of education that characterise employees in the sector limit the ability to adopt new technologies and innovative techniques.
- **Inefficient organisation.** In contrast to many successful international practices, agricultural cooperatives in Greece have not taken the form of producers' associations with entrepreneurial characteristics, but rather distribution mechanisms for national and EU funds as well as tools for exerting political

pressure. The lack of autonomy in the cooperatives and their 'pyramid' management structures are more commonly characteristics of professional associations than of organised entrepreneurial schemes. The role of the cooperatives in promoting agricultural products in Greece is very limited: only 8% of products are distributed through cooperatives in the country, compared to 49% in the EU (Karantininis, 2020).

- **Incomplete vertical integration and promotion of Greek brands.** A disproportionately large share of Greek agri-food products are sold without being packaged or labelled, resulting in lower added value. This is also indicated by the high contribution of primary production to the value added of the agri-food sector (50.0% in Greece in 2017, compared to 40.9% in the EU). A typical example is olive oil, of which only 27% of Greek production is bottled and branded, compared to around 50% in Spain and 80% in Italy.

The CAP for the period 2021-2027 is an opportunity to reposition the country's domestic agri-food sector and alleviate its weaknesses. The new CAP aims to improve the ability of the agri-food sector to respond to current and future challenges, such as climate change or generational renewal, while continuing to support European farmers to ensure a sustainable and competitive agricultural sector (European Commission, 2019b). Its environmental and climate change goals are ambitious and will motivate farmers to adopt climate-friendly agricultural practices. Income support will continue to ensure an environment of stability and predictability for producers. Emphasis will also be placed on the development of rural areas by (a) assisting young farmers to enter the profession by offering mentoring from more experienced farmers, strengthening the transfer of knowledge from generation to generation or developing succession plans; (b) encouraging member states to take more initiatives at a national level, for example through more flexible taxation and inheritance regulations, in order to improve the access of young farmers to land; and (c) establishing stricter requirements for farmers regarding food safety and quality, for example by providing financial support only when they comply with regulations regarding the reduction of pesticides or antibiotics use. In addition, the core of the policy will shift from compliance and regulations to *results and performance*.

The following will have important roles for the prospects of the agri-food sector:

- The **Farm to Fork Strategy** (European Commission, 2020a), which is part of the EU Green Deal. This aims at transitioning to sustainable food systems that will (a) have a neutral or positive environmental impact; (b) help to mitigate climate change and adapt to its impacts; (c) reverse the loss of biodiversity and ensure food safety, public health and access to sufficient, safe, nutritious and sustainable food; and (d) ensure access to food while generating fairer economic returns, fostering competitiveness of the EU food sector and promoting fair trade. Research and innovation will be key drivers for the implementation of the strategy.

- The **Biodiversity Strategy for 2030** (European Commission, 2020b) will operate alongside the Farm to Fork Strategy and the CAP. It aims to reverse the loss of biodiversity and to define how Europe can contribute to achieving this goal through actions and commitments for nature protection and restoration in the EU.

The implementation of these strategies in Greece, given the structural characteristics and weaknesses of the agricultural sector, will pose new challenges in the coming years.

6.3.3 Policy suggestions

Implementing policies to reverse the chronic weaknesses of the agri-food sector in Greece, following international best practices, can lead to a better use of the country's comparative advantages. The allocation of operating subsidies and capital aid is a very powerful mechanism that can be used more efficiently to correct chronic weaknesses of the agricultural sector. In the context of the new CAP, income support must be targeted, taking into consideration specific social, environmental and growth criteria. In particular, actions are required in the following directions (Maniatis, 2020):

- **Increase in the size of agricultural holdings.** In this direction, strong economic incentives could be given to encourage participation in cooperative schemes (business groups of producers and cooperatives) and a higher level of vertical integration in agricultural production process (such as the development of manufacturing activity by agricultural cooperatives and the support of contract farming programmes). Moreover, legislation that increases the autonomy, internal organisation and entrepreneurial nature of cooperatives is also needed (Skylakaki et al., 2019).
- **Modernisation of agricultural holdings.** The consolidation of holdings is also a key step towards their modernisation. In addition, capital transfers to the agricultural sector must play an important role in investing in modern equipment and innovative techniques.
- **Improvement of human capital.** This requires systematically carrying out training programmes that are specialised in recent developments in the agri-food field. In addition, incentives for attracting young farmers, with higher education attainment and better response in using modern production methods and business strategies, are needed.
- **Fostering collaboration with universities and the research community.** Internationally, innovation in the agri-food sector has strong momentum, as it is evidenced by the particularly high productivity in northern European countries (such as the Netherlands). This high productivity is partly driven by the introduction of innovations (e.g., precision agriculture and the use of robotics) that have emerged through close interconnection between production

(agricultural cooperatives and firms) and the research community. Measures that build a stronger start-up environment in the agri-food sector have also made a significant contribution, as has full use of the EU Agricultural Knowledge and Innovation System (AKIS). The study and implementation of best practices from other countries in this area is an essential part of the domestic agri-food strategy.

- **Higher added value of agri-food products.** The above measures for greater vertical integration, modernisation, human capital development and innovation will also contribute to the increase of the added value of agri-food products. Lower cost and higher productivity can be achieved through efficient management of plant protection, selection of certified seeds with high standards, rational purchases of agricultural equipment and fertilizers, efficient irrigation and techniques such as co-cultivation. In addition, promotional activities and a marketing strategy at a regional and product level can contribute to the encouragement of product labelling and further development of domestic branding. Aggregating sales under common trademarks and a national brand would lead to more efficient product promotion, concentration of production, more opportunities to receive funding and lower production and distribution costs. Measures aiming to interconnect the agri-food sector with others in the economy – such as tourism, the cultural industry and manufacturing of other products – could also have a positive impact, under common promotional strategies. Supporting the organisation and participation in sectoral trade shows in Greece and abroad would also be a move in the same direction.
- **Better interconnection of the agri-food sector with tourism.** The interconnection of these two important sectors could be closer, with mutual benefits. The presence of Greek food products – preferably branded, or at least recognisable – could significantly increase sales not only in hotels and cruises but also when visitors return to their country, throughout the year, with local sales. In addition to developing strong and recognisable brands, it is important to take actions to strengthen economies of scale for producers, promote their integration into international networks, and help them access digital and other modern sale methods.

6.4 ENVIRONMENT

As mentioned in Chapter 2, climate change and the environmental degradation of natural ecosystems are creating serious risks, highlighting the importance of environmental protection actions. At the same time, the international environmental policies established to confront these risks are considered important opportunities for

the attraction of productive investments in relevant economic sectors. It is now widely accepted that tackling the climate crisis and the degradation of ecosystems can generate jobs and increase an economy's value added, and at the same time it must become the main component of the COVID-19 exit plan.

The green growth axis of the Greek economy should be based on the following three thematic areas:

- A circular economy
- Climate change mitigation, such as energy transition, and adaptation
- Biodiversity and bio-economy

6.4.1 Circular economy

The transition to a circular economy has become a strategic priority in the EU. As mentioned in Chapter 2, Greece lags behind in the circular use of materials: in 2017 only 2.4% of the consumed materials derived from recovery processes, compared to 11.2% in the EU and 29.9% in the Netherlands (Figure 2.1). The country's linear processes increase the pressure on natural ecosystems due to the disposal of waste that could have had a significant market value under a different setup. Furthermore, they maintain the dependence of the Greek economy on primary raw materials, a great volume of which are imported from other countries.

On the demand side, the use of secondary raw materials by the manufacturing industry (disposed materials that have been processed at a previous link in the value chain) is greatly limited. At the same time, the manufacturing sector of other EU member states is actively participating in research and development of systems that convert waste into high-value secondary raw materials. The sector has moved from the recycling of basic materials (glass, metal, plastic) to the development of valorisation systems that produce secondary materials of high commercial value, also benefiting the natural environment.

The National Strategy for the Circular Economy establishes the key directions, long-term targets and a specific timeline for their achievement to ensure environmental protection and the strengthening of green entrepreneurship. Since 2019, the LIFE programme, the only European funding tool for the environment, has co-funded an integrated project that aims at capacity building for the implementation of the National Strategy (LIFE IP Circular Economy Implementation in Greece). Despite the above, there are delays in the implementation of the National Strategy, many of which were identified before the pandemic.

The new National Waste Management Plan (NWMP) is based on leveraging private investments in several stages of waste management to achieve the 2030 targets (10% landfill, increase of recycling to 60%, energy exploitation of waste). In addition, the new law on single-use plastics foresees the banning of several plastic materials, the reduction of plastic use and the use of recycled polymers when use of plastics cannot be avoided.

It is now clear that the circular economy targets in Greece cannot be achieved solely through the development of collection and treatment infrastructure. Instead, an integrated plan should be developed that will focus on increasing people's awareness on waste issues, and enhancing relevant private entrepreneurship related to both waste management and the development of tradeable secondary raw materials. The public sector must take the lead in the transition to a new paradigm of lower environmental impact through the sound design of green public procurement and public works specifications.

Turning the Greek economy from linear to circular will equip Greek businesses with characteristics of high competitiveness and added value, while creating new jobs. Overall, the successful application of circular economy systems in the EU is expected to reduce corporate operating costs by €600 billion (almost 8% of the total turnover) and to create almost 580,000 jobs.

Policy priorities

- Accelerate the implementation of the National Strategy for the Circular Economy. Creation of a plan for the effective use of the EU funds available to confront the pandemic and to catch up from delays.
- Immediate initiation of public-private partnerships for some of the most emblematic projects foreseen under the new NWMP. The social reactions that might be prompted by the location of these projects require compensatory mechanisms that would provide significant benefits for these areas. Several characteristics, such as the distance from the waste treatment facility or the distance from the waste collection routes, should be taken into consideration in the system's overall design.
- Update of the institutional framework to include basic circular economy principles. For example, Greece's road construction specifications do not foresee the use of recycled or other materials (end-of-life tyres) in the asphalt mix, a practice that has been commonly implemented in other EU member states for many years.
- The specifications of public procurement should be designed to internalise the environmental cost from the supply of products and services of higher environmental impact. Thus, solutions that today appear expensive will become more attractive.

- Redesign of the municipal curb collection system, which should include a simple and effective sorting-at-source system and separate collection of the organic portion of household waste. The continuous training of the population and the effective waste collection are considered basic requirements.
- Identify the basic food waste sources (manufacturing companies, stall markets, super markets, restaurants, etc.) and provide incentives for the redistribution of food surpluses to vulnerable social groups. Current food redistribution initiatives are fragmented, and as a result 30% of produced food is disposed of in waste treatment facilities.
- Reuse of products with exceptionally costly and difficult waste treatment (i.e., waste from electrical and electronic equipment). In several Scandinavian countries, repairing old electric micro-appliances has created a new value chain and jobs in the local economies.
- Research and innovation for the development of circular solutions mainly for those manufacturing industries that contribute significantly to the Greek economy (e.g., the food manufacturing industry). Collaboration with research and academic institutions for the development of marketable solutions is imperative. The use of relevant EU funding mechanisms (Green Deal call, Horizon 2020, LIFE) can facilitate this effort.

6.4.2 Climate change

Greece is among the countries that are expected to be intensely affected by climate change in the next few years. As mentioned in Chapter 2, climate mitigation actions might bring to a halt a significant part of the production capital of Greece. The expected total cost for the Greek economy from climate change might surpass €700 billion by 2100. In tackling the above challenges, Greece will face ‘transition risks’, namely, the impact of the mitigation policies imposed by international climate treaties, and should exploit the relevant growth opportunities that will arise from their implementation. In addition, the country will have to confront the material risks, namely, the effects of climate change on its territory.

A. Transition risks and growth opportunities

The Greek climate change mitigation policies foresee the reduction of GHG emissions in high-emissions sectors. The energy sector, responsible for 58.1% of annual GHG emissions (EEA, 2019), needs radical reform. One of the most emblematic projects in the transition to the new energy paradigm is the phasing out of lignite in the Greek electricity sector, which includes the development of alternative energy sources with a lower environmental footprint. The gradual lignite phase-out will reduce the GHG emissions of the energy sector, but it is expected to generate socioeconomic problems in the regions where the local economy has developed around the lignite mining value chain. Since the energy

transition has to be socially just, it is imperative to implement actions and initiatives that will offer sustainable employment and business opportunities to the inhabitants of the affected regions (training and reskilling, funding new businesses, support from research institutes, etc.).

The reduction of electricity consumption is also very important. As mentioned in Chapter 2, the ratio of energy consumption to GDP in Greece is higher than most other Southern European countries (such as Italy, Portugal and Spain) and Central and Northern European countries with a strongly developed industrial sector, such as Germany. This is the result of the low levels of energy efficiency in the country. For example, most of the buildings and houses (55%) were built before 1980, following older building regulations, and therefore have very few or no insulation systems. Only 1.4% of houses have modern and integrated systems that improve their energy efficiency. Besides the increase in energy consumption and the relevant household expenditure, this entails significant socioeconomic implications that are exacerbated during periods of economic difficulty. In 2009-2014, the share of the Greek population without access to sufficient heating increased from 19% to 33% (Eurostat). Building renovation is one of the core priorities of the European Green Deal. The European Renovation Wave, announced in October 2020, aims at doubling annual energy renovation rates by 2030.

Improving energy efficiency in buildings through private investment and renovations is linked to significant economic impact. It is estimated that every €1 of relevant private investment generates €1.5 in GDP and €0.50 in tax revenues in Greece. Moreover, each job in the renovation sector creates 3.1 full-time jobs in the Greek economy (IOBE, 2018d).

It is also necessary to reduce emissions in other sectors of the Greek economy that might be emitting less compared to the energy sector, but are lowering environmental quality, public health and the productivity of local economies. For example, the fleet of private vehicles in Greece is one of the oldest in the EU, leading to the deterioration of the air quality in the Greek city centres and to low passive safety levels. Since summer of 2020, the purchase of private zero-emission vehicles (e.g., electric cars) is subsidised by the state. Extending this subsidisation to also include low-emission vehicles that are currently considerably cheaper could accelerate the modernisation of the private fleet with immediate benefits for air quality, emissions and road safety.

Many of the above are mentioned in the revised National Plan for Energy and Climate (NPEC), which aims at climate change mitigation and improving life quality in urban areas. The NPEC envisages that in order to achieve the targets set for 2020-2030, private and public investment of about €43.8 billion is needed in the development of renewable energy systems, improvement of energy efficiency, the circular economy, the modernisation of the private vehicles fleet and urban transportation, as well as in other relevant sectors.

Policy priorities

The reduction of electricity consumption must start from buildings and residences. The effectiveness of the incentivisation programmes has been limited so far, since (a) the tax incentives were lower than the benefits from implementing activities not recorded in the formal economy; and (b) the implementation of the incentivisation programmes was connected to heavy and time-consuming bureaucratic procedures. Stronger tax incentives and the removal of legislative barriers are necessary to increase the effectiveness of the programmes. The renovation of public buildings should be accelerated, focusing on buildings that have high energy consumption, such as hospitals and schools. The renovation of apartment blocks and multifamily buildings would also benefit from relevant state measures. The energy efficiency upgrades and the relevant renovation activities would entail significant economic impact, generating jobs and income for the economy in general, as well as for the construction sector and for businesses offering innovative building materials in particular.

The lignite phase-out should become an opportunity for improving the socioeconomic characteristics of the affected regions, avoiding the creation of public resistance to climate and environmental protection policies. This requires a long-term plan for the development of new activities in the affected regions that should be initiated immediately. The creation of research centres, collaboration with academic and research institutes, the incentivisation of green entrepreneurship, the development of eco-tourism and any other types of activities that would replace the jobs lost in the transition regions should be among the key objectives of this long-term plan.

Reducing emissions from road transport would significantly improve the air quality in cities as well. It is important to design a programme that will incentivise not only the purchase of electric vehicles but also of new lower-emission vehicles that entail both environmental and road safety benefits. At the same time, thorough inspections of older private and commercial vehicles are necessary as, for many of these vehicles, emissions are higher than factory specifications due to erratic maintenance.

Research and innovation is needed in energy efficiency and energy production with a lower environmental footprint. Indicatively, technologies related to wind energy, energy storage and insulation materials are expected to grow further in Europe. High-tech firms using frontier research could become highly competitive, gaining a share of the global demand.

B. Material risks

Adaptation to climate change is the second pillar of combatting the climate crisis. The higher frequency of extreme weather phenomena, the short but intense precipitation (especially in autumn) and the peri-urban fires, together with anthropogenic interference such as urban sprawl, the lack of water management infrastructure and limited management and protection of forests, intensify the effects of the above phenomena,

leading to human loss, destruction of production facilities and lower economic productivity. In addition, the higher frequency of high-temperature periods during summer (heatwaves), together with the dominance of thermal absorbent materials (e.g., cement) and the absence of green spaces, has intensified the frequency of urban heat island effects in Greece's cities.

The National Strategy for Adaptation to Climate Change provides guidelines for the development of a methodological monitoring framework focused on specific economic sectors (agriculture, livestock farming, tourism, transportation, mining, insurance, etc.). Furthermore, the strategy foresees the assessment and prioritisation of adaptation measures and investments to protect the Greek economy from the material risks of climate change. The implementation of the National Strategy is also supported by the LIFE programme (LIFE IP AdaptInGR, 2019-2026).

Policy priorities

- Compilation of an integrated study for the identification of high-vulnerability regions in Greece (high temperatures, peri-urban fires, intense precipitation, floods). Establishment of a dynamic forecasting model for the next decades that will be integrated in the National Strategy for Adaptation to Climate Change.
- Climate proofing the Greek economy. Identification of the economic sectors most vulnerable to climate change and design of counter measures, including awareness raising actions and incentives that will facilitate their adaptation investment.
- Implementation of infrastructures that improve urban adaptation, such as green spaces, use of low-water-demand ornamental plants, green roofs on public buildings, etc.
- Adaptation of public works standards to include characteristics related to the climate vulnerability of each area. Indicative examples include the use of thermal reflective materials in dense urban areas and water permeable materials in high-precipitation areas. The environmental and social cost of solutions with lower climate performance should be included in their total cost for public procurement decisions.
- Incentives for adaptation at household level (e.g., green roofs) and possible interconnection with energy-saving incentivisation programmes.
- Continuous update of the population on the climate risks by region and presentation of organised response plans coordinated by the General Secretariat of Civil Protection and any relevant ministries. The use of early forecasting and warning systems (i.e., through the 112 number and social media) that include warnings for floods, forest fires, days of intense heat-island effects, and dust storms is imperative.

6.4.3 Biodiversity utilisation

Greece has the sixth biggest network of Natura 2000⁶¹ areas in the EU and rich biodiversity due to its geographical position, diverse relief and multitude of landscapes. However, biodiversity protection in Greece needs to be strengthened. Indicatively, as also mentioned in Chapter 4.5, the absence of forest maps for all of the Greek territory leads to insufficient protection of forests, especially in terms of land grabs and illegal exploitation. The Natura 2000 management framework has been revised, but the effectiveness of the revisions has not been yet confirmed. Greece has been referred to the European Court of Justice due to its fragmented and delayed implementation of the legislation on nature and biodiversity protection.

The National Forests Strategy (2018-2038) is implemented along three horizontal axes (forest sector governance, inventory/monitoring and research/innovation) and four vertical axes (forest economy, climate change, forest ecosystem protection and international/European policies). In addition, the National Biodiversity Strategy aims at halting the loss of biodiversity and at considering biodiversity to be part of the country's natural capital.

The rich fauna and flora of Greece present opportunities for innovation in the primary sector and in the development of agricultural products of high quality and added value. For example, the demand for organically cultivated products has grown considerably over the past few years in Europe, while the implementation of organic cultivation practices leads to significant reductions of GHG emissions from the primary sector. Pilot projects that are being implemented in Southern Europe (Italy, Cyprus) show that the development of organic agriculture significantly improves the soil's physicochemical properties and reduces the impact of agriculture on climate change, while raising the income of the farmers.

The sound management and use of the natural heritage, based on the principles of sustainability and the circular economy, will enhance the attractiveness of the products with protected designation of origin (PDO) and protected geographical indications (PGI), boosting the value of Greek exports. Furthermore, the application of circular economy solutions can, under specific circumstances, support the development of natural cosmetics and healthy food products that can be placed in both domestic and international markets.

61 https://ec.europa.eu/environment/nature/natura2000/index_en.htm

The utilisation of Greece's natural environment could both extend the tourist season and boost the quality of the domestic tourism products. The development of forms of tourism that are based on the protection of flora and fauna, such as agrotourism, has been extensive in other EU member states with similar climatic and environmental characteristics (e.g., Italy and Spain). Investing in the relevant infrastructure and activities, especially in the mountainous areas of Greece, could become a lucrative business opportunity, also supporting the reversal of the trend for urbanisation.

Forest protection, besides securing biodiversity, can lead to more carbon capture and storage. European policy considers forests and their products as issues of particular importance for the achievement of its climate goals. The new EU strategy on forests, expected to be initiated in January 2021, envisages land afforestation, protection of forests to increase their carbon capture and storage potential, promotion of bio-economy and protection of biodiversity.

Policy priorities

- Improve the management and protection of Natura 2000 sites, as part of the implementation of the National Forest Strategy. The use of natural capital should be appropriate and sustainable, following the example of other EU member states (with the development of agrotourism and attracting bird watchers, travellers, walkers etc.), with economic benefits for the local economies.
- Assessing the application of carbon credit systems in forests and in the agricultural sector in the context of relevant EU policies that are under preparation today. Selling carbon credits to companies and other entities for offsetting their carbon emissions or as part of their corporate responsibility activities could provide an additional income for farmers, which could support investment in more resilient cultivations with higher carbon sequestration potential.
- Research and development in the primary sector in collaboration with academic and research institutes to identify cultivations that make a neutral or negative contribution to climate change.

6.5 CULTURE

Greece is known for its rich cultural and historical heritage, with the value of its cultural assets transcending the country's borders, highlighting its strong cultural identity internationally. It has a number of important cultural monuments and is ranked 16th out of 167 countries in the list of UNESCO World Heritage Sites.⁶² Culture undoubtedly has an autonomous significance for a society. At the same time, it is inextricably linked to the economy, as cultural activities create jobs and income.

62 UNESCO World Heritage List (<https://whc.unesco.org/en/statesparties/gr>).

In the wider European and international context, as living standards increase and the pursuit of quality leisure activities grows, driven partly by the technological progress, the cultural sector is expected to remain a steady source of job creation and income.

For Greece, the enhancement of culture is also a condition for the development of tourism, especially for its quality upgrade and the extension of the tourist season beyond summer. Additionally, it would enhance Greece's attractiveness as a place of permanent or holiday residence.

Although the cultural sector in Greece has a strong foundation and comparative advantages, there are significant gaps both in the promotion of cultural heritage and in new production, as well as in the connection with the economy and new technologies. The weak connection of culture with the economy in the country works to the detriment of both. The development prospects in specific cultural areas, and in the sector overall, are particularly important.

6.5.1 Indicators

The cultural sector consists of all sectors whose activities are based on cultural values or other artistic individual or collective creative expressions.⁶³ The following activities are included in the sector:⁶⁴

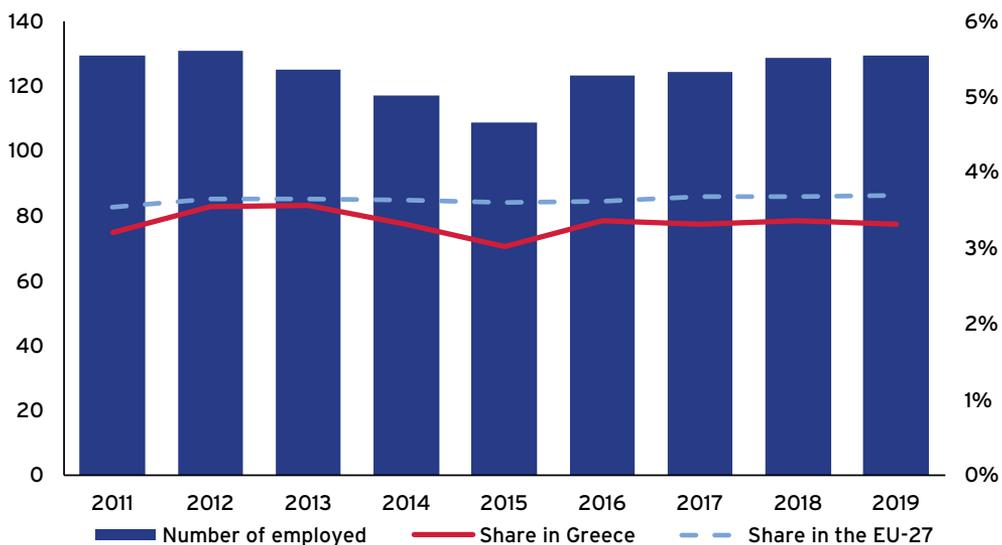
- Publishing activities (includes publishing of books, newspapers, journals and computer games)
- Media and arts (includes printing activities, film production, television programming, music publishing, radio programming, performing arts and artistic creation)
- Design and manufacture of jewellery and musical instruments
- Architectural activities
- Retail sale of books, magazines and audio-visual media
- Specialised design and translation
- Museums and libraries (includes library activities, culture centres, museums, historical sites and botanical gardens)

63 <https://ec.europa.eu/culture/sectors/cultural-and-creative-sectors>

64 Source : European Commission DG Culture.

In 2019, Greece's cultural sector employed approximately 129,400 people, accounting for 3.3% of total employment in the economy, while the corresponding share in the EU exceeded 3.7% (Figure 6.13). The value of exports of cultural goods was €163 million in 2018, corresponding to only 0.5% of total exports of goods from the country, while the corresponding rate in the EU was 0.8% (Figure 6.14). These gaps are significant, especially given the country's comparative advantages in the cultural sector.

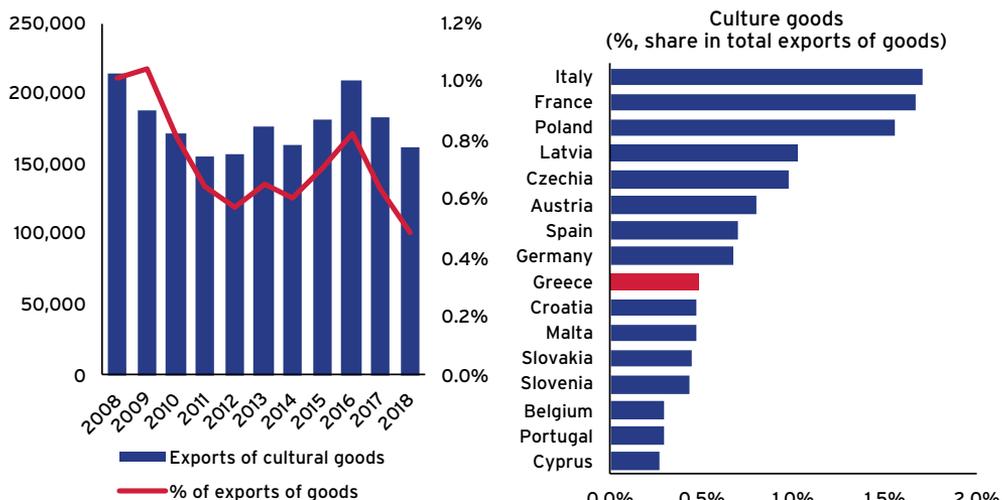
FIGURE 6.13 EMPLOYMENT IN THE CULTURAL SECTOR



Note: Architectural activities are not included.

Source: Eurostat.

FIGURE 6.14 EXPORTS OF CULTURE GOODS



Source: Eurostat.

For the 156 archaeological sites for which data are available, receipts totalled €107.6 million in 2019, with the number of visitors reaching 13.7 million. Receipts from the 175 museums for which there are data exceeded €23.3 million, while the number of visitors amounted to 6 million.⁶⁵

In 2017, the cultural sector in Greece included approximately 29,500 enterprises, with a total turnover of €3.2 billion.⁶⁶ These enterprises corresponded to 4.1% of all enterprises in the country, while the corresponding share in the EU27 was 5.1%. The leading industry in terms of number of companies is that of architectural activities (40%), followed by media and arts (27.5%), retail trade of books, magazines and audio-visual media (14.7%), specialised design and translation (7.3%), publishing (6.1%), and design and manufacture of jewellery and musical instruments (5%). The average enterprise in the cultural sector in 2017 had a turnover of €108,000 and employed approximately 2.3 people.⁶⁷ The corresponding indicators in the EU were €328,000 and 4.7 people.

Government spending for cultural activities in Greece amounted to €450 million in 2018, or 0.3% of total government spending. The corresponding share in the EU was 0.7%.⁶⁸

The cultural sector has played an important role in the processes of economic development in the EU over the past ten years: it employs over 7 million people, and the approximately 1.2 million cultural enterprises have a turnover of around €380 billion. The cultural sector in Greece is smaller than the European average and is also less productive in value added terms.

6.5.2 Challenges and prospects

Greece needs a single cultural policy with goals and criteria, focusing on quality and promotion of cultural heritage but also on contemporary cultural and artistic creation.

Mapping of cultural activities

The mapping of the wider cultural sector ecosystem, its employees and enterprises, is a precondition for policy formulation and implementation.

Cultural heritage and urban development

Greece has a rich cultural heritage, from ancient to modern times, but a significant number of cultural monuments are not properly restored and maintained, nor are they efficiently utilised. In addition, the design and implementation of infrastructure projects in urban centres sometimes leads to alterations to monuments.

65 Source: ELSTAT.

66 Source: Eurostat.

67 Source: Eurostat "Cultural Sector, 2017".

68 Source: Eurostat.

Protecting cultural heritage can go hand-in-hand with urban development. The design and implementation of large projects that respect the protection of cultural monuments, and the effective maintenance and promotion of monuments in the urban environment, should be key axes of development in a unified cultural strategy. In addition, urban development must make full use of cultural goods through the promotion and creation of interconnected networks of monuments located nearby, with the aim of upgrading the wider area. In particular, within the urban fabric, the general upgrade of buildings that must proceed in any case for energy and other reasons should be combined with architectural interventions, ideally on groups of buildings or building blocks, highlighting cultural elements and free spaces. Achieving such an endeavour, however, would require initiatives and cooperation of all competent authorities (government agencies, local government and cultural institutions).

Collaborations and synergies with other areas of activity

The development of cooperative relations between cultural sectors and technology and information systems sectors can be an important tool for the promotion of cultural activities. The digital transition of cultural activities is a challenge for the cultural sectors. The introduction of modern technological means – with interactive platforms, digital screenings, digital book and art exhibitions, e-book lending services, cultural navigation applications, and more generally with the digitalisation of services – would contribute to audience expansion, higher revenues and job creation. The centres of art and culture can become laboratories for experimentation and cultural innovation by harmonising their actions with the new digital age, which would require cultural and artistic services and products to compete on the basis of their innovation and recognition. In this regard, the usage of high-tech media in the production of television programmes, movies and art shows, as well as in software development (video games, entertainment and educational activities), has been important in recent years.

The synergies that the cultural sector develops with the tourism sector are also crucial for its development prospects. The promotion of contemporary cultural activities and artistic events (theatre, art, cinema, music) in package tours showcases cultural sites and monuments, increasing interest in the country.

Handicrafts

Greek handicrafts include activities such as jewellery making, ceramic art, silversmithing and textile art. These have deep roots in tradition and are important for the economy, as they are closely linked to local geographical features, mainly through very small businesses. However, the growth and international presence of the sector is significantly below potential due to deficiencies in funding, innovation, use of new technologies, education and information. Aside from these aspects, however, it is also important to ensure the systematic support of the sector with local plans as part of the wider cultural, touristic and educational upgrade.

6.5.3 Policy recommendations

Substantial support for the cultural sector and its alignment with the ever-changing trends and challenges of the global economy will enhance its growth prospects.

Regulatory framework

The need to revise the regulatory framework and the relevant regulations, based on the needs of individual cultural activities, is urgent. Indicatively, the following interventions are suggested:

- Elimination of barriers related to the tour guide profession, with the implementation of the relevant law (Law 4093/2012).
- Simplification of the processes for issuing filming permits, in order to attract international film producers (Law 3905/2010).
- Clarification and strengthening of the copyright regulatory framework (Law 4481/2017).
- Review and improvement of the regulatory framework for labour, taxes⁶⁹ on cultural activities and social security contributions of freelancers in the sector.
- Integrated review of spatial and regulatory rules regarding projects that aim to develop local and digital content, and to improve the accessibility, attendance and interconnection of sites of historical and cultural interest.

Financing

Facilitating access to financing for companies operating in the sector, either through public spending or by leveraging private resources and alternative mechanisms, can make an important contribution to upgrading the cultural sector. In this direction, in the past three years, the state has supported the audio-visual sector in Greece through investment incentives (Law 4487/2017), while a law was enacted in 2019 for the financing of film producers through the Public Investment Programme (Law 4603/2019).

Urban regeneration and infrastructure development

The integration of cultural heritage in urban planning is a key factor in highlighting the dynamics of the cultural sector, and also has positive effects on tourism. A key priority is the modernisation of infrastructure, the expansion of visitors' access to cultural sites, as well as increasing the share of people interested in cultural activities in and outside of Greece. The following are indicatively suggested:

69 Different tax rates apply for book production services (VAT at 24%) and sales (6%), and for cinema (13%) and theatre and concert tickets (6%).

- Restoration, maintenance and promotion of cultural sites as well as ancillary areas to support cultural activities.
- Extending hours to facilitate and attract more visitors.
- Development of a modern telecommunications network for the use of digital technology and for services upgrade (such as electronic ticketing, interactive platforms, navigation and tour applications).
- A structured policy to ensure coherence between cultural heritage and urban regeneration.
- Creation of cultural routes and their full integration with package tours for the interconnection of monuments located nearby and for the promotion of the wider area to tourists.

Promotion activities

The promotion of cultural activities, exhibitions, archaeological sites and museums through targeted public campaigns, using the right promotional techniques both within the country and abroad, enhances the cultural identity of the country and places the cultural sector at the forefront, thus attracting visitors. Attracting European and international exhibitions to Greece and implementing measures that support the promotion and export-orientation of businesses could enhance the competitiveness of cultural products.

Employee education and training

The education of those employed in the cultural sector is of paramount importance. The implementation of training and education programmes, as well as learning to use new technologies, should be an important priority for the state and also for the sector's businesses and employees themselves.

6.6 TRADABLE PROFESSIONAL SERVICES

The term 'tradable professional services' refers to a broad array of services that usually produce some form of information (such as text, sound, images, computer code). These services are provided by highly specialised professionals, such as computer programmers, researchers, engineers, architects, designers, business consultants, financial asset managers, lawyers, publishers, journalists and artists.⁷⁰ Digital technologies enable these professionals to provide their services remotely and at the same time increase the productivity of the individuals and groups providing these services. As a result,

70 NACE Rev.2 two-digit codes 58, 59, 60, 62, 63, 64, 65, 66, 69-74.

many of these services have become internationally tradable and subject to economies of scale. Certain types of education and healthcare services have also acquired similar characteristics,⁷¹ but the same cannot be said for the entire education and healthcare sectors.

Professional services, or ‘knowledge services’, are becoming internationally tradable mainly in the following ways: (a) when the services can be offered remotely (e.g., software as a service, or legal advice); (b) when the provider of the services visits the client at a different country (e.g., an engineer setting up a factory abroad); and (c) when the provider of the service has a commercial presence in a foreign country collecting royalties for his or her property rights (for example, when a particular technology, developed in the R&D centre of the service provider, is incorporated into a product produced in a partnering factory in a foreign country).

Exporting professional services is a relatively new economic trend. In most economies, including Greece, the professional services sectors are usually thought of as oriented to the domestic market, and therefore there are no policy initiatives to support them and enhance their international competitiveness. This view must change and appropriate policies must be designed, especially in light of the fact that the knowledge economy will continue to grow as a share of global GDP and will become even more globalised. Indeed, the economic and social benefits for economies producing such professional services are very large. Moreover, knowledge services are particularly important in Greece, as these services have a comparative advantage vis-à-vis the capital-intensive exporting sectors.

Benefits for the Greek economy

- a. **Agglomeration economies:** It is technically feasible for tradable professional services to be produced virtually anywhere, even in remote villages. However, there are social reasons pushing professionals to seek contact with people of other similar professions, or people with a similar social life. When they live closer together, they have better career options, engage in lifelong learning, have more entertainment options and make friendships and families. As a result, they tend to concentrate in a few cities, or a few regions of a country (Moretti, 2012; Eckert et al., 2020). This concentration in turn attracts more international employers, and hence a virtuous circle of growth is created.
- b. **Higher income for many:** Labour productivity is very high in tradable professional services and is continuing to rise thanks to new technologies (Eckert et al., 2020). As a result, professionals earn a high income from their work. Their personal and family spending is directed to a large extent to local services, such as hospitality, entertainment and education. The income of employees in

71 NACE Rev.2 two-digit codes 85, 86.

local services is therefore higher (in purchasing power terms) than it is in areas without a high concentration of knowledge-intensive professions (Moretti, 2012). Therefore, the virtuous circle of growth also affects locally oriented professions, or lower-skill jobs.

- c. **Meritocracy:** Tradable professional services can offer opportunities for upward social mobility to talented scientists from middle- and lower-income backgrounds. This is already happening in Greek technology start-ups and will probably expand to other types of professional services, when exporting businesses emerge.

Tradable services face international competition. Regulatory protection offered by national governments cannot be as effective for the income of professionals providing tradable services as it is for non-tradable services. As a result, employers tend to hire and promote professionals based on their productivity and quality of work. In this sense, employers in tradable services are substantially different from most Greek employers in domestically oriented family businesses, which tend to choose family members for important senior positions and rarely offer opportunities to outsiders.

Comparative advantage in Greece

It is easier for tradable services to grow in the Greek economic and social environment than it is for capital-intensive sectors, for several reasons.

- Bureaucratic barriers in the form of licenses and compliance with regulations are fewer in services than in industrial sectors.
- Professional services have lower requirements for new or upgraded infrastructure in transportation, energy, water supply and waste management. Professional services do, however, require good telecommunications infrastructure, and there should be substantial improvement in this area in Greece.
- Professional services typically do not require large initial investments. Groups of professionals usually start small and grow gradually as they achieve progressively more challenging targets. This is particularly appealing to foreign prospective employers, as they are not willing to take on any great risks in attempting to establish operations in Greece. It is also appealing to domestic employers who often do not have large funds available for an initial investment.
- Knowledge-intensive professional services enjoy high social status in Greece. As a result, local communities are quite welcoming towards new businesses in such fields and employers can easily attract talent for such initiatives from every social background.

Professional services that support activities around shipping have an additional distinct advantage in Greece, as shipping is a large and very dynamic sector in the country. Even though sea transportation services are offered in a very competitive global market, the fact that Greek owners control a large part of the global shipping fleet and many of them have offices in Greece ensures easy access to clients and greatly facilitates any providers of professional services supporting shipping who operate in the country.

6.6.1 Indicators

In other EU countries of similar size to Greece,⁷² exports of tradable professional services are already high; Greece is lagging behind. In these countries, the average value of exports of professional services as a share of GDP was 9.3% in 2019, against merely 2.0% in Greece.⁷³

Table 6.1 presents the value added of the exports of each sector of services as a share of the total value added of the sector in the above countries and in Greece in 2015.

The software development and IT services sectors⁷⁴ generally exhibit strong exports in all countries, including Greece, but these sectors perform much better in export terms in Northern and Western Europe than in the Southern and Eastern EU countries (with the notable exception of Hungary, which boasts very strong exports of software and IT services). Regarding the exports of professional, scientific and administrative services (sectors M-N), there are great differences among European countries, but Greece has by far the lowest relative value added of exports. There is therefore much room for improvement in the export performance of all these sectors in Greece.

6.6.2 Policy recommendations

There is no global consensus on the best policies to support knowledge-intensive services. Indeed, this field has not yet been studied extensively. It is recommended to set up a taskforce to collect data from other countries and recommend appropriate policies for Greece. The following paragraphs present some indicative policy recommendations to support these tradable services.

The main factors affecting the production of tradable services are remuneration, working conditions and quality of life of the professionals. There are three interesting target groups of professionals: (a) scientists who currently live in Greece (most of whom are Greek), (b) Greek professionals living abroad, and (c) foreign specialists who could

72 In the "EU9" group, as defined in Section 6.7.

73 Table 6.4 in Section 6.7.

74 NACE Rev.2 sectors J62-J63.

consider moving to Greece. Notably, the practice of working remotely, which expanded greatly and rapidly during the COVID-19 pandemic, is nudging ever more workers and employers to consider moving to countries with a lower cost of living and better quality of life.

TABLE 6.1 VALUE ADDED OF EXPORTS FOR EACH SERVICES SECTOR AS A SHARE OF THE TOTAL VALUE ADDED OF THE SECTOR IN 2015

Value added exports/ total value added (2015)	Publishing, audio-video, broadcasting	Computer programming and information service activities	Finance and insurance	Professional, scientific, technical and administrative activities
NACE	J58-J60	J62-J63	K	M-N
Austria	24.55%	58.33%	25.05%	25.50%
Belgium	16.41%	62.98%	30.43%	57.32%
Czechia	61.85%	28.87%	11.22%	31.65%
Denmark	10.22%	27.73%	8.25%	22.84%
Hungary	30.67%	57.28%	8.84%	51.44%
Netherlands	20.69%	49.11%	15.86%	39.73%
Portugal	9.76%	24.59%	6.83%	18.35%
Slovakia	26.16%	24.03%	8.44%	27.35%
Sweden	10.89%	63.65%	20.30%	36.02%
EU-9	23.47%	44.06%	15.02%	34.47%
Greece	14.10%	36.28%	11.02%	13.83%

Note: The value of the index for the EU-9 group of countries is a simple (non-weighted) average of the respective indices in the nine countries.

Source: OECD.

Personal income taxation: As discussed in other sections of this report, tax rates for personal income taxation, as well as the rates of social security contributions, are excessive for the relatively high personal incomes earned by professionals in knowledge-intensive services. Unless taxation and social security contributions rates are greatly reduced, they will continue to pose a huge barrier to the growth of these activities.

Regarding professionals who are willing to settle in Greece from abroad, it is recommended to introduce a personal income tax discount for the first five years after moving to Greece (in the Netherlands, for example, this discount is 30%).

Incentives for employers: Section 5.4 discussed recommendations regarding offsetting employer social security contributions with R&D spending and offering tax deductions on profits from R&D and intellectual property activities. Such measures would affect a wide range of tradable services and should be implemented as long as fiscal constraints do not allow the horizontal implementation of the measures discussed in the paragraph above. It should be noted, though, that these measures would not be effective for the majority of professional services.

Simplifying bureaucratic processes: It is crucially important to simplify the processes required for foreign firms and professionals to get work and a residence permit, in particular the processes required to get a tax registration number, a social security number and a bank account. It would be helpful to set up a special public service centre dedicated to foreign professionals and firms, which could initially only operate online with just a few bricks-and-mortar offices in some big cities.

Regulations regarding working hours: A large percentage of professionals and employers in the sector prefer to work remotely rather than in-person, which often implies non-typical and flexible working hours. The relevant regulation regarding working hours should adapt to facilitate such options.

Private sector services: Foreign professionals moving to Greece will require properly equipped housing options, good medical services, English-speaking schools for their children and the opportunity to carry out their professional activities and to have an active social life while speaking English.

Telecommunications infrastructure: The quality of broadband internet connections in Greece is still quite low compared to most other EU countries, while prices are high. Higher investment and more intense competition are necessary in telecommunications, so that the quality of services improves and prices are lowered.

6.7 SMALL AND MEDIUM-SIZED ENTERPRISES

SMEs are the backbone of the economy, both nationally and at European level. They make a significant contribution to production, employment and social stability.

Given the high importance of SMEs for the European economy, the European Commission has set the objectives of promoting entrepreneurship and improving the business environment for SMEs, in order to strengthen their growth potential. In this context, the EU has set up support actions exclusively for SMEs to alleviate the difficulties they face in accessing finance. Also, support programmes at national level are exempt from European state aid restrictions when they are properly targeted at SME support.

For the Greek economy, the goal of supporting and strengthening SMEs is fully compatible with the need for systematic growth of all businesses, regardless of their size. This is because companies gain strength as they grow, which in turn improves their cost structure and financing terms. The broader policy measures outlined in this report would make a decisive contribution in this direction. This section focuses on policy measures that would specifically strengthen SMEs so that they can take advantage of economies of scale and be as successful as possible in innovation creation and exports.

6.7.1 Indicators

Businesses are classified into micro, small, medium and large based on the number of employees. Businesses with 0 (i.e., self-employment) to 9 employees are considered micro enterprises. Businesses with 10-49 employees are considered small, with 50-249 employees they are considered medium, and with 250 or more employees they are considered large. The category of SMEs includes micro, small and medium-sized businesses.

Based on these definitions, 99.96% of the companies in Greece in 2018 were SMEs. These businesses employed almost 88% of people working in the business sector (Table 6.2). For comparison, 99.8% of companies in the EU27 were SMEs, employing 66.6% of the workforce. While the percentages in Greece are higher, the crucial difference with the EU lies in the composition of SMEs. Specifically, micro-enterprises employed 62% of workers in Greece,⁷⁵ more than double the EU27 average (29.7%). This fact is considered an indication of employment fragmentation.

The main sector of activity of SMEs, including sole proprietorships, is wholesale and retail trade, with approximately 227,600 enterprises, followed by professional and technical services (135,500), accommodation (107,700), construction, and transport and storage (59,800 in each sector). The distribution of size categories differs significantly across sectors (Table 6.3 and Figure 6.15).

75 The difference with the percentage mentioned in Chapter 1 (48.5%) is due to the fact that the calculation concerns a different time period and is done with a different methodology.

TABLE 6.2 CONTRIBUTION OF SMES TO ENTREPRENEURSHIP AND EMPLOYMENT

Size	Number of enterprises			Number of employed			Value added		
	Number	Share	EU28 Share	Number	Share	EU28 Share	Greece billion €	Share	EU28 Share
Micro	800,075	97.4%	93.0%	1,527,075	62.0%	29.7%	9.0	17.6%	20.8%
Small	18,958	2.3%	5.9%	398,514	16.2%	20.1%	11.8	23.1%	17.6%
Medium	2,176	0.3%	0.9%	239,627	9.7%	16.8%	11.7	22.9%	18.0%
Small and medium (SMEs)	821,209	100.0%	99.8%	2,165,216	87.9%	66.6%	32.6	63.5%	56.4%
Large	331	0.0%	0.2%	297,411	12.1%	33.4%	18.7	36.5%	43.6%
Total	821,540	100.0%	100.0%	2,462,627	100.0%	100.0%	51.2	100.0%	100.0%

Note: Estimates based on data from the Eurostat Structural Business Statistics database, covering SMEs from all sectors except for the financial sector, the primary sector, education services and health services.

Source: Greece, Factsheets 2019, Small Business Act.

The dominance of sole proprietorships and micro-enterprises is a problematic feature of entrepreneurship in Greece, as productivity in these enterprises is generally low. However, as they cover almost the entire economy, SMEs differ significantly in their characteristics and orientation. In areas of high-tech activities, the existence of many small businesses is anticipated and useful. Many of them are at an early stage of the scientific and business cycle that favours flexibility, with prospects of growing in the future as well as of interconnecting with other businesses. Also, in business areas such as retail trade, tourism, food services, cultural activities and entertainment, small businesses with special characteristics can create significant value by working towards a high-quality specialisation, targeting demand segments that larger enterprises may not be able to reach as easily.

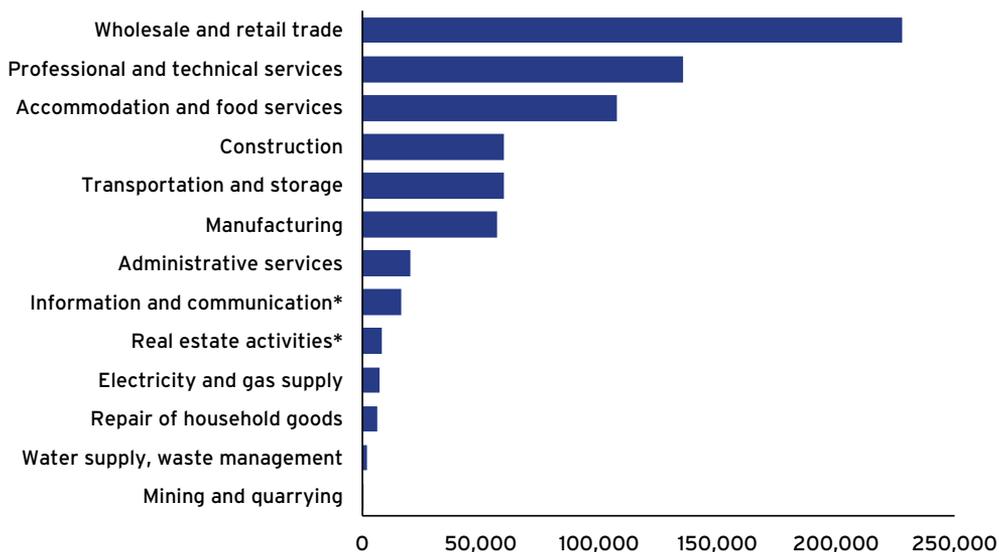
TABLE 6.3 SME SIZE DISTRIBUTION PER INDUSTRY

	Size		
	Micro	Small	Medium
Mining and quarrying	485	114	15
Manufacturing	51,854	4,412	766
Electricity supply	7,158	68	13
Water supply, waste management	1,692	197	62
Construction	57,898	1,755	175
Wholesale and retail trade	219,488	7,391	713
Transport and storage	57,966	1,519	225
Accommodation and food services	93,230	13,480	976
Information and communication*	15,650	763	--
Real estate activities*	8,210	245	--
Professional and technical activities	133,870	1,460	192
Administrative activities	18,806	1,313	302
Repair of computers and household items	6,458	45	4
Total	672,765	32,762	3,443

Note: Sole proprietorships included *SMEs with more than 50 employed persons not included due to confidentiality of data.

Source: Structural Business Statistics, ELSTAT.

FIGURE 6.15 NUMBER OF SMES PER SECTOR



Note: Sole proprietorships included *SMEs with more than 50 employed persons are not included due to confidentiality of data.

Source: Structural Business Statistics, ELSTAT.

6.7.2 EU programmes to support SMEs

For SMEs to be able to respond to the global competitive environment and to current challenges such as the green transition and digitalisation, continuous modernisation in production and management, the creation of innovative services and products, access to relevant information, the adoption of advanced technologies, and international networking and collaborations are required. The role of economic policy can be crucial in supporting small and medium-sized businesses, through the creation of a favourable business environment and the development of support and funding mechanisms. The European Commission provides best practices, programmes and initiatives in this direction.

EU SME strategy

At the core of the European Commission's actions on SMEs is the new strategy for an environmentally sustainable and digital Europe. The strategy aims to significantly increase the number of SMEs implementing environmentally sustainable business practices, as well as those using digital technologies. Another aim is to make Europe an attractive place to start a small business which will be able to grow within the Single Market and beyond. To achieve these goals, the following steps are necessary:

- **Reduction of regulatory barriers and improved market access:** Actions to remove regulatory and practical barriers to entrepreneurship.

- **Improved access to finance:** Access to finance is one of the most important barriers to SME growth. In this regard, EU programmes and tools leverage financial resources from the banking system and the private sector to give SMEs better access to investment funding. The consolidation of EU capital markets (Capital Markets Union), combined with the development of innovative SME financing tools through the stock markets (such as VC firms and portfolio investment companies), can also give significant impetus to SME access to investment funding.
- **Cooperation between the EU and local authorities:** The new SME strategy aims at strong partnerships between the EU and regional and local authorities to achieve the desired results from the implementation of EU policies.
- **Support structures:** Entrepreneurship support through training programmes, entrepreneurship centres, as well as support for projects coming from vulnerable social groups (e.g., through microfinance tools).

EU Structural Funds

The European Regional Development Fund (ERDF) is one of the main sources of support for the EU SME strategy, with about 20% of its resources allocated exclusively to SMEs. The main objectives are:

- Access to financing for investments through grants, loans, loan guarantees, venture capital, etc.
- Creating collaborative relationships and synergies with research centres and universities to promote innovation.
- Business support, such as know-how and scientific advice, information and networking opportunities, and cross-border collaborations.
- Better access to global markets and international value chains.
- Utilisation of new opportunities in sectors such as the green economy, logistics, IT, knowledge-intensive services, sustainable tourism, health and social services, cultural and creative activities.
- Investment in human capital and in vocational education and training oriented to the current needs of the markets.

Other support programmes

SMEs' access to finance can also be achieved through EU support programmes that mainly opt for strengthening competitiveness, research and development, and innovation. The EU programmes⁷⁶ that provide financial support to SMEs are the following:

- **COSME:** EU programme for competitiveness that mainly concerns SMEs during their growth and expansion phases.
- **InnovFin Program (Horizon 2020):** Joint initiative of the European Investment Bank and the European Commission under the Horizon 2020 programme. It aims to facilitate and accelerate access to finance for innovative businesses.
- **Creative Europe (Cultural and Creative Sectors Guarantee Facility):** Aims to provide funding to SMEs active in the cultural and creative industries. The intangible nature of their assets, the special characteristics of these markets and the lack of familiarity with the particularities of these sectors by financiers are the main reasons that access to finance for companies in the cultural and creative sectors is particularly difficult.
- **Programme for Employment and Social Innovation (EaSI):** The programme's goal is to facilitate access and availability of microfinance to small businesses as well as to vulnerable people who want to start a business venture or grow a small business. It also provides support for developing social enterprises.
- **COSME Loan Guarantee Facility:** Supports the financing of SMEs' digital transformation projects in all sectors of the economy, regardless of their starting level of digitalisation.

6.7.3 Policy recommendations

Support for SMEs is a key public policy to support entrepreneurship, as SMEs represent the vast majority of Greek businesses. SME support measures should aim to overcome the problems posed by the small scale of these businesses.

Research and development activities, innovation, human capital development, green and digital transformation, as well as exporting activity for a business, entail costs that can be overwhelming if the business is small. Theoretically, such a business could cover these costs through financing from banks or capital markets, if the benefit in terms of future income is greater. However, as documented in Section 5.1, access to finance, and

76 https://europa.eu/youreurope/business/finance-funding/getting-funding/access-finance/index_en.htm

in particular equity, is difficult for SMEs. Without financial and other tools in order to overcome such problems, the scale of businesses remains small and they follow inefficient business practices. Some of them are forced to survive on the margins of the formal economy, instead of growing and joining either national or international value chains.

As access to finance is difficult for SMEs, public sector participation in their financing can be a good use of state financial resources. As highlighted in Section 5.1, a key additional condition is that the implementation of their investment plans has significant positive externalities for the economy as a whole. This condition is more likely to apply to investment projects involving innovative products or production methods, contributing to the development of new ecosystems or sectors, having a positive environmental footprint, assisting vulnerable social groups, or contributing to the development of degraded areas. Public funding, through national or European resources, should generally focus on such investment projects and companies.

The use of resources from EU programmes has been insufficient in Greece for a long time, with a relatively low degree of absorption, weak orientation to achieve programme goals and inadequate monitoring of the effectiveness of the actions. Often the resources were fragmented, while efforts to monitor implementation and effectiveness concerned mainly managerial or accounting issues and less actual evaluation with feedback to policy redesign. Every new SME support programme should therefore focus on solving specific problems of SMEs, respond to the needs that they really – and not potentially – have, and also adapt to the scale of the existing production ecosystem. In other words, there must be a ‘body of businesses’ to serve and utilise these tools.

Financial instruments and support policies for SMEs should not replace general financing through the banking system, the capital market and private resources. On the contrary, an important factor of their success is the leverage of public resources with institutional and private investment funds, as well as the effective replenishment of EU resources with co-financing from the domestic Public Investment Programme. Guarantees and loans should be managed in cooperation with the network of banks, while participation in the equity of SMEs should be leveraged with private resources and managed according to the model of the existing EquiFund. In both cases, private investors must share the risk of low returns with the state.

Based on the above, and given the characteristics of European financing tools, domestic SME support programmes should focus on one of the following areas:

- **Digital transformation:** The widespread diffusion of information and communication technologies in the business-productive system and the development of digital entrepreneurship constitute a key strategic pillar of an enterprise policy. The public resources directed at supporting the digital transformation of SMEs should aim at increasing the production and efficiency of the supported companies. Plausible forms of financing for innovation creation and the digital transformation of existing SMEs are guarantees and loans, as well

as participation in the equity of innovation start-ups. The funds that are recouped from the repayment of loans and the sale of shares in companies that have already exceeded their initial stage of growth could be reused to support other businesses and projects. An important tool for boosting innovation and productivity of medium-sized businesses could be the introduction of tax incentives for investing in domestic SMEs, as per the relevant provisions of EU law and practice in a number of EU member states (IOBE, 2019a).

- **Better innovation performance:** Greece's innovation performance is greatly influenced by the few large companies in the country that have the required human and financial resources, technological capabilities and infrastructure to invest in R&D and innovation. However, the boost to national competitiveness should come through the overall quality upgrade of the products and services offered by the production system of Greece. This requires that the knowledge that exists in the industry is utilised and innovation is made even in traditional industries with poor performance in standard indicators (hidden innovation). Therefore, more R&D programmes are needed among universities, public research institutions and private companies, as well as the facilitation of knowledge diffusion from academia to businesses.
- **Better environmental performance:** The business sector is crucial in achieving the goals to mitigate climate change and transit to a circular economy. Many of the practices in this area, such as energy savings in the services sectors and the reduction of packaging materials, have business benefits and create opportunities for start-ups. Businesses could be motivated to manage their waste efficiently (e.g., by investing in modern liquid and solid waste management methods), to make better use of energy resources, to produce energy from renewable sources, and so on. Special green entrepreneurship financing programmes – through guarantees, loans or grants – could improve both the environmental performance of businesses and their competitiveness.
- **Social entrepreneurship:** The activity of micro and small enterprises can also have an important social dimension. Small-sized entrepreneurship is an important outlet for social integration and economic development of people from vulnerable groups (long-term unemployed, immigrants, persons with disabilities, former drug addicts, released prisoners, and members of their households). Support for the social dimension of entrepreneurship with public resources should focus on social enterprises that contribute to specific social goals and business plans that come from vulnerable groups of the population. The use of grants is appropriate in the case of social enterprises, while an important tool to support the entrepreneurship of vulnerable groups is guarantees for microfinance. The latter are managed by specialised credit institutions, which can also provide mentoring to beneficiaries.

- **Enhancing openness:** In general, the size of SMEs does not favour the creation of a competitive advantage that would allow them to gain and maintain access to international markets and value chains. It is necessary to activate and develop consulting services aiming to support business openness and to create support 'nodes' for Greek companies abroad that will facilitate the networking of businesses and entrepreneurs with foreign markets. It is also necessary to facilitate access to international distribution networks and to provide comprehensive support for advertising business products and services in foreign markets. At the same time, the cooperation of companies for the creation of export value chains or business clusters should be promoted. It is often useful to finance business partnerships and projects submitted by domestic business consortia that supply a large export-oriented business.

6.8 EXPORTS

The goal for Greek exports, as described in Chapter 3, is to grow and reach 50.5% of GDP by 2030. This section sets out the growth targets for exports by export sector and describes the most important challenges as well as the policies that can facilitate the achievement of these objectives.

6.8.1 Exports by sector and quantitative targets

The growth potential of each sector is assessed using two criteria: the change in the sector's exports in recent years and how this compares with the respective export performance of nine EU countries that have a similar population size to Greece (EU9 countries: Austria, Belgium, Bulgaria, Denmark, the Netherlands, Hungary, Portugal, Sweden, and the Czech Republic) (Table 6.4).

Total exports account for 37.2% of Greece's GDP compared to 65.5% for the EU9 countries, thus the export sector of the Greek economy is comparatively less developed. The following paragraphs describe the export performance by category of products ("agricultural products, food and raw materials", "petroleum products" and "industrial products") and services ("transport", "tourism", "other services").

Exports of the **agricultural products, food and raw materials** sector account for 4.4% of GDP. They have seen a steady growth rate of 4-5% over the last two decades, even during the period of deep recession (2008-2013). Nevertheless, Greece lags the EU9 average in terms of share of exports in GDP. Given the comparative advantage of Greece in the production of these goods, mainly due to the favourable climate, and the resilience of the industry to adverse economic conditions, it is estimated that this industry has significant untapped growth potential.

Petroleum refining is highly developed in Greece compared to other European countries: the sector's exports as a share in GDP is more than double the EU9 average (6.3% versus 3%). The Netherlands is the only country with a higher GDP share of the sector. During the period 2013-2019, oil exports were stagnant, mainly due to the falling crude oil prices – a performance better than the EU9 average. Given the high level of maturity of the sector, the relatively limited range of exported products and the recent stagnation in the value of exports, this sector is considered to have limited potential for further development.

TABLE 6.4 EXPORTS BY SECTOR

	Greece		EU-9	
	GDP share 2019	Average annual change 2013-2019	GDP share 2019	Average annual change 2013-2019
Total exports	37.2%	4.1%	65.5%	4.5%
Agricultural products, food & raw materials	4.4%	3.8%	6.4%	2.9%
Petroleum products	6.3%	0.1%	3.0%	-2.8%
Industrial products	9.2%	6.7%	38.2%	4.9%
Chemical products	2.4%	8.0%	7.3%	5.9%
Industrial items (by raw material)	3.0%	5.1%	6.8%	2.5%
Machinery & vehicles	1.9%	8.0%	18.3%	5.9%
Various manufactured items	1.7%	8.5%	5.4%	4.6%
Transport (mainly sea)	7.5%	6.2%	4.5%	4.7%
Tourism	7.8%	6.9%	4.0%	6.2%
Other services (health, education, IT, etc.)	2.0%	3.4%	9.3%	7.4%

Notes: The EU-9 is the unweighted average of Austria, Belgium, Bulgaria, Denmark, the Netherlands, Hungary, Portugal, Sweden, and the Czech Republic. For the services exported by EU-9 countries, the shares of exports in GDP refer to the year 2018 and the growth rates of exports concern the period 2013-2018. All other data refer to the year 2019. Following the Standard International Trade Classification for the trade of goods, the sector "agricultural products, food and raw materials" corresponds to categories 0, 1, 2 and 4, the "petroleum" sector corresponds to category 3 and the "industrial products" sector corresponds to categories 5, 6, 7 and 8.

Sources: Eurostat, Bank of Greece.

The **industrial products** sector is the largest export sector, as it makes the highest contribution to exports in most countries. It includes a wide variety of products that require different levels of technological specialisation, such as chemicals, base metals and processed metal products, machinery, vehicles, textiles, and clothing. This sector is relatively less developed in Greece: its exports represent only a quarter of total exports and 9.2% of GDP compared to 55% and 38.2%, respectively, in the EU9 countries. It should be noted, however, that Greek exports of industrial products increased significantly after the country joined the euro area, except during the deep crisis period

(2008-2013). Exports of industrial products increased annually by 7.5% in 2002-2008 and by 6.7% in 2013-2019, the second-best performance among the 15 countries that were members of the EU before the 2004 enlargement. While Greece's industrial products sector is less developed than the European average, the sector includes a wide range of products. Therefore, it is possible to find comparative advantages in some of the sector's products. Also, it has seen high growth rates in recent years (when the economy was stable). Thus, the growth potential for exports in this sector is considered significant.

The **maritime transport** sector is highly developed in Greece: the sector's exports are 65% higher than the EU9 average and are second only to Denmark in terms of share in GDP. The value of the sector's exports increased rapidly in 2013-2019 but this was preceded by a collapse of revenues by 40% in 2008-2013, and 2019 revenues were thus 10% lower than 2008 levels. Given the high level of maturity of the sector, the relatively limited range of exported services and the high price volatility, this sector is considered to have limited potential for further growth.

The **tourism sector** is highly developed, and the value of its exports increased significantly in 2013-2019, since the start of the European economic recovery. This sector is considered to have untapped growth potential, mainly through the extension of the tourist season and the expansion of tourism products. COVID-19 poses significant challenges in the short run, but it is anticipated to have limited effects in the long run.

The **other services** sector has exhibited low levels of growth (similar to other southern European countries) and has significant growth potential, especially in activities complementary to existing exports (e.g., health and tourism, banking/accounting services and shipping) as well as in IT services and professional/scientific activities.

In conclusion, the petroleum and maritime transport sectors, which account for 40% of Greece's current exports, have relatively limited growth potential and the key challenge for the next decade is to diversify their export mix.⁷⁷ Industrial products, agricultural products, and other services have the greatest growth potential. An annual export growth target of 9% for these sectors is feasible, albeit ambitious. The tourism sector has the potential to increase its share in GDP and an annual export growth target of 6.5% is achievable. Exports of the petroleum and maritime sectors are estimated to maintain their current share in GDP, i.e., to increase by 3.5% per year (same growth rate with the GDP target discussed in Chapter 3). If these growth rates of exports by sector are achieved, real exports will increase by 90% by 2030 and reach 50.5% of GDP.

77 Of course, the oil and maritime sectors are expected to maintain a significant share of Greek exports.

6.8.2 Challenges and policies

Achieving such a significant increase in Greek exports will require a multifaceted and systematic effort in three main areas. First, the Greek economy needs to become more productive and competitive. Second, more Greek companies need to start exporting and the range of exported products needs to expand. Third, the administrative costs of exporting must be reduced. Below, we describe the challenges associated with these areas as well as some policies to address these challenges.

Labour **productivity** could be enhanced in two main ways; first, with horizontal interventions in the economy, which will enhance total factory productivity (as described in detail in Chapter 4); second, with increased investments, especially in sectors producing capital-intensive products. Fixed capital (excluding housing) per employee in Greece is about half of that in the EU9 countries, and this ratio decreased by almost 10 percentage points during the crisis due to the collapse of investment.⁷⁸ Reversing this trend will require investment incentives and better funding.

We use a cutting-edge economic model which analyses international trade in a general equilibrium environment to calculate the magnitude of productivity growth that will lead to the desired increase in exports of goods. According to the model's estimates, labour productivity should increase by 3.3% annually until 2030 in the agricultural products, food and raw materials sector, by 2.2% in the petroleum sector and by 5.2% in the industrial products sector.⁷⁹ These goals are achievable based on historical evidence from previous decades: in 1995-2002 the average annual productivity growth was 4.4% in the agricultural products, food, and raw materials sector and 3.1% in the petroleum sector. In the industrial products sector it was 2.9%, but in 2002-2008 it increased to 4.6%.

In the product industries, it is estimated that half of the productivity growth will come from the horizontal reforms described in Chapter 4 and the rest from capital deepening (i.e., investments).⁸⁰ It is estimated that €65 billion in total investment is needed over the next decade in the export sectors to achieve the desired result: €30 billion in agricultural products, food and raw materials, €11 billion in the petroleum sector and €24 billion in the industrial products sector.⁸¹ At the moment, only the petroleum industry is investing sufficiently to achieve these goals; the rate of investment must increase by 20% in agricultural products, food and raw materials and by 45% in industrial products.

78 The value of fixed capital (excluding housing) per employee in Greece is approximately €70,000 while in the EU9 countries it is over €130,000. In 2008, the corresponding figures were €67,000 and €112,000 (source: Eurostat).

79 Using the model, we calculate the necessary increase in labour productivity to achieve the desired increase in exports, in each sector separately.

80 These calculations are similar to the corresponding calculations in Chapter 3 (Eurostat data).

81 The total value added of the agricultural products, food and raw materials sector is about 20% higher than the value added of the industrial products sector; for this reason, we estimate that a higher amount of investment is needed. The industrial products sector, however, exports 60% of the value added it produces, compared to 30% for the agricultural products sector, and therefore accounts for a larger share of total exports (source: OECD).

Exporting is often a demanding and difficult process, even for companies with high productivity. It presupposes overcoming many barriers related to information (e.g., overseas market research, product advertising, finding business partners and product distributors), access to financing (e.g., working capital, trade insurance), and public administration rigidities (e.g., customs, VAT refund), which are analysed in more detail below. Overcoming these barriers is more difficult for small businesses and companies trying to export new products for which they must find new markets. The academic literature also confirms that in all countries, export companies are on average much larger than companies operating only domestically.

There are two structural features of the Greek economy that may hinder the rapid growth of exports, and is imperative to design appropriate public policies to curb these. First, the Greek economy is dominated by small businesses (with fewer than 50 employees). In 2017, small businesses accounted for three quarters of employment and 55% of total value added. Exporting companies are also smaller in Greece and have a lower value of exports compared to their European counterparts. For example, the average export value of Greek exporting companies in 2017 was €2.2 million compared to over €8 million for the EU9 countries. Second, the Greek economy has a limited export base, especially in two major categories of industrial products ("Machinery and vehicles" and "Various manufactured items"). For this reason, almost the entire increase in exports in these categories in 2013-2018 came from exporting products in which Greece did not have strong export activity in 2013. By contrast, in Portugal (where these sectors are more developed) 85% of export growth was in products with solid existing export activity – hence the value of additional exports was four times as large.⁸² On the positive side, interventions that alleviate these difficulties can lead to a significant increase in exports by helping small businesses unleash their growth potential.

Public export promotion agencies (EPAs) can play an important role in addressing the difficulties faced by small businesses and businesses producing new products, especially in reducing information barriers. EPAs can facilitate the promotion of Greek products through advertising and participation in trade fairs. Indeed, the Enterprise Greece organisation (under the Ministry of Foreign Affairs) already carries out these activities for certain products. Internationally successful EPAs provide additional support, such as supply of information, analysis for specific markets and help in finding potential distributors and business partners. These organisations are often specialised to meet the needs of each business and require significant know-how. Recent research has shown that this kind of support increases the likelihood of exporting as well as the value of exports. In addition, the effectiveness of this support is greater for SMEs and especially for those who are exporting for the first time or export a new product, which is exactly

82 For Greece, the definition of products with strong export activity is products that are exported with greater intensity compared to the international average. This definition corresponds to values on the revealed comparative advantage (RCA) index higher than one, where the RCA index for a product is defined as the ratio of the share of the product in Greek exports to the share of the product in world exports.

what is required for the Greek economy (Munch and Schaur, 2018). While it would be difficult to afford an EPA offering this range of services (the Danish Chamber of Commerce, for example, has an annual budget of €60 million and employs 75 people in Denmark and another 230 people in embassies and consulates abroad), the cost-benefit analysis is positive (in Denmark, the benefit in the added value of new exports is three times higher than the direct cost of export promotion). The benefit-to-cost ratio may be even higher for Greece since most potential exporters are small or medium-sized, and therefore the demand for such services will be very high.

The **administrative cost of exporting** is particularly high in Greece compared to other European countries. The World Bank estimates that the completion of customs procedures and other controls for a product shipment from Greece took 24 hours in 2019, while the EU average is 7.5 hours.⁸³ In addition, the cost of these procedures per shipment is estimated at \$300, compared to \$80 for the EU.⁸⁴ Reducing the administrative burden on exports requires changes that have been identified in several OECD, IMF and European Commission reports. Some of these have already been initiated, including the completion of the ‘single window’ system for exports and the acceleration of VAT refunds to exporters.

Using the economic model of international trade, we estimate that reducing administrative costs by half would lead to an increase in exports of 30%, because exports would become more profitable. We also estimate an increase in real income of 4%, due to increased specialisation.⁸⁵ These calculations are, of course, subject to some degree of uncertainty, but they show that the cost of administrative burdens is significant (especially for the export-oriented sectors of the economy) and also unnecessary, based on the World Bank's comparison with other European countries.

83 “Time to export, border compliance” (<https://data.worldbank.org/indicator/IC.EXP.TMBC>).

84 “Cost to export, border compliance” (<https://data.worldbank.org/indicator/IC.EXP.CSBC.CD>).

85 Hornok and Koren (2015) estimate that a reduction of administrative trade costs by 50% corresponds to a reduction of total trade costs by 9% on average (this also includes transport costs, duties, financing costs). Our model is used to calculate the consequences of reducing export costs by 9%.

Final remarks

7.1 GENERAL DIRECTIONS

The policy actions described in this report aim to increase the incomes of Greek households over the next decade and to achieve convergence with European averages on a sustainable basis. This can happen if there is a systematic increase in productivity and labour market participation, areas in which Greece has lagged for a long time. To increase productivity, structural changes in the way the public sector and markets operate are necessary, while investment and the integration of innovative production methods and new technologies must play a central role.

Given the particularly high unemployment and the large investment gap under the current conditions, significant growth of the Greek economy can be achieved immediately after the end of the current crisis related to the COVID-19 pandemic. However, this growth will be temporary and relatively weak unless the conditions for a significant increase in productivity are created. In addition, the implementation of policy actions aimed at the systematic and medium-term increase of productivity is expected to have a positive effect through the improvement of expectations, which can attract physical and human capital in a much more immediate time horizon.

The systematic increase in productivity is closely linked to the openness of the economy. Increasing exports of services and goods is a key condition for a strong growth path, for two main reasons. First, the small size of the domestic market does not allow for a sufficient degree of specialisation and exploitation of economies of scale. Second, participation in international markets goes hand-in-hand with innovation, and it also helps companies to increase their average size and competitiveness. In this way, it intensifies the integration of the Greek economy with the global technological and economic trends, thus allowing for higher incomes domestically.

The implementation of the plan presented in the report, in addition to achieving closer connection of the economy with the global environment, would make the economy operate domestically as a more open system with simpler rules and fewer restrictions. There are two aspects to this. First, the tax and social security burden on formal employment should decline, and the formal and informal barriers to entrepreneurship in terms of market entry and expansion should ease. Second, the public sector should operate as a pillar offering security, education and continuing training to all employees, thus facilitating innovative activity and better connection with the evolving needs and opportunities of the labour market.

Making the economy more open would favour sections of the population that the current situation holds at a disadvantage, such as women and young people. It would also enhance social mobility, which is currently at low levels. Both more general measures that make the markets of products and labour more dynamic, as well as other more specific measures described in the report, would contribute to this. Special care must be taken for the more effective integration into the economy of people with disabilities and immigrants, where there is currently a significant gap.

Transforming the economy by increasing productivity and exports would allow for gradual convergence of its core features with those of other EU economies. It would allow, in parallel, the fullest use of comparative advantages related to specific features of the country, such as its geographical location and the existence of a strong Greek expatriate community abroad.

7.2 TIME HORIZON AND FUNDING

Although the dynamics of the world economy will be particularly uncertain in the next decade, this period can be schematically divided into two parts for the development of the Greek economy.

During the first half of the decade, the following characteristics are expected to coexist. The domestic output gap can be exploited to achieve real GDP growth, with a gradual reduction of unemployment and the investment gap. There will also be the possibility to boost exports due to higher international demand, following the suppressed consumption and investment during the COVID-19 pandemic. However, domestic private investment will lag in relation to needs, to the extent that the relevant barriers in the institutional environment and funding will be eliminated only gradually. Funding from EU pandemic programmes will be significant. International interest rates are expected to remain low, despite the reversal of broader monetary policy measures, which will allow for relatively easier refinancing of public and private debt. The requirements for refinancing bilateral public debt, in agreement with the European institutions, will be low.

During this period, it will be crucial to make effective use of European and national public resources in order to, first, support investment in public infrastructure, and second, implement structural reforms that raise productivity and labour market participation. Given the exceptionally high unemployment initially, priority should also be given to interventions that lead to strong job creation in the short term and create conditions for unemployment to stay systematically low in the coming years. Finally, the economy needs to maintain fiscal credibility, with primary surpluses that will gradually reduce public debts without being so large so as to hinder the expansion of the production base.

The role of NextGenerationEU and the NSRF 2021-2027 (Multiannual Financial Framework) will be particularly important during this period, not only to fill part of the initial private investment gap and to heal wounds left by the pandemic, but mainly to help shift the production model of the economy. At the same time, the Public Investment Programme should be strengthened with both resources and measures to increase its effectiveness, though rolling but systematic medium-term (five-year) planning. However, public resources, although significant, will not be sufficient on their own to fill the investment gap and cover other related needs. They should be used as catalysts to leverage multiple private resources in a variety of ways, including PPPs and Hellenic Development Bank (HDB) programmes.

By the second half of the decade, most of the trends listed above are expected to have reversed to their long-term means. Financing rates may move up, at a time when the requirements for refinancing bilateral public debt are also planned to increase. The possibility to increase employment by reducing unemployment will subside. Funding from specific EU programmes is also expected to decline, without completely disappearing. Developments, with uncertain direction, are expected regarding the further deepening of the euro area and the coordination of economic policy. Technological developments are expected to accelerate, such as those related to digitalisation and artificial intelligence, green technologies and medicine, that will eliminate many jobs and create others.

During this period, it will be crucial that the structural interventions of the previous years have borne fruit, as these will support higher productivity and participation in the labour market. A stronger production base and a more favourable business environment will attract more investment from domestic and foreign investors and support the desired increase in productivity and exports. Consolidating an environmentally friendly identity and a more efficient public sector will also make the country more attractive to residents and visitors.

7.3 PRIORITIES

The actions proposed in this report would act in tandem with a common goal to strengthen the Greek economy. While all actions are expected to have beneficial effects, they are not of equal priority. Some actions may be more effective or easier to implement if other actions take place alongside or before them. Some may have greater benefits than their cost or produce results in a shorter time horizon. Others can be easily integrated with European programmes and therefore be more easily funded.

As a general principle, actions that make the labour market more flexible are easier to implement and more effective if they have been preceded by actions that reduce barriers to entry into product markets. This is because more intense competition in product markets reduces the excessive profits that some companies make at the expense of consumers and intermediary buyers, thus increasing productivity in the

economy as a whole and creating new jobs. Therefore, even if labour market flexibility causes a temporary reduction in the share of profits going to employees, these losses are smaller and offset by easier job search and higher earnings in a more dynamic economy (Blanchard and Giavazzi, 2003).

Similarly, actions that reduce barriers to entry into product markets are easier to implement if they have been preceded by actions that improve the functioning of capital markets and investor protection. This is because the expansion of production and the entry of new companies into the markets requires investment and access to finance. In addition, owners of incumbent firms are likely to lobby less aggressively against more intense competition when they can sell their firms to more productive management teams on better terms in more developed capital markets (Caselli and Gennaioli, 2008). Hence, improving the business environment and opening up the economy to new investments and businesses must be a priority and a condition for the success of other reforms.

Priority should also be given to investment in physical and human capital, which will gradually increase productivity and make the country an attractive business destination. Actions to upgrade physical capital include investment in digital infrastructure, transport and energy networks, waste management and other green technologies. The strengthening of human capital includes training programmes in emerging sectors of economic activity and upgrade of the education system. Investment in human capital is particularly important, given the country's comparative advantages in labour-intensive activities and the potential role of the Greek expatriate community, which has a strong presence in leading scientific and professional fields.

Resources from European cohesion programmes and NextGenerationEU are crucial for investment in physical and human capital. These resources create short-term fiscal space for Greece, which should be used effectively to achieve a high growth multiplier.

In addition to strengthening physical and human capital, priority must be given to actions that will help to rapidly reduce unemployment, by harnessing both European and other available resources. Unemployment is currently very high and it has not only cyclical but also structural features, so reducing it will not be easy.

Given the above, and without implying that the implementation of other actions should be delayed, we recommend the following actions as immediate priorities:

- **Production and investment:** Dramatic reduction of the cost of formal labour by reducing the tax and social security burden. More favourable tax amortisation treatment for investment in mechanical equipment and innovation. Energy upgrade of buildings. Investment in infrastructure with priority in freight transport and congested transport corridors for visitors and the public. Boosting export-oriented branches of manufacturing by reducing the energy cost and easing administrative barriers. Waste management and circular economy.

- **Human capital:** New training programmes and arrangements for employees and the unemployed. Organisational interventions in schools. Expanding and upgrading preschool education. Facilitating the full integration of women in the labour market. Adaptation of the institutional framework to enhance cutting-edge research in universities and research centres that will support clusters linked with production.
- **Public sector and administration:** Accelerate the digitalisation of public sector services. Boosting primary health care and hospitals with monitoring system upgrade. Expansion of special sections in the courts for financial cases and extension of the out-of-court dispute resolution mechanisms. Strengthening the system of financial supervision in the field of investor protection.

7.4 IMPLEMENTATION AND MONITORING

The reversal of the trend for the Greek economy to diverge from the EU averages presupposes significant changes in the functioning of the public sector and markets. Many of the changes require the systematic implementation of policies for a period of time that may exceed the term of a government. It will be useful, therefore, to have a consensus between the main political forces as well as within society on the central political choices and their necessity.

Crucial to reaching this consensus is the realisation that without strengthening the economy, even today's low incomes will not be sustainable, while new risks may emerge. Consensus can be stronger to the extent that there is a reasonable expectation that everyone, without exclusion, will have access to the benefits of a stronger economy. All the changes suggested in the report would contribute in this direction, as they would lead to the reduction of restrictions on access to public services and markets, thus making the economy a more open system.

In addition to the need for consensus and to the extent that it is feasible, mechanisms for monitoring and analysis of implemented economic policy are also useful. Some of these institutions and actions are located within the public sector, some are at the European level, and some are within the country but outside of the public sector.

At government level, it is desirable to have a medium-term policy plan that clearly supports the growth model change and places intermediate quantitative targets for the core features of the economy. An equivalent planning is desirable at the level of each region.

Like any other economy in the euro area or the EU, the Greek economy is monitored by European institutions as part of the European Semester and more broadly. It is particularly important that this monitoring focuses more on the country's development outlook and not only on its fiscal performance. At the same time, the national growth plan, which will be agreed with the European Commission as part of NextGenerationEU, should acknowledge the special characteristics of the Greek economy and the need to strengthen its production base.

Particularly important is the role of institutions that monitor and analyse implemented economic policy and are located in Greece. These institutions should cooperate with the government but remain independent of it and have a long-term outlook and approach. Independence is crucial for the institutions to be able to identify potential economic policy failures in a timely and credible manner.

- Some independent institutions are located in the public sector and operate as independent authorities. Among their other responsibilities, they provide reliable data in a comparable way over time, as well as analysis for critical aspects of the economy. Examples are the Hellenic Fiscal Council, the Hellenic Statistical Authority, the Hellenic Competition Commission, the Hellenic Capital Market Commission and the Bank of Greece. Some of these institutions need to be strengthened in terms of independence and resources, as highlighted in previous chapters of the report. The input of policy monitoring committees in areas such as the environment, education, health and justice is also important. These committees should systematically provide information to all.
- Some other independent institutions operate outside the public sector and include representatives of companies, employees and scientists. Examples are the social partner institutes (General Confederation of Greek Workers (GSEE), SEV, etc.), the Foundation for Economic and Industrial Research (IOBE), and the Council of Competitiveness of Greece. These institutions can have a distinct and important advisory role based on measurements and analyses in areas such as competitiveness, the business environment, the labour market and sub-sectors such as industry or tourism.
- Finally, we recommend the establishment of a highly prestigious scientific body that operates with complete independence from any government and other private and public bodies, with the mandate to monitor annually the overall economic policies, indicate progress and identify any gaps and needs of direction change. Indicative examples of such institutions are the Council for Economic Analysis (*Conseil d'Analyse Economique*) in France and the Council of Economic Experts (*Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung*) in Germany.

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The Greek government appointed in January 2020 a Commission chaired by Nobel Prize winner Christopher Pissarides to propose a growth plan. The Commission produced in November 2020 a comprehensive report that analyses the strengths and weaknesses of the Greek economy, charts the direction that the economy should take in the next decade, and proposes a set of policies to achieve the desired targets.

Given the high unemployment and underinvestment in the decade preceding the report, Greece was poised to exceed – and did exceed – the average rate of growth in the euro area. Such growth, however, risks being temporary unless policies to raise long-term productivity are put in place. Raising productivity is closely linked to making the economy more outward-looking and less dependent on low value-added sectors. Participation of Greek companies in international markets will enable them to innovate, become competitive and grow, supporting sustained improvements in living standards.

The policies recommended in the report seek to make the Greek economy a more open system with simpler rules and fewer restrictions. There are two aspects to this. First, the tax and social security burden on formal employment should decline, while the formal and informal barriers that firms face when entering markets and expanding in them should be lowered. Second, the public sector should offer improved levels of social safety nets, education and continuous training to the labour force, thus facilitating innovative activity and a better connection with the evolving needs and opportunities of the labour market. Making the economy more open will favour segments of the population who are at a disadvantage, such as women and the young, and will enhance social mobility.

The report of the Pissarides Commission has had considerable impact, shaping parts of government policy and serving as a point of reference in the public debate about economic reforms.

