



Institute for Hellenic Growth and Prosperity

**The Greek economy:
Looking back and charting the way forward**



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October 2023

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Institute for Hellenic Growth and Prosperity
The American College of Greece

Executive Summary

The McKinsey 2012 report "Greece, Ten Years Ahead. Defining Greece's new growth model and strategy," as well as its update in 2017, represented landmark efforts to identify areas of the Greek economy primed for expansion and growth. The American College of Greece (ACG), in response, created a strategic plan designed "to leverage education for social and economic impact," especially by creating Centers of Excellence (Food, Tourism & Leisure; Logistics, Shipping & Transportation; and Sustainability, as well as a Research, Technology & Innovation Network), all under the auspices of the Institute for Hellenic Growth and Prosperity (IHGP).

When the original McKinsey Report was published Greece was implementing the second MoU with the EU and the IMF. A third MoU followed for the years 2015-2018. In 2020 the Pissarides Committee Report, "Growth Plan for the Greek Economy" (2020), was submitted to the Greek government and suggested a less centralized and more market-driven approach to economic policy. Subsequently, the Greek government issued a National Recovery and Resilience Plan (2021) aimed at framing economic development towards clean energy and digital transformation.

Over the past decade the Greek economy has developed in ways accurately envisioned in the McKinsey report as well as in unanticipated ways. Important developments have altered the economic landscape: in addition to Greece exiting the MoUs, the COVID-19 pandemic, the Russian invasion of Ukraine, the EU energy crisis, global supply chain disruptions, and the rise of new technological sectors associated with the Digital Revolution have created new challenges and opportunities.

The present IHGP update examines all these Reports in the light of economic and political developments between 2012 and 2022. It provides relevant summary and analysis, beginning with recommendations that were brought forward by other prominent think tanks, committees, and international organizations. It addresses the evolution of macroeconomic indicators and discusses structural changes in the Greek economy. It concludes that having followed the McKinsey 2012 recommendations proved to be a wise decision. Due to the time elapsed since then, we offer our own recommendations for improving the economy and some suggestions for the Greek educational system. These are designed to address changes in economic conditions and market demand.

Summary of Principal Findings:

- In 2012, the McKinsey Report proposed a new growth model for economic productivity, extroversion, investment stimulation, and employment growth for the next ten years. However, in the following years fiscal austerity measures took priority over other targets. Few significant reforms of the existing economic model or other growth measures were taken.
- The McKinsey Report and its update accurately predicted sectors of the economy primed for growth and subsequent economic developments, which validated the ACG 150 strategic plan's response.

- In 2020, the Pissarides Commission's report argued for reduced centralization and government intervention in the economy. Four issues were identified as important: institutional changes, social cohesion, infrastructure improvement and measures to strengthen certain sectors of economic activity.

- In April 2021, the Greek Government released "The National Recovery and Resilience Plan (RRP), Greece 2.0". It aspires to change the Greek growth model and institutions via ambitious reforms and investments with a particular emphasis on the green and digital transitions. This Plan aims to affect economic activity and attitudes, addressing technology and institutions and proposing a transition via reforms that combine economic efficiency with social cohesion and justice. The key element of the Plan is the mobilization of significant resources from the private sector with the aim of increasing private investment to achieve significant multiplier effects.

- The IHGP recommends that the New National Growth Model for Greece must focus on the necessary transformation of the Greek economy towards full engagement with the Digital Revolution while strengthening traditional industry sectors, as follows:

- On the area of the Digital Revolution in the form of startups, supported by private or public capital and encouraged and/or accelerated via funds and partnerships that draw on Greece's excellent academic/intellectual capital,
- on the area of Government's Executive Branch with the creation of an independent Task Force or Economic Development and Reform Team, for the purpose of changing the way in which the Greek Public administration operates,
- on the area of Justice with the completion and implementation of an e-justice program using digital technology for a faster administration of justice,
- on the area of Training of Human Resources to the Requirements of the Digital Revolution for labor and companies,
- and on the area of Education significant reformation of the school schedules in elementary, middle, high school and at the post-secondary level in order to provide students with the necessary skills for their subsequent activity in the sectors of the Digital Revolution.
- Emphasis should be given to the strengthening of certain sectors of the Greek economy that have a significant growth perspective and enjoy comparative advantages and can upgrade Greece's position in international competition (Tourism, Energy, Transportation, Broadband penetration and Manufacturing – Food Processing).

- Responding to current macroeconomic indicators and the environment created by the developments/proposals above, the IHGP recommends that ACG 150 create a new Center of Excellence focusing on Digital Transformation, Artificial Intelligence and Computer Sciences in general, as well as enriching its private sector outreach and curriculum by developing a "start-up" network in cooperation with its existing partnerships at Demokritos and the Athena Research Center.

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1. Introduction

In 2012, McKinsey produced a report titled "Greece 10 Years Ahead," outlining the possibilities for Greece's economic growth and development in the middle of a severe Greek Government-Debt Crisis that began in 2009. The report examined the structure and development prospects of key economic sectors, as well as the Greek economy's underlying cross-sector macroeconomic drivers, challenges, and opportunities.

The research focused on the five largest sectors ('major sectors') and eight smaller but high potential-areas of the economy ('rising stars') that could power the country's future economic growth. It acknowledged that there may be other development potential in other industries or sub-sectors that it has not addressed.

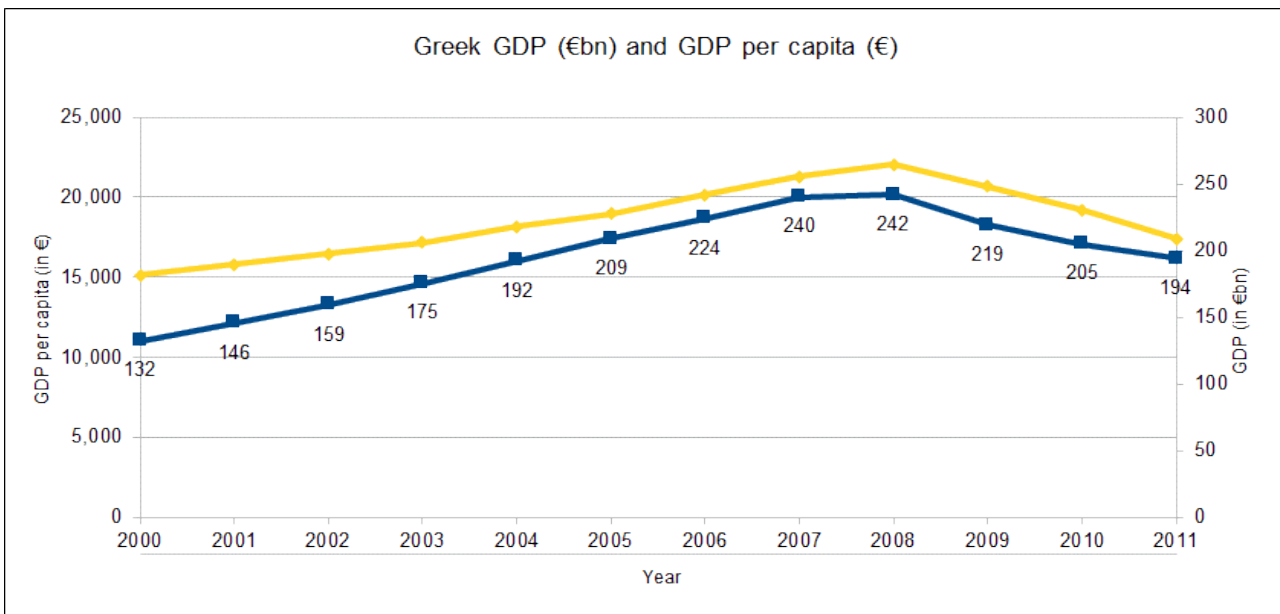
The widely discussed summary outlines the challenges that Greece must overcome in order to implement the new National Growth Model as presented in the report. It then defines this new model in macroeconomic terms and briefly discusses the cross-sector and sector-specific goals and initiatives that the Greek government and market actors should explore in order to generate growth and employment.

2. Short Economic Brief for Greece: 2000-2011

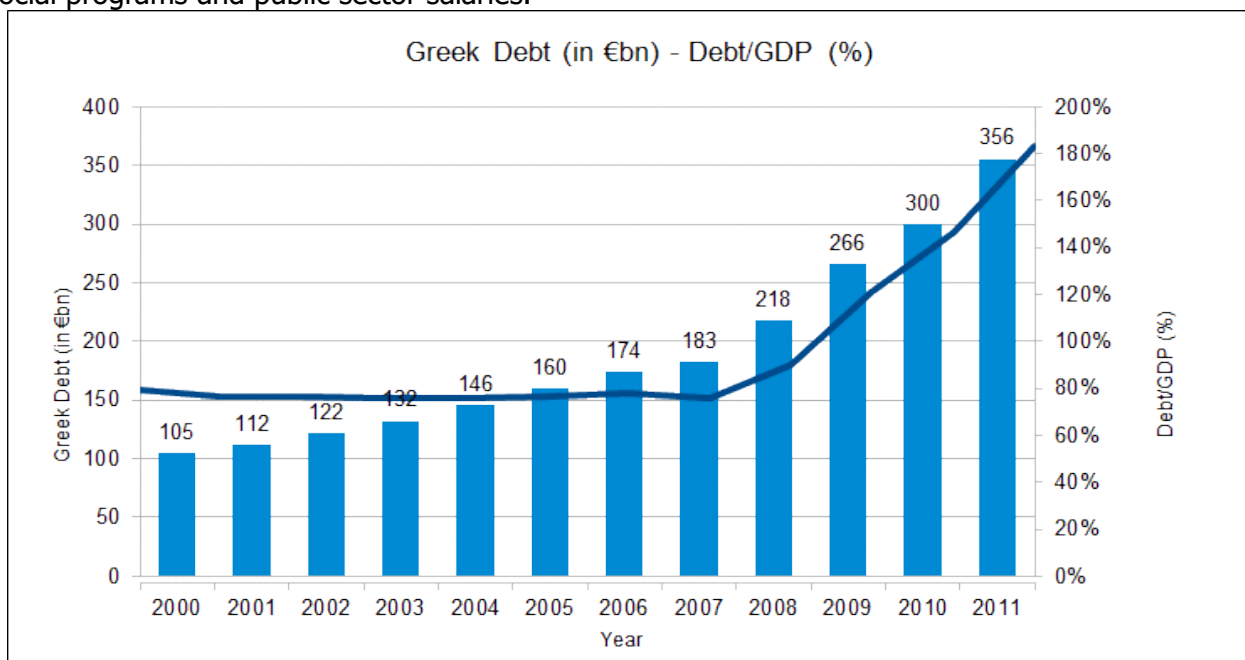
The Greek economy underwent significant changes during the period from 2000 to 2011. An overview of this period would include the following key events and trends:

Euro adoption: In 2001, Greece adopted the Euro as its currency, joining the European Union's single currency area. This was a significant milestone for the Greek economy as it provided greater stability and access to the Eurozone's financial markets.

Strong growth: Between 2000 and 2008, Greece experienced strong economic growth, with GDP expanding at an average rate of 4.2% per year. This was largely driven by increased government spending, low interest rates, and a booming real estate market.



Public debt: However, the strong growth was accompanied by a significant increase in public debt. In 2009, Greece's debt-to-GDP ratio reached 121%, making it one of the highest in the Eurozone. This was partly due to a lack of fiscal discipline, as the government continued to spend heavily on social programs and public sector salaries.



Financial crisis: In 2008, the global financial crisis hit Greece hard, with the economy entering into a recession. This was compounded by the country's high debt levels, which made it difficult to borrow money to fund its budget deficit. In 2010, Greece was forced to accept a bailout package from the European Union and the International Monetary Fund in exchange for implementing austerity measures.

Austerity measures: The austerity measures included cuts to public spending, tax increases, and structural reforms to improve the efficiency of the economy. These measures were highly controversial and led to widespread protests and social unrest.

Unemployment: The recession and austerity measures led to a significant increase in unemployment, with the rate rising from 7.7% in 2008 to 17.9% in 2011. This had a devastating impact on many Greeks, particularly young people and those with low levels of education.

Overall, the period from 2000 to 2011 was a tumultuous time for the Greek economy, marked by both strong growth and significant challenges. The legacy of the period continues to be felt in Greece today, with the country still grappling with the consequences of its debt crisis and the austerity measures implemented to address it.

Greece: Macroeconomic Trends (2000-2011)													
	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
People													
Population	in millions	10.64	10.65	10.66	10.66	10.67	10.68	10.69	10.71	10.72	10.73	10.74	10.78
Life Expectancy at birth	in years	77.3	77.5	77.8	78.0	78.2	78.5	78.7	79.0	79.2	79.4	79.6	80.0
Economy													
Gross Domestic Product (GDP):	€ bn	132	146	159	175	192	209	224	240	242	219	205	194
	% Change	4.9%	4.2%	4.4%	4.1%	4.7%	3.5%	5.3%	4.8%	2.0%	-3.2%	-5.5%	-9.1%
GDP per capita	€	15,139	15,790	16,474	17,180	18,171	18,956	20,164	21,269	22,032	20,660	19,219	17,388
GDP Economic Sector Components													
Agriculture / GDP	%	5.7%	5.6%	5.5%	5.5%	5.6%	5.5%	5.2%	5.1%	4.7%	4.4%	4.2%	4.0%
Industry / GDP	%	22.4%	22.9%	23.0%	22.8%	23.2%	23.5%	23.7%	23.9%	23.6%	23.5%	23.5%	23.2%
Services / GDP	%	71.9%	71.5%	71.5%	71.7%	71.2%	71.0%	71.1%	71.0%	71.7%	72.1%	72.3%	72.8%
GDP Components													
Private Consumption / GDP	%	71.1%	70.7%	70.8%	71.0%	72.0%	72.4%	72.8%	73.0%	73.9%	73.0%	72.0%	71.0%
Government Consumption / GDP	%	16.6%	16.5%	16.5%	16.4%	16.3%	16.1%	15.8%	15.5%	15.4%	17.0%	18.7%	19.2%
Gross Fixed Capital Formation / GDP	%	24.4%	24.1%	23.7%	23.5%	24.0%	24.5%	25.0%	25.1%	24.0%	21.0%	20.3%	16.8%
Exports of Goods & Services / GDP	%	20.3%	20.90%	21.3%	23.4%	24.7%	26.0%	26.4%	26.8%	27.3%	28.3%	28.1%	31.3%
Imports of Goods & Services / GDP	%	32.4%	32.2%	32.3%	34.3%	37.0%	39.0%	40.0%	40.4%	40.6%	39.3%	39.1%	38.3%
Government Budget Data													
Government Debt	€ bn	105	112	122	132	146	160	174	183	218	266	300	356
Government Debt / GDP	%	80%	77%	76%	76%	76%	76%	78%	76%	90%	121%	146%	183%
Government Surplus (Deficit) / GDP	%	-1.7%	-2.5%	-1.7%	-2.9%	-4.6%	-4.5%	-3.9%	-2.5%	-7.7%	-15.8%	-10.3%	-9.5%
Government Revenues / GDP	%	38.5%	38.1%	39.2%	39.4%	39.2%	39.4%	40.4%	41.8%	42.8%	40.6%	39.1%	39.3%
Government Expenditures / GDP	%	40.3%	40.6%	41.0%	42.2%	43.8%	44.0%	44.3%	44.3%	50.5%	56.4%	49.4%	48.8%
Trade													
Exports of Goods / GDP	%	18.5%	17.3%	19.3%	20.7%	20.5%	19.9%	20.4%	21.4%	22.6%	23.3%	24.0%	24.5%
Imports of Goods / GDP	%	35.3%	34.7%	36.1%	38.3%	42.4%	44.4%	45.6%	47.1%	51.2%	50.8%	48.1%	45.5%
Balance of Trade / GDP	%	-16.8%	-17.4%	-16.8%	-17.6%	-21.9%	-24.5%	-25.2%	-25.7%	-28.6%	-27.5%	-24.1%	-21.0%
Balance of Payments / GDP	%	-8.2%	-9.2%	-6.7%	-7.3%	-10.6%	-11.7%	-12.4%	-12.5%	-14.6%	-13.1%	-10.7%	-7.5%
Current Account Balance / GDP	%	-2.3%	-3.6%	-0.9%	-1.4%	-4.4%	-4.9%	-5.3%	-4.6%	-6.4%	-6.0%	-4.7%	-2.4%
Prices													
Inflation rate: all items	%	3.9%	3.7%	2.2%	2.2%	3.3%	3.4%	3.3%	2.9%	4.2%	1.2%	-2.0%	3.1%
Core Inflation (excluding food and energy prices)	%	3.0%	2.7%	2.2%	2.2%	3.4%	3.5%	3.3%	3.1%	4.1%	1.2%	0.5%	2.0%
Price Level Index (PLI)	OECD=100	67	67	70	80	85	87	87	95	98	97	94	95
Labor Market, Skills and Innovation													
Unemployment rate	%	11.1%	10.7%	10.4%	10.4%	10.0%	9.0%	8.3%	7.9%	7.7%	9.5%	12.7%	17.9%
Employment rate	%	56.1%	56.9%	57.3%	57.4%	58.0%	59.2%	60.1%	60.8%	60.5%	57.6%	52.8%	47.9%
Participation rate	%	61.8%	62.6%	63.2%	63.4%	63.8%	64.9%	65.8%	66.3%	66.0%	62.8%	59.4%	56.4%
Gross Expenditure on R&D / GDP	%	0.48%	0.49%	0.51%	0.53%	0.52%	0.54%	0.60%	0.65%	0.68%	0.72%	0.69%	0.65%
Tertiary educational attainment (aged 25-64)	%	14.7%	15.2%	16.2%	17.6%	20.0%	22.4%	24.8%	27.2%	29.3%	31.5%	32.8%	34.5%
Society													
Income inequality (Gini coefficient)	Index [0-100]	31.7	32.0	32.2	32.3	32.4	32.5	32.5	32.5	32.5	33.1	34.6	35.1
Relative Poverty Rate	%	20.5%	20.8%	21.1%	21.3%	21.5%	21.7%	21.5%	21.5%	21.6%	23.1%	24.6%	25.7%
Median Household Income	€	14,800	15,000	15,200	15,300	15,400	15,500	15,700	16,000	16,300	16,200	15,800	14,700
Public and Private spending (% of GDP)													
Healthcare spending / GDP	%	4.8%	4.9%	4.9%	5.1%	5.2%	5.3%	5.5%	5.7%	5.7%	5.9%	5.8%	5.5%
Pension spending / GDP	%	12.2%	11.5%	11.3%	11.5%	11.7%	11.9%	11.6%	11.3%	11.1%	11.4%	11.9%	12.1%
Education spending / GDP	%	4.1%	4.3%	4.3%	4.3%	4.3%	4.2%	4.2%	4.2%	4.2%	4.1%	4.2%	4.2%
Education Outcomes (PISA scores)													
Reading:	0-1000	482	-	-	461	-	-	473	-	-	483	-	-
Mathematics:	0-1000	431	-	-	416	-	-	424	-	-	466	-	-
Science:	0-1000	437	-	-	429	-	-	452	-	-	455	-	-

Source: World Bank, OECD

3. McKinsey Report Overview (2012)

When the report came out, Greece had yet to recover from the deep recession of 2008. At the time there was almost no private or public investment while the public debt had increased substantially in order to fund social payments, payroll expenses and the fiscal deficit. To add to the severe debt and fiscal crisis, Greece was struggling with its level of competitiveness and employment. When the report was released in June of 2012, official unemployment was above 21% and would reach an even larger rate of 28.10% in July of 2013.

Poor foreign investment, productivity and employment were recognized as the causes of Greece's under-performance. The country's growth was mainly driven by consumption, since business and investment were undermined by over-regulation of the economy. Moreover, the administrative and tax system created legal and procedural disincentives for businesses, while "*failing to collect an estimated €15-20 billion in annual tax revenue.*"

The insufficient investment capital and the relative lack of economies of scale and scope widened the productivity gap, with the country increasingly relying on imports and reaching in 2010 a trade deficit of €20bn.

The debt crisis forced Greece to adopt harsh austerity packages and implement a fiscal stabilization program. Still the McKinsey Report pointed out that to achieve sustainable growth Greece would also need a new Growth Model and Strategy.

«Greece 10 Years Ahead aimed to address this need by proposing a new National Growth Model, which could lead within 10 years to the creation of 520,000 new jobs and €49bn in new Gross Value Added (€55bn in GDP terms) in the five largest 'production' sectors of the economy and eight 'rising star' sectors alone. In addition, the impact on Greece's trade and fiscal balance could be significant. Specifically, an annual impact on the trade balance of €16-17 billion and of the fiscal balance of €8-9 billion was estimated.» (McKinsey 2012: p. 7)

The new model aspired to six changes.

1. Focused investment and resource allocation which can develop a more extrovert approach to creating exportable goods and services and bringing in capital.
2. Business environment reforms to help the transition from "*public debt to private sector equity and investment*".
3. Gradually minimize excessive public sector and improve public administration efficiency while supporting larger and more extrovert private organizations.
4. Reduce tax evasion and transactions between private sector and state agencies which enable/facilitate corruption.
5. Promote female and youth participation in the economy, continuous education, innovation and entrepreneurship.
6. Upgrade and revitalize public administration (management) to effectively accommodate the aforementioned changes.

20 'horizontal' (cross-sector) and more than 130 'vertical' (sector-specific) possible reforms and measures for the state and the private sector were further defined in the report.

Regarding horizontal reforms, the report suggested that the Greek government should prioritize

strengthening its capacity for coordination and execution of reforms.

To assist the Greek government in planning, coordinating, facilitating, and overseeing the implementation of fiscal adjustment and growth reforms, it would be necessary to establish the "Economic Development and Reform Unit" (EDRU) as a separate institution reporting to the Prime Minister.

Additionally, it would be essential to establish a public sector "Talent Placement Office" (TPO) to recruit and place 200 accomplished executives from the public and private sectors in key managerial positions within the Greek public administration and state-owned enterprises (SoE).

A "*National Liquidity Relief and Growth Fund*" that would inject lower cost liquidity to companies using an independent underwriting platform under the supervision of the Bank of Greece was one example of a "horizontal" priority that addresses how Greece could start and maintain a growth trajectory.

Additionally, it was seen crucial to restart sector and infrastructure investment flows by unblocking stalled growth-related infrastructure projects and launching new investments that are imperative to growth such as "*high speed cargo train, cargo gateway and transshipment port facilities, 3-4 cruise embarkation ports*". Additionally, the "*Greece 10 Years Ahead Investment Fund*" could be introduced to finance sector investments, starting with private funds from Greece and the diaspora.

Last but not least, the report found it crucial to finish the efficiency-related labor reforms, to speed up decision-making in the Council of State (CoS) and earlier degree courts (e.g., by creating a 7th CoS department for strategic investments and reforms), to immediately implement internationally proven methodologies in tax evasion detection and collection, to reduce informality in the employment framework and to establish a Central Procurement Unit for the public sector combining all internal auditing activities for the public sector into one Central State Auditing Unit.

The private sector and local businesses should build healthier and more productive operating models and Greek-branded goods and services should be promoted more aggressively in key export markets.

One of the potential sector-specific priorities listed was to strategically shift tourism toward bigger, untapped markets like the US, Russia, and China (while defending core European markets), draw in more wealthy tourists, support investments in expansive integrated resorts and luxury vacation homes, and aggressively pursue cruises, yachting & sailing, and "city break" as add-ons to the core "*sun & beach*" theme.

In the energy sector, significant opportunities exist to decrease energy use in buildings, speed up productivity gains in the oil and power industries, and increase Greece's extroversion and involvement in the value chain of the industry (e.g., upstream oil & gas, regional power and gas projects).

Agriculture and food production could be refocused on a set of prioritized export markets, where niche food items like olive oil, dairy, and fresh and processed fruits and vegetables could successfully enter global markets. The creation of a "*Greek Foods Company*" should make it possible for small and medium-sized businesses to benefit from synergies and reach new markets abroad.

In the majority of "*rising star*" industries a gradual and growth-minded deregulation, accelerated consolidation, and a stronger focus on innovation and operational efficiency could help scale-up these sectors' distinct advantages in know-how and resources.

This strategic reorientation was regarded to have the potential to improve the demand structure in the economy, benefiting the primary sectors, promoting investment, and generating jobs in manufacturing and heavy industry, where the elimination of unneeded complications and the establishment of a stable and predictable business environment is the most crucial condition for businesses to thrive and generate growth and employment.

The report proceeded to describe the challenges Greece was expected to face in implementing its new National Growth Model. It then provided a macroeconomic overview of this new model and briefly discussed the sector- and cross-sectoral priorities and actions that the Greek government and market players should take into consideration in order to promote growth and employment.

3.1 Greece's unsustainable growth model

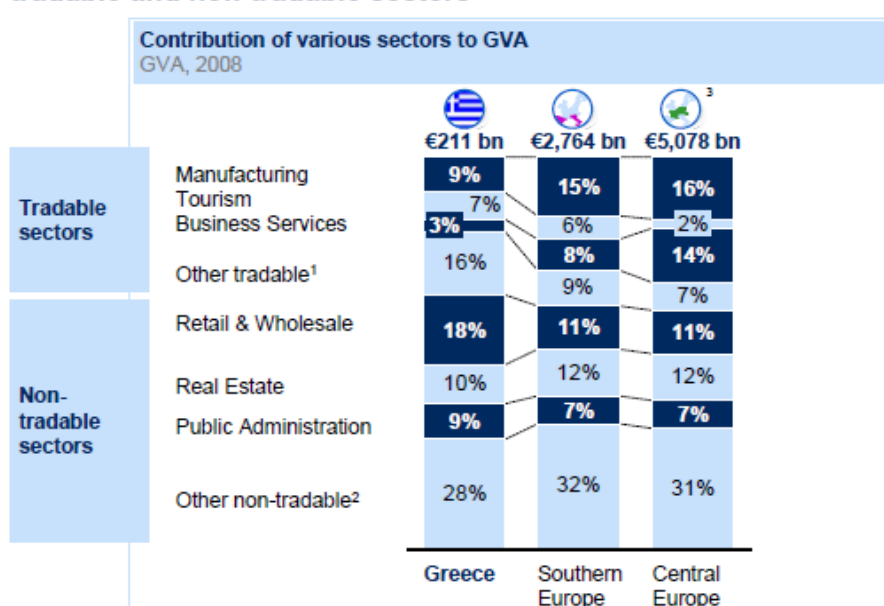
In 2009 the Greek economy crashed, revealing a flawed model driven by over-consumption in the public sector which overflowed into the private sector, crowding out investment and undermining competitiveness and productivity. Even before the crisis Greece had the highest levels of public debt and consumer lending in Europe. However, between 2008 and 2010, Greece lost 1.75% of its GDP every year, which, along with continuous fiscal deficits and emergency loans from the EU, ECB, and IMF, pushed the country's public debt to more than 160% of GDP in 2011.

Although Greece joined the EEC in 1981, it never really increased its external orientation or fully benefited economically from its membership. Imports far outstripped exports and most of the relatively small private investments were financed by Greek public and private debt.

A high level of domestic demand that was artificially inflated by an abundance of credit and a heavily leveraged public sector drove Greek growth. Analyzing the Greek GDP components, the McKinsey report observed that tradeable sectors made up 3–4 percentage points less of GDP than they did in other European nations whereas specific non-tradeable industries, like Greek retail and wholesale, were much larger accounting for 18% of Greek GDP, compared to 11% in south and central Europe.

Debt-fuelled consumption creating imbalances between tradable and non-tradable sectors

ESTIMATES

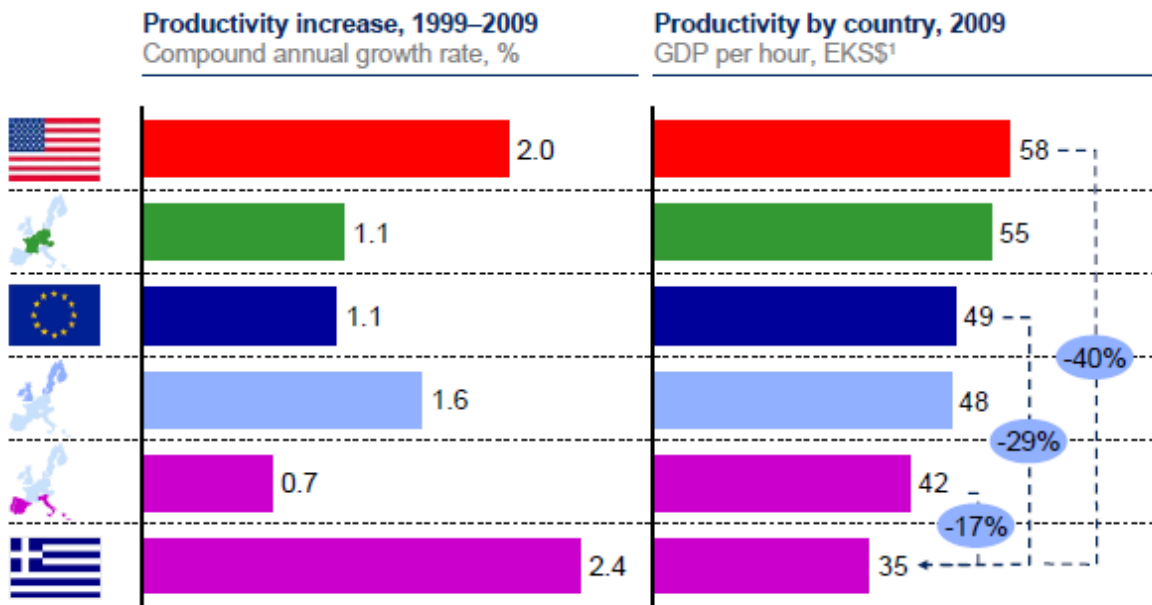


¹ Agriculture, shipping, energy, other ; ² Health, education, post & telecom, utilities, financial services, construction, land transport; ³ Excluding Luxembourg

SOURCE: Eurostat; WIS Global Insight

McKinsey & Company

Persistent productivity gaps even after years of strong growth



¹ Efteto-Koves-Szulic method to derive transitive multilateral purchasing power parities

SOURCE: The Conference Board; IMF; McKinsey Global Institute

McKinsey & Company

3.2 Persistent productivity and labor participation deficits

Apart from the debt accumulation, Greece was lagging in wealth generation, primarily due to its lower productivity and secondarily, lower labor participation rates than in other European countries. Note that Greece's productivity gap was greater than the GDP per capita gap itself when compared to the US and the various European regions (in terms of their differences from the US in terms of GDP per capita).

Another issue was the low workforce participation rate (mostly reported among young people and women), which was however offset by more hours worked per employee. The dire conclusion of the report was that a comparatively smaller proportion of Greeks put in longer hours than their European counterparts to support a largely unproductive economic system. It was also clarified that improving productivity precedes labor participation, which by default requires more available jobs.

3.3 The underlying problems of the Greek economy

In this section five major handicap areas responsible for the productivity and competitiveness gaps are identified with focus on 17 growth and competitiveness barriers that need to be removed.

(a) Discouragement of investment and scale

In addition to family ownership, several over-regulated markets, a burdensome bureaucracy that must approve investments, scale-restrictive tax laws and administrative procedures, and labor regulations when it comes to larger businesses have all contributed to the relative dearth of larger businesses.

(b) Large and inefficient public sector

The public sector in Greece was relatively large with low quality of output, and severely fragmented between the various Ministries and numerous other authorities resulting in overlapping duties that slow down business operations and encourage informality. Moreover, a large number of “private firms” were directly or indirectly controlled by the state, and many firms were dependent on financial transactions with the public sector.

(c) Rigid and ‘narrow’ use of human resources and capital

Employers were reluctant to hire more workers due to rigid legal requirements and inflexibility associated with collective labor agreements.

Consequently, in 2000 Greece had the highest average tenure in current position among OECD (Organization for Economic Co-operation and Development) countries, with 14 years, and the lowest employment turnover rate (14%) in Europe. Labor force mobility was indeed lacking.

In addition, universities are detached from the labor market, making it harder for young graduates to find employment. Apart from that, innovation and entrepreneurship are severely hampered by the lack of collaboration between academia and business.

(d) Cumbersome judicial and legal system

The legal system’s complexity was resulting in a rigid and ineffective administration that frequently caused delays and confusion, overburdening the juridical system with unresolved cases. (Decision lead-times would range from two to six years)

(e) Widespread informality

The informal sector made up about 30% of Greece's total economic activity, with the immediate implication being gaps in tax receipts (approximately €15-20bn in 2009) and a severe problem of tax evasion.


Productivity, competitiveness and growth barriers in the Greek economy


A <i>Investment and scale discouraged</i>	1. Fragmentation and small scale of businesses across sectors 2. Over-regulation of markets and professions 3. Complex and restrictive licensing and operating processes 4. Lack of integrated and systematic zoning and real estate planning 5. Highly complex and volatile tax framework creating scale disincentives
B <i>Large, inefficient public sector</i>	6. Large, expensive public sector with low quality outputs 7. Very low efficiency driven by highly fragmented and overlapping tasks 8. Lack of mechanism to inject private sector expertise & management talent 9. Low performance clarity/accountability; limited use of “double entry” system
C <i>Rigid and ‘narrow’ use of human resources</i>	10. Low employment participation of youth and female 11. Limited employment flexibility (e.g., part-time, mobility) and turnover 12. Binding and inflexible collective agreement framework 13. Disconnect between market and education; lack of innovation support
D <i>Cumbersome legal and judicial system</i>	14. Over-abundance of laws often conflicting and with unclear applicability 15. Heavy administrative burden in courts resulting to long trial lead times
E <i>Widespread informality</i>	16. Extensive tax-evasion; detection and collection reforms still emerging 17. Substantial wealth creation and transaction outside formal economy


McKinsey & Company

Tax evasion counter-measures emerging; still major gaps with international best practices

INDICATIVE

	Indicative best practices (non-exhaustive)	Current status
1 Detection 	<ul style="list-style-type: none"> Pro-active deterrence – targeted and relevant outreach/awareness programs, as well as pre-filing certification to pro-actively assist taxpayers to comply 	✗
	<ul style="list-style-type: none"> Sophisticated detection – definition of the probability of 'hit' and likely 'yield/audit outcome/payout' based on selected key taxpayers parameters 	✓
	<ul style="list-style-type: none"> Prioritization and segmentation – use of the above as well as other parameters (e.g., likelihood/ability to pay) to segment taxpayers and prioritize segments and cases 	✓
	<ul style="list-style-type: none"> Continuous calibration – detection, segmentation, prioritization parameters calibrated with continuous inflow of contact and audit results and data 	✗

2 Contact/ Collections 	<ul style="list-style-type: none"> Contact strategies – definition of the most suitable contact and audit strategy based on segment/cases characteristics and available audit resources; use of variable approaches (e.g., letter, call centre, audits of variable 'intensity') 	✗
	<ul style="list-style-type: none"> Auditors deployment/'rostering' – complexity and fraud prevention based case allocation 	✓
	<ul style="list-style-type: none"> Audit guidance and monitoring – on-line audit direction, workflow audit recording 	✗
	<ul style="list-style-type: none"> Debt settling strategies – flexible payment arrangements where applicable 	✓
	<ul style="list-style-type: none"> Demand management – dynamic pay-as-you-earn system and pre-due date contact 	✗
	<ul style="list-style-type: none"> Tight performance management – 'closed files' reviews and frequent tax audit controls 	✗

3 Taxpayer service 	<ul style="list-style-type: none"> High e-filing rates – reduction of processing costs, clear taxpayers benefits 	✓
	<ul style="list-style-type: none"> Efficient processing of paper returns – digital technology as productivity driver 	✓
	<ul style="list-style-type: none"> Claims/liabilities clearance – robust offsetting mechanism for open positions 	✗
	<ul style="list-style-type: none"> Query resolution – efficient/effective delivery using demand/triaging expertise 	✗
	<ul style="list-style-type: none"> Channel management – increased use of self services; targeted in-person channels 	✗
	<ul style="list-style-type: none"> Taxpayer education/assistance – targeted education/assistance campaigns 	✗
	<ul style="list-style-type: none"> Tax auditors capabilities and training – robust selection/termination, rotation, training 	✗

SOURCE: Tax administrations; interviews

McKinsey & Company

Along the whole tax value chain, there is a considerable disparity compared to internationally accepted best practices. The ability to efficiently and effectively audit large amounts of cases, the automated detection of potential tax offense perpetrators, the degree to which effective segmentation is used to drive different contact/audit approaches, and the tactical orchestration and escalation of intervention methods to maximize tax revenue collection are the most prominent shortcomings.

In addition, there was a sizable informal labor market where income taxes and social contributions were not collected (especially among the self-employed and very small businesses), as well as a sizable number of other untaxed areas like fuel informality and unreported gaming.

According to the outside-in analysis of the McKinsey team, the total system revenue loss (state, businesses, and consumers) due to fuel informality in 2010 was between €600 and €650mn and illegal gambling could have generated an additional €2bn in unreported income.

3.4 The new National Growth Model

Major principles and impact on growth

The report suggested a new National Growth Model featuring six major changes and pillars.

1. outward and extrovert economic model
2. transition from public debt to private sector equity and debt
3. productivity and efficiency of the public and private sector needs a substantial boost
4. tax compliance
5. new employment opportunities and culture
6. radically improve the execution and managerial capacity of its public administration
 - a. coordination among Ministries and important state entities

b. Managerial capabilities within the public administration

Impact of the new “National Growth Model” on major indicators of the Greek economy

ESTIMATES

	From (2010)	To (2021)	References	
Performance	GDP per capita USD thousand PPP ¹	31	41	<ul style="list-style-type: none"> Average GDP growth of ~3% p.a.; realizing the €49 billion growth upside in the sectors studied while rest of economy grows at 1.5% p.a. GDP growth as above Average employment growth of 1.0-1.3% p.a. Consumption adjustment to sustainable levels and increased extroversion in the economy Trade balance improvement validated from 'bottom-up' analysis of selected sectors' trade balance evolution Matching Southern European peers' performance (Italy ~20% and Spain ~23%)
	Productivity USD PPP/hour worked ¹	35	41-43	
	Private and public (final) consumption over GDP	93%	75-80%	
	Net Exports over GDP	-9%	0-2%	
	Investments over GDP	16%	20-23%	
Health	Tax gap ²	30%	15-20%	<ul style="list-style-type: none"> Matching international benchmarks; typical impact from intensive counter tax-evasion programs
	Employment turnover ³	14%	20-25%	<ul style="list-style-type: none"> Converging to average European practices

1 In 2009 terms

2 Amount of tax liability that is not paid on time

3 Hirings plus separations over total employment

McKinsey & Company

The report predicted that a number of significant performance improvements in key economic metrics would result from these new standards: economic wealth (GDP per capita) would increase by more than 32%; aggregate productivity would increase by more than 17%; dependence on private and public consumption would decrease from 94% to 75-80% of GDP; investments would reach or even exceed levels of 20-23%; and net exports would change from a negative 8-9% to zero or even positive 2% of GDP.

The ongoing reduction of private consumption, mainly to the fiscal stabilization efforts triggered by the recession, should be complemented with increased investment flows.

Twenty 'horizontal' macroeconomic growth reforms

To reduce productivity, competitiveness, and development constraints and unlock the nation's economic potential, the report identified 20 viable reforms.

For the first six targeted reforms the need to improve the execution capacity while also limiting the size of public sector.

1. Introduce the “Economic Development & Reform Unit” (EDRU) as an independent institution under the Prime Minister to support the government in planning, coordinating and monitoring the execution of the reforms

2. Establish a public sector “Talent Placement Office” (TPO) to hire and deploy local and international talent.

3. Consolidate all state entities’ IT architecture design and strategic management into a central IT unit.

4. Enforce IPSAS / IFRS1 double-entry standards across all state entities; establish a budgeting and financial consolidation system to plan, monitor and manage performance centrally.
5. Accelerate the integration or discontinuation of marginal state-owned enterprises / state entities to gain effectiveness, efficiency and reduce public sector size
6. Broaden scope of the HRADF2 to include performance management and asset consolidation to maximize the impact of the privatization program and TRS4

The next six reforms addressed how Greece might start and maintain a growth trajectory.

7. Set up the "National Liquidity Relief & Growth Fund"
8. Restore infrastructure and sector investment flows
9. Grouping sectors and launching a program to remove administrative, regulatory and infrastructure barriers while providing growth-linked output-based (e.g., investment, exports) incentives (e.g., tax rebates)
10. Revisit the "Fast Track" framework and upgrade "Invest in Greece" using proven Athens 2004 practices.
11. Revise the environmental and zoning framework
12. Re-design the University-Business R&D collaboration and patenting framework to promote innovation and entrepreneurship

The remaining 8 reforms related to the employment structure, judicial procedures, and combating informality.

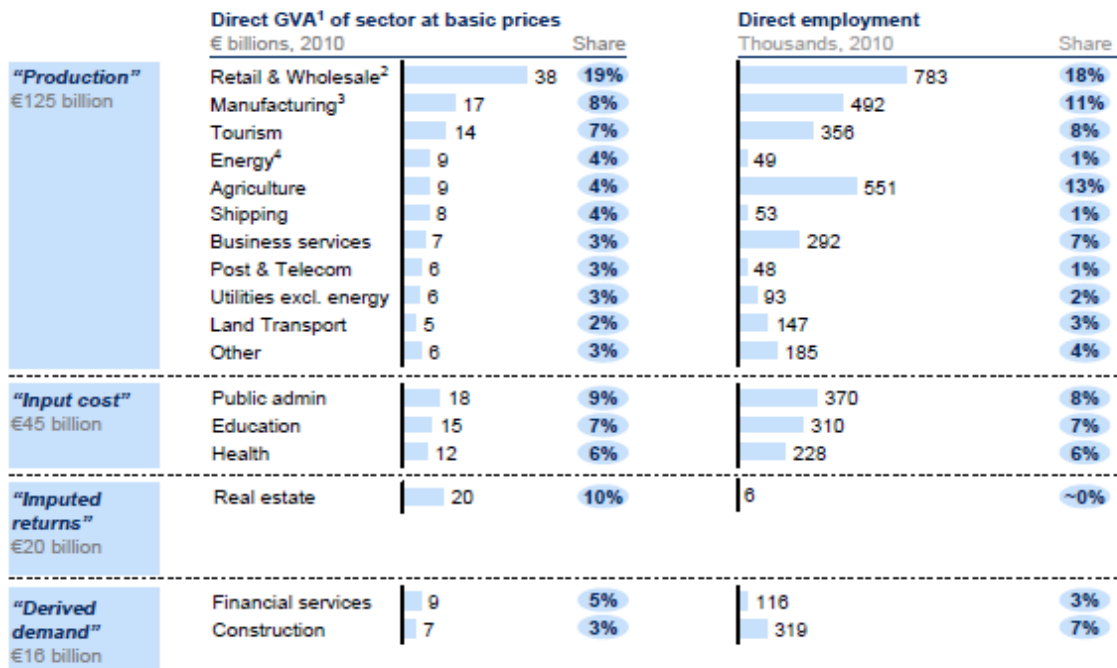
13. Launch "Ellada & Ergasia" as a cross-ministerial program
14. Revamp undergraduate, graduate and technical education
15. Complete pending flexibility and efficiency-related labor reforms
16. Accelerate decision making in Council of State (CoS) and earlier degree courts
17. Consolidate all internal auditing functions into one Central State Auditing Unit
18. Dedicated projects ("SWAT teams") to investigate and eliminate possible informalities
19. Internationally proven methodologies in tax evasion detection and collection
20. Central Procurement Unit

3.5 Laying the foundations in key economic sectors

The report suggested that the strongest chances for growth were likely to be found in sectors where maximizing competitiveness, productivity, and extroversion would increase production. The study characterized them as "production" sectors, with the five largest being tourism, retail, energy, manufacturing, and agriculture.

Mapping the economic sectors of Greece

ESTIMATES



¹ GVA=GDP-Taxes + subsidies; ² Excluding fuel retail; ³ Excluding pharma manufacturing and ship building; ⁴ Extraction, processing and retail distribution of fuels; electricity; Note 1: Figures include only direct GVA and employment and are therefore not comparable with figures that include indirect effects

SOURCE: WIS Global Insight; EU KLEMS 2009; Eurostat

McKinsey & Company

The study also prioritized six primary and two secondary rising stars, based on "Greece's intrinsic assets and capabilities" and "Market profile and success conditions": Manufacturing of generic pharmaceuticals, aquaculture, medical tourism, long-term & elderly care, regional cargo & logistics hub (transshipment and gateway), waste management (primary), and Graduate Classics education hub, and Specialized Greek foods (secondary).

The new National Growth Model analysis estimates 520.000 new jobs and €49bn in additional GVA upon the application of the suggested practices to the above sectors.

3.6 Major sectors

Tourism:

At the time of the report, tourism accounted for 15% of the Greek economy (7% direct, 8% indirect). Most of the growth was driven by domestic demand. Greece's competitive position in its core markets was weakening, and it has had little luck luring tourists from growing countries like China and Russia. The tourist season was too short and concentrated in the summer, while average tourist spending was less compared with competitor destinations.

The reported issues are:

- Ineffective commercial strategy
- Lack of real estate planning, infrastructure and a clear and attractive investment framework
- Limited connectivity to emerging markets
- Untapped capabilities. Academic institutions do not equip graduates for the tourist industry

Tourism sector strategy should

- Develop overall sector strategy, determine country positioning and branding
- Define Tourism products/destinations and source market targets; provide brief for product/customer management
- Determine marketing budget and allocation; provide brief for marketing execution (country

wide and specific campaigns)

- Identify Tourism related infrastructure requirements and coordinate with other Ministries/Authorities for execution

"Greece 10 Years Ahead" synthesized 13 possible priorities for tourism grouped into four strategic themes.

A. Re-defining and re-focusing Greece's commercial strategy.

- Target core mature and emerging markets
- Upgrade and expand the product portfolio while improving the mass-affluent mix
- Deepen destination marketing sophistication
- Introduce multi-channel platforms for a distinctive pre-visit experience (e.g., "Visit Greece" portal)

B. Developing quality infrastructure while accelerating investments.

- Revamp Tourism zoning and planning legislation
- Pursue growth-relevant public infrastructure investments (airport expansions, new marinas)
- Upgrade cultural sites' infrastructure and develop major conference facilities
- Leverage the "fast-track" framework

C. Facilitating access and transportation.

- flight connectivity, Schengen procedures
- Re-plan and re-schedule capacity, connectivity and quality/cost offering for island transportation.
- pricing at access points based on demand

D. Revamping Greece's Tourism capabilities and know-how.

- Tourism Studies (undergraduate and graduate)
- Step-improve central sector planning and management capabilities

According to their projections, Greece's new tourism strategy might result in an increase in yearly tourism demand of more than €10bn over the next five years and more than €25bn over the next ten.

International travelers would make up much of the demand growth for tourists (about 62%), which would be fueled by a comparable rise in both visitor numbers (+48% in ten years) and average day spending (+32%) resulting *"to a €18 billion increase annual GVA (in a ten-year horizon) and an increase in employment by approximately 220,000 jobs. The positive impact on Greece's trade and fiscal balance could reach approximately €9bn and €3bn respectively."*

Energy

Energy contributed significantly to the competitiveness of local industrial operators and directly accounted for 4% of Greece's GVA, but this high contribution and overall growth during the years 2000-2008 was driven by sector inefficiencies including relatively high energy consumption in buildings and transportation. At the same time, the sector's potential for expansion was limited by its restricted extroversion and its constrained value chain.

"Greece 10 Years Ahead" outlined 14 possible priorities across the following four areas that sector players and the Greek state should consider:

A. Improving energy efficiency.

- parametric and progressive electricity pricing
- awareness campaigns on energy efficiency
- specify energy policies with strict auditing
- revisit incentives for retrofits

B. Boosting productivity.

- smart metering
- "price and cap" system
- critical productivity improvements

C. Optimizing the energy mix

- review the options and trade-offs for meeting the 2020 environmental targets
- robust national energy strategy
- island interconnections to reduce costs and emissions

D. Increasing extroversion and participation in the sector's value chain

- possibly manufacture renewable energy parts and equipment locally
- regional gas and power infrastructure projects
- tactical exports of oil products and power
- National Hydrocarbons entity

According to the report *"the potential growth upside in a ten-year horizon from the energy sector could be an additional (direct and indirect) annual GVA of approximately €9 billion (versus 2010) and measures in the sector could lead to an improvement in fiscal and trade balance by approximately €500 and €700 million respectively."* (McKinsey 2012: p. 50)

Manufacturing - Food processing

The four broad sub-sectors of manufacturing and their respective GVA at the time of the report were:

- (a) food processing, accounting for approximately 25% of manufacturing GVA and 20% of employment
- (b) heavy industry, accounting for 23% of manufacturing GVA and 33% of employment
- (c) beverages, accounting for 10% of manufacturing GVA
- (d) a set of smaller size sub-sectors with a diverse set of activities that represent the remaining 41% of the manufacturing GVA

Greece has significant potential to increase output, boost exports, and contain imports in the food processing industry because of the availability of high-quality raw materials and produce, specialized knowledge, and reasonable cost levels, particularly in four major categories: oils & fats, fruits & vegetables, dairy, and bakery products.

"Exploiting these opportunities would require Greece to address a number of issues related to the lack of large scale modern and productive processing capacity, product innovation and international market access."

Greece 10 Years Ahead outlined 12 possible priorities and measures for market participants and the Greek state to consider, grouped in four major strategic themes.

A. Prioritizing target export markets.

B. Step-improving product value proposition and innovation.

- Convert exports of bulk olive oil to branded packaged and substitute imports of other oils
- Standardize the quality and increase the value added of Fruits & Vegetables category
- Emphasize origin, and extend the portfolio in dairy products
- Deepen the geographic coverage and increase the innovation content of the bakery category
- "Made in Greece" origin certification mechanism

C. Increasing Greece's processing capacity and efficiency.

- 4-6 large scale modern processing and packaging units
- defragmentation of 'niche' Greek Specialty categories
- form larger modern milk farms (processing concentrated and powder milk to reduce imports)

D. Securing strong commercial access to priority target markets.

- Establish the "Greek Foods Company" (GFC)
- Differentiate commercial strategy and country coverage model
- "Greek Diet" international campaign

The sector's yearly GVA contribution could rise by around €6.5bn during a ten-year period and the effect on employment would probably be greater than 120,000 extra jobs. Trade balance was estimated to improve by approximately €1.2bn and fiscal balance by almost €250mn per year.

Agriculture - Crops agriculture

Agriculture has always been important for Greece; however, the sector has been characterized by its low productivity and competitiveness.

Greece had a very low export market share (less than 2%, compared to 10% and 13% for Italy and Spain, respectively), and it lacked a comprehensive and targeted export and product strategy. Its labor input and land productivity lagged behind other south European neighbors and agricultural units are typically about five times smaller than they are in the EU-15.

Despite these obstacles, the sector's fundamentals, particularly in terms of the quality of its products and its underlying cost structures, remain encouraging.

"Greece 10 Years Ahead" had identified nine priorities and measures grouped in four major strategic themes:

A. Sharpening Greece's market and product strategy

- Prioritize target export markets
- 'Export Engines' and 'Emerging Traders'
- 'Domestic/processed focused'
- 'Consumption/import majors'

B. Improving competitiveness through scale, productivity and quality.

- Stimulate scale, productivity, and extroversion
- new standardization and quality certification mechanism

C. Ensuring international market access and presence.

- "Greek Foods Company" (GFC)
- Greek Diet campaign
- "Made in Greece" origin certification mechanism

D. Revamping capabilities.

- Agriculture (and Aquaculture) University education
- "Agricultural Development Institute"

"In a 10-year horizon, the annual incremental (direct and indirect) GVA (versus 2010) is estimated to be €4.5bn, employment could increase by an additional 140,000 jobs and the trade balance could improve by approximately €2.7bn."(McKinsey 2012: p. 56)

Retail and wholesale

The Greek economy's largest sector, accounting -at the time of the report- directly for 19% of the country's total gross value added (GVA) and 18% of all employment, is retail and wholesale commerce. It is 30-40% lower compared to EU-15 countries levels. However, there is significant room for improvement.

To understand the drivers of performance four core dimensions were examined:

- the format mix accounting for 10-15 percentage points of the total productivity gap
- the retail operating model and efficiency accounting for 9-10 percentage points and the upstream value chain explaining another 2-5 percentage points
- other factors such as market competition, regulatory context and informality

Ten possible priorities and reforms to be considered by the Greek state and market participants were identified, grouped into two major strategic themes:

A. Further reinforcing competition, investment and regulatory compliance.

- defining commercial zones in urban and suburban areas
- Lift constraints in product categories
- price transparency
- Extend informality controls
- Secure fair competition by increasing the capacities of Competition Committee

B. Boosting retailer and wholesaler productivity

- expanding the scale of existing players through further consolidation and partnerships
- Targeted investments in IT, logistics and e-commerce
- liberalization of transportation market
- simplify reporting and regulatory compliance requirements
- eliminate labor rigidities

"In terms of growth upside, in a ten-year horizon, retail productivity could increase by 22% and annual retail sales (grocery, apparel, appliances) could grow by an extra €1.5bn. At total economy level, the incremental (versus 2010) GVA uplift could reach €4.3 billion (€2.6 billion direct and €1.7 bi indirect), while tax revenues could increase by €1.3bn." (McKinsey 2012: p. 60)

3.7 Rising Stars

In the report, the six primary 'rising stars' that could contribute to the Greek economy's growth in a five- to ten-year horizon were manufacturing of generic pharmaceuticals, aquaculture, medical tourism, long-term and elderly care, regional cargo & logistics hub and waste management, while the two secondary ones, were the development of Greece as a Graduate Classics education hub and Greek specialty foods. These 'rising stars' could contribute approximately €7bn of additional annual GVA and create more than 70,000 new jobs in a 10-year horizon.

Manufacturing of generics pharmaceuticals

Greece 10 Years Ahead has defined four major growth levers:

- Promoting generics attractiveness and penetration.
- Competing through scale, focus and innovation.
- Penetrating high potential export markets.
- Securing access to alternative financing sources.

Aquaculture

Aquaculture was still comparatively modest, with a GVA of around €400mn in 2010, but it was expanding at a rate of about 3% annually, with 80% of production going outside. Only two items,

sea bass and sea bream, account for around 90% of local aquaculture production and approximately half of the world market.

Greek players and the Greek state would have to consider these key priorities:

- Pursuing a phased product and market strategy
 - (i) defend leadership position in sea bass and sea bream in core European markets
 - (ii) expand geographic coverage
 - (iii) broaden product portfolio into mussels and larger-size, higher value-added fish categories
- Building competitiveness through scale, product focus and labor efficiency
- Ensuring systematic planning and regulatory compliance, to avoid excessive oversupply and major price volatility.

In a ten-year horizon, GVA could increase from €0.4 to €1.4bn creating 20,000+ new jobs.

Medical tourism

Greece has the ability to participate in the rapidly expanding "middle market" of medical tourism, but the nation lacks a thorough national sector growth plan and the essential infrastructure.

Five levers that would enable the local industry to capture the growth opportunity presented by Medical Tourism were reported:

- Developing a national strategy to position Greece in the 'middle market' with specific product and market focus.
- Establishing modern quality assurance, licensing and control frameworks
- Pursuing and maintaining 'offer' specialization to reduce costs through scale
- Leveraging networks to attract inbound volumes
- Complementing the offer with the necessary auxiliary services for medical tourists, e.g., health resorts

It was estimated *"that in a 10-year horizon medical tourism could contribute €450mn in additional annual GVA and 11,000 new jobs to the Greek economy."*

Long-term and elderly care

Aging population creates a disproportionate cost to healthcare systems and especially Greece faces a challenge due to demographic and system pressures across health and social care.

Possible measures and reforms grouped in four major strategic themes are identified in the report as a response to the development barriers for an effective out-of-hospital integrated care system that would address the long-term conditions and aging.

- Developing a robust sector strategy focusing on high potential areas (e.g., case/disease management, care at home, rehabilitation, assisted living services)
- Building relevant capabilities and supporting mechanisms.
- Boosting product attractiveness and awareness for all involved parties (for instance, bundling LTC/elder care with medical travel services for patients who might be considering retirement abroad)
- Securing and enabling access to diverse financing sources.

According to the projections, market expansion in all its sub-segments over a ten-year period could result in €665mn in sector revenues and €670mn in reductions from previous spending. The incremental yearly impact (direct and indirect) on GVA could be up to €1bn and 24,000 additional jobs.

Waste management

Greece's waste management is less advanced than that of its European counterparts, thus possible

priorities and measures for the Greek state and market players/investors to consider are grouped into three main themes:

- Reducing waste volumes and improve sorting
- Up-scaling and upgrading recycling and other alternative (to land-filling) capacity
- Ensuring systematic regulatory compliance and planning.

"The annual impact on GVA could reach approximately €0.6bn, while more than 11,000 new jobs could be created in a 10-year horizon."

Regional cargo hub & logistics hub

With roughly 19 million TEU (Twenty-foot-container Equivalent Units) passing through the region in 2009 and a major increase in commerce of around 9% annually between 2004 and 2008, the Eastern Mediterranean region provides solid underpinnings for the establishment of a cargo & logistics center.

In general, Greek ports are well positioned and can act as regional hubs. Piraeus may act as a transshipment hub, while both Thessaloniki and Piraeus are well situated to act as gateway ports. Several obstacles must be overcome for Piraeus and Thessaloniki to solidify their status as regional centers.

Greece's logistics performance was, however, inferior across most levers in terms of infrastructure and operational preparedness. Port infrastructure could meet current demand at the time, but it was evident that it should be improved to handle future volumes. Local and national rail networks are underdeveloped, and Greece falls behind rivals in terms of stability and operational effectiveness.

'Rising Star' growth opportunities and selection criteria

Prioritization criteria for 'Rising Stars'



Note: The scope of G10YA involved 13 sectors/sub-sectors (the 5 largest 'production' sectors and 8 'rising stars') of the economy, clearly recognizing that there might be additional growth opportunities in other sector/sub-sectors not been covered by G10YA

McKinsey & Company

Under the following four strategic themes possible priorities were identified.

- Enhancing Greece's strategic relevance and supporting transport infrastructure.
- Improving port infrastructure and operational attractiveness.
- Ensuring cost competitiveness.
- Building sector critical capabilities.

"The transformation of Piraeus and Thessaloniki into hubs would have substantial positive impact on the Greek economy adding approximately €1.3bn of annual Gross Value Added (GVA) and creating a minimum of 9,000 new jobs in a 10-year horizon."

Secondary Rising Stars (Classics Hub and Greek Specialty Foods)

Classical Hub

Greece could capitalize on its distinctive history and Classical legacy to establish itself as a significant Classical Hub on both the fronts of Classical Studies and Classical tourism.

Two top-notch international postgraduate programs with a focus on classical teatrology and classical archaeology could be developed in the context of classical studies. Regarding Classical Tourism, action should be taken to improve facilities and overall infrastructure parallel to targeted campaigns to promote Classical Tourism.

Greek Specialty Foods

Greek Specialty Foods comprise a range of items, from specialty foods (like mastiha) to readily accessible food types (like honey), including both hand prepared and industrially made goods.

The main constraints to growth for Greek Specialty Foods recognized by the report, were on the one hand marketing and sales, and on the other production capacity. 3 main strategic priorities were outlined:

- Defining clear strategic directives and a detailed end-to-end strategy for Greek Specialty Foods.
- Ensuring production and supply chain efficiency.
- Ensuring market access.

The McKinsey report analyzed the structural and developmental prospects of key economic sectors and examined fundamental cross-sector macroeconomic drivers, challenges, and opportunities of the Greek economy. The study focuses on the five largest (in term of Gross Value Added – GVA) 'production' sectors ('major sectors') and eight smaller but high potential-areas of the economy ('rising stars') that have significant potential to fuel the country's economic growth in the future. **It clearly recognizes that there might be additional growth opportunities in other sectors or sub-sectors that have not been covered by it, a limitation which we will try to address here.**

McKinsey's updated Report in 2017 confirmed the above key economic sectors as appropriate for the country's economic development in the future.

4. Greece in Transition: In search of a New Economic Model

4.1 Greek Macro-data 2012-2020

Any review of the Greek economy after 2012 must start with the sovereign debt crisis faced in the aftermath of the financial crisis of 2007–2008. This reached the populace as a series of sudden reforms and austerity measures that led to impoverishment and loss of income and property, as well as a small-scale humanitarian crisis.

The Greek economy suffered from 2010 to 2016 the longest recession of any advanced economy to date. As a result, social exclusion increased, and almost half a million of well-educated Greeks have left the country seeking employment mostly in EU countries.

The Greek crisis was triggered by the turmoil of the world-wide Great Recession, but deepened because of structural weaknesses in the Greek economy, and lack of monetary policy flexibility as a member of the Eurozone and the fact that economic policy had not complied with the EU rules set forth in the Stability and Growth Pact in 1997 and 1999.

The crisis led to a loss of confidence in the Greek economy, evidenced by a widening of bond yield spreads and a rising cost of risk insurance on credit default swaps compared to the other Eurozone countries. The government enacted 12 rounds of tax increases, spending cuts, and reforms from 2010 to 2016, which at times triggered local riots and nationwide protests.

Despite these efforts, the country required three Economic Adjustment Programs via adjustment loans in 2010, 2012, and 2015 from the International Monetary Fund and EU members, and negotiated a 53.5% "haircut" on debt owed to private investors in 2012, which amounted to a €106bn debt relief.

In 2015, and due to the sudden stop of the economy and the subsequent depression, GDP fell and Greek debt levels stood at €321bn or some €30,000 per capita. This meant that little had changed since the beginning of the crisis in terms of the debt to GDP ratio of the country. Its debt per capita value was below the OECD average, but remained very high as a percentage of the respective GDP.

In all, between 2008 and 2020, the Greek government debt rose from €218bn to €342bn. However, during the same period the Greek debt-to-GDP ratio more than double from 90% to 193% due to the severe GDP drop during the handling of the crisis.

Key statistics during this period according to the OECD Greece's statistical profiles (OECD 2020 & 2022) for the years 2012-2020 reveal the following picture:

- Greek GDP fell from €242bn in 2008 to €176bn in 2015, a 27% decline, which was a devastating blow to the economy and the Greek people. Greece was in a deep crisis and GDP returned to a modest growth rate of 0,8% only in 2014. This cumulative fall in GDP dramatically increased the Debt to GDP ratio, severely worsening Greece's debt crisis. By 2016 Greek GDP climbed higher gradually, but declined again to €177bn in 2020, due to COVID-19 pandemic.

However, the Greek economy started to recover from 2017 on-wards, with GDP growing by 1.5% in 2017, 1.9% in 2018, and 1.9% in 2019. This growth was largely driven by the country's strong tourism sector and exports of goods and services. Unfortunately, the COVID-19 pandemic has had a severe impact on the Greek economy, and GDP contracted by around 8% in 2020.

The Greek GDP figures in euros for the last 15 years reflect a turbulent period for the country's economy, with significant fluctuations. While the country has shown resilience and made progress

in recent years, the ongoing challenges of the pandemic and the need for structural reforms continue to pose significant obstacles to sustained economic growth and recovery.

- The public debt to GDP ratio in 2011 was 183% of GDP or €356bn. This ratio was the world's third highest after Japan and Zimbabwe. Public debt peaked at the same year; it was reduced by a bailout program to €319bn in 2013 and then rose gradually to €344bn in 2018 after the Third Memorandum and reached €342bn during the pandemic in 2020.

While the country has made progress in reducing its deficit and implementing structural reforms, the sustainability of the public debt remains a critical issue that requires ongoing attention and action from policymakers.

- Government revenues were at 39.1% of GDP in 2012 and increased steadily as a percentage of GDP for the period, hitting 42.7% in 2020. This increase was driven by a combination of factors, including tax reforms, higher tax collection, and stronger economic growth.

Despite the recent improvements, Greece's government revenues per GDP remain relatively low compared to many other European countries. This reflects the ongoing challenges that the country faces in terms of tax evasion, informality, and the effectiveness of tax administration. It also highlights the need for continued efforts to improve tax compliance, simplify the tax system, and promote economic growth, which are essential for boosting government revenues and achieving long-term fiscal sustainability.

- Government expenditures were at 51.36% of GDP in 2013 and went down as a percentage of GDP for the period 2013-2019 to 42.9%, but increased abruptly to 52.1% in 2020, due to pandemic measures. This decline was driven by a combination of factors, including fiscal consolidation measures, pension and healthcare reforms, and public sector wage cuts.

Despite the recent improvements, Greece's government expenditures per GDP remain relatively high compared to many other European countries. This reflects the ongoing challenges that the country faces in terms of public sector inefficiencies, low productivity, and social spending needs.

- The Government's budget deficit (expenses over revenues) was 9.6% of GDP in 2012, much improved versus the 15.8% of 2009, but it hit 9.4% in 2020 due to COVID-19 pandemic government measures having produced in the meantime primary surpluses reaching between 0.8% to 1.5% during 2017-2019, according to the bailout requirements.

The Greek government had a significant deficit in 2009, which was one of the highest in the Eurozone at that time. This was due to the combined impact of the global financial crisis, which hit Greece hard, and the country's structural economic problems. In response, the Greek government implemented a series of austerity measures and structural reforms, which led to a gradual improvement in the government deficit. However, the deficit remained relatively high (4.2%) until 2015.

From 2016, Greece's government deficit has been gradually decreasing, and it turned into a surplus in 2018 and 2019, reflecting the positive impact of fiscal consolidation measures and economic growth. However, the COVID-19 pandemic had a significant negative impact on the Greek economy in 2020, leading to a sharp increase in the government deficit.

- The unemployment rate rose from below 10% (2005–2009) to 24.3% in 2012 finally reaching 27.6% in 2013. For the period 2014-2020 the rate declined to 16.3%. Since 2013, the Greek unemployment rate has been gradually decreasing, reflecting the positive impact of structural reforms, improved competitiveness, and economic growth. However, the unemployment rate remains relatively high compared to many other European countries, and it is still a major

challenge for the country.

Overall, reducing the Greek unemployment rate and creating more job opportunities remains a key policy priority for the country, as it is essential for achieving long-term economic growth and social stability.

- The balance of trade for goods deficit (exports over imports of commodities) was 19.5% in 2012 and reached 14.3% in 2020. The balance of trade deficit for goods has decreased significantly since 2012, reflecting the impact of the economic and fiscal crisis and the subsequent structural reforms that aimed to improve the country's competitiveness. However, the balance has remained negative over the past 10 years, indicating that the country is still heavily reliant on imports to meet its consumption and investment needs.

One way to reduce the trade deficit is to increase exports of high-value-added products and services, which can help to generate new jobs and boost the country's competitiveness. Additionally, promoting import substitution by supporting the development of domestic industries can also help to reduce the country's dependence on imports.

- The balance of payments deficit was 6.3% in 2012. During the period 2012-2020 it gradually went down to 2.4% in 2020. This reflects the positive impact of the economic and fiscal reforms that aimed to improve the country's competitiveness and attract foreign investment. However, the balance remained negative over the past 10 years, indicating that the country still relies on foreign capital to finance its current account deficits.

One way to invert deficit to surplus is to boost the country's export competitiveness by investing in research and development, infrastructure, and education. Additionally, attracting more foreign direct investment by improving the business environment and promoting entrepreneurship can help to boost the country's export capacity and reduce the dependence on imports.

- The index of price levels, which measures the price level of goods and services in Greece relative to other OECD countries (OECD average = 100) was at 87 in 2012. It declined due to the collapse of living standards down to 74 in 2020. In parallel the relative poverty rate increased from 27.1% in 2012 to 27.3% in 2020. The poverty rate remains stubbornly high, with one in 4 Greeks still living in poverty in 2020. Increasing employment opportunities, improving the quality of education and training, and promoting inclusive growth can help to reduce poverty and promote social inclusion.

- Inflation (CPI) was 1.1% in 2012 and went into a deflationary regime from 2013 to 2016, reaching 1,1% in 2020, due to energy costs. The inflation turned negative during the economic and fiscal crisis in 2010 and 2013. Since 2017 inflation has remained low and stable, with a slight uptick in 2020. The low inflation environment in Greece can be attributed to a combination of factors, including subdued domestic demand, weak wage growth, and structural reforms aimed at improving competition and reducing prices. However, low inflation is also be a sign of weak economic activity.

- Greece has participated in the Program for International Student Assessment (PISA) since its inception in 2000. It is a global assessment that measures the performance of 15-year-old students in reading, mathematics, and science. Greece's PISA scores have remained relatively stable over the past 10 years, with no significant improvement or decline. However, Greece's scores are below the OECD average in all three subjects, indicating that there is room for improvement.

To improve PISA scores, the Greek government has implemented a number of policies aimed at improving the quality of education, including increasing investment in education, strengthening

teacher training, and promoting more interactive teaching methods. Additionally, efforts have been made to address inequality in education, such as by providing additional support to students from disadvantaged backgrounds. It will be important for the Greek government to continue to prioritize education and ensure that all students have access to high-quality education to improve PISA scores and prepare students for future success.

Despite these challenges, there have been some positive developments in the Greek economy over the past decade. For instance, the country has made significant progress in reducing its budget deficit and stabilizing its public debt. The government has also implemented structural reforms aimed at improving the business environment, increasing investment, and promoting economic growth. In addition, Greece has successfully returned to the international bond markets, indicating a gradual return to economic stability.

The ongoing COVID-19 pandemic has presented additional challenges, but the Greek government has implemented measures aimed at mitigating the economic impact and promoting a strong recovery.

In all, the economy after its crisis did not experience a V-shaped recovery. The economy rebounded slowly and it might have performed better had not been the post 2020 realities as COVID-19 and other global developments.

Greece: Macroeconomic Trends (2012-2020)									
	2012	2013	2014	2015	2016	2017	2018	2019	2020
People									
Population	10.81	10.82	10.84	10.86	10.87	10.77	10.72	10.72	10.72
Life Expectancy at birth	80.2	80.3	80.5	80.7	80.9	81.0	81.1	81.3	81.5
Economy									
Gross Domestic Product (GDP):	178	176	179	176	181	185	194	201	177
% Change	-7.3%	-3.2%	0.8%	1.8%	0.0%	1.5%	1.9%	1.9%	-8.2%
GDP per capita	16.347	15.883	16.268	16.679	17.165	18.027	18.864	19.337	17.954
GDP Economic Sector Components									
Agriculture / GDP	3.8%	3.9%	3.8%	3.8%	3.6%	3.5%	3.5%	3.5%	3.5%
Industry / GDP	22.7%	22.6%	22.9%	23.2%	23.1%	23.3%	23.4%	23.4%	22.5%
Services / GDP	73.5%	73.5%	73.3%	72.9%	73.3%	73.2%	73.1%	73.1%	74.0%
GDP Components									
Private Consumption / GDP	69.8%	68.8%	67.8%	67.0%	67.8%	68.9%	69.2%	69.3%	66.9%
Government Consumption / GDP	18.7%	18.6%	18.6%	18.7%	18.8%	19.0%	19.8%	19.4%	19.7%
Gross Fixed Capital Formation / GDP	15.7%	14.2%	14.1%	14.6%	15.0%	16.0%	16.2%	16.5%	15.9%
Exports of Goods & Services / GDP	33.0%	35.1%	36.0%	36.5%	35.4%	35.6%	36.0%	38.4%	38.7%
Imports of Goods & Services / GDP	37.2%	36.7%	36.5%	36.8%	37.0%	39.5%	41.2%	43.6%	41.2%
Government Budget Data									
Government Debt	305	319	317	321	317	317	344	332	342
Government Debt / GDP	172%	181%	177%	182%	175%	172%	177%	165%	193%
Government Surplus (Deficit) / GDP	-9.6%	-12.2%	-3.9%	-4.2%	-0.5%	0.8%	0.7%	1.5%	-9.4%
Government Revenues / GDP	39.1%	39.1%	40.2%	41.0%	42.5%	43.7%	44.5%	44.4%	42.7%
Government Expenditures / GDP	48.8%	51.3%	44.2%	45.2%	42.9%	42.9%	43.8%	42.9%	52.1%
Trade									
Exports of Goods / GDP	23.3%	23.5%	24.7%	26.5%	28.1%	28.8%	29.4%	29.7%	27.8%
Imports of Goods / GDP	42.8%	42.5%	44.3%	47.0%	47.5%	48.0%	49.0%	48.9%	42.1%
Balance of Trade / GDP	-19.5%	-18.4%	-19.5%	-20.6%	-19.4%	-19.2%	-19.6%	-19.2%	-14.3%
Balance of Payments / GDP	-6.3%	-5.7%	-6.2%	-6.3%	-5.5%	-5.2%	-5.5%	-4.6%	-2.4%
Current Account Balance / GDP	-2.1%	-1.9%	-2.1%	-2.2%	-1.9%	-1.7%	-1.7%	-0.9%	-0.1%
Prices									
Inflation rate: all items	1.1%	-0.9%	-1.4%	-1.1%	0.0%	1.0%	0.8%	0.3%	1.1%
Core Inflation (excluding food and energy prices)	0.6%	0.6%	0.2%	0.1%	0.1%	0.9%	1.0%	0.6%	0.5%
Price Level Index (PLI)	87	85	84	77	75	75	76	73	74
Labor Market, Skills and Innovation									
Unemployment rate	24.3%	27.6%	26.5%	24.9%	23.5%	21.5%	19.5%	16.9%	16.3%
Employment rate	42.7%	40.4%	41.1%	42.1%	43.0%	44.1%	45.3%	46.6%	44.5%
Participation rate	53.3%	51.7%	52.4%	53.5%	54.6%	55.8%	57.2%	58.8%	56.3%
Gross Expenditure on R&D / GDP	0.61%	0.54%	0.52%	0.50%	0.49%	0.51%	0.53%	0.57%	0.61%
Tertiary educational attainment (aged 25-64)	35.7%	37.0%	38.3%	39.4%	40.3%	41.2%	42.1%	42.7%	43.2%
Society									
Income inequality (Gini coefficient)	35.4	35.6	35.8	35.7	35.4	35.4	35.4	35.3	35.3
Relative Poverty Rate	27.1%	28.0%	28.0%	27.7%	27.5%	27.5%	27.5%	26.8%	27.3%
Median Household Income	13.500	12.800	12.400	12.000	12.100	12.500	13.000	13.800	13.500
Public and Private spending (% of GDP)									
Healthcare spending / GDP	5.4%	5.3%	5.2%	5.0%	5.0%	5.1%	5.1%	5.3%	5.2%
Pension spending / GDP	11.8%	11.6%	11.6%	11.7%	11.6%	11.4%	11.3%	11.3%	11.7%
Education spending / GDP	4.1%	4.1%	4.0%	4.1%	4.0%	4.1%	4.2%	4.3%	4.4%
Education Outcomes (PISA scores)									
Reading:	484	-	-	480	-	-	472	-	-
Mathematics:	453	-	-	454	-	-	451	-	-
Science:	467	-	-	455	-	-	453	-	-

Source: World Bank, OECD

5. Pissarides Commission Report (2020)

The Pissarides Commission's report (prepared by Professor Christopher Pissarides and his colleagues at the request of the Greek Prime Minister), which was published in draft form in August 2020 before the final version was released in November 2020, furnishes the government with a vision statement for transforming the country's economy and provides the road-map from which the Recovery and Resilience Facility (RRF) proposal navigates.

The Pissarides Report, or to be more precise the "Development Plan for the Greek Economy", follows a previous publication ("Interim Report") as well as a book ("Beyond Austerity") by the same group of authors, released by the University Press of Crete in 2017. Four authors, assisted by 12 co-authors on paragraphs and subsections of the Plan, as well as about 60 named commentators, submitted opinions and policy proposals aspiring to be heard by some or all of the economic policy actors.

Analysis and argumentation were extended in 244 pages of dense and difficult to reproduce in a summary form. In general, the Report argued for reduced centralization and public sector. More specifically, the central goal for the Greek economy during the next decade must be the systematic increase of real per capita income, so that it gradually converges with the European average. Further key objectives in the convergence process should be to strengthen social cohesion and improve environmental performance. From the Pissarides report emerged the need to act on four fronts: institutional changes, social cohesion, infrastructure improvement and measures to strengthen the branches of economic activity. The entire analysis is divided into seven chapters.

The Report was the work of a committee comprised mostly of academic economists, many based outside Greece. Two aspects of the Pissarides report drew heavy criticism when the first draft was released: it was perceived as an attack on small and medium-sized enterprises (which make up a large portion of the Greek economy). Another issue that was criticized were the proposed changes to the country's pension system.

The report stated that the central goal for the Greek economy over the next decade is to raise incomes – in a socially inclusive and environmentally sustainable manner – by raising productivity and export orientation. A measure of this transformation is the increase in the share of exports and investment in GDP towards average levels of other small, open EU economies.

Preconditions for this development include increasing the number of medium and large firms in the economy, strengthening salaried employment, reducing self-employment and the gray economy, and increasing household savings, which should be channeled into increased corporate investment.

The main position of the authors and the starting point of what is recorded and analyzed was that the Greek economy is suffering today due to the inefficient functioning of the public administration and institutions. Consequently, these two areas are then given the greatest emphasis.

The Commission's report lays out a series of horizontal structural reforms to achieve these goals. The recommendations are wide-ranging and include reducing the burden on salaried work through tax cuts and reduced social security contributions, bolstering the private sector-capitalized component of pension provision, and a radical overhaul of training of the unemployed, with "improved targeting of social benefits so they don't operate as a disincentive to work." (Pissarides 2020: pp. 12-14)

The commission recommended policies for increasing women's participation in the workforce and eliminating discrimination, and for improving public administration and functioning of the justice system, with a heavy emphasis on thorough digitization of the economy and services.

The report also contained recommendations for infrastructure investment and policies to facilitate the green energy transition and bring down the country's carbon emissions. When the report was taken together with Prime Minister Mitsotakis' economic policy announcements at the Thessaloniki International Fair – with tax cuts as the central plank – it was clear that granting incentives through tax breaks and reducing the fiscal burden on incomes will be a key pillar of the government's approach to economic recovery from the COVID-19 recession.

An example of this would be the use of the Next Generation EU grants and loans to finance tax incentives for the creation of larger companies, something the Pissarides plan highlighted was needed to capture a larger share of export markets.

The problems the Pissarides Commission's report identified – such as low productivity and export-orientation, low female participation in the workforce, the heavy tax burden on incomes, and a slow-moving justice system that disappoints citizens and impedes investment – represent serious problems that Greece needs to address. The heavy emphasis on digitization of Greek public services and the economy is welcome and has already produced results as public opinion polls have indicated.

The Pissarides Plan was an important Report of opinions regarding the future of the Greek economy, which is at a difficult crossroads. New researchers and interested parties can find useful aggregated quantitative data and charts comparing the performance of the Greek and European economies. Collaborators and commentators had provided the authors of the report with more detailed information on pathogens as they assess them, as well as suggestions for overcoming them, so that problems are listed, and solutions are proposed. This record is an important legacy.

Yet one thing that the plan pays insufficient attention to possible effects of the pandemic on the Greek economy. One would have expected that the Pissarides Plan would have included a discussion on the effects of the pandemic, since it was published in November 2020. For example, the Pissarides report's section on education put great emphasis on "human capital" and skills acquisition, particularly in science, technology, engineering and mathematics, but made only one fleeting reference to COVID-19, pointing out that the pandemic exposed the need for improved digitization of teaching. It did not address a topic that generated controversy over that summer and brought the government into conflict with teachers and students: the reopening of schools with overcrowded classrooms, a factor that is preventing learning from happening in a safe environment.

Overall, the government spurred on by the Pissarides report had presented a technocratic vision for Greece's national recovery. While the program did promise money for social programs, health and education, the guiding philosophy behind its remedies for economic inequality and improving social justice is that liberal economic reforms will lead to increased prosperity and incomes – with a rising tide lifting all boats.

It is inclusive in this vision, arguing for greater integration of immigrants into Greece's economy and education system, better support for disabled persons and setting goals for increased female participation in the workforce.

Due to Greek political realities, the polarization of the public debate means there is little prospect of social dialogue helping to achieve a broad national consensus on a transformative plan for the economy. Instead, the government's economic response to the current crisis has become another partisan topic, and any future change in government will probably bring new priorities and a new growth plan.

But as the WWF report - published in December 2020 - pointed out, the plan's environmental and social objectives seem more-like afterthoughts than integral guiding principles of the country's recovery strategy. In particular, there is no reference (i) to the need to phase out environmentally harmful subsidies (development of natural gas infrastructure and hydrocarbon extraction), (ii) to structural reforms required in the fields of financial supervision and corporate governance for the alignment of private investments / financial flows with the goals of the Paris Climate Agreement and the UN Sustainable Development Goals and (iii) there is no mention of specific measures to promote innovation in green technologies. As risks stemming from the global ecological emergency materialize in the years to come, they will test the robustness of the government's plans.

6. Greece 2.0 – National Recovery and Resilience Plan (RRP - 2021)

In April 2021, the Greek Government released “The National Recovery and Resilience Plan (RRP), Greece 2.0”. It aspires to change the Greek growth model and institutions:

- Via ambitious reforms and investments
- Towards an extroverted, competitive, green and digital growth model
- via a fundamental economic and social transformation, which affects economic activity, but also technology, attitudes and institutions via reforms
- utilizing a transition that combines economic efficiency with social cohesion and justice

The RRP was designed in line with “Next Generation EU” funding for Greece. It is also in full alignment with the Country Specific Recommendations (CSRs) addressed to Greece in the context of the European Semester [European Union’s framework for the coordination and surveillance of economic and social policies] and the plan aims to enhance growth, productivity, job creation and economic and social resilience.

In 2019, the EU Council recommended that Greece tackle its excessive macroeconomic imbalances by pursuing reforms and focus on investments. The Commission's assessment on Greece for the 2020 European Semester was that the country faced excessive macroeconomic imbalances (high public debt, high share of non-performing loans on banks' balance sheets and a perennially high unemployment rate of around 17%, especially pronounced among women and young people).

The EU Commission grouped the CSRs issued to Greece in 2019 and 2020, around four topics: i) public finances and healthcare; ii) labor market and social policy; iii) public and private investment; and iv) structural reforms to improve the functioning of the economy.

The key element of the Plan is the mobilization significant resources from the private sector, with the aim of increasing private investment, in order to achieve significant multiplier effects. It is fully in line with the six pillars of the Recovery and Resilience Facility (RRF), with particular emphasis on the green and digital transition.

Budget

Pillars	RRF Budget (in €bn)	Mobilised Investment Resources (in €bn)
1. Green Transition	6.0	10.4
2. Digital Transformation	2.1	2.1
3. Employment, Skills, Social Cohesion (Health, Education, Social Protection)	5.2	5.3
4. Private investment and transformation of the economy	4.8	7.8
Sum of Grants <i>Green tag: €6.9bn (38%), Digital tag: €4.0bn (22%)</i>	18.2	25.6
Loans	12.7	31.8
Total Investment Resources	30.9	57.5

The Greek RRP ("Greece 2.0") will provide total assistance of €30.9 billion split between grants and loans, it is expected to mobilize total investments and capital of €57.5 billion the next four years.

The "Greece 2.0" program aspires to change the country's economic development model—by focusing on green transition—to digital transformation, to investments and value-added skills, but

also to social cohesion and resilience. The absorption of the Recovery Fund funds is expected to strengthen the competitiveness of the Greek economy and to support the transition to a sustainable human-centered economic development, laying the foundations for Greece and to support the transition to a sustainable human-centered economic development, laying the foundations for the Greece of the future: a Greece that is more sustainable, more digital but also more resilient.

The Greek plan was approved by the EU Council on 13 July 2021, which allowed the disbursement of the pre-financing payment of €4 billion to Greece on 9 August 2021. Further disbursements will be made up until 2026, upon fulfillment of the agreed milestones and targets. Grants are scheduled in nine equal installments, and loans in six equal installments. A first payment request was submitted by Greece on 29 December 2021 for the fulfillment of 15 milestones. On 7 January 2022, implementation had begun of 103 measures, corresponding to €6.1 billion.

The Key investments included in RRP are as follows:

- Upgrading energy efficiency of buildings for households, firms and the public sector
- Investments in energy storage, electric charge points, batteries, electric vehicles
- Improving electric inter-connectivity of islands
- National reforestation plan, biodiversity and strengthening of civil protection
- Urban plans and strategic urban regeneration
- 5G infrastructure, fast broadband connections, fiber optic infrastructure in buildings, submarine fiber cables
- Digitization of the public sector (Health, Education, Justice, EFKA, Urban Planning, licensing, etc.),
with emphasis on archives, interoperability of IT systems and quality service to firms and citizens
- Revenue-enhancing digitization of tax authorities and real-time interconnection with firms
- Strong incentives for private investment (green, digital transformation, innovation, extroversion, economies of scale)
- Public-Private Partnerships in new, large infrastructure projects (irrigation, railways)
- Investments in culture, tourism and the agri-food sector as drivers of growth
- Training, upskilling and reskilling of the workforce (with emphasis on digital skills)
- Large investments in health, education and social inclusion of vulnerable groups

These areas overlap significantly with ACG 150's aims, including especially the emphases on sustainability, technology, public/private collaboration, logistics, food and tourism.

Key reforms include:

- Reform of the licensing procedure for renewable energy sources
- Promotion of e-mobility through a modern institutional framework
- Preparation of urban plans, establishment of new spatial planning for renewables, industry, tourism and aquaculture, and marine spatial planning
- Action plan for the provision of "customer-centric" digital services by the public administration
- 5G technology and development of innovative digital services
- Transition to fast broadband
- Digital transformation of SMEs
- Reforms to promote basic and applied research
- Reforms to simplify the business environment and licensing, improve the ease of doing business, support investment and trade facilitation
- Improve the efficiency of the justice system, including digitization and administration reform
- Incentivizing economies of scale through increasing the size of enterprises
- Artificial intelligence and big data deployed against tax evasion
- Modernizing and upgrading Greece's upskilling and reskilling system
- Labor law reform
- Reform of active and passive labor market policies, including to increase female labor force

participation

- Digitization of education, both equipment and curricula
- Primary health care reform and digital tele-medicine service
- Training against discrimination in the public and private sector

The amount €12.7bn financed from the RRF loan envelope will be channeled only to projects reflecting the Pissarides Committee priorities. The loans are to be provided through International Financial Institutions (IFIs) and the Greek banking system and will flow exclusively to the private sector, based entirely on market criteria, with no state involvement. The maximum RRF funding set at 50% of project value without state guarantees and the participation of banks and investors will at least be 30% and 20%, respectively.

With regard to the country's economy, the objective is to make it more competitive, efficient and green, with a less bureaucratic, digitized public administration and business environment, and a more growth-friendly tax system. The reforms aim to fill the large investment gap and stimulate private investment through the RRF loan component, improving Greece's productivity. This is expected to mobilize, €59.8bn, including the resources from the plan. When it comes to the social dimension, the plan envisages reforms and investment in the labor market and the healthcare system to strengthen social fairness, integrate vulnerable groups and promote equal opportunities.

The Bank of Greece (BoG) analysis indicates that the macroeconomic effect of the plan will be a lasting rise in real GDP of 6.9 % by 2026, i.e., a contribution to the output growth rate of approximately 1.15% on average per annum, compared to the baseline scenario, over the 2021-2026 period covered by the plan's implementation. The BoG estimates the joint effect of the grants and loans to be a yearly average increase of real GDP of around 0.7 %, i.e., 4.3 % by 2026, with the effect of grants 1.45 % and of loans 2.85 %. Structural reforms are expected to contribute 0.45% on average per annum, thus 2.6 % by 2026. Employment is meanwhile expected to grow by 4% with the creation of between 180.000 and 200.000 new permanent jobs over the 2021-2026 period.

The RRF Regulation identifies four priorities under which measures can be financed. The Greek NRRP is aligned to these areas, and organized around four pillars:

– 'Green transition' aims to contribute to the country's gradual reduction of energy dependence. It envisages investment in energy networks, and reforms to increase the resilience of the electricity network, promote the use of renewable energy sources, enhance energy efficiency and energy renovation of buildings, and improve infrastructure for electric vehicles. It includes the revision of urban and maritime planning and measures for waste and wastewater management and reforestation. It commits to fully phase out lignite-based electricity production by 2028. Loans aside, with €6.2 billion, it is the pillar that has been allocated the most in grants.

– 'Digital transition' aims to enhance broadband connectivity and the digitization of the public administration and businesses. It provides for investment in the development of 5G networks, the deployment of submarine cables, connecting the mainland with the islands and Cyprus, and support for the adoption of digital technologies by businesses, especially SMEs. The grant allocation is €2.2 billion.

– The 'Employment, skills and social cohesion' pillar is aimed at modernizing the labor market, and improving vocational education and training deficiencies, including the digital transformation of key sectors of the employment and social security public services, and the development of e-learning. Investment in healthcare will seek to reinforce social cohesion and the resilience of the health sector. €5.2 billion in grants is allocated to this pillar.

– The 'Private investment and transformation of the economy' pillar provides for the strengthening

of the public administration and the improvement of the judicial and financial systems. Digitization, modernization of the public financial management framework, tax incentives, and a set of financial sector reforms and investments in key sectors of the economy are envisaged. €4.84 billion has been set aside from the grant component. This pillar includes the use of loans, totaling €12.8 billion for long-term investments by the private sector, as well as reforms to simplify the regulatory framework and improve the business environment.

Under the RRF Regulation, at least 37% of NRRP resources must be used to finance the green transition and at least 20% must contribute to digital transformation. All four pillars support Greece's green transition. The Greek plan goes slightly above the expenditure targets, dedicating 37.5 % of the plan to the green transition and 23.3 % to the digital transition.

The plan also includes 18 components under the different pillars, which include mutually reinforcing measures, and covers 106 investments and 67 reforms. Additional private-sector investments are envisaged through the loan facility.

The Greek NRR proposes 67 reforms, corresponding to 39% of the plan's measures. Ten of these constitute key reforms given their impact and maturity while the rest are classified under 28 'groups' of measures, depending on their specific objective and the ministry responsible. The plan accelerates the structural reforms and complements those envisaged by the national reform plan.

Among the ten key reforms, four relate to the environmental dimension (Pillar 1), aiming to improve the efficiency of the electricity market through the development of renewable energy sources plants, the installation of publicly available electric vehicle charging infrastructure and the promotion of sustainable waste and water management.

The plan provides for the improvement of public services, reducing bureaucracy and administrative costs (Pillar 2). It includes the reform of the labor law acts and the digitization of employment and relevant public administration services, by introducing a single information technology system for labor market monitoring. It also covers the resilience of the healthcare sector (Pillar 3).

The plan intends to rationalize the relevant expenditure, in particular to reduce pharmaceutical claw-back, and to invest in pharmaceuticals research and development. Reforms under pillar 4 aim to simplify the institutional framework and the business environment, efforts that will be essential in closing the country's investment gap.

In particular, Pillar-3 Employment, skills, and social cohesion contains a crucial component under the title 3.2 Education, vocational education, training, and skills. The RRF budget will reach €2.3bn and the mobilized investment resources up to 2,4bn.

In more detail:

Life-long Skilling (total amount €1.04bn)

Through a set of wide-ranging reforms and investments, the overarching objective is to increase the effectiveness, efficiency and relevance of the lifelong learning system, and reinforce upskilling and reskilling practices across sectors. The strategic aim of this bundle of reforms and investments is to develop an innovative mechanism for diagnosing labor market needs, thus, being able to design informed skills and upskilling policies.

Governance will consist of the following pillars:

- Involving all key stakeholders to generate and disseminate skills intelligence and labor market needs.
- Supporting employers, citizens, education and training providers, and other stakeholders in making informed choices.
- The government, in close alignment with national policy priorities and interacting with key

national bodies and stakeholders, will address skills anticipation and matching in the national context and identify possible development opportunities for the near future.

The reforms and investments aim at (a) improving basic skills for all, (b) reducing skills mismatches in the context of a recovering labor market, (c) promoting financial literacy for all, (d) increasing the quality of upskilling efforts and their relevance with labor market, including by targeting policies and placing emphasis on the digital transition.

Excellence in Universities and Innovation (total amount €471mln)

This reform aims to enhance the research performance of Greek universities and the quality of education offered to students, in terms of skills and relevance to the job market. Achieving these targets will have numerous positive spill-over effects across the Greek economy and society, by means of building a dynamic ecosystem of innovation, attracting qualified and distinguished academic staff and researchers and boosting economic competitiveness and growth. Moreover, it will contribute to the international competitiveness, positioning and visibility of Greek universities, thus, contributing towards turning Greece into an international education hub and enhancing graduate employment prospects.

Strengthening the Apprenticeship System (total amount €143mln)

The aim of the reform is to reestablish the OAED EPAS (apprenticeship vocational schools of the public employment service) as an integral part of the government's strategy for vocational education and training (VET) and youth employment.

Vocational Education and Training (total amount €69mln)

The main aspects of this reform pertain to 1) improving quality control (e.g. evaluation systems tracking progress and performance of trainees) in the public employment service's (OAED) vocational training units and 2) updating their modules in accordance to current and future labor market needs, as part of the comprehensive reform of OAED's active labor market policies (ALMPs).

Digital Transformation of Education (total amount €364mln)

The proposal features the digital transformation of education in terms of content, infrastructure and services, embedded within a comprehensive reform strategy to update curricula, rationalize services and monitor educational outcomes. The goal is to lay a solid foundation for an inclusive digital educational model in Greece, a key prerequisite for a resilient and competitive Greek economy in the long term. Building on the Open Source Software Strategy 2020-23, the aim is to use solutions that have been tested globally and join the international effort for incremental innovation through the sharing of knowledge and skills. The investment consists of the following components:

1. Digital Content in Schools
2. Digital Equipment in Schools
3. Professional development of the teachers in schools
4. Digital Services in Schools and Universities

Upgrading Vocational Education and Training reform (total amount €92mln)

This investment seeks to upgrade and modernize the infrastructure of vocational education and training (VET) units across Greece, in particular as regards the supply of laboratory equipment for Laboratory Centers for IEK, EPAL, Post-Secondary Year-Apprenticeship Class and Vocational Training Schools.

7. Market Reaction to Greece 2.0

Various responses have been registered with Greece 2.0 announcement. Bank of Greece, INE/GSEE) and the Levy Economics Institute, WWF, IMF, ESM and Deloitte Northwest Europe amongst others, have all shown strong interest in this initiative.

An analysis of SMEs by the Bank of Greece (BoG) assesses the potential economic impact of the RRF funds and the planned reforms. It highlights that after the difficulties faced by Greek SMEs hit by the pandemic and the Greek crisis, the RRF offers a unique opportunity to bridge the competitiveness gap with larger businesses.

According to Bank of Greece estimates, presented in the government's recovery plan, smooth implementation of the Greek RRP could boost GDP by around 6.9% by 2026 (1.45% from the direct effects of grants, 2.85% from loans, and 2.6% from the impact of structural reforms).

The Labor Institute of the General Confederation of Greek Workers (INE/GSEE) and the Levy Economics Institute analyzed the course of the Greek economy in 2021 and 2022 under two economic policy scenarios. The results showed that both the pace of absorption of RRF resources and the reduction of unemployment are important factors in the dynamics of the Greek recovery. In an earlier newsletter on the economic prospects of Greece for 2021, INE/GSEE had underlined the crucial role for Greece's recovery of the way RRF funds will be channeled.

Before Greece submitted the plan, environmental organization World Wide Fund for Nature (WWF) Greece argued that while several projects seemed to have a positive environmental impact, for most of them the impact was impossible to estimate. It considered the plan insufficient concerning, in particular, the circular economy, organic farming and transition to sustainability in the agri-food sector and fisheries.

In November 2020 the International Monetary Fund (IMF) country report for Greece noted that the country's debt vulnerabilities were being eased by a substantial cash buffer and NGEU funds. The NGEU funds would support growth but structural bottlenecks needed to be addressed.

In an April 2021 interview, meanwhile, ESM Chief Economist Rolf Strauch underlined that NGEU and the RRF presented a unique opportunity for Greece's post-pandemic recovery. He welcomed the government's emphasis on investments, a stronger business environment and labor market participation, and an improved justice system and insolvency framework. He also considered that, if Greece made the best possible use of the NGEU funds, it would be possible to bridge the gap caused by the pandemic and unleash long-term growth potential, even beyond pre-pandemic levels.

Next Generation EU (NGEU) and the national plan "Greece 2.0" were the subject of two specialized investigations by Deloitte Northwest Europe (together with Deloitte Central Mediterranean) and Deloitte Greece (with the support of the members of Association of Businesses and Industries SEB), to European citizens and Greek businesses respectively.

The Deloitte Greece carried out a nationwide survey in more than 100 enterprises at the beginning of the second half of 2022 with the aim of capturing the perception of Greek businesses regarding "Greece 2.0" program, as well as the possibility and conditions of utilizing its resources program with the future business needs of the companies in mind, contributing essentially in the recovery of the economy.

According to Deloitte Greece pan-Hellenic research, the most important findings that have emerged categorized as follows:

The general perception of the Greek business community about "Greece 2.0" is that the "Greece 2.0" program is a unique, positive development opportunity for businesses. On this basis, more than nine out of ten Greek companies consider the program a strategic and necessary tool for the support of entrepreneurship recovery policies in Greece.

More specifically, the opinion was expressed that the Digitization and Innovation (23%), Research and Development (19%), Environment and Sustainability (17%) and Infrastructure (16%) are expected to play the more important role in this recovery, all areas closely related to ACG 150 initiatives.

Correspondingly, the bureaucracy / delayed procedures (32%), the delay / impossibility of implementation of reforms (32%) and funds absorptivity (24%), emerged as the most important challenges that must be overcome in order to fully exploit the "Greece 2.0" program.

Although the Greek business community considers that the degree of digital maturity within it of their business is judged as "Satisfactory" by only 41%, more than six out of ten Greek companies intend to use up to 50% of their investment plan for the next years in digital transformation investments. On the way to a more digital future, nationwide research highlighted cyber-security (23%) and the lack of knowledge and skills (30%) as the biggest challenges to be overcome.

Research and innovation: It is hopeful that more than 60% of Greek business believes that the "Greece 2.0" program can respond effectively to the requirements/needs of the business in mind innovation and new product development. In fact, Grants (39%) and National Programs such as "Research Create Innovate" (30%) were characterized by Greek businesses as the most important resources to utilization for research and development of new products.

Equally encouraging is the fact that 90% of businesses recognize as very important the creation of a strategic relationship between Innovation and Sustainability as a very progressive and necessary concept for the development of a strong competitive advantage.

Green transition: Almost 70% of Greek businesses believe that the program can largely meet the demands/needs of the business with driven by the green transition. In addition, the reduction of energy consumption (23%) and the increase of energy efficiency (16%), are the most popular sectors for green transition investments, while at the same time social responsibility (21%) and positive image and reputation of the business (20%), emerge as the more important incentives for the development of sustainable business actions development (ESG).

According to the domestic business community, the lack of resources and financing and/or tax incentives (53%) the high costs and the insufficient budgets (42%) as well as the uncertainty about the return on investment (38%) are the biggest challenges for the implementation of sustainable development best practices.

Employment, skills and social cohesion: The difficulty of finding a competent workforce remains one of the major challenges of the Greek economy. It is typical that almost 75% of Greek businesses consider the lack of specialized human skills potential, as the main inhibiting factor for the development of their business next years. In fact, at least six out of ten businesses face difficulty in finding specialized human resources.

On this basis, more than eight out of ten companies believe that the reform that aims to radically overhaul and modernize the upgrade system skills of the active population will be an essential factor for development the next years. Additionally, as highlighted by its recent pan-European survey Deloitte about STEM education, the point is to promote criticism and the hybrid abilities, but also the shift to original thinking and adaptability that must be demonstrated in the face of continued uncertainty.

Investments and development plan: In conclusion, the Deloitte Greece report highlights the human potential (20%), the technologies IT & communications (19%) and research & development (16%), as most popular sectors to invest in the next three years. Remarkably, almost 50% of Greek businesses consider it likely/very likely to utilize the resources of the "Greece 2.0" program for possible acquisitions or mergers.

8. The OECD Economic Survey on Greece (2023)

In January 2023, the Organization for Economic Co-operation and Development (OECD) published its latest examination and policies review of the economic situation of Greece. According to survey, Greece has recovered strongly from the COVID crisis.

On the positive side, government support measures, reviving tourism and other exports, and improving consumer and investor confidence all supported a rebound in demand, returning GDP to its pre-COVID crisis level. Continued reforms are improving the business environment, helping to attract rising foreign direct investment. These factors and the end of short-time work schemes contributed to strong jobs growth and reduced the unemployment rate to a 12-year low.

On the negative side, surging energy prices, supply disruptions and renewed uncertainty, especially since Russia's aggression against Ukraine, are sharply slowing the recovery. The war is directly affecting Greece's energy supply and costs. Its indirect effects are compressing spending and delaying investment and hiring. The government's accelerating disbursement of its ambitious RRP and expanding fiscal support to energy consumers have been buffering these shocks and would help the recovery resume once the security situation and energy prices stabilize.

The recovery is slowing (numbers in %) (source: OECD-2023)

	2022	2023	2024
Gross domestic product	5.1	1.1	1.8
Private consumption	8.0	0.5	1.4
Gross fixed capital formation	8.5	2.5	5.0
Exports of goods and services	5.1	-0.5	2.9
Current account balance (% of GDP)	-7.1	-8.9	-8.8
Employment	6.2	1.1	0.3
Harmonised consumer price index	9.5	3.7	2.3
Fiscal balance (% of GDP)	-4.3	-2.6	-1.7
Primary budget balance (% of GDP)	-1.6	0.5	1.5
Government gross debt (Maastricht definition, % of GDP)	175.1	170.7	163.6

According to the OECD report, recent public investment management reforms can help to address challenges such as shortages of well-trained staff and fragmented responsibilities across many different bodies, such as for public procurement. New dedicated public project implementation and auditing bodies may further build spending quality and integrity, furthering recent improvements in perceptions of corruption.

But a sustained recovery will require tackling long-standing challenges. The share of adults in work lags other OECD countries, especially among women and youth, despite the post-COVID recovery in employment. Yet skill shortages are emerging and aging is reducing the working-age population. A legacy of low private investment weakens productivity and firms' ability to seize emerging opportunities in digitization and the green economy transition.

The government introduced some policies that could raise youth employment. It has been expanding both the number and quality of apprenticeships and is reshaping all levels of education to focus more on the skills and experience needed in the workplace. OECD's cross-country experience suggests that youth employment support based on profiles of individuals needs and that integrates multiple interventions – such as temporary employment subsidies, focused training and work experience – is most beneficial.

Private investment has been low for many years. Digitization and the green economy transition are creating new investment opportunities. Rising foreign direct investment creates opportunities for domestic firms to raise their productivity and expand their markets. Expanding the role of medium-sized and larger firms, and deepening management capacity, will help Greece to seize these opportunities.

Adapting to climate change will require adjusting public infrastructure and encouraging people to take protective measures. But climate policies can stoke opposition and risk being reversed. Responsibility for implementing climate policies is spread across many bodies, weakening implementation. Many workers and firms will need to adjust their skills and activities. Climate-related active labor market measures focus on workers in the most directly-exposed sectors.

Preparing Greece's infrastructure for a sustained recovery and the green economy transition will require more and better-quality public investment. In education, both spending and outcomes had fallen short of other OECD countries (for example, regarding overall skill levels of adults, and the government has been undertaking extensive reforms intended to improve outcomes.

The on-lending strategy [i.e. to borrow money and lend it to someone] seeks to provide timely financing at below-market costs to address Greece's large private investment gap, without requiring direct contributions from public finances.

The ambitious scheme requires loans be for new investments that are flagged as green, digital, or that support either exports, research and innovation, or mergers and acquisitions. The investments are funded by one of three channels:

1. The main domestic private banks, for investments by firms of all sizes. The Recovery Funds can cover up to half of the investment costs, the private investor at least 20% and the bank the remainder.
2. The European financial institutions, mainly for significant investments by medium and larger corporations. The government has entered a €5bn (2.6% of 2022 GDP) agreement with the European Investment Bank (EIB) and €0.5bn with the European Bank for Reconstruction and Development (EBRD). The Recovery and Resilience Funds can cover up to half the investment costs and include an additional contribution of up to EUR 0.5 billion from the EBRD.
3. A fund to finance up to 70% of equity investments in potentially high-growth or digitally innovative smaller and medium sized enterprises, overseen by the state-owned Hellenic Development and Investment Bank (HDIB).

Venture capital can be especially supportive to entrepreneurs without established relationships with banks, such as researchers looking to commercialize their innovations, an area which has been especially challenging in Greece. The government is expanding its support for venture capital funds, notably through on-lending of its Recovery and Resilience Facility credits. Strong, independent monitoring and accountability can support their performance and the efficiency of their governance and operations.

Reviving firms' willingness to invest, innovate and grow is essential for Greece to seize the looming

opportunities of digitization and the green economy transition. Greece's increased competitiveness, and the ongoing reform efforts to improve the business environment and access to finance are addressing long-standing barriers to private investment. Some indicators suggest Greece's private sector may be starting to become more dynamic. The share of fast-growth firms has risen in recent years, medium-sized firms are leading the growth in goods exports, and businesses' research spending is rising.

Nurturing such positive trends is essential for raising private investment. Much of the workforce and capital stock are trapped in low-productivity-low-growth firms. Weak business dynamism, with few new challengers entering markets, low productivity firms remaining in the market, and few workers who move to more productive firms, stifle willingness to invest and productivity growth.

The productivity and adoption of digital technologies of small firms lag further behind larger firms than in other OECD countries. A number of these firms have a legacy of defaulted loans and restructuring these loans so as that they are again serviced will be key for these firms to again be able to access new finance.

9. Greece: Latest available numbers

While the outlook for 2023 and beyond remains uncertain, with GDP well above pre-Covid levels reopening effects should now be largely over. Tourism receipts also returned to their historical peak in the summer of 2022 making it unlikely that Greece will see further substantial gains in 2023.

The recovery seen in employment was a powerful driver of consumption over the first half of 2022 but now appears to be losing steam. Changes to real disposable income will increasingly depend on inflation developments, with inevitable side effects on consumption. Investments should, in principle, remain relatively supported thanks to the inflow of European Recovery Funds but will not be immune to persistent uncertainty surrounding the cost of projects.

Despite global headwinds, the Greek economy will grow by around 2% in 2023. Higher prices should squeeze consumers through the winter, but fiscal support would partly compensate for the hit. At the same time, the economy should continue to benefit from the implementation of the EU Recovery Plan.

Even though GDP growth will slow down substantially in 2023, Greece can avoid a recession and outperform versus the rest of the euro area due to tourism and investments. Over the medium term, Greece will grow smoothly, largely linked to the execution of investments and implementation of reforms under the EU RP.

The Greek economy's recovery from the pandemic crisis has been among the fastest among euro area countries, with Greece's GDP returning to pre-COVID levels as early as 3Q21, thanks to a broad-based recovery in private consumption, investment and exports. Post-pandemic tailwinds and households' excess savings likely boosted activity in 2Q and 3Q22: as a result, we see strong GDP growth this year, at 6.1%. Again, we expect the economy to slow down this winter, as higher prices squeeze consumers' disposable income.

The Greek economy in a nutshell (%YoY)

	2021	2022F	2023F	2024F
GDP	8.1	4.9	0.7	1.6
Private consumption	6.1	7.8	0.7	1.8
Investment	19.8	8.6	3.5	5.4
Government consumption	2.4	-1.3	0.4	0.4
Net trade contribution	0.8	-1.6	-0.5	0.4
Headline CPI	0.6	9.3	4.3	2.4
Unemployment rate (%)	14.8	12.4	11.6	11.7
Budget balance as % of GDP	-7.8	-4.0	-2.9	-2.4
Government debt as % of GDP	193.3	176.0	170.3	164.5

Source: Thomson Reuters, all forecasts ING estimates

(Note: %YoY is the percent change year to year)

The government's large fiscal packages supporting firms and households should mitigate the impact of higher inflation on the economy, and the continued implementation of the Recovery and Reliance Plan (RRP) should support growth next year. All in all, while we expect GDP growth to

slow down substantially in 2023, we project that Greece will avoid a technical recession and outperform vs the euro area economy. Risks, however, remain tilted to the downside, in particular in a scenario of a full cut-off of Russian natural gas.

Over the medium term, the RRP should help address some of the more endemic and chronic issues that have been affecting the Greek economy since the financial crisis, lift potential GDP and contribute to reducing the country's high unemployment rate. The implementation of reforms aimed at increasing the ease of doing business in Greece will likely boost Foreign Direct Investments (FDIs) and help the country to close the investment gap versus the rest of the euro area that was opened with the financial crisis.

Private consumption rose sharply in 2022, supported by a normalization in the saving rate and households starting to dip into their excess savings. Greece has accumulated a large share of excess savings during the pandemic, a factor that likely supported consumption in 2Q and 3Q in 2022.

However, part of these savings is most likely sitting in the pockets of higher-income households with lower marginal propensity to consume, a fact which should in part limit the extent of the support.

Non-discretionary inflation has been rising sharply in Greece and stands now above the level of other major euro area economies, and this has put pressure on consumers going into the winter. However, the government in Greece has delivered one of the largest packages of measures to shield consumers from higher inflation, and this will in part moderate the impact of higher inflation on activity.

The Greek growth profile has recently reflected developments on the inflation front. The acceleration of inflation over the summer (culminating in September's 12.1% peak) took its toll on consumption, which saw a 0.1% quarter-on-quarter contraction in the third quarter of 2022 despite generous energy subsidies.

Together with a net export drag, this caused a 0.5% contraction in GDP for the third quarter of 2022. We suspect a similar pattern will follow in the fourth quarter despite confirmed fiscal support and decelerating inflation.

In order to address rising inflation and its negative effects on lower income households and firms, the Greek government has delivered several fiscal packages since September 2021, for a total of around €8bn (or 4.4% of 2021 nominal GDP).

Measures include fuel subsidies (Fuel Pass 1 and 2), subsidies for households and businesses' electricity bills, one-off payments to lower-income households, and cash incentives to replace old energy appliances. Most measures are due to expire in January 2023, but the Greek government has already announced its intention to deliver an additional package of measures as the autumn approaches.

The new set of measures could extend the Fuel Pass as well as subsidies for electricity bills and reintroduce a one-off payment in support of lower income households. The new package would not affect the current government's fiscal deficit estimates, given that stronger-than-expected growth so far in 2022 has generated more than €2bn of extra revenues that can be used for the new set of measures.

The tourism sector accounts for a large share of Greece GDP, more than 20% based on 2019 data, before tourism flows were disrupted by the pandemic. Tourism into Greece has already started normalizing as of April 2022, a fact which was reflected in higher services exports in 2Q22 and

3Q22.

The normalization of tourism activity has clearly been one of the main drivers behind stronger growth in 2022 in Greece. A recession in the rest of the euro area, which is the likely base case for 2023, would probably cause some slowdown in tourism activity in 2023, an effect mitigated by the fact that around 40% of tourism in Greece comes from outside Europe.

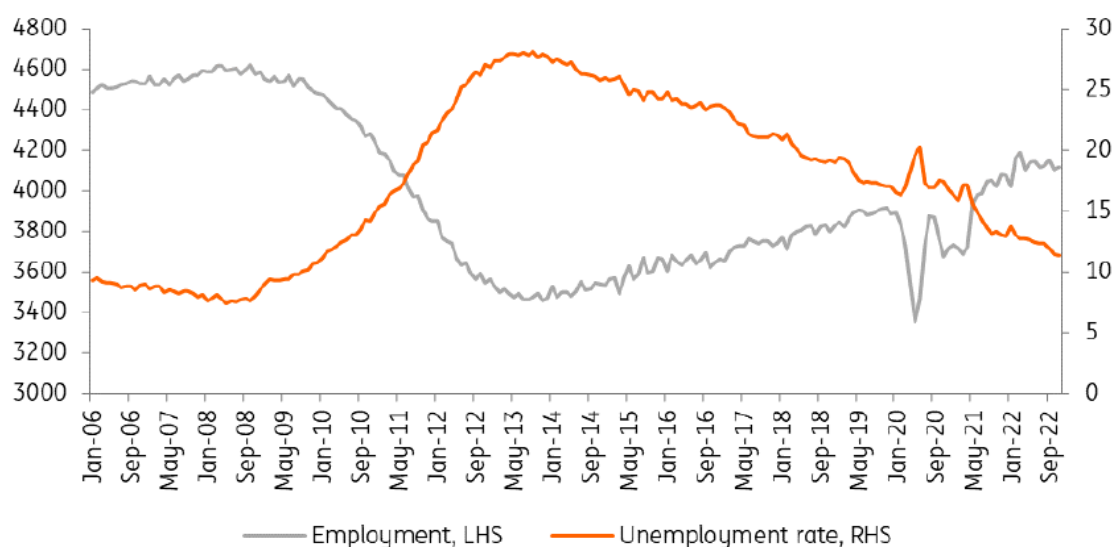
After several years of under-investment in Greece, resources under the Recovery Fund Facility represent a major opportunity for the country: Greece's RRP is worth a total of €30.5bn, around 16% of the country's 2019 GDP, and of this amount, the country has already received €7.6bn.

The execution of the plan is progressing at a somewhat slower pace than initially anticipated, suggesting that the money from the RRF will start to have a more material impact on the Greek economy only later in 2023 via stronger investment. At the same time, the progress made in reforms implementation and improved macroeconomic fundamentals—which allowed Greece's exit from the enhanced surveillance framework mid-August this year—all led to a gradual rise in foreign direct investments (FDI) in Greece.

Higher FDI could help the country close the investment gap versus the rest of the euro area, and boost growth. Foreign direct investments into Greece have been mainly focusing on the service sector so far, reflecting amongst other things the improvements in Greece's financial sector, real estate management and logistical activities. However, investment in the secondary sector also picked up somewhat in the aftermath of the pandemic.

The RRP for Greece provides financing to as many as 106 investment projects, which include investment in transport infrastructure, in energy efficiency for buildings, upgrades of the electricity network (in particular, for the islands), digitization of SMEs as well as upgrading Greece's up- and reskilling systems.

Employment recovery is losing steam



Source: Refinitiv Datastream

The Greek RRP also addresses many of the country's structural economic challenges as identified by the 2019 EC country-specific recommendations and the Pissarides Report's suggestions. Among these, the reform of the public administration, modernization of the labor law, and, boosting FDI

and domestic investment, reforms that aim at simplifying the business environment in which firms operate.

The weakness of its labor market represents a big challenge for the Greek economy. Not only is the unemployment rate in Greece around two times that of the euro area, 11.4% vs 6.6% in July 2022, but Greece also shows one of the highest levels of long-term unemployment (defined as people who have been unemployed for 12 months or more), and one of the lowest labor participation rates.

Greece's inflation has been rising sharply in 2022, from around 5.5%Y at the start of the year to 11.6%Y in July 2022. In August, inflation fell modestly according to a preliminary Eurostat release, with HICP at 11.3%Y. The main drivers behind such high rates of inflation are fuel and electricity prices; as of July, energy inflation stood at almost 50%Y within CPI.

Food inflation has more than doubled this year, from 5.0%Y in January 2022 to 13.0%Y in July. Core inflation remains much lower than headline in Greece, at around 3.6%Y; however, items such as furnishing as well as services such as hotels and restaurants have also seen a rapid rise in inflation. Overall, we expect Greek inflation to reach 9.5%Y in 2022, and to average 3.7%Y in 2023.

A smooth and efficient implementation of the Greek RRP would likely contribute to credit rating upgrades within our forecast horizon, together with sound fiscal policies aimed at fiscal consolidation and an improvement in banks' asset quality.

Greece has the highest debt to GDP levels in the euro area, at around 193% at the end of 2021. In an environment in which the ECB is embarking on monetary policy normalization and yields are rapidly rising, such high debt levels could become less sustainable over time.

A round 75% of the country's debt comprises official liabilities, and virtually 100% of Greek debt is fixed rate. The weighted average maturity of debt stands at 20.6 years if we include official debt (ESFS and ESM loans for example have a maturity of 30 years) and at 9 years for the debt securities. The ongoing sharp rise in interest rates can still be accommodated in the short run without raising debt sustainability concerns. The inflation tax effect, albeit less powerful than in 2022, will still be at work.

Although the Government's primary surplus target [i.e. the component of the fiscal surplus (deficit) that is comprised of current government spending less current income from taxes, and excludes interest paid on government debt] could be slightly missed, a substantial fall in the debt/GDP ratio towards the 170% level materializing nonetheless.

All these factors contribute to a very low implicit interest rate in Greece—in fact, the lowest across all euro area peripheral countries—and given the structure of Greek debt, it will likely remain unchanged for a very long time. Last but not least the ECB's PEPP re-investments and the presence of the newly announced TPI provide additional insurance against an unwarranted tightening in financing conditions in Greece.

10. The ACG 150 Perspective and Recommendations

A focus on Greece's greatest present and future needs and the question of how ACG can assure the best futures for its students and Greece as a whole gave birth to the ACG 150 strategic plan in 2017. This plan and the resulting initiatives aim at advancing ACG's tradition of educational excellence while simultaneously making a material contribution to the economic and social vitality of Greece and the promotion of Hellenic culture. (For the structure of the ACG 150 initiatives and the relationships between the various units involved see Appendix 14.4.)

10.1 Food, Tourism and Leisure in Greece

a. Greece 2023: Food Market Overview - Economic Contribution

The food industry and, on a broader scope, the agri-food¹ sector are vital components of the Greek economy and a largely stable source of employment for the country. These aspects of the agri-food sector have been generally maintained throughout challenging times such as the Greek economic crisis and the COVID-19 pandemic, thus demonstrating the sector's ability to continue serving as a fundamental catalyst for progress. The agri-food sector's importance to the Greek economy derives from its prominence in the manufacturing landscape of Greece, the tight link between the Greek and the healthy Mediterranean diets, the rich soil of the country along with favorable climate conditions, a strong presence of prosperous food companies, a high level of food safety and quality, and a focus on exporting domestically produced agricultural and processed food items (Alpha Bank, 2020; Enterprise Greece, n.d.; Hellenic Republic, 2018; Mylonas, 2015; Skylakaki & Benos, 2023).

The agricultural² sector in Greece has traditionally held a prominent position within the nation's economic and social fabric. Between 2006 and 2021, the ratio of the gross value added (GVA) of the agricultural industry to the gross domestic product (GDP) for Greece increased by 0.8%, the largest increase out of 10 EU member states that also recorded an increase during this period (Eurostat, 2022). The GVA from 2018 (2.7%) to 2019 (3.1%) to 2021 (3.3%) each time surpassed the European average (2018 EU-28: 1.1%, 2019 EU-27: 1.3%, 2021: 3.3%) by more than double (Eurostat, 2019; Eurostat, 2020a; Eurostat, 2022).

In 2021, Greece's primary sector, including forestry and fishing, achieved a GVA of €7.03 bn., which is 4.4% of the country's total GVA and more than double the EU average (1.6%), signifying the importance of agriculture's contribution to the primary sector in particular and the economy of Greece in general (Skylakaki & Benos, 2022). The agricultural sector has a high proportion of small and family-owned farms. In 2016, of the total share of farms 67.7 % were very small farm, with less than €8000 of standard output, and 99.3 % were family farms, with more than 50 % of regular labor coming from family members (Eurostat, 2019).

A growing contribution to Greece's overall economy even during the COVID-19 pandemic also comes from the food & beverage sector (including tobacco), where an upwards GVA trajectory was noted from 2017 (2.6%) to 2020 (2.8%) (Enterprise Greece, n.d.). In 2019, the food & beverage industry came first among the manufacturing sectors in terms of the number of companies, covering 28.5% of all Greek manufacturing companies, and its turnover corresponded to about 1/4 of the total turnover of all branches of manufacturing.

1 Agrifood is a broader term which encompasses both the agricultural sector and the food industry. It refers to the entire value chain involved in the production, processing, distribution, and consumption of food products. Agrifood encompasses activities related to agricultural production, such as farming, cultivation, and livestock rearing, as well as activities related to food processing, manufacturing, packaging, distribution, and retailing (Alpha Bank, 2020; Campanhola & Pandey, 2019).

2 Agriculture is classified as a primary sector activity within the economy, which focuses on the extraction or harvesting of products from the earth's resources (Eurostat, 2019).

In terms of turnover within food & beverage itself, the bakery sub-sectors seem to have the highest shares at 16%, dairy products and fruit at 15% each, meat at 13% and beverages at 12% (IOBE, 2022). When it comes to the distribution of resources within the food & beverages manufacturing sector, the largest enterprises account for 36% of the total production value, 40% of the gross value added, and 34% of the turnover (Alpha Bank, 2020).

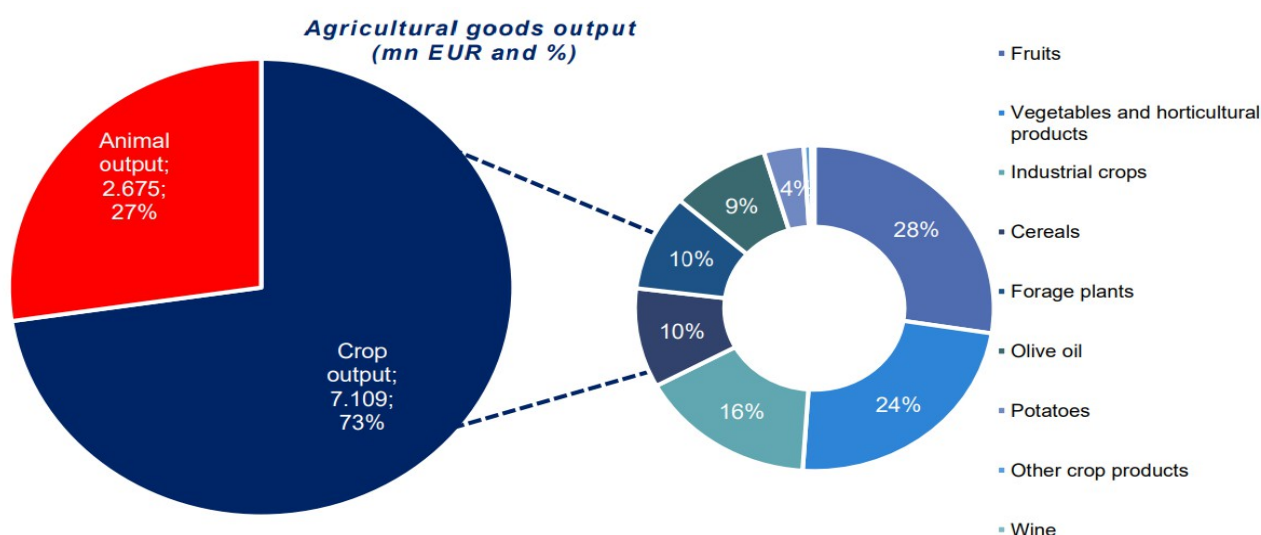
In regard to revenue, the food & beverage sector has shown consistent growth over the years. Between 2009 and 2016, it achieved an average annual revenue growth rate of +1.86% and in 2016 it accounted for one-third of the Greek manufacturing sector's revenue. The sector experienced a rise from €15.1 bn. in 2016 to €16.5 bn. in 2019 to €17.7 bn. in 2021, with a minor decline in 2020 attributable to the pandemic. Despite this, it retained its position as the dominant sub-sector within Greek manufacturing in 2021.

An interesting aspect of this sector is the concentration of revenue among a small percentage of companies. Remarkably, 63% of the total revenues in the food & beverages sector are derived from just 1% of the companies, indicating a significant level of consolidation. Conversely, the agricultural sector, including forestry and fishing, demonstrated remarkable resilience, achieving a growth of approximately 19% between 2019 and 2021, even amidst the challenges posed by the COVID-19 pandemic (Enterprise Greece, n.d.; PwC, 2018).

Key Market Segments

Crop production holds the highest share of the total agricultural goods output in Greece, at 73% in 2019 (see Figure 1) (Alpha Bank, 2020). The main products of crop production include categories connected to a healthy diet such as fruit, vegetables, and olive oil (Alpha Bank, 2020; European Commission, 2021; Skylakaki & Benos, 2023). Animal production comprised 27% of the total agricultural goods output in 2019 (Alpha Bank, 2020).

Figure 1. Greek agricultural goods output in 2019



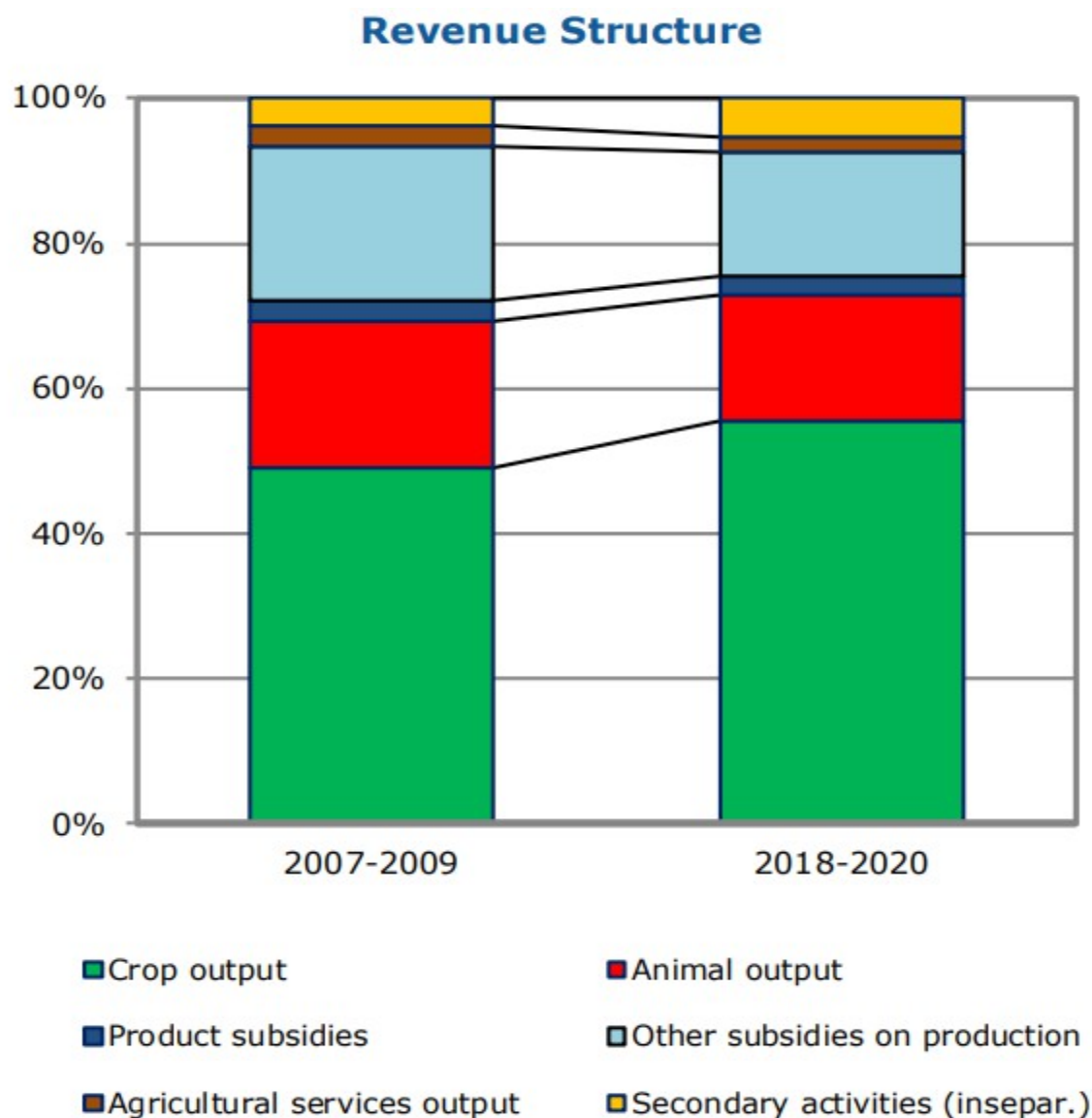
Source: Eurostat, Economic accounts for agriculture, Data processing: Alpha Bank, 2020

The main products of animal production include meat, milk, and other products such as eggs and raw wool (Alpha Bank, 2020; European Commission, 2021). Regarding milk, the production in 2019 is divided among sheep (46%), cattle (33%) and goat (21%). Aquaculture recorded in 2019 64% out of the total fish production. The majority of fish farms are found in the regions of

Thessaly and Central Greece (27%) and the Aegean Sea (16%) (Alpha Bank, 2020).

In terms of agricultural revenue structure, the revenue generated from the crop output rose from under 50% during the years 2007-2009, which include the economic crisis, to over 50% during the years 2018-2020, which include the beginning of the COVID-19 pandemic (see Figure 2) (European Commission, 2021).

Figure 2. Revenue structure of Greek agricultural output, 2007-2009 vs 2018-2020



Source: European Commission, 2021

When it comes to Greece’s position in the EU market, it ranks high in the production share of various food product categories.

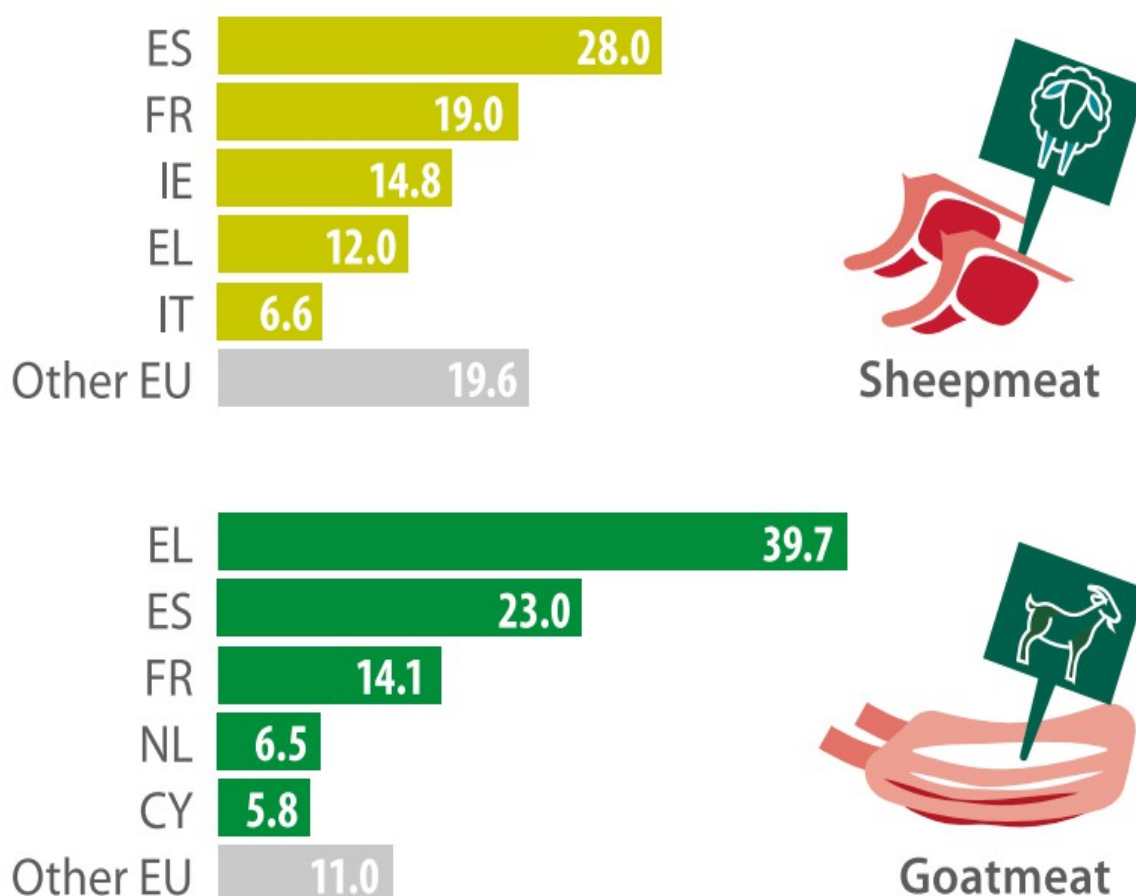
Considering EU fruit production, Greece holds a significant share with peaches, a key fruit, and oranges. In 2018 Greece ranked third in orange production (14%) and second in peach production (30.9%) (Eurostat, 2019). In 2021, even though the share dropped from 2018, Greece still ranked highly, being third in orange production (12.4%) and third in peach production (23.8%) among other EU states (Eurostat, 2022).

Regarding livestock population, Greece accounted for the highest share of goats (24.9%) and the

third highest share of sheep (12.1%) among the EU member states in 2021 (Eurostat, 2022). Befittingly, the country achieved in the same year the fourth highest share of sheep meat production (12%) and the highest share of goat meat production (39.7%) (see Figure 3) (Eurostat, 2022). Despite these distinctions among EU member states, Greece's meat production is mainly focused on poultry, which reached a 94% domestic share in 2019 with 54% of the production coming from Epirus (Alpha Bank, 2020).

While Greece does not hold a significant share of EU dairy products, it holds the second highest share of EU milk from animals besides cows (20.9%), following Spain (24.3%). In terms of value, non-processed cheese emerged as the top food & beverage product in Greece (€1.2 bn.) in 2021, as well as in Estonia (€0.1 bn.), the Netherlands (2020: €2.8 bn.), France (2020: €6.5 bn.), and Italy (€7.5 bn.) (Eurostat, 2022).

Figure 3. Share of quantity of EU meat production



Note: Greece is marked as EL.
Source: Eurostat, 2022

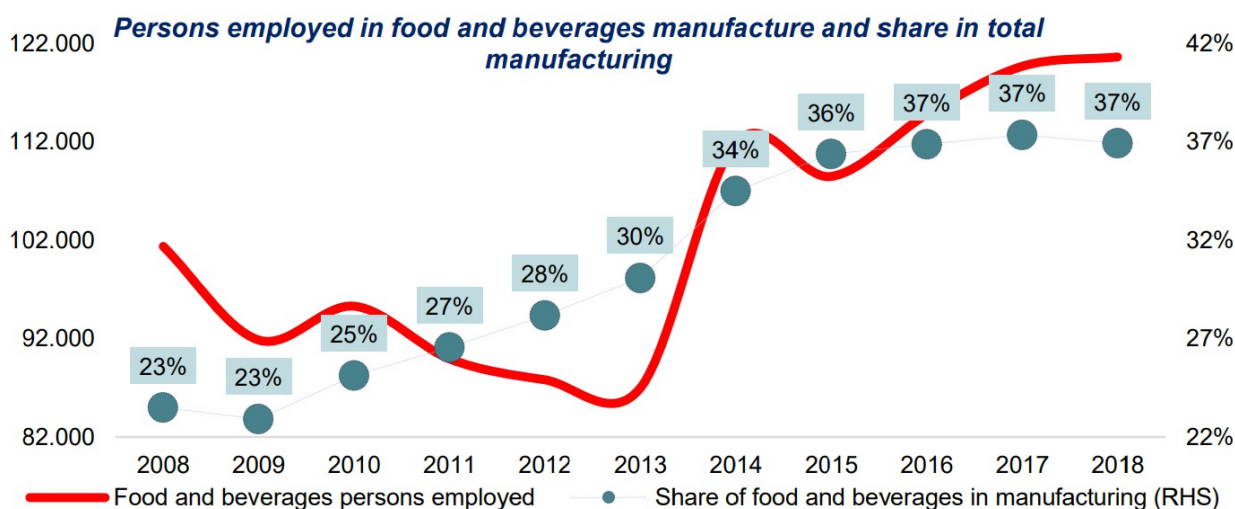
Employment

The agri-food sector remains a vital sector of employment in Greece and, generally, the agricultural sector stands as a steadfast and significant "employer," with 12.4% of Greece's workforce employed in 2010 and 10.6% in 2017, more than double the European average (EU-28, 2017: 4.1%), highlighting its enduring stability and importance (Eurostat, 2019; Hellenic Republic - Greece in the World, n.d.).

Focusing on food & beverages manufacturing, the sector has proven to be resilient, demonstrating remarkable recovery during the previous economic crisis when compared to other industries. While

total manufacturing employment decreased by 24%, employment in food & beverages manufacture witnessed a cumulative increase of 19% after 2013 (see Figure 4). In terms of employment, food and beverages dominate the manufacturing sector, employing 37% of the total workforce in this industry in 2018 and 35.2% in 2019 (Alpha Bank, 2020; IOBE, 2022). The largest enterprises in the food & beverages manufacturing sector employ the second-largest share of persons, at 23% (Alpha Bank, 2020).

Figure 4. Persons employed in food & beverages manufacture and share in total manufacturing, 2008-2018



Source: Alpha Bank, 2020

Among EU member states, Greece presented the second highest percentage of food supply³ workers in 2019, at 18%. Romania and Poland were first and third in the ranking, with 23% and 14% of the food supply workers share, respectively. At the same time, the highest percentages of food supply workers were recorded in regions of the same three countries.

The ten regions in Greece that surpass all other EU regions (with the exception of Polish and Romanian regions) in food supply workers share are the following: Western Greece (34%), Peloponnese (31%), East Macedonia, Thrace (28%), Continental Greece (27%), Thessaly (26%), West Macedonia (23%), North Aegean (23%), Crete (23%), Central Macedonia (22%) and Epirus (21%) (Eurostat, 2020b).

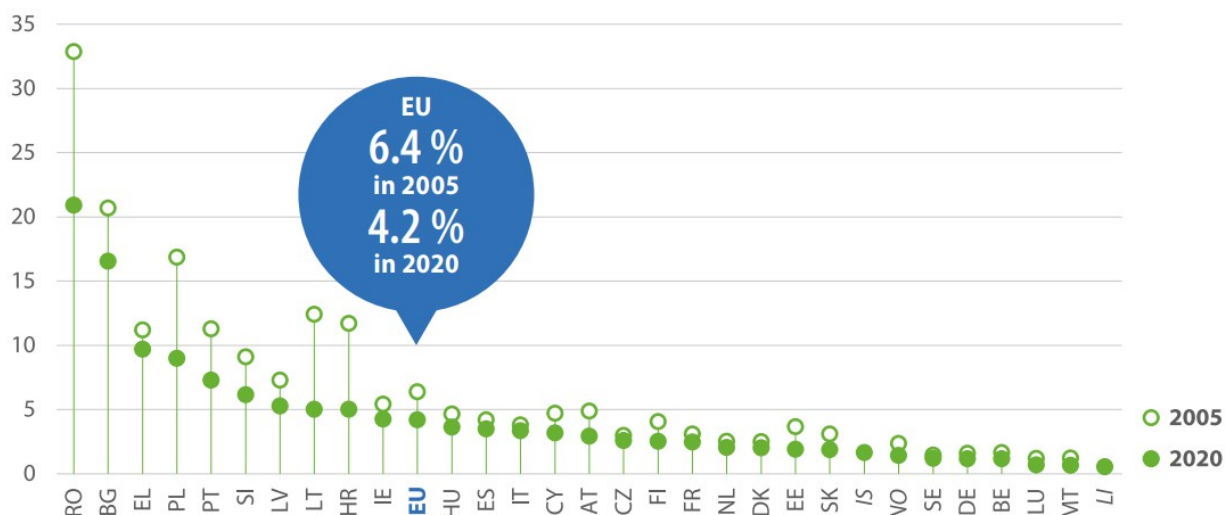
When focusing specifically on crop and animal production, hunting and related service activities, Greece remained a big employer in 2020 after the start of the COVID-19 pandemic, with the relevant workforce accounting for just under 10% of total employment. Even though Romania (20.9%) and Bulgaria (16.6%) rank higher in workforce share, Greece's drop since 2005 is significantly lower than the former and fairly close to the latter (see Figure 5) (Eurostat, 2022).

³ Eurostat utilizes the term "food supply" to refer to the following economic activities, as defined under [NACE Rev.2](#) classification: 01 - Crop and animal production, hunting and related service activities, 03 - Fishing and aquaculture, 10 - Manufacture of food products, 11 - Manufacture of beverages, 46.2 - Wholesale of agricultural raw materials and live animals, 46.3 - Wholesale of food, beverages and tobacco, and 47.2 - Retail sale of food, beverages and tobacco in specialised stores.

Figure 5. Employment share in crop and animal production, hunting and related service activities

Employment in agriculture, hunting and related service activities

(% share of total employment, 2005 and 2020)



Note: Greece is marked as EL, Bulgaria as BG, and Poland as PL.

Source: Eurostat, 2022

Export Capabilities

During the decade 2009-2019, the agri-food sector demonstrated a substantial increase in the ratio of exports to imports, ranging from 65% to 88%. This growth was primarily driven by the significantly higher export growth rate compared to imports, with agri-food product exports surging by 51% while imports increased by only 12%. These findings highlight the sector's considerable exporting orientation, particularly notable in aquaculture products, as 80% of Greek aquaculture products, specifically sea bass and sea bream, are exported to 32 countries worldwide, mainly in the EU market (72%). Moreover, the agri-food sector witnessed a significant cumulative decline of 62% in its trade deficit over the same decade, with figures dropping from €2.7 bn. in 2008 to €840 mn. in 2019 (Alpha Bank, 2020).

In 2020, Greece experienced a positive trade balance for agricultural products after a decade, with exports accounting for 21.3% of total exports and surpassing €6.5 bn. This was primarily due to the surplus in processed products, both within the EU and globally; a fruitful result of export efforts in the processed food sector in recent years (European Commission, 2021; Skylakaki & Benos, 2022). In more detail, processed food & beverage exports represented 13.8% of the Greece's overall merchandise exports in 2020. In 2021, there was a slight drop to 12.1% (IOBE, 2022).

The product mix of Greece's food & beverages sector in terms of exports reveals a consistent pattern and stable composition, which has remained largely unchanged between 2020 and 2021. Notably, fruits and vegetables (28.7%), dairy products (19%), and olive oil and other fats (17%) continue to dominate the export landscape, collectively accounting for approximately 65% of total exports in this sector in 2021 (IOBE, 2022).

Greece's agricultural product exports showed a consistent motif of distribution over the years. In both 2011 and 2020, 38% of exports were destined for non-EU countries, while 62% went to EU countries (European Commission, 2021). Notably, while agricultural exports to non-EU countries exceeded imports, the opposite was true for EU countries. Despite two-thirds of exports going to

the EU, negative balances persisted across individual categories such as food preparations and beverages (Eurostat, 2022; Skylakaki & Benos, 2022).

Another relatively stable factor regarding Greece's food & beverage exports are its largest trading partners. Five trade partners have been key clients over the last decade, namely Italy, Germany, Cyprus, the UK, and the USA. The USA has climbed the ranks in regard to share of Greek agri-food exports compared to a decade ago, from fifth to third place (IOBE, 2022; Mylonas, 2015). The ranking of key trade partners in 2021 is as follows: Italy (15.6%), Germany (15.4%), USA (8.7%), UK (7.3%), and Cyprus (6%). The top 10 Greece's largest trading partners of domestically processed food exports can be completed by adding five EU countries, namely Bulgaria (4.7%), the Netherlands (4%), France (3.8%), Romania (2.8%), and Poland (2.4%). This top 10 accounts for 70.7% of all food & beverages exports in 2021 and is largely unchanged from 2020 (IOBE, 2021; IOBE, 2022).

Industry Trends

- Increasing demand for customized food services tailored to individual preferences and characteristics of food enthusiasts.
- Rural areas in some countries offer specialized tourism experiences to attract foodies, but urban environments are favored due to their wide range of diverse culinary options.
- Millennials and GenZ prioritize culinary experiences when choosing a destination.
- European consumers show a willingness to adapt their dietary preferences for environmental sustainability.
- Increased awareness of the importance of a healthy diet due to the pandemic and a general shift towards plant-based food products in the EU, with a projected increase in the ratio of vegetable to animal protein intake within the next decade. This is a favorable trend for Greek production, as more than 50% of the value of Greek agricultural production comes from fruits, vegetables, and olive oil, which are linked to healthy nutrition.
- Brand awareness of organic products in the EU is satisfactory, as 1 in 4 consumers recognize the relevant brand used in the EU.
- Greek organic farming is in an upward trend, with the share of the total Greek agricultural area dedicated to organic farming being 10.15% (534,629 hectares) in 2020 compared to 9.01% (462,618 hectares) in 2012. The 2020 share surpasses the EU average (EU-27: 9.09%) but lags behind EU's Farm to Fork Strategy's objective to achieve a minimum of 25% organic farming across the EU's agricultural land by the year 2030.

Opportunities

- Growing investment interest in sector
- Expansion to high potential markets (USA)
- Entrepreneurial opportunities from COVID-19
- agri-food + tourism -> agrotourism
- Branding and marketing of Greek specialty foods to increase awareness and connect them with signature experiences (e.g., yachting)

Challenges

- Limited agri-food exports compared to their potential as high-quality products (e.g., olive oil, fish).
- Structural issues in the Greek agricultural sector, which include small and fragmented agricultural units, ineffective organization, high average age of farmers, and a negative age structure of the rural population. These have led the Greek agricultural sector to increasingly rely on subsidies while neglecting to strategically promote and brand Greek agri-food products.
- A lack of targeted technological knowledge and specialized training.
- Having a well-defined culinary identity plays a crucial role in the strategic development of a country's culinary tourism. In the case of Greece, however, there appears to be a lack of

clarity regarding the definition of pure national gastronomy.

Future Outlook

The objective is to augment productivity growth and enhance competitiveness through unexploited dynamics of the sector. To achieve this, policy actions tied to agri-food that Greece has or could set as part of its growth strategy involve the following:

1. Fostering sustainable growth.
 - Via labor inspections in the agriculture sector as part of an action plan to diminish undeclared employment (Hellenic Republic, 2018).
2. Enhancing productivity.
 - Establishment of the "Greek Innovation Node for the connection of the Agri-Food-Industry-Tourism", a legal body governed by private law, and implementation of an "Action Plan" to link the tourism sector with agri-food and processing (Hellenic Republic, 2018).
 - Timely implementation of the "National Strategic Plan for the Agri-food Sector", which includes policy measures that support five operational priorities (Hellenic Republic, 2018):
 - i. Strengthening the competitiveness and productivity of the agri-food sector through policy initiatives that facilitate collaborative production models, foster the modernization of farms, reduce production costs, develop public infrastructure, and establish supportive frameworks for advisory services, knowledge dissemination and innovation to enhance productivity and competitiveness.
 - ii. Expanding the value chain of domestically manufactured goods through policy actions that promote value-added production and ensure quality and safety certifications for production and exportation.
 - iii. Human capital development and fostering entrepreneurship through policy initiatives that encourage the settlement and startup of young farmers, education, and training opportunities.
 - iv. Ensuring environmental and natural resources protection, while adapting to climate change through specific agri-environmental measures that simultaneously enhance product quality and added value.
 - v. Strengthening the social fiber of rural areas through local development policies that focus on public and private investments, which aim to diversify household incomes and improve access to digital support services (such as CLLD/LEADER and rural broadband).
3. Brand strengthening.
 - Efforts to achieve vertical integration within the food supply chain should also prioritize the development of strong brands. In this regard, fostering the promotion of Protected Designation of Origin (PDO) products and exploring synergies with sectors like tourism can play a significant role in effectively branding Greek agri-food products (Mylonas, 2015).

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b. Greece 2023: Tourism at a Glance – The Way Forward: The Context

According to the Travel & Tourism Development Index framework (World Economic Forum, 2021), Europe and Eurasia regions score highest and are expected to grow even more, while 32 out of the 43 economies of these regions score above the global average, thus placing Greece within a highly competitive context. Especially Balkan, Eurasian and Eastern European countries tend to build their competitiveness on pricing, with Southern European countries being highly dependent on tourism (World Economic Forum, 2021).

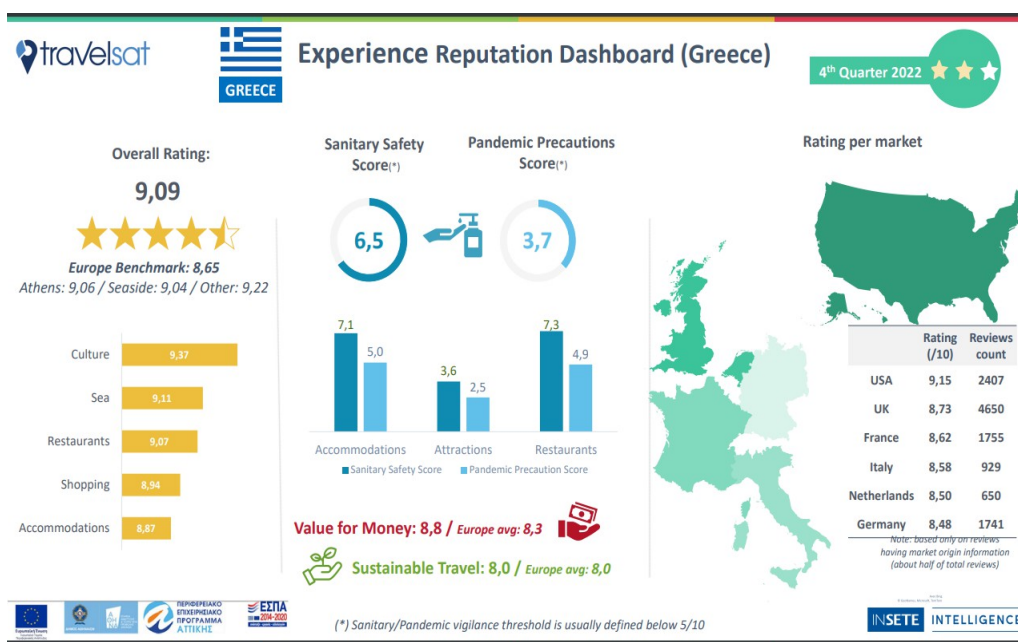
The 3S model “Sea-Sun-Sand” (Mediterranean Quality Status Report, 2017) has prevailed the coastal tourism development across the Mediterranean, placing 7 Mediterranean countries among the top 15 European Tourist Performers (Bloom Consulting, 2022), with Greece ranking at the 11th place.

Tourism is of vital importance to the Greek economy, as according to the latest reports it accounts for 14.9% of the GDP, while Greece ranks 13th among the top 20 countries that reported the biggest growth of tourism sector’s contribution to the GDP (World Travel & Tourism Council, 2022) in the post-pandemic era.

Greece Key Data		
2019	2020	2021
Total contribution of Travel & Tourism to GDP:		
20.7% of Total Economy EUR 38.2BN (USD 42.0BN)	9.2% of Total Economy EUR 15.5BN (USD 17.1BN) Change: -59.3% Economy change: -8.7%	14.9% of Total Economy EUR 27.2BN (USD 29.9BN) Change: +74.9% Economy change: +7.9%
Total contribution of Travel & Tourism to Employment:		
819.8 (000s) 21.0% of total jobs	707.8 (000s) 18.3% of total jobs Change: -13.7%	781.6 (000s) 19.9% of total jobs Change: +10.4%
Visitor Spend:		
International:		
EUR 20.5BN 27.6% of total exports (USD 22.6BN)	EUR 5.5BN 10.2% of total exports (USD 6.0BN) Change: -73.3%	EUR 13.1BN 17.6% of total exports (USD 14.4BN) Change: +138.8%
Domestic:		
EUR 9.7BN (USD 10.7BN)	EUR 5.7BN (USD 6.3BN) Change: -41.3%	EUR 7.8BN (USD 8.6BN) Change: +37.3%

Source: World Travel & Tourism Council, 2022

Regarding the overall rating of Greece in terms of reputation among tourists, INSETE (2022) provides the below depiction.



Source: INSETE, 2022

The Challenges

At a global level, the main challenges that tourism faces during the unstable recovery times, can be summarized in the following points, with a full recovery of the industry being expected in 2025 at the earliest (OECD, 2022):

- Rising energy, food, and other input costs
- Labor shortages and skills gaps
- Increased cost-of-living (limited/no household budget for tourism)

The biggest challenge faced by the tourism sector in Greece during the post-pandemic period is the lack of workforce, as during summer 2022 almost 23% of the vacancies was not filled in (Ikkos & Rassouli, 2022). This resulted in the production of lower quality services, fact that could jeopardize the long-term competitiveness of Greek destinations, as it was reflected on tourists' low-score evaluations of the respective 4* and 3* hotels (Ikkos & Rassouli, 2022).

This situation is attributed to the shift of employment that occurred during the pandemic, when employees working in tourism moved to other sectors that remained active during COVID-19 era, demonstrating lower vulnerability to environmental factors and no seasonality, thus providing a safer employment framework. For these reasons, many employees decided to remain in these sectors also after the crisis was over (Kourlibini, 2023).

The Plan

According to the World Economic Forum (2021), the tourism stakeholders could use as a platform to build local, regional, and even global development on, the following pillars.

Aligning with the global orientation towards sustainable development, Greece is working on a 10-year National Strategic Plan for Tourism Development, based on "product development and visibility, accessibility and connectivity, sustainable management and development, quality private and public infrastructure, and funding opportunities" (OECD, 2022).

In the meanwhile, the National Recovery and Resilience Plan (Greece 2.0) funds projects on (a) mountain, health and wellness tourism, (b) agrotourism and gastronomy, (c) marine and coastal infrastructure, (d) accessibility improvements, and (e) upskilling and reskilling in tourism, while a new legislation is at place regarding the establishment and operation of Destination Management and Marketing Organizations (DMMO) and Tourism Sustainable Development Observatories. (OECD, 2022).



Source: World Economic Forum, 2021

Furthermore, technological advancements in the field of digital transformation and artificial intelligence are also included in various projects under development, such as the digital transformation of the National Tourism Organization (NTO) (OECD, 2022).

Strategic Priorities/Plan

Holistic approach to brand "Greece" embracing destination brands, plus tangible and intangible cultural elements to strengthen the total "offer".

Decrease reliance on mass tourism destinations (such as Mykonos and Santorini) by developing alternative tourism models (e.g., agritourism, medical tourism, ecotourism, yacht tourism, wine tourism) that will allow for (a) a more sustainable future for the whole industry and (b) a better balanced exploitation of the Greek environment diversity - this would require a strategic mapping of the market as well as the respective existing/potential customers

Development of resilience across all levels of the hospitality industry to be able to pro-act/react towards any potential crisis (based on all weaknesses and challenges revealed during the pandemic).

Upgrading of the whole industry through a model that would incorporate/link the following key pillars (a) landscape/environment (b) customers/tourists (c) residents (d) businesses/industry and (e) governmental stakeholders. This would allow for a more sustainable and inclusive place branding process that would not only strengthen the respective local/regional/national place brands but would also allow for the design of more authentic and competitive touristic experiences.

Capitalize on the digitalization of the contemporary society to (a) attract special audiences [e.g., digital nomads (office view and respective campaign example by Marketing Greece), people with disabilities (virtual tours, AI applications to facilitate their experience on the spot), demanding audiences (to shape their own experience - customization at all levels)] and (b) build on Greece's rich heritage through famous sites/monuments (e.g., COSMOTE Chronos) and/or revival of less known aspects of our history (e.g., Smyrna project with Demokritos) that would also allow for attraction of more specialized audiences (e.g., dark tourists).

Managerial Priorities/Plan

Working team needs to be appointed for "Greece - Nation Brand Management" - to develop a clear and long-term strategic plan in cooperation with NTO, regional/local DMOs, to overview the implementation of the plan and to coordinate synergies across all parties/domains.

Seminars and workshops to be organized across Greece to promote exchange of knowledge and experience among stakeholders, to identify best practices and areas for improvement, as well as to explore potential opportunities and threats not only at a local level (e.g., per city/municipality), but also per sector (e.g., agritourism, yacht tourism, etc.)

Strategic mapping of the industry to take place based on the following parameters (a) location, (b) type of tourism, (c) industry infrastructure available, (d) accessibility, (e) human resources available/needed, (f) unique selling propositions/competitive advantages (i.e., sites/monuments, PDO products, tangible/intangible cultural heritage), (g) existing/potential audiences/customers.

Integrated marketing communication plan to be developed to ensure communication consistency across all audiences and in the long-term, umbrella slogan needed that would allow for incorporation and highlighting of all aspects of the Greek touristic product offer

Synergies need to be developed among the main stakeholders of the industry to strengthen competitiveness of the total offer, allow for bigger-scale investments, and promote exchange of

knowledge/expertise.

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10.2 Logistics, Shipping and Transportation Industry in Greece

Greece is considered the global leader of the maritime industry, controlling approximately 20% of the global commercial fleet, accounting to 5514 Greek owned vessels according IHS Global (n.d.).

Furthermore, Greece's strategic location at the crossroads of Europe, Asia, and Africa has made it an important hub for logistics and transportation. With a coastline of over 13,000 km, Greece has 16 commercial ports that handle around 230 million tons of cargo annually.

Piraeus, Greece's largest port, is the busiest port in the Mediterranean and serves as a gateway to the Balkans, the Middle East, and North Africa. It has been ranked as the 4th largest container port in Europe, handling 5.6 million TEUs in 2020 (EY, 2021).

Greece is also home to 15 international airports, with Athens International Airport being the largest and busiest airport in the country, handling over 25 million passengers annually. The Greek highway network consists of more than 2.145km conforming with the European motorway

standards, while an additional 500km are currently under construction, linking the country with neighboring countries, providing access to important markets and transit traffic.

However, the railway system seems to be the weak link of the logistics sector offering limited number of connections and dated infrastructure. The total railway network extends to 2552 km, however only 70% of which is appropriate for commercial traffic (Hellenic Railways Organization, n.d.)

The commercial transport industry, regardless of the mode, land, aviation, or maritime, and despite the generally positive outlook, has been facing a great number of challenges arising from both global and local (Greek) effects.

a) Russian invasion to Ukraine

The Russian invasion in Ukraine had a detrimental effect in the global supply chains. About 140 ships and more than 1500 seafarers got stranded in the war zone, many of them of Greek origin. Ukrainian ports became inaccessible while the EU sanctions on Russian products affected tremendously the trading patterns. Commodities have to be supplied from further away increasing the vessel demand and transport costs (UNCTAD, 2022b).

The Russian Federation is a leading oil and gas producer. The imposed Russian trade restrictions led to higher energy costs, consequently increasing marine bunker prices, increasing shipping costs for all sectors. By the end of May 2022, the global average price for very low sulfur fuel oil (VLSFO) had increased by 64 per cent with respect to the start of the year.

b) COVID-19 Pandemic

The pandemic disrupted global trade due to crew restrictions, port congestions and closures as well as increased demand for certain products. (UNCTAD, 2021). Following the dramatic drop in trade of 2019 and 2020, years 2021 and 2022 maritime trading demand rose by 3.2% and 1.4% respectively, which led to profound boost especially for container transport (UNCTAD, 2022a).

c) Environmental Regulations

Shipowners are faced with a hefty bill on the path towards decarbonization following the International Maritime Organization (IMO) set targets. The global investment to decarbonize the shipping industry is expected to exceed \$1.5tn (Krantz et al, 2020). Shipowners need to invest severely at the adoption of new technologies and renew their fleets with modern vessels in compliance with the newly imposed Carbon Intensity Index (CII).

In Europe the emissions trading system (EU ETS) alone will cost shipowners €7.38 billion per year by 2026 (Cullinane et al, 2022) further increasing the cost of transport and driving to larger required investments.

After 50 years of limited change, decarbonization demands adoption of innovation at the ship propulsion systems. While up to now the entire cargo fleet relied on internal combustion engines (ICEs) consuming heavy fuel oil (HFO), the industry currently faces two distinct choices. The first option is to continue utilizing ICEs that run on various "green" fuels, each possessing different techno-economic characteristics and challenges, supplemented by carbon capture and sequestration (CCS) techniques. The second "radical" alternative involves embracing all-electric ships that derive power from fuel cells utilizing green fuel, batteries, or small nuclear reactors. Similar challenges exist in all transportation modes including rail, truck, and aviation, where the alternative environmentally friendlier fuels and electric propulsion are also examined.

d) Digital Transformation

Further investments at the logistics, transport and maritime sectors are required to adopt and implement new Internet of Things (IoT) and Artificial Intelligence (AI) technologies to enhance

operational efficiency and safety. The digital revolution plays a significant role in dramatically enhancing various aspects of transport performance by replacing the outdated-legacy systems. The logistics and maritime industries need to utilize a wide range of digital tools that will significantly contribute at the improvement of fleet performance through information management, AI, performance monitoring, and optimization. Many of these tools can be retrofitted into existing the existing fleet of vessels and vehicles, offering opportunities for enhancing both new and current fleet operations. These advancements have the potential to unlock numerous small yet significant improvements in performance, spanning from fine-tuning transport efficiency to innovative cargo distribution systems.

Existing professionals should be trained to the new technologies, while a new era of young executives possessing a novel set of competences should be employed to implement them. (Hernandez-de-Menendez, M., et al, 2020).

Organizations are increasingly steering their attention towards automation optimization solutions like robotics automation and advanced analytics to gain more sophisticated insights of their operations and cut down on costs throughout the entire door-to-door transportation process. In addition, logistics key players are implementing more environmentally friendly solutions that eliminate emissions and overall waste to become more efficient.

e) Infrastructure development

Logistics-related facilities in Greece received approximately €150 million in investments in 2020. The sector's growth is being fueled by Greece's infrastructure master-plan, which has a budget of €13 billion and aims to modernize the country's transportation links, including roads, railways, ports, and airports. The plan also involves the privatization of ports and the construction of new road and rail networks.

Two significant logistics projects, the "Thriasio Pedio" freight village near Athens and the "Gonos" logistics center in Thessaloniki, are expected to play a vital role in transforming the industry. According to a recent study by EY, transportation and logistics accounted for 12% of total investments in Greece between 2017 and 2019, making it one of the top five sectors for investment in the country, twice Europe's average ratio.

f) Organization of the industry

Transportation and storage Gross Value Added (GVA) in Greece accounted for 7.5% of the total GVA economic activity for 2019, the 5th highest among EU-27 countries. The 3rd party logistics (3PL) sector is showing significant growth, with an average 9.8% CAGR in the 3PL industry revenue from 2015 to 2019, with EBITDA and liquidity portraying an overall positive performance of the sector over the same period. (KMPG, 2022).

The Greek 3PL market mainly consists of small-medium players. 78% of the total 1.550 3PL companies have annual revenue below EURO 1 million. The market is competitive, highly fragmented despite the presence of many global logistics organizations and most companies are showing significant growth. The Greek 3PL market grew by 4.6% in 2019 and is expected to grow by an annual average rate of 2.8% in the medium term (up to 2023).

Last mile delivery is also growing rapidly with approx. 5845 pickup drop off points (PUDO) (Last Mile Experts, 2022). On the other hand, the aviation and rail transport are essentially operating as monopolies since the facilities are operated by a single organization for each sector (Fraport operates 14 Greek airports and Trainose is the single operator of the rail system).

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10.3 Sustainability and Environment in Greece

The past decade (2012 – 2022) is characterized by the global realization of the urgency to respond to climate change, to environmental and social threats, economic crises and the need to focus on the green transition, circular economy, inclusiveness and justice as means of economic growth. Milestones of the past decade comprise a. the Paris Agreement (2015), a legally binding international treaty on climate change, adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France and b. the United Nations 2030 Agenda for Sustainable

Development and its UN 17 Sustainable Development Goals (SDGs) adopted in 2016, both signed by Greece.

The Climate Change Framework

Following the European Strategy on Adaptation to Climate Change (2013), Greece issued the National Strategy in Greece (2016) with the obligation for Regional Plans on Adaptation to Climate Change in the 13 Regions of the country. Greece has secured E.U. grant for the implementation of the Regional Plans through the LIFE17 IPC/GR/000006 AdaptInGr Boosting the implementation of adaptation policy across Greece (2019 – 2026).

In compliance with the European Climate Law that is a legally binding obligation upon which the European Union purports to achieve climate neutrality by 2050 and the European Climate Pact, Greece adopted the National Climate Law 4936/2022 on Transition to climate neutrality and adaptation to climate change.

Targets on decarbonization of the electricity production have been negatively affected by the war in Ukraine and the related energy crisis. Furthermore, the National Climate Law although a very important framework with provisions on environmental impact assessment, environmental licensing, carbon emission assessment it falls short in addressing appropriately nature conservation, climate and energy democracy and decentralization issues.

Interesting findings were pointed out in the 5th European Investment Bank (EIB) Climate Survey (issued March 2023), with 66% of Greek respondents being in favor of stricter government measures to impose a change in personal behavior (75% of people under 30); identified the climate impact of prospective employers as an important factor in job hunting, even comprising a top priority for up to 18%; 57% of respondents are in favor of carbon taxation for the most climate-damaging consumption (65% of people under 30); 59% of Greeks would pay more for climate-friendly food and 82% are in favor of labeling all food to help limit the impact on climate and the environment.

Assessment of the 17 SDGs – Greece

a. Ensuring that “no one is left behind” is a high political priority for Greece, as the country has recently exited a period of prolonged economic crisis.

In 2018 Greece submitted the 1st Voluntary National Review, which is a voluntary state-led national review, aiming to outline experiences in implementing the SDGs, successes, challenges and lessons learned. Such reviews are carried out by the High-Level Political Forum on Sustainable Development (HLPF) under the auspices of the Economic and Social Council (ECOSOC), every 4 years.

In this review Greece identified and endorsed eight national priorities for SDG action:

1. Fostering a competitive, innovative and sustainable economic growth (SDGs 8,9);
2. Promoting full employment and decent work for all (SDGs 8,4);
3. Addressing poverty and social exclusion, and providing universal access to quality health care services (SDGs 1, 2, 3, 8, 10);
4. Reducing social and regional inequalities and ensuring equal opportunities for all (SDGs 10, 5, 4, 8, 1, 3, 11, 16);
5. Promoting high-quality and inclusive education (SDG 4);
6. Strengthening the protection and sustainable management of natural capital as a base for social prosperity and transition to a low-carbon economy (SDGs 6, 7, 11, 12, 13, 14, 15);
7. Building effective, accountable and transparent institutions (SDGs 16, 17);
8. Enhancing open, participatory, democratic processes and promoting partnerships (SDGs 16, 17).

Overall Performance



Performance by SDG



SDG Dashboards and Trends



b. By 2019, line ministries together with ELSTAT (The Hellenic Statistical Authority that coordinates the system of identifying indicators, certifying and collecting statistics) had carried out three rounds of consultations and mapping to set a framework of the most adequate indicators for tracking progress at the national level. A list of around 160 indicators (90 out of 169 indicators from the global SDGs and 70 from Eurostat adapted to national priorities and circumstances) were selected for quantitative tracking of progress towards the SDGs.

c. The ten years of economic depression and the COVID-19 pandemic affected the efforts of Greece towards achieving the SDGs, as reflected in the Europe Sustainable Development Report (2021). Greece is placed in the 27th place out of the 34 countries of Europe and Turkey, while it scores 29/34 regarding inequalities, with particular low scores on gender inequality. The overall index score for the country is 64.8.

d. The Global Assessment of SDGs for 2022, finds Greece at ranking 32/163 OECD countries, with 76.8 country score, which is however, below the regional average at 77.2, while the impacts of the war in Ukraine are obvious in specific goals affected by the energy crisis, e.g. SDG 7 – Affordable and Clean energy and SDG 9 – Industry Innovation and Infrastructure have changed from ‘on track or maintaining SDG achievement’ to ‘moderately improving’.

e. Greece’s second VNR issued in July 2022, reflects challenges and strategies related to three crises: the aftermath of a ten-year national depression, the consecutive COVID-19 pandemic which put a significant strain on the national health system and the economy and the repercussions of a war outbreak within the European continent. Under these pressures, particular concerns for Greece include weak demographic rates, increased female and youth unemployment and low scores on gender equality. Moreover, the pandemic brought out long overdue reforms in the health sector; the justice and waste management systems have exceeded their operations limit causing complications to the society, economy and environment, and to achieving targets and priorities relating to circular economy and green transition.

The immediate future

The scoring in the different SDGs as well as the recent EU and national reporting indicate the main stresses for the Greek economy and society that need to be addressed in the immediate future:

- α. Gender equality scoring is at the lower rates of EU according to all previous assessments. Emphasis needs to be placed on reforming the regulatory framework for reducing unemployment rates for women, forming maternity provisions, supporting women entrepreneurship, providing the framework for reduced gender-based inequalities, discrimination and violence, improve female representation at higher administration positions.
- β. Support of the national health care system with human resources and infrastructure at all levels: prognosis, treatment and emergency response.
- γ. Clean energy transition, new plans for decarbonization and integration of energy from renewables in the grid. The EU report Clean energy for EU islands: Study on regulatory barriers and recommendation for clean energy transition on the islands Greece, December 2022, identifies existing and emerging legal, regulatory and policy frameworks for the development of local decarbonized energy systems on Greek islands. The European Commission approved a €341 million budget for Greece in support of electricity production from wind and solar sources and storage capacities (September, 2022). Incentives for electric mobility to be considered in order to increase the low integration of electric vehicles in the Greek market.
- δ. Revisit, improve and implement the regulatory framework regarding protected areas (land and marine) and the building permits in peri-urban and rural areas.
- ε. The Mediterranean region and Greece are experiencing the highest average temperature rise due to climate change in the EU, fact that calls for contingency planning and civil protection planning to face climate-induced hazards such and disasters.
- φ. Improve waste management, re-use and recycling of municipal waste and packaging waste. On 8 June 2023, the EU issued an early warning report addressed to Greece and Member States at risk of failing to meet: (i) the 2025 target of 55% for the preparing for re-use and the recycling of their municipal waste (according to Directive 2008/98/EC); and (ii) the 2025 target of 65% for the recycling of their packaging waste (according to Directive 1994/62/EC).
- γ. Support sustainable agricultural production and exports to the EU to address the current food crisis that is resulting from the war in Ukraine.

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10.4 Research & Technological Innovation in Greece

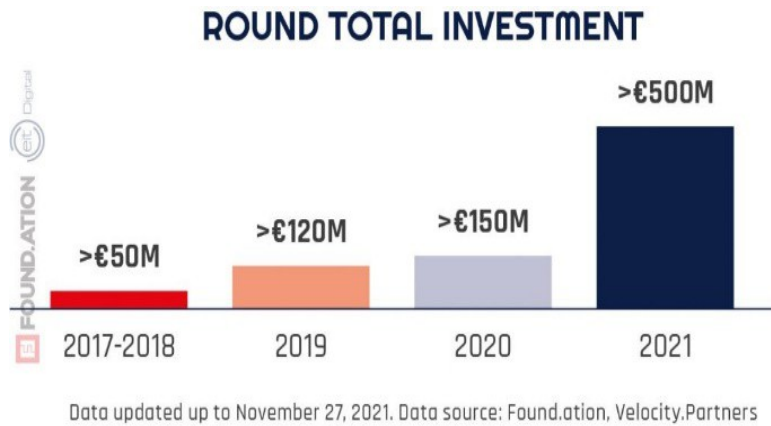
Greece's economic reality with respect to Research & Technological Innovation is vastly different than when the 2012 McKenzie report appeared. In many ways, it confirms that report's assessment that Greece's R&I segment had significant locked potential, hence room for growth.

Trends in Research & Innovation

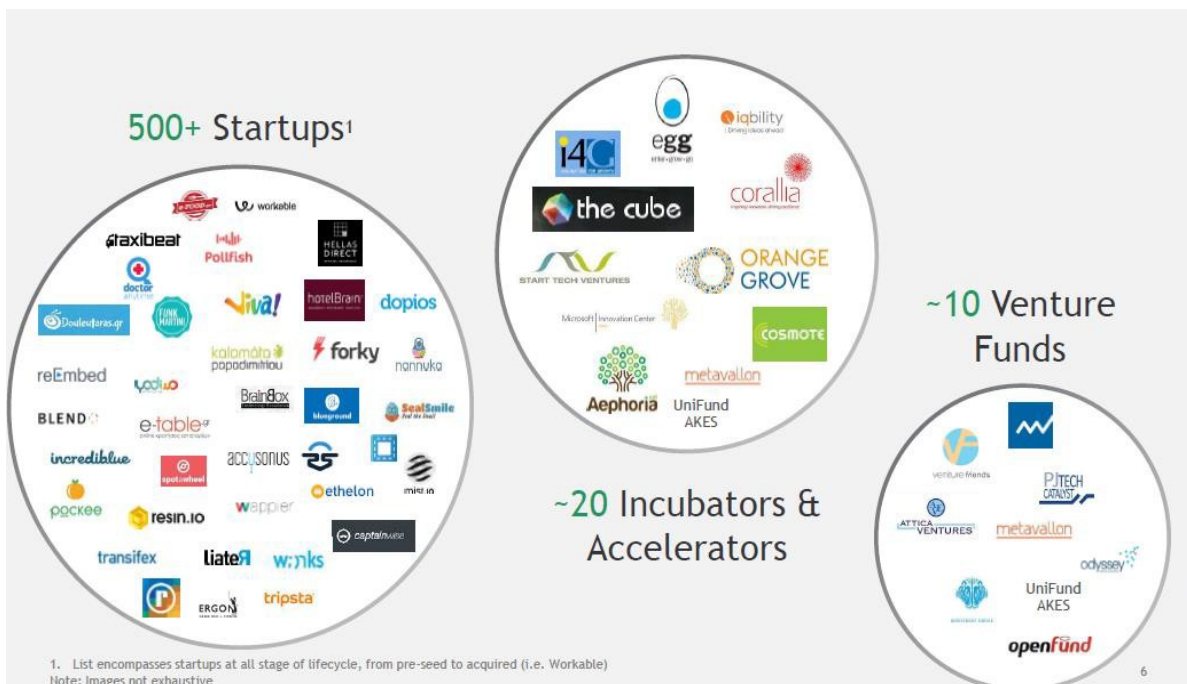
The main corresponding trends in today's, post-pandemic Greece's economy, and which are highly visible, are the following:

1. Startups:

Tech-based startup generation has boomed in the past two years [1][2]. This has been accompanied by an order-of-magnitude increase in VC-based funding compared to only 4 years ago (see chart below taken from [1]). There is also a proliferation of other startup-oriented entities such as angel investors, incubation facilities, technology clusters, etc.



There are now over 500 startups, 20 incubators and 10 VCs, see chart below taken from [3].



Biotech, energy and tourism are the 3 dominant fields in terms of startups (see [4]).

2. Big Tech:

Several major technology firms (Pfizer, Cisco, Microsoft, Amazon, Google, etc.) are setting up major operations in the country (see [5]). Also, some big tech companies have acquired successful Greek startups, thus creating the first 5 Greek unicorns, with another 5 on the way [6].

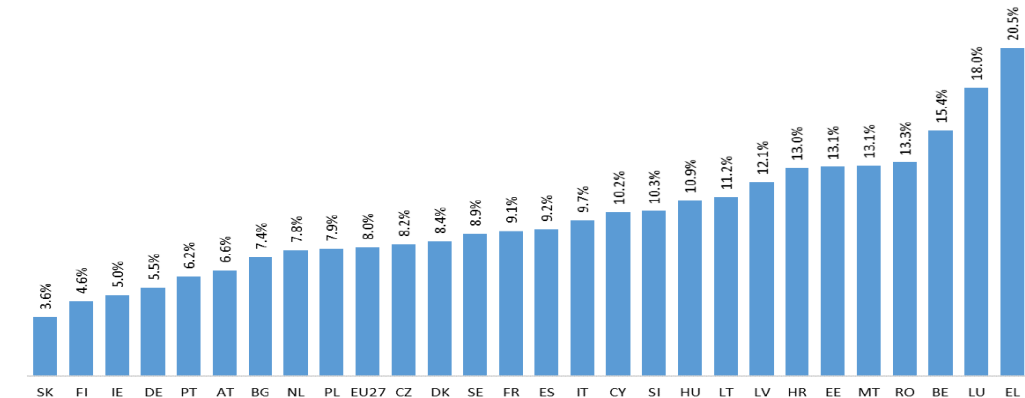
3. Corporate & Academic Research:

Big Greek deep-tech firms are still at an early stage regarding the establishment and operation of dedicated research units as part of their R&D operations. The situation has improved in softer sectors such as banking, consulting and software, with several firms running sizable units for big data analytics, cyber-security and artificial intelligence (AI) in spite of Greece's overall weak

position in AI.

There has been a considerable increase of the number of small Greek companies (SMEs) that run very strong portfolios of EU-funded projects. Greece has been #1 in the EU in terms of SME growth in 2021 (see chart below taken from [7]):

Figure 17: Annual growth rate of SME value added in the NFBS in 2021 in the EU-27 and across EU Member States



Source: Calculations by the JRC based on Eurostat's Structural Business Statistics, Short-Term Business Statistics and National Accounts Database

In many cases, their business model relies almost exclusively on such grants. This represents a shift of EU Commission funding priorities, where more funds go to SMEs as opposed to Universities and Research Centers. Greece maintains a strong position overall in EU-funded grants, being 8th in the EU [8] with a traditional dominant position in the area of Information and Communication Technologies (ICT).

Public Greek universities are still far from liaising strongly with the market. However, recent legislation has regulated the creation of tech transfer offices in Greek public Universities. Several have been by now established, yet it's too soon to see the results. Also, the elevation of former Technological Educational Institutes (TEI) to Universities (State-accredited higher education) has attracted new worthy faculty members who are setting up new research operations.

Public Greek Research Centers are now allowed to establish private companies to manage parts of their operations. These are expected to make their overall operation more efficient. Also, public research centers keep leveraging support from EU & government sources in order to start new institutes and operations. Notably, NCSR Demokritos seems well-placed towards future tech-oriented science, by establishing new institutes in quantum, nanotech, hosting part of Tesla's engine-oriented research operation, etc.

New entities have been generated to support Greece's research & technology ecosystem, such as the newly established "competence centers," which complement the existing technology clusters, gathering a number of players in a given field and setting up thematic networks kicked-off by Government funds (see e.g. [9]). To these one should add the operations at ACG (ACG 150 Units, ACG-Research Center, etc.), which are rapidly creating a new type of player in the ecosystem (independent / non-profit / research-oriented) that uniquely combines education, research and innovation under a single roof.

4. Government:

Government agencies and processes have become much more digital-oriented, adopting rather low / soft-tech solutions, which are however crucial to service platforms for the citizen. Yet, there is still a lot to be done to fully take advantage of ICT (see [10]). Hopefully the progress in ICT will be soon accompanied by progress in heavier infrastructure sectors, such as the transportation sector, whose operation has been often in a poor state as evidenced by the recent train collision tragedy.

Emerging economic environment and outlook

In terms of promising economy sectors, Enterprise Greece [11] provides the following list of sectors that are promising overall for the Greek economy: Movie (A/V) industry; Global Business Services; Tourism; Energy; ICT, Life Sciences and Pharmaceuticals, Quality Food & Agriculture, and Logistics. Greece is one of the EU front-runners in 5G [12], with the corresponding investments representing a projected 190,000 new jobs in all sectors of the economy [13].

Perhaps less promising in the immediate future, the defense & space sectors do not seem to have taken off fully yet. Nevertheless, both these sectors present huge economic opportunity – defense being however on the rise with efforts to restore the Hellenic Arms Industry (see [14]). The major contracts that the government has signed for firefighters and frigates will very likely accelerate this and lead to a significant manufacturing / operation / maintenance ecosystem for defense systems. There is also an increase of drone-related companies. On the side of space, there have been efforts to set up a National Space Agency and some local companies are active in the space sector, e.g., in micro-satellites (see [15]).

Yet, there is much more potential ahead, if one thinks that, indicatively, the entire EU Horizon Program for funded research in all areas is about as large as the European Space Agency's research budget alone. Finally, Greece has the 4th lowest share in the use of Internet-of-Things (IoT) and the 3rd lowest in the use of at least one Artificial Intelligence (AI) technology among the EU-27 member states [16]. This means that both IoT and AI remain important sectors of high potential for growth.

Recommended actions

Based on the above, the following actions are suggested:

1. Academia:

The long-standing weak link between academia and industry in Greece needs to come to an end. While some first steps have taken place, it is still commonplace that Professors in Greek Public Universities, largely due to their status as civil servants, are reluctant to engage in technology transfer activities through companies that they either kick off or support. An improved framework for further enabling University spin-offs, startups founded by faculty and students, funds brought in from the industry and direct corporate sponsorship is needed. Also, a further growth in the recently established industrial PhD process, with more participating companies attracted via appropriate incentives and an increased budget from various sources, including, e.g., municipal & regional entities. Industrial / market internships are another direction that has started growing but needs further expansion, possibly making such internships a standard practice for all relevant academic programs. Embracing non-public academic institutions who have the capacity to contribute to the research & innovation ecosystem should be encouraged. The current situation of Article 16 results in several missing opportunities (such as, e.g., joint graduate programs between public and private academic units) that will likely not be waived until it is amended. However, joint participation in research grants does not present constitutional obstacles and should be further encouraged by the Greek state, similarly to the way private and public academia & research centers participate in joint projects at EU level. Finally, the recent reporting that Greece is among the lowest in the EU in terms of sufficient qualified IT professionals, points to the establishment of new strong IT academic programs that match the market needs. Equally strong graduate (Masters-level) degrees specialized in key technology areas and application domains should be also pursued.

2. Industry:

The culture in Greece's large industry echoes to a large extent the weak link to Academia mentioned above. Large corporations seldom feature R&D units, let alone research labs – with

notable exceptions. They are also reluctant to host PhD candidates for training, a trend that is particularly visible in funded Marie-Curie projects that require industrial “secondments.” Their willingness to host student interns has increased in the last decade, but more needs to be done. The Greek technology industry in particular seems not to benefit much by the large pool of talent in Greek academia. More consulting deals with expert professors in fields related to a company, hosting of undergraduate, graduate and PhD students for professional & research visits, direct donations and sponsorships to academic departments & programs, should all be encouraged. Greece’s economic competitiveness has a lot to gain from this cross-fertilization of academia and industry, a process that is strong in all other competitive economies.

3. Research centers and SMEs

Research centers in Greece are largely either public or supervised by the State, with few exceptions. The latter, typically adjacent to public Universities, mostly run EU-funded research grants, with otherwise weak industrial linkage or funding from other sources. This could be improved, bringing in both funding & opportunities from a variety of players (regional / municipal, corporate, etc.). On the front of SMEs, while several exist due to EU funding, they often limit their activities to low technology readiness levels, shying away from product generation. This needs to change if these SMEs are to contribute to the economy’s competitiveness and not just to job creation.

4. Entrepreneurship:

While the available funding for technology-based entrepreneurship in Greece has increased, young professionals looking to establish a startup or SME in Greece are still faced with a number of challenges. These include a high cost for maintaining the company’s active status even before there is sufficient activity to cover them, and a tax regime that is not competitive compared to neighboring and other countries (see, e.g., Estonia, Bulgaria, Cyprus, etc.). Improving the regulatory framework in this respect would provide more incentives for establishing companies here and not in a neighboring country.

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10.5. IHGP recommendations for a New National Growth Model for Greece

Although any possible national growth model must focus on the necessary transformation of the Greek economy towards full engagement with the Digital Revolution while strengthening traditional industry sectors, it should be specialized on the basis of specific criteria—that is, certain sectors (value chains) of the Greek economy that have a significant growth perspective and enjoy comparative advantages (business and technological innovation, installed base [the number of units of a system or product that are currently in use], etc.) and can upgrade Greece's position in international competition.

A critical point is the proper focus on sectors/value chains in which a new comparative advantage can be built. Greece has critical resources and especially highly qualified human capital, not only within the country, but also abroad, and one of the most daunting goals of the new government should be to attract with appropriate incentives the talented Greeks in the diaspora to return to Greece. An estimated 500,000 people moved abroad during the financial crisis, with obvious consequences to labor market.

10.5.1 1st Pillar: Locating areas for "Developmental Leap".

A New National Growth Model inspired by the Digital Revolution

Most areas where a "developmental leap" can be achieved stem from research, technology and innovation related to the Digital Revolution and will benefit from public, private and joint efforts.

This requires an increase in public spending on research, technology and innovation needs (by amounts larger than the 1,2% of GDP in 2020) making full use of the new National Strategic Reference Frameworks (NSRF) for the sectors of the Digital Revolution. It is very positive that the new NSR focuses on strengthening research and innovation capacities, exploiting advanced technologies and exploiting the benefits of digitization as well as developing skills for smart specialization, industrial transition and entrepreneurship.

Focusing on specific areas that can be developed and bring Greece a competitive advantage on a global scale are areas of the Digital Revolution such as information technology (with emphasis on artificial intelligence, machine learning, Internet of Things, Big Data analysis), 3D printing, nanotechnology, automation, robotics, biotechnology, etc.

The actors of the Digital Revolution in Greece can initially appear in the form of startups, supported by private or public capital and encouraged (incubated) and/or accelerated via funds and partnerships that draw on Greece's excellent academic/intellectual capital. There is already an established startup base in Greece, but the framework, the operating conditions and the general business context of their development is at a very early stage. The aim of the development efforts of startups should be their transformation into small and medium-sized enterprises as the areas of expertise of existing SMEs do not fall under the sectors of the Digital Revolution and thus do not provide great competitive advantages for Greece.

The growth and success of startups can be maximized by mergers between startups of similar areas of specialization and by creating joint ventures with Greek and foreign research/academic institutions and businesses, in addition to self-reliant development and spin-offs, all encouraging startups to become parts of larger enterprises. In any case, financial support and adequate financial tools from private and public entities are needed while direct input from research institutions should be encouraged through policies that incentivize individual researchers and institutions housing them.

The problem that startups lack access to the required talent mainly due to the brain drain should be addressed by offering financial incentives for talented Greeks abroad to return to Greece and establish or work in startups or in the related research ecosphere.

Another problem of startups in Greece is that the majority of startups do not participate in developed networks of cooperation with other startups, with universities, and/or with small and medium-sized and large enterprises in Greece and abroad. The state and relevant private entities should actively provide incentives that will favor cooperation between startups, academic institutions and businesses providing funding to offset business risks involved in their space. Private investment in research and technology must be incentivized to promote startups creation and success.

The interconnection of academic research programs, projects and groups of scientists with the world of business should result in the co-establishment of startups. Despite some efforts within public universities, this problem remains open, often due to policies or a public culture inhibiting faculty connection with the private sector. In addition, it requires the interconnection of existing startups and their cooperation with small and medium-sized enterprises and large enterprises in Greece mainly and, in the absence of these, with businesses abroad. Public incentives can play a role here as well.

Startups by necessity must have a new idea for an innovative product or service and small and medium-sized enterprises and large enterprises can undertake their mass production and distribution. Therefore, startups are synonymous with innovation, a fact making it necessary to promote the culture of establishing and operating startups in general and to diffuse it throughout society. The non-entrepreneurial spirit and the very great fear of taking a business risk that characterizes the entire Greek society must be actively combated.

There is a clear need for an extensive network of Greek startups—with each other and with businesses and academic/research institutions in Greece and abroad. The networking program will aim at finding possible funding from private investors (e.g., venture funds) and mentoring/incubating and accelerating, i.e., educating startups about ways to increase their output workload and to avoid frequent mistakes, guiding them through the difficulties of their regulatory framework, and identifying new innovation opportunities in the market.

A rare but relevant example, Lefkippos Tech Park, was founded by the National Centre for Scientific Research "Demokritos" (NCSR Demokritos), the largest multidisciplinary Research Centre

in Greece, as a unique and efficient tool for strengthening the links between public research laboratories and the industry. Lefkippos offers business incubator and accelerator services that support innovative ideas within an academic collaborative environment from discovery to commercialization.

Such a networking program could take the form of an electronic platform allowing increased capabilities, created and financed by a public-private collaboration. Some efforts at such networks have been made but they remain underdeveloped and underfunded.

Emphasis when strengthening startups from national, European and private resources should also be given to startups that can potentially help the development of existing companies and their sectors in Greece (e.g., in tourism and green energy) but also independently of them, to startups that focus on the sectors of the Digital Revolution itself, i.e., digitization, artificial intelligence, IoT, nanotechnology, etc., thus leveraging both the current economic trends and capabilities in Greece and public funds being made available in these sectors.

Startups in this category can contribute significantly to the development of small and medium-sized enterprises as they help create the so-called "smart factories" using fast microcomputers, artificial intelligence, sensor invention, 3D printing, the ability to analyze "big data", the development of nanotechnology, etc. as they allow the creation of a virtual copy of the plant's physical world, providing capabilities for monitoring and communicating all production processes in real time.

This means (in particular for the processing industry) the elimination of dead time in the factory, ensuring that no work begins on the production line that cannot be completed with the materials, manpower and machinery available. The smart factory allows the products produced to give back services to the company and allows for better communication with customers.

The change across the manufacturing industry should be even greater – as in previous industrial revolutions, Industry 4.0 will change the scope of competition, the way businesses gain customers and shake up the structure of the industry.

In this environment, many challenges arise (mainly in relation to the need for modernization and digital transformation) but also opportunities both for manufacturing industries and for startups that develop solutions and services that help large companies cope with the needs of this new environment.

The great advantage of supporting startups is that they do not need a fully developed economy to flourish. It is a promising sector that, if Greece strengthens it, will bring it great economic benefits in the future. It is also an area where the other European countries are also under-developed. Therefore, the possibility remains of gaining a competitive advantage for Greece and upgrading its economy to the core levels of the eurozone countries. (thefoundation.gr 2022)

In order to better connect startups, it is important to concentrate them in certain locations/neighborhoods that will become "innovation spaces" and suitable ecosystems along the lines of Silicon Valley and others (e.g., Israel). Appropriate spatial and urban planning and the provision by the public of spaces that are no longer used differently are required in order to create these interconnected innovation communities; where communication, interactivity, mobility and collaborations between their employees are the goal.

Failing free spaces available that could be granted by the state, financial incentives are required (e.g., reduction of tax rates, etc.) so that startups (especially from abroad) settle in the same area and benefit from the benefits of coexistence and co-operation of innovation networks. In addition, the creation of such places of concentration of startups will lead to the creation of clusters of

research and business innovators that could give a significant boost to the economy.

Lefkippos Tech Park within the Demokritos campus provides the guest companies with some unique research opportunities. The five Institutes of the Centre offer interdisciplinary, world-class research infrastructures that are accessible to users. State-of-the-art laboratories in exponential technologies such as Nanotechnology, Artificial Intelligence, Machine Learning, Big Data Analytics and the Internet of Things are open to the enterprises housed at Lefkippos, which offers an excellent model for similar efforts.

At Lefkippos, productive synergies are encouraged and well-funded collaborations with research groups in a variety of sectors where Demokritos maintains a strong world presence: Advanced Materials, Telecommunications, Life Sciences and Health, Energy, Environment and Climate Change, Safety, Security and Heritage Sciences. In addition, unique (at the national level) infrastructure is also available in Nuclear Technology and Radio-protection.

This emphasis on enterprises focused on the Digital Revolution does not mean ceasing to support the traditional model of development of upgrading agricultural production, improving the tourism product and improving the country's infrastructure.

The strengthening of these sectors should be a follow-up to the national development strategy, since in its traditional form it has not yet shown that it can lead to a large increase in productivity, the production of value-added products and/or a sufficient increase in exports. One exception is undoubtedly the tourism sector, but it also needs to be upgraded with the help of the increased added value of products and services of the companies of the Digital Revolution (Tourism Tech). The same applies to agriculture and the food processing and processing sector (Food Tech).

In the field of research, innovation and technology, it is necessary to create clusters attracting foreign researchers to Greece. Due to the ideal climate, culture and lifestyle, as well as its strong education tradition, Greece is a very attractive place for research and technological development (it is no coincidence that the most important global research and innovation center is located at Silicon Valley in California with its mild climate and ocean nearby).

10.5.2 2nd Pillar: Change the way in which the Government's Executive Branch operates

a) The need for the creation of an independent legal person governed by private law with professionals from Greece and abroad for the formulation and implementation of the National Strategic Development and Reform Plan.

The IHGP recommends the creation of an independent Task Force or Economic Development and Reform Team that will exist independently of the public administration and will be staffed by leading Greek and foreign experts / personalities of recognized prestige in matters of public administration and economic policy / development with salaries competitive with the free market, to ensure that it will be staffed with the leading talents of the international market.

This Task Force will have a managing director in charge of two Advisory Councils: the Council for Reform Measures and Private Capital and the Council for Implementing Reforms and Overseeing Development Project. The Council for Planning and Attracting Capital will include a network of external specialists/technocrats who will offer specific knowledge and advice on the whole development strategy and all the required reforms. Its main mission, however, will be to attract private capital through links with market players, through economic "diplomacy" and public relations.

On the other hand, the project managers will be included in the Council for the implementation of

reforms and supervision of development projects, who will constantly supervise the implementation of individual reforms, will calculate the benefit and will report to the managing director the results of each individual project.

Also, this Council will include the group of contacts with the Ministries, consisting of experts/technocrats who will be placed in each Ministry and will act as a contact group that will coordinate the Ministries carrying out the individual projects.

Finally, the Council for the implementation of reforms and supervision of the development project will consist of two other groups: a reference team that will record, quantify and codify the development work carried out and an analysis team that will make specific analyses of development policy and reforms and will act as a joint team of the two Councils and as a link between them.

The IHGP also recommends the creation of a Fund/Independent Authority for the Exploration and Exploitation of Talents for the Public Administration that will hire and supplement the pay gap between the salary of the state and the salaries of the free market for 200 senior executives / managers. These executives will be placed in senior positions in the public sector (Deputy Minister, Secretary General of the Public Sector, General Manager, Managers, etc.). The agreement with the Greek Constitution remains unknown.

The Task Force or economic development and reform team should be in the form of a legal person governed by private law and will report directly to the Prime Minister.

Also recommended would be the abolition of the General Secretariat for Research and Technology (GSRT) of the Hellenic Foundation for Research and Technology and the General Secretariat for Digital Policy. Merger of co-competent bodies of digital policy, research, innovation and technology in order to create a single body in the form of a legal person governed by private law under both the Ministry of Economy or Education and Task-force for development policy and reforms that will monitor, formulate a strategy and support with subsidies all public and private digital development agencies, research, innovation and technology, exploiting overlaps and synergies that exist or that will exist in the near future.

Fragmentation of responsibilities for similar development themes creates confusion, inefficiency and public service mentalities. Disengagement from the model of strengthening mainly public research institutions will broaden the model to cover any kind of research institution along the lines of the Israel Innovation Authority (IIA).

The Hellenic Development Bank should also develop special financial instruments, like public equity and quasi-equity fund aimed at supporting innovative startups. Finally, the creation of an independent private research and innovation fund with funding from private individuals is required; which will select independently and according to its own criteria the startups to be funded.

Of course, more funds (such as equity funds or venture capital companies VCs) and banks with a variety of financial instruments are required to meet the equally diverse needs of the world of startups. The same, as well as the activation of a variety of private capital and financial institutions, is required for the rest of the country's businesses. Increasing the collection and supply of private capital to a development agency should be one of the major priorities of the new government and the Task Force on Development Policy and Reforms with its network of contacts and wide interconnection of economic personalities would play a pivotal role in achieving this.

The number of startup incubators should be increased, especially when trying to invent an innovation with initial funding and in exchange for offering shares in the corporate form of the startup, with strategic partnerships and the creation of business innovative clusters. As an

example, Ireland is a country with a thriving startup and VC ecosystem, that nurtures startups by tax incentives, grants and support programs in order to help them succeed.

The same should be done with startup accelerators that fund startups' partnership programs with mentor groups in order to solve operational problems along the way and accelerate the work of startups in order to produce a final product or service and through co-financing by public bodies as well.

b) Innovation-friendly and Development-friendly structures for the award of Justice

The IHGP recommends the completion and implementation of an e-justice program using digital technology for a faster administration of justice including the following:

Establishment of separate chambers of the Council of State for investment and development projects with no possibility of referral to the Plenum and recruitment of additional administrative judges in order to hear disputes in a shorter period of time, under the provision of legal agreement with the Greek Constitution.

Acceleration for the administration of justice in commercial, corporate disputes. Increase the number of judges and, as a matter of priority, implementation of the program for the digitization of judicial proceedings in chambers of commercial disputes.

Increasing the powers and purview of single-judge courts.

Due to lack of capacity in the courts, the ability to process cases via video-conferences.

Obligation of out-of-court settlement of disputes with state-certified mediators and arbitrators who will be equated with judicial officers for a large category of commercial cases and along with an obligation for attempted out-of-court resolution for disputes in most types of civil cases.

10.5.3 3rd Pillar: Training of Human Resources to the Requirements of the Digital Revolution

a) Labor Market 4.0

Due to the current rapid development of technology, some sectors and/or professions will disappear completely and new ones will emerge. It is also estimated that 50% of the workforce employed in low-skilled jobs will be abolished (OECD 2022). By 2025, 50% of people working in companies will have to be retrained in order to claim higher-skilled jobs, thus delaying their reintegration into the labor force and thus temporarily reducing the supply of labor.

This, on the one hand, can be addressed by the very enterprises that, through lifelong training and skills-building programs, can support workers in this process of moving them to other roles where they will be called upon to undertake new activities.

On the other hand, it can also be addressed by policy-makers, for which technological developments pose new challenges for the education system, for social welfare systems or for "the safety net". Those who fail to enter the reintegration programs, they will have to move to other activities, always bearing in mind that there will be new forms of employment that will affect people's social lives etc.

Changing education systems and adapting them to the changes brought about by the Digital Revolution is of primary importance to reduce current and future inequalities. The immediate priority is also to ensure the retraining of people who will lose their jobs, as well as the

establishment of a guaranteed minimum income for those who will lose their earnings.

The new professions that will be in high demand in the labor market of the future include among others software engineers, user experience designers (UX), Business Intelligence (BI) and Data specialists, visual designers, virtual interaction designers, black box testers, report designers, experts in requirements understanding, experts in quality assurance.

The risk of implementation is enhanced by the hitherto complete inadequacy of measures addressed at the upgrading or completion of skills necessary for the preservation of a job or career development, as well as for retraining old employees in new responsibilities for the assumption of completely new professional roles. The Public Employment Service (OAED) should stop offering seasonal employment programs that do not actually combat unemployment and turn exclusively to the financing of retraining programs and the acquisition of new skills for jobs in businesses of the Digital Revolution.

b) Education

The IHGP recommends significant reformation of the school schedules in elementary, middle and high school in order to provide students with the necessary skills for their subsequent activity in the sectors of the Digital Revolution.

Greece has extremely strong similarities with Israel in terms of the average level of basic education, student performance in international rankings and its basic infrastructure and invests a similar percentage of GDP in public spending, but the two countries are not growing at the same rate in GDP.

There appears to be an inadequacy in Greek education at the post-secondary level. While the university in Israel pushes the student to excel, that in Greece does not. Despite the general feeling that Israel spends a much larger proportion of its GDP on infrastructure and technology, the evidence does not bear this out. The resources are proportionally the same, the only difference is in the way the two countries invest them.

The Israeli government is investing significantly in supporting universities and the related research and high-tech sectors. By way of contrast, the Greek government spends primarily on the very large public administration and bureaucracy, that is the real difference. (OECD Education GPS for Greece and Israel, 2022).

Policy makers together with education providers should work to improve the basic level of skills in the scientific fields of the Digital Revolution, i.e., technology, engineering and mathematics. They should also pay particular attention to creativity as well as to critical thinking and systems of thinking. As all work will change greatly, it is important to maximize ingenuity, resilience and flexibility

For these reasons, it is necessary to expand the teaching of programming and to place special emphasis on the teaching of mathematics with applications in computer science. In the future, programming languages will likely become standard in general education, and illiteracy could also take on the dimension of programming; some exceptions will certainly exist, but many professions will require knowledge of some programming languages.

Also needed is early familiarization of students with entrepreneurship, both through intensive courses on various aspects of business administration and through their participation in programs on children's, adolescent and youth entrepreneurship.

We recommend familiarization with robotics as early as primary school (there are already suitable

programs ready for use at this early stage). In fact, Greece has ranked 2nd, 3rd and 4th place at the World Robot Olympiad (2015, 2016, 2017, 2018 and 2019), performing best in the Football, Open and Regular categories. What is more, at the 2019 World Robot Olympiad held in Hungary, the teams from Greece collected the most medals – along with Russia – among 423 teams from 73 countries. (see STEM Education site)

We recommend discouraging students from choosing studies that have no future in the labor market during the career guidance course and highlighting the importance of new technologies, research and innovation professions.

We recommend increasing of the number of students admitted and establishment of more faculties and departments of informatics and new technologies in all universities and polytechnics.

We recommend provisioning of knowledge with special post-secondary courses and integrated programs in all faculties of universities and polytechnics of sciences, polytechnic and technological Sciences for youth entrepreneurship, the ways of starting, financing and operating a successful startup.

Efforts of the Task Force for economic development and reforms of the country to attract research centers of foreign universities to the country, and without the possibility of establishing private universities until the new revision of the Constitution. Also the Task Force should focus on establishing innovation centers of foreign universities and enterprises, both private and public in Greece. The contribution of the Task Force with its know-how, "diplomacy" and interconnections, will be of decisive importance.

It is necessary to establish or upgrade entrepreneurship centers in academic institutions that will operate as incubators for new startups. In this area the public universities suffer from several inhibiting factors including the institutional inexperience of creating a space for private institutions and public-private partnerships. A successful, innovative model for such university-based entrepreneurship is the Center for Entrepreneurial Studies of the Stanford Graduate School of Business, which helps students to shape and test new ideas for the commercialization of new products (industrially owned), hosts lectures by potential investors and market participants as well as mounting events designed to connect students with the free market.

Other initiatives of at the post-secondary level could include competitions between startups, the organization of student visits to startups and the establishment of programs for entrepreneurs to stay as visiting teachers in the teaching programs of universities. Large enterprises can also contribute to the interconnection with the universities by creating internships and training and training rounds in their spaces as well as sponsoring innovative student projects.

10.5.4 4th Pillar: 'Horizontal' Growth Reforms

13 Sector Reports: Fourth Reports on the Largest 'Production' Sectors

a) Tourism

Tourism is the most important economic sector in Greece, yielding 16 billion in GDP and forming approximately 15% of the economy. There are however various problems. For example, there is a constraint on cruise embarkation turnaround time. This would not be a problem anymore if the port authorities allow the use of ports for cruise embarkation. The new private management of the port of Piraeus provides an example of solving this problem. Piraeus now not only allows the use of the port for cruise embarkation but also has constructed a new terminal for tourists arriving in Piraeus or leaving Piraeus on a cruise ship.

Indicative shortcomings in the tourism sector that could easily be addressed include such things as the absence of a framework for re-using/exploiting dormant capacity. Also, there are unfavorable building rules for vacation homes, along with limited opening hours for archaeological and cultural sites.

These problems could be resolved as follows: The port authorities should allow the use of more/all/different ports for cruise embarkation, and they should upgrade 3-4 cruise ship embarkation ports. Hotel owners and other similar local business owners should also be allowed to re-use/transfer rights of dormant capacity. By doing so, there will be more accommodation options for tourists and the sector of tourism will grow rapidly. All these problems are going to be solved through government decisions.

Another solution is the bundling/clustering of marina projects with 'hubs' and 'through-puts' to improve viability.

Although Greece has as its main rivals the countries of Southern Europe, it has managed to shift the mix of visitors towards higher-income segments. The traditional markets of Sun and Bed tourism (UK, Germany, Scandinavia and then France, Italy, Netherlands) are not enough to generate more wealth.

There should be an aggressive penetration and gain share from North America, Russia, and China). Since 2012 much has been done to gain tourists from non-traditional target markets thanks also to the fact that Athens' Airport has become more attractive to international airlines, which are flying to Athens. A subsequent positive sign since the McKinsey report is that many new 4- and 5-star hotels have been built and are in operation.

However, not all islands and mainland Greece have grown at the same pace. And this a point that needs to be considered, based on environmental concerns and sustainable growth.

Another important step needed is the building and operation of three-to-four new major conference facilities. The development of Large Integrated Resorts and of resort-based vacation homes will also attract many wealthy tourists. Steps in the right direction have already been made.

Operation of hydroplanes

Expansion of hydroplane operation has yet to be achieved. Hydroplanes are a great means to attract tourists to more remote islands as well as to mainland Greece. There could be a network of flights connecting all the islands, which aren't interconnected yet and where no traditional or high-speed ferries stop or where it takes a very long time for ferries to reach.

Greece still hasn't built marinas for nautical tourism. It still needs to build many more marinas in the next 10 years. (Greek Marinas Association, 2019)

There must be a great effort to promote winter tourism from abroad in Greece with the initial aim of expanding the tourist season by at least two months. At the same time there should be national tourist campaigns to highlight the beauty of winter Greece with its ski centers and traditional hostels or hotels in beautiful villages near to the ski centers. The ultimate goal of this strategy would be the development of year-round tourism.

b) Energy (Energy Revolution)

Hydrocarbon exploration should be promoted and accelerated. Investigations of exploration for hydrocarbons southern of Greece and at Ionian Sea are under way. Nevertheless, while Greece's industry remains dependent on petroleum, the COVID pandemic and other factors have

illustrated the need to transition to cheaper energy sources. There should be a construction of more terminals for LNG from the USA and other countries to curtail Russia's and OPEC monopolistic influence.

Renewable energy sources should be a priority of any Greek government. Since 2012 the percentage of renewable energies produced in Greece has grown at a satisfactory rate. The energy that comes from renewables increased from 8.1% in 2012 to 19.4% in 2021. Greece should adopt a mix on energies to curb petroleum and natural gas dependency.

There should be a strengthening of strategic cooperation and ties with Israel by reactivating the EastMed pipeline proposal between Israel, Cyprus, Greece, Italy for the transportation of natural gas to the rest of Europe. This pipeline would cover approximately 10% of Europe's needs. Discussions are underway.

Intensification of the promotion, production and use of green energy with appropriate financial incentives for those who install sun energy collectors.

Promotion of offshore wind power parks is one other measure that the government says it will promote. A Norwegian company member of Norwegian Offshore Wind Cluster has proclaimed a desire to build and make use of offshore wind power parks. This would be part of the National Strategy for climate change with transition to a clean energy market without lignite and coal. Also, an Israeli company Eco Wave Power wants to produce energy from tidal sources. This technology has been known for many years now but now we will see it operating live.

c) Cross-sectoral investments

Such investments should include:

High-speed cargo train-line (Patras – Athens – Thessaloniki – Evzoni/Kipoi).

Expansion/upgrade of major ports for cargo gateway (e.g., Piraeus, Thessaloniki, Patras) and/or transshipment (e.g. Piraeus).

Further expansion of broadband penetration and development of 5G (and beyond) capability.

d) Manufacturing – Food Processing

The manufacturing sector has been declining in the last 20 years in Greece. This is not a Greek peculiarity, since the manufacturing sector in the Eurozone has also been declining. The services sectors are now flourishing. However, Greece should not neglect manufacturing entirely. The manufacturing sector remains the second largest GVA contributor and the third largest employer among Greece's "production" sectors.

The manufacturing sector includes food processing, heavy industry, beverages and a number of other, smaller sub-sectors. Greek development in food processing would first involve the clustering of foreign markets based on common retailers' presence and priorities based on size and growth of exports to those countries like the UK, Germany and Austria, North America, and Balkans.

In a second step Greece should encourage the conversion from bulk olive oil to branded, packaged olive oil. Then it should be supported by an aggressive campaign in core markets to build brand awareness touting the advantages of Greek oil versus Italian and Spanish. Greece has a competitive advantage also in some fruits and vegetables, which could benefit from the same type of campaign. (Kathimerini 2019)

It should emphasize the "Made in Greece" origin certification mechanism not only in fruits and vegetables but also in dairy bakery products. In the food-processing sector, there still are severe barriers to overcome. There are long lead times and complexity of export procedures and lack of funding.

11. Conclusion

In 2012, the McKinsey Report proposed a new growth model for Greek economic productivity, extroversion, investment stimulation, and employment growth for the next ten years. However, in the following years fiscal austerity measures had a priority over other targets. Few significant reforms of the existing economic model or other growth measures were taken.

The McKinsey Report and its update in 2017 accurately predicted sectors of the economy primed for growth. Subsequent economic developments have validated the ACG 150 strategic plan's response, which focused on creating units focused in a number of these areas.

ACG 150 rightly embraced the McKinsey report's concentration on Greek industrial and agricultural sectors that, even if EU competitive, require specialization-competence and further enhancing export markets. Since the majority of Greece's GDP is produced by services, this sector should be transformed to high-tech skills and capabilities through digital transformation, a fact which has become increasingly clear since the 2017 McKinsey update.

"The National Recovery and Resilience Plan (RRP), Greece 2.0" has focused on the green and digital transitions. This Plan seeks to change the economic activity model and related attitudes. As we have seen, the key element of the Plan is the concerted mobilization of significant resources from the private sector with the aim of increasing private investment to achieve significant multiplier effects.

Meanwhile, a workforce crisis has affected much of the west. In a McKinsey Global Survey (2020) on future workforce needs, nearly nine in ten executives and managers say their organizations either face skill gaps already or expect gaps to develop within the next five years. The pandemic has only exacerbated this process.

As technologies and business models continue their rapid evolution, companies are experiencing a step change in the workforce skills they need to thrive and grow. Although most respondents say their organizations consider it a priority to address skill shortages, few say their organizations understand how to equip themselves with the workforce skills they will need most. In fact, only one-third of respondents say their companies are prepared to cope with the workforce disruptions resulting from technology and market trends.

The findings from this survey confirm that companies lack the talent they will need in the future: 44% of respondents say their organizations will face skill gaps within the next five years, and another 43% report existing skill gaps. In other words, 87% say they either are experiencing gaps now or expect them within a few years.

The McKinsey Global 2020 Survey addresses potential skill gaps in a wide range of business areas. When asked where the greatest need exists, most of the respondents often say data analytics, followed by IT management and executive management. Similarly, when looking at the specific skills with the greatest mismatch between current supply and what will be necessary in the next five years, respondents expecting skill gaps to open during that time most often identify advanced data-analysis and mathematical skills.

We conclude therefore that responding to current Greek macroeconomic indicators, the environment created by the developments/reports presented above and taking into account the global trends involving the skills gaps over the next five years, the IHGP recommends that ACG 150 creates a new Center of Excellence. This Center should focus on Digital Transformation, Artificial Intelligence and Computer Sciences in general, as well as enrich its private sector outreach and curriculum by developing a "start-up" network, in cooperation with its existing partnerships at Demokritos and the Athena Research Center. A move in that direction promises to be rewarding both for the educational level already reached by ACG and for the needs of the

Greek economy.

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13. Appendices

13.1 Greece's General Macroeconomic Picture (OECD 2023)

Basic statistics of Greece, 2021¹

(Numbers in parentheses refer to the OECD average)²

LAND, PEOPLE AND ELECTORAL CYCLE				
Population (million)	10.7		Population density per km ²	82.7 (38.7)
Under 15 (%)	13.4	(17.6)	Life expectancy at birth (years, 2020)	81.1 (79.7)
Over 65 (%)	22.6	(17.7)	Men (2020)	78.6 (77.0)
International migrant stock (% of population, 2019)	11.6	(13.2)	Women (2020)	83.7 (82.5)
Latest 5-year average growth (%)	-0.2	(0.5)	Latest general election	July-2019
ECONOMY				
Gross domestic product (GDP)			Value added shares (%)	
In current prices (billion USD)	216.3		Agriculture, forestry and fishing	4.5 (2.6)
In current prices (billion EUR)	182.8		Industry including construction	18.3 (27.7)
Latest 5-year average real growth (%)	0.6	(1.5)	Services	77.3 (69.7)
Per capita (thousand USD PPP)	31.3	(50.7)		
GENERAL GOVERNMENT				
Per cent of GDP				
Expenditure	57.1	(47.1)	Gross financial debt (OECD: 2020)	225.7 (129.8)
Revenue	49.7	(39.4)	Net financial debt (OECD: 2020)	168.4 (81.0)
EXTERNAL ACCOUNTS				
Exchange rate (EUR per USD)	0.85		Main exports (% of total merchandise exports)	
PPP exchange rate (USA = 1)	0.55		Mineral fuels, lubricants and related materials	27.6
In per cent of GDP			Manufactured goods	15.6
Exports of goods and services	40.6	(29.7)	Food and live animals	14.8
Imports of goods and services	48.6	(29.8)	Main imports (% of total merchandise imports)	
Current account balance	-6.7	(0.2)	Mineral fuels, lubricants and related materials	25.5
Net international investment position	-163.5		Machinery and transport equipment	18.9
			Chemicals and related products, n.e.s.	16.9
LABOUR MARKET, SKILLS AND INNOVATION				
Employment rate (aged 15 and over, %)	43.3	(59.2)	Unemployment rate, Labour Force Survey (aged 15 and over, %)	14.8 (6.1)
Men	52.0	(64.1)	Youth (aged 15-24, %)	35.7 (12.8)
Women	35.3	(48.7)	Long-term unemployed (1 year and over, %)	9.2 (2.0)
Participation rate (aged 15 and over, %)	50.8	(60.3)	Tertiary educational attainment (aged 25-64, %)	34.6 (39.9)
Average hours worked per year	1,872	(1,716)	Gross domestic expenditure on R&D (% of GDP, 2020)	1.5 (3.0)
ENVIRONMENT				
Total primary energy supply per capita (toe)	1.9	(3.8)	CO ₂ emissions from fuel combustion per capita (tonnes, 2019)	5.3 (8.3)
Renewables (%)	16.6	(11.6)	Water abstractions per capita (1 000 m ³ , 2020)	0.9
Exposure to air pollution (more than 10 µg/m ³ of PM 2.5, % of population, 2019)	96.6	(61.7)	Municipal waste per capita (tonnes, 2019, OECD: 2020)	0.5 (0.5)
SOCIETY				
Income inequality (Gini coefficient, 2019, OECD: latest available)	0.308	(0.315)	Education outcomes (PISA score, 2018)	
Relative poverty rate (% , 2019, OECD: 2018)	11.5	(11.7)	Reading	457 (485)
Median disposable household income (thousand USD PPP, 2019, OECD: 2018)	15.4	(25.5)	Mathematics	451 (487)
Public and private spending (% of GDP)			Science	452 (487)
Health care (2020)	9.5	(9.7)	Share of women in parliament (%)	21.7 (32.4)
Pensions (2017)	15.6	(8.6)	Net official development assistance (% of GNI, 2017)	0.2 (0.4)
Education (% of GNI, 2020)	3.1	(4.4)		

1. The year is indicated in parenthesis if it deviates from the year in the main title of this table.

2. Where the OECD aggregate is not provided in the source database, a simple OECD average of latest available data is calculated where data exist for at least 80% of member countries.

Source: Calculations based on data extracted from databases of the following organisations: OECD, International Energy Agency, International Labour Organisation, International Monetary Fund, United Nations, World Bank.

13.2 Greece 2.0 Snap-Shot (OECD 2023)

Box 1.2. The ambitious “Greece 2.0” Recovery and Resilience Plan

Greece’s Recovery and Resilience Plan provides an ambitious and detailed programme of reforms and investment across many of the areas holding back longer-term prospects for stronger, sustainable and inclusive growth. The plan includes 68 different structural reforms, and 106 investment projects. The government estimates that, fully implemented, the plan will lift annual GDP growth by 1.2 percentage points. By 2026, it estimates the plan will raise output by 6.9%, private investment by 20% and employment by 4%. While capital investments will absorb most of the funds, some of the administrative and policy reforms funded from the Plan may have more enduring benefits for Greece’s public services and business environment.

Initial progress has been strong. The Plan was among the first submitted and approved for access to the NextGenerationEU Facility. Progress with the reforms and preparing projects allowed Greece to access a pre-payment and the first payment by April 2022. By November 2022, 440 projects had been approved for a total budget of EUR 13.2 billion (6.4% of GDP in 2022). These mostly relate to the green transition, digitalisation in the public and private sectors and of public healthcare, and financial incentives for private investment.

Table 1.2. Greece 2.0 foresees sustained disbursements from its inception

EUR billion, in 2018 values

	2021	2022	2023	2024	2025	2026	Total
	Pre financing disbursed	Projected (disbursed)	Projected	Projected	Projected	Projected	
NextGenerationEU resources	4.0	5.3 (3.6 paid up to May)	5.3	5.3	5.3	5.4	30.5 (14.9% of 2022 GDP)
<i>of which</i>							
Grants	2.3	3.4 (1.7 paid up to May)	3.4	3.4	3.4	1.7	17.8
Loans	1.7	1.9 (9 paid up to May)	1.9	1.9	1.9	3.7	12.7

Table 1.3. Greece 2.0 prioritises the green transition, employment and skills, digitalisation and private investment

Pillars	Recovery Fund Budget (EUR billion; 2018 values, % of 2022 GDP)	Total investing resources mobilised (EUR billion; 2018 values, % of 2022 GDP)
1. Green Transition	6.2 (3.0%)	11.6 (5.7%)
2. Digital Transition	2.2 (1.1%)	2.4 (1.2%)
3. Employment, Skills, Social Cohesion (Health, Education, Social Protection)	5.2 (2.5%)	5.3 (2.6%)
4. Private investment and transformation of the economy	4.8 (2.4%)	8.8 (4.3%)
Total investment resources	18.4 (9.0%)	28.1 (13.7%)

Fully implementing the plan will be challenging. Some of the Plan’s reforms are highly ambitious and are likely to encounter implementation challenges including administrative hurdles, growing supply and workforce constraints, and challenges from some affected groups. To meet these challenges, in line with other OECD countries’ experiences in successfully implementing major projects, the government has created a dedicated secretariat linked to the Prime Minister’s office in charge of implementing and monitoring the Plan. It has developed a strategic project pipeline and project preparation facility, and dedicated units to manage, control and audit the Greece 2.0 programme and investments. It has committed to building on these measures to improve its ongoing project implementation capacities.

Source: Ministry of Finance of Hellenic Republic (2022), Stability Programme; Bank of Greece (2022) 2021 Annual Report

13.3 Greece 2.0 Implementation of RRP: Cumulative effect on GDP (2025-2040)

Policy scenario	Policy actions	Cumulative effect on real GDP relative to 2021 policies, %:		
		2025	2030	2040
1	Implementing the 'Greece 2.0' Recovery and Resilience Plan	1.0	5.6	12.3
2	Continuing the reform and investment momentum beyond Greece 2.0	1.1	6.4	17.7
3	Continuing the reform and investment momentum beyond Greece 2.0 and maximising the contribution from net migration	1.1	6.6	18.4
<i>Of which:</i>				
3.i.	Continuing the momentum beyond Greece 2.0, focusing on improving the institutional climate, and maximising the contribution from net migration	1.0	5.8	15.8
3.ii.	Continuing the momentum beyond Greece 2.0, focusing on public and R&D investments, and maximising the contribution from net migration	1.1	6.6	15.4

Note: The baseline projections take into account the reduction of the corporate income tax rate to 22%. The projections assume that the pension reforms implemented up to 2021 lead the average effective retirement age to rise to 65 by 2030 and to rise with life expectancy thereafter.

Source: Simulations based on the OECD's Global Long-Term Model and Eurostat population projection scenarios, and OECD Economic Outlook 111 (database) updated.

13.4 Structure of the ACG 150 initiatives

A centerpiece of ACG 150 was the creation and/or development of three institutes as the foundation for leveraging and focusing the College's economic, cultural and social impact:

- Institute for Hellenic Culture and the Liberal Arts
- Institute for Hellenic Growth and Prosperity
- Institute of Public Health

In addition, in 2023 ACG incorporated its Institute of Global Affairs (IGA) into the ACG 150 structure, coordinating its initiatives with fellow ACG 150 units.

The ACG 150 initiatives seek to facilitate the convergence of academia, private industry and the public sector to capitalize on Greece's greatest economic opportunities, by

- Generating high growth potential by performing sector-specific as well as cross-sector applied research and outreach
- Producing superbly-prepared graduates ready to lead and respond to change
- Enhancing technology commercialization and incubating startups
- Continuing and expanding the institutional mission "to serve rather than to be served" in areas like responsible citizenship, sustainability and public health

The Institute for Hellenic Culture and the Liberal Arts (IHCLA) was founded in 2019 and aspires to have an impact far beyond the academy by promoting a simple fact:

Hellenic culture provides not only the basis for all liberal arts education but also the model for successful popular government based on principles such as personal and civic responsibility, civilian control of the military, resistance to tyranny, law applied without respect to person and the right to trials by a jury of one's peers.

Beyond its contributions to government and education, Hellenic culture arguably produced or advanced more scientific, aesthetic and intellectual disciplines than any culture before or since, including astronomy, geometry, music, drama, philosophy, history, ethnography and rhetoric. In a very real sense, the modern West and much of the rest of the world inhabit an intellectual and aesthetic space largely created by Hellenic culture.

The IHCLA focuses on Greek culture by explicitly tying the liberal arts tradition to its origins in Hellas and by emphasizing its relationship to citizenship and popular government as well as the continuing influence of Greek culture on the world after the classical and Hellenistic ages.

The Institute for Hellenic Growth and Prosperity (IHGP) pursues its mission of fostering Greece's economic growth by serving as the home for Centers of Excellence in the areas of Food, Tourism & Leisure (CoEFTL); Logistics, Shipping & Transportation (CoELST); and Sustainability (CoES); as well as the Research, Technology & Innovation Network (RTIN).

These units target specific areas of the Greek economy or factors (technology, sustainability) that cut across the economy as a whole, particularly areas identified in the McKinsey group's "Greece: 10 Years Ahead" report as poised for expansion in the coming decade - including transportation, tourism, leisure, agri-food and digital transformation - while promoting research and innovation within a framework for sustainable growth. As this update has demonstrated, the areas identified by the McKinsey Report (and often confirmed by subsequent reports and government efforts) have indeed played a major role in Greece's economic recovery and remain crucial sectors for continued growth and development.

CoEFTL:

Resting on two of the main pillars of the Greek economy, i.e., the agri-food sector and the tourism and leisure sector, the CoEFTL promotes the intellectual, pedagogical and outreach infrastructure necessary to make Greece a leading academic innovator in these vital sectors.

Through fostering innovative research, teaching, and public outreach in the areas of food, tourism and leisure by means of targeted academic programs, fellowships, internships, lectures, policy papers, media productions, symposia and conferences, the CoEFTL seeks to help propel Greece's economic growth.

The CoEFTL promotes scientific excellence & build relevant research capacity, leverage competitiveness and sustainability in the agri-food and tourism industries, contributes to the public discourse on social perspectives of agri-food and tourism, undertakes educational activities & foster teaching excellence and develops public policy recommendations & advocacy.

CoELST:

The CoELST promotes the intellectual, pedagogical and outreach infrastructure necessary to make Greece a leading innovator in logistics, shipping and transportation. Through fostering innovative research, teaching and public outreach in these fields by means of academic programs, fellowships, internships, lectures, policy papers, media productions, symposia and conferences, the CoELST seeks to help propel Greece's economic growth.

The CoELST promotes efficient and sustainable transportation systems, develops public policy research & advocacy that opens new opportunities for innovation in the shipping and infrastructure industries and supports scientific research & educational activities that are responsive to real-time industry challenges.

CoES:

The Center was established in 2011 with the aim of promoting sustainability on the ACG campus and beyond. The CoES serves all ACG entities (Deree – Pierce – Alba) and supports all academic programs. During the 12 years of its operation, CoES is connecting academic offerings with research, initiatives and operations on all ACG's campuses.

The CoES connects directly with two ACG programs of study through the program specifications in the Environmental Studies and Biomedical Sciences programs, under the Department of Science and Mathematics, as well as impacting numerous other programs through particular courses and research activity.

The CoES thus facilitates ACG students' ability to engage in sustainability-related projects, become involved in sustainability-related research, establish and enhance a sustainability culture on campus, and become future sustainability leaders.

The Center promotes environmental awareness, education for sustainable development and sustainability research on campus and beyond, coordinates educational programs and activities while promoting experiential learning, facilitates faculty and student collaboration between disciplines and connects with other stakeholders and actors in the wider community in collaboration and coordination with the Office of Public Affairs.

RTIN:

The RTIN seeks to combine the in-house research and innovation (R&I) potential stemming from ACG's faculty, schools, departments, institutes, centers, programs and labs with an external network of collaborators and innovation players (corporations, investors, start-up clusters and incubators, funding agencies, innovation and market fora and think-tanks, venture capital funds, standardization and regulatory authorities, legal counsels, sponsors and donors).

The Network's activities track the evolution of many science and technology (S&T) disciplines that shape our world like information and communication technologies, optimization and operations research, economics and finance, marketing, business and management, biomedical science and e-health, psychology and cognitive science, visual arts, literature, philosophy, history and journalism.

The RTIN aims at impacting science, technology and business along the following key axes:

- Contributing to the S&T knowledge base via top-tier publications and white / position papers
- Participating in collaborative R&I via joint research and industrial projects
- Fostering industry-oriented innovation via patents, standards contributions and policy advising
- Nurturing startup companies and promoting other innovation-based entrepreneurship.

Supporting the work of all these units, the IHGP seeks to sponsor research as well as scholarly and public discussions designed to promote the adoption of innovative and best international practice solutions to Greece's economic challenges through such means as traditional publications, media productions (including social media), a bespoke website featuring archived publications and media productions, and conferences/seminars/symposia (real and virtual/electronic) that seek to bring public officials, academics (faculty and students), and business leaders together to address specific economic issues facing Greece and the world today.

The Institute of Public Health (IPH) was founded in 2016, building on a collaboration that began in 2010 between the Harvard University School of Public Health and the Hellenic Cancer Society.

Through a U.S.-modeled comprehensive strategy, the IPH has engaged thousands of people annually with important research, information and practical guidance about smoking cessation and other pressing public health issues.

Since its inception, the IPH has focused on combating Greece's high rate of smoking and related health costs through the SMOKEFREEGREECE Initiative targeting primarily youth. Funded by the George Behrakis Family Foundation, the initiative contributed to Greece leading the European Union in smoking reduction and lowered Greece's projected 10-year healthcare costs by \$1.3B.

As this successful campaign winds down ACG remains committed to continuing to address smoking cessation and to expanding the IPH's work to address additional public health issues, such as childhood obesity, nutrition and mental health.