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The economic opportunity of AI in Greece

Capturing the next wave of benefits from generative AI

An Implement Consulting Group study commissioned by Google
April 2024

Generative AI has the potential to boost Greece's GDP

Despite a weaker starting point, Greece can still capture huge benefits from AI by investing in skills, promoting innovation and ensuring clear rules.

The economic opportunity

Generative AI technology is developing rapidly. In the most advanced countries, the economic contribution could peak in as little as ten years.

In about ten years from now, generative AI alone could boost Greece's annual GDP by

€10-12 billion

+6% GDP
annual contribution if Greece achieves widespread adoption of generative AI.

Gains come from three sources …

Productivity boost from people working with generative AI.

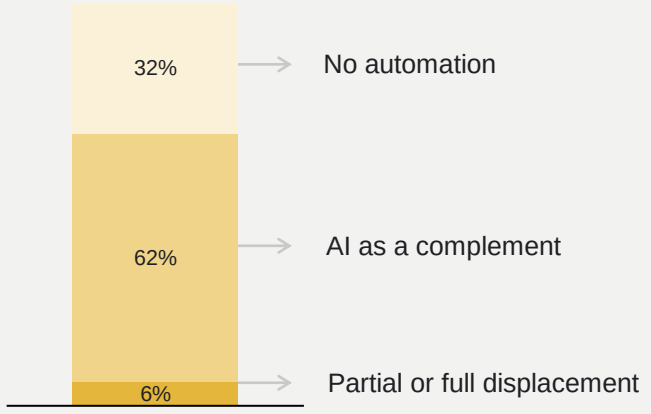
Freed-up time when generative AI helps to automate our work.

Re-prioritised and re-employed time for other value-creating activities.

The job implications

62% of jobs in Greece are estimated to work **together with** generative AI.

Share of jobs exposed to automation by generative AI
% of total employment in Greece



The Greek workforce can benefit from generative AI.

New jobs in the AI-powered economy are expected to replace those lost due to automation, resulting in unchanged employment levels. The highly exposed jobs represent around 10% of the expected future level of job changes in Greece.

The transition is expected to be gradual, allowing workers time to adapt to new tasks and develop new skills.

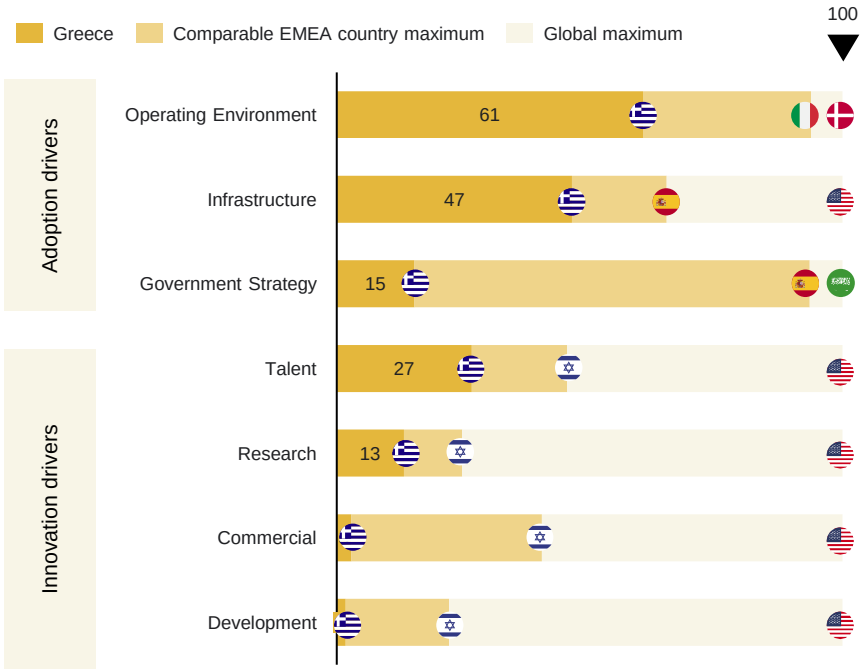
Maximising the gains from generative AI requires accelerated commercial uptake and leveraging and enhancing talent and research

AI readiness in Greece

Greece is lagging behind other comparable EMEA countries on AI adoption drivers …

Greece's AI capacity according to the Tortoise Global AI Index

Global AI Index, score out of 100 (global leader)



Greece lags behind comparable countries and global leaders across all indicators and could especially look to ramp up its strategic efforts and AI operating environment and invest further in digital infrastructure.

Conclusions and policy implications

A LARGE POTENTIAL

+6%

Widespread scenario
Generative AI is expected to boost medium-term economic growth in Greece. The 6% annual boost to GDP given a 10-year adoption timeline is lower than in other more digitalised economies.

… WITH AN UPSIDE

+8%

Leapfrogging scenario
Greece could succeed with faster adoption by leveraging Greek talent and knowledge and achieve a bigger boost of 8%.

…AND A RISK

+1%

Delayed scenario
Greece could risk slower adoption, and a five-year delay in adoption reduces the 10-year potential from generative AI to only 1%.

Maximising the gains from generative AI requires:

Accelerate commercial uptake

Grow R&D by local innovators

Retrain and upskill workforce

Note: The Tortoise Global AI Index is underpinned by 111 indicators collected from 28 different public and private data sources and 62 governments. Comparable countries refers to nine EMEA countries comparable to Greece in terms of size and level of digitalisation.

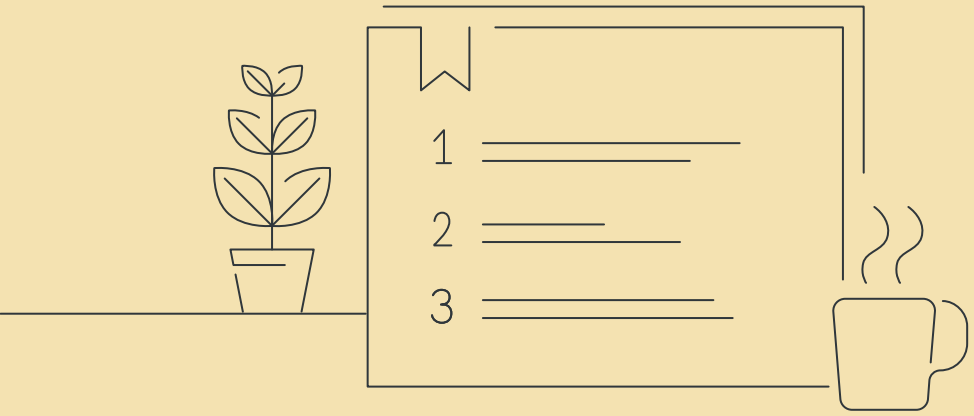
Foreword

Making AI benefit society as a whole requires an adaptive, human-centric and trustworthy approach

AI and the next wave of generative AI have the potential to be the most powerful technology in decades. Responsible AI can help solve global challenges like climate change and access to quality medical care.

AI can make countries more prosperous, productive, innovative, creative and secure. At the same time, there are plenty of pitfalls, paradoxes and tensions that decision-makers will need to navigate.

AI has evolved rapidly with the breakthrough of generative AI in 2022 and its fast adoption in 2023. This report estimates the economic potential of generative AI while recognising the significant economic potential of other types of AI.



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01

Introduction to AI

This report covers all types of AI with a particular focus on generative AI.

AI can help humans solve tasks faster and better – and with generative AI, machines can now understand and interact in language, sound and images

Artificial Intelligence (AI)

- AI is a general term for anything that allows computers to carry out human-like behaviours, including rule-based programmes.

Machine Learning (ML)

- ML is a subset of AI where machines do not need to be explicitly programmed. They use algorithms to identify and learn patterns in data, apply that learning and improve themselves to make better and better decisions.

Deep Learning (DL)

- DL is a subset of ML where computers learn in a way that mimics the human brain. In deep learning, machines build layers of knowledge that are increasingly complex.
- These AI models are typically trained on specific data sets and used within a given field or industry.

Capabilities include:

Forecasting and prediction

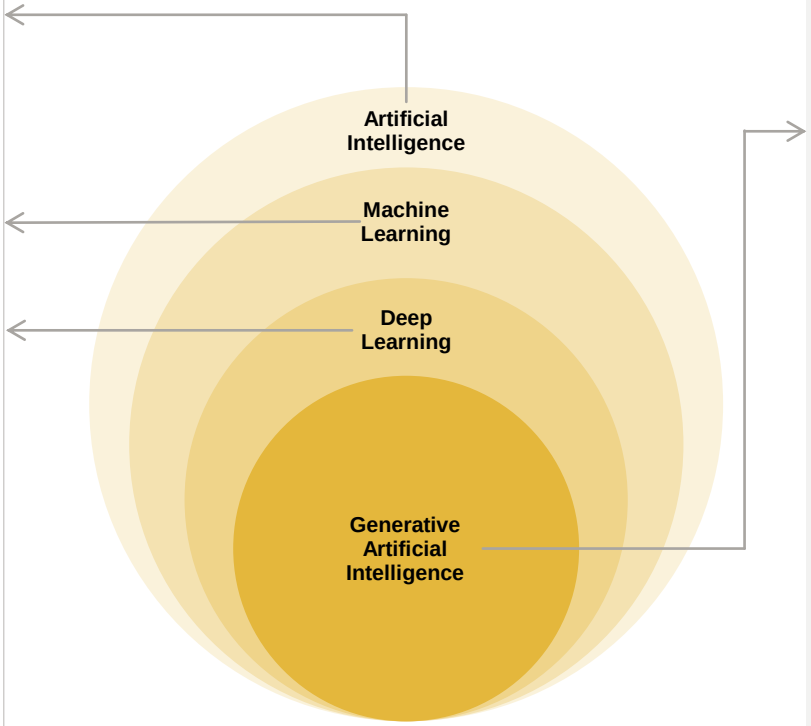
In addition to weather forecasting, similar predictive models are employed in managing warehouse inventories.

Categorisation and recognition

Beyond email spam filtering, AI can be utilised to categorise and recognise patterns in legislative documents.

Optimisation

When it comes to optimisation, AI not only aids navigation via GPS but also plays a crucial role in enhancing the efficiency of energy consumption in data centres.



Generative AI

- Generative AI is a new form of AI made publicly available in 2022. It can understand text, code, images, sound and video and can use it to generate or synthesise new content.
- Generative AI models are trained on huge general data sets to gain a general comprehension of text, visuals, code and sound.
- Generative AI can be used generally across almost any field or industry.

New capabilities include:

Create new unique images

For example, generating an image of a product that does not yet exist based on user input in natural language.

Interact with voice and sound

For example, translating a doctor's memo into a structured text or following up with a customer in writing based on a phone conversation.

Analyse and revise text and code

For example, translating text and adapting it to a different target group or translating code between programming languages.

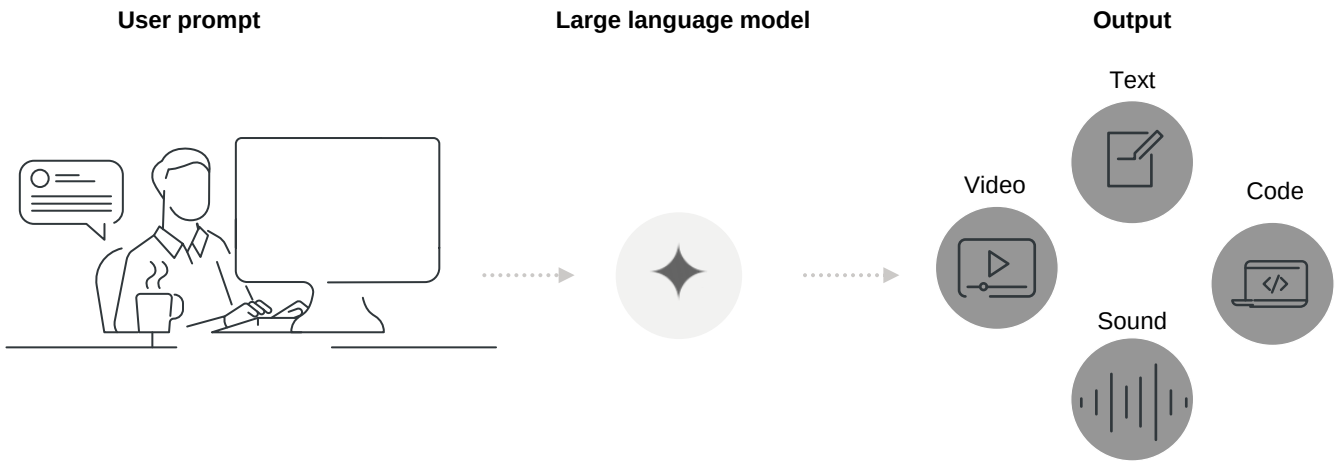
Do research and analyse data

For example, searching the web for relevant information and synthesising conclusions from large data sets.

Note: An algorithm is a detailed set of instructions that a computer follows to carry out a task or solve a problem.
Source: Implement Economics based on expert interviews.

Recent developments have increased the capabilities and availability of AI models and have accelerated uptake

Generative AI models have strong built-in capabilities and are easy to work with …



No or low data requirements

Generative AI models are already trained on huge data sets. This makes them readily available for many tasks without any further data needed.

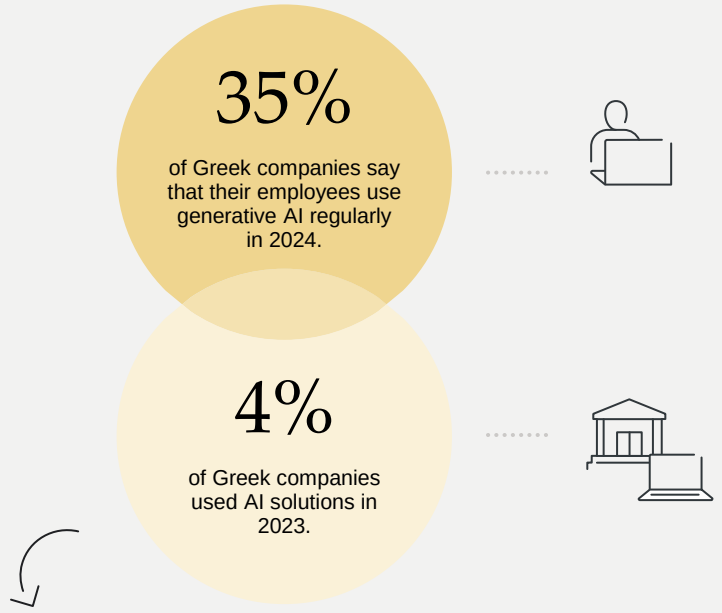
Easy to use in plain language

Generative AI models can be operated using ordinary language and do not require any specific coding skills to use.

Many models are online and free of charge

Several high-performing generative AI models are available online and do not require local ML setups or infrastructure to use.

… and several users have already adopted the technology



Solutions adopted at a company level are driven by non-generative solutions today.

Generative AI is still at an early stage and is yet to be widely adopted at a company or institution level.

Source: Implement Economics based on the European Commission and survey by Public First survey.

Leveraging the full potential of AI will require further research, development and innovation

AI capabilities and requirements by level of development

	Organisational ML-based AI	Generic pre-trained models used online	Adaptions of pre-trained models using APIs	Specialised fine-tuned models	Foundation models
Solvable tasks	Specific	General	General and moderately specialised	General and specialised	Most
Example	*E.g. detection of flawed products in manufacturing*	*Online chatbots, e.g. Gemini or ChatGPT*	*Organisation-level automation solution, e.g. auto-replies*	*Pre-trained model like Llama trained further on context-specific data*	*Model trained from the ground on new data, e.g. Mistral*
Requirements					
Competences for use	●	○	◔	◔	◔
Competences for integrating solution	◕	◔	◔	◕	●
Data and infrastructure	◑	○	◔	◕	●
	Pre-2022	Current fast-adopting models	Next level of adoption	Only adopted by few frontrunner organisations	New frontier of AI

- Generative AI is still in its early phase using generic pre-trained models.
- Future value creation from AI requires more advanced models than the pre-trained models that are available online today.
- Leveraging the full potential of AI technology requires more advanced and specialised models.
- This requires new organisational skills, more data, more computing power and better infrastructure.

Figure explanation

○ No requirements

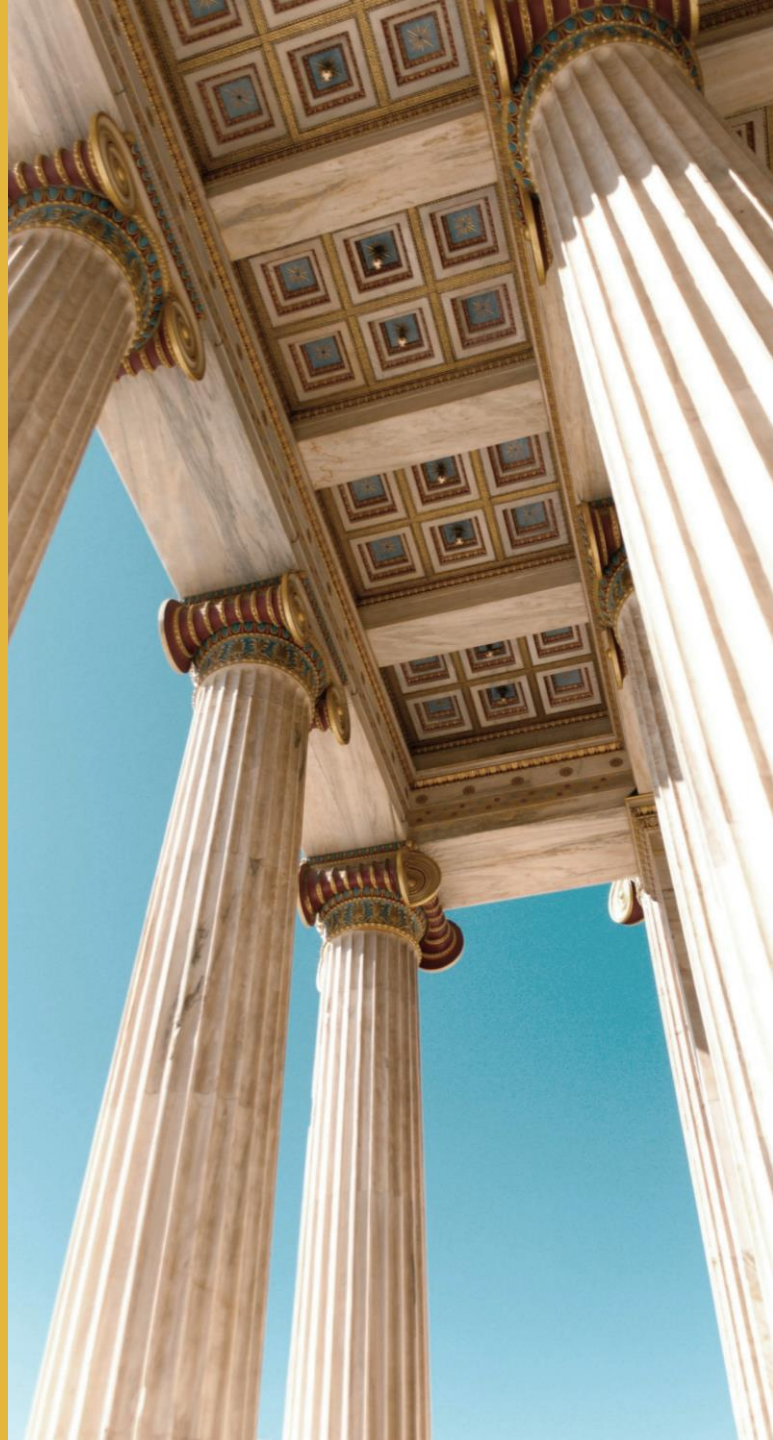
● Highest requirements

Note: Training or fine-tuning generative AI models generally requires significantly more computational resources compared to classic machine learning training.
Source: Implement Economics based on OECD.

02

Economic opportunities from AI

The main economic opportunity in Greece arises from humans working together with generative AI.



AI has great economic potential which can be further boosted by generative AI

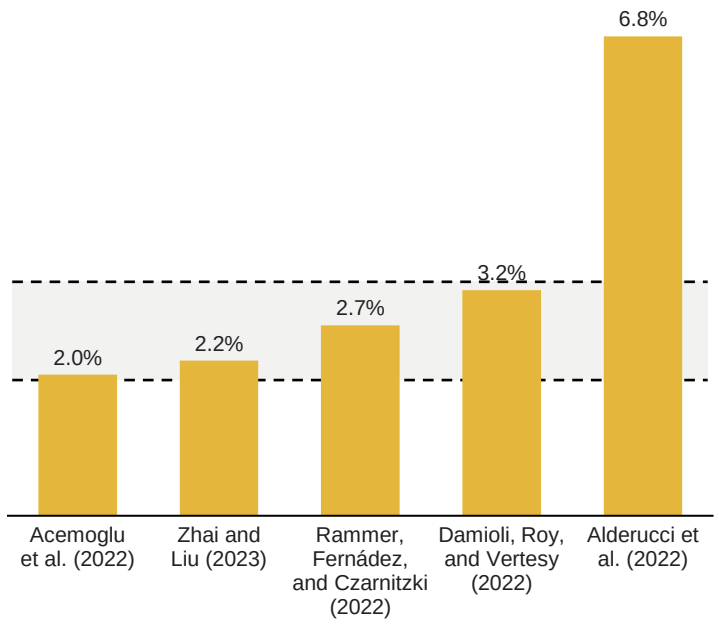
How to think about generative AI:

"What would you do if you had 1,000 well-trained interns ready to work for you day and night?"

AI can increase productivity

Academic studies conclude that labour productivity typically increases by 2-3 percentage points per year after firm-level AI adoption. The studies have been carried out on early adopters of AI technology and, as such, cannot be extrapolated to the general effects of AI on productivity.

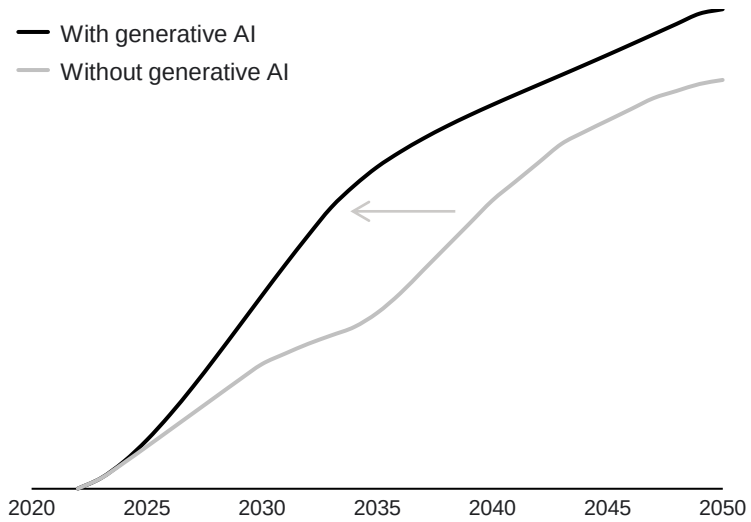
Growth in labour productivity from AI adoption
Percentage points



Generative AI advances automation

Generative AI can advance automation by nearly a decade because it is easier to use for individuals and organisations. However, significant uncertainty about adoption rates and speed of realisation of its benefits remain.

Automation potential
Adoption of AI technology



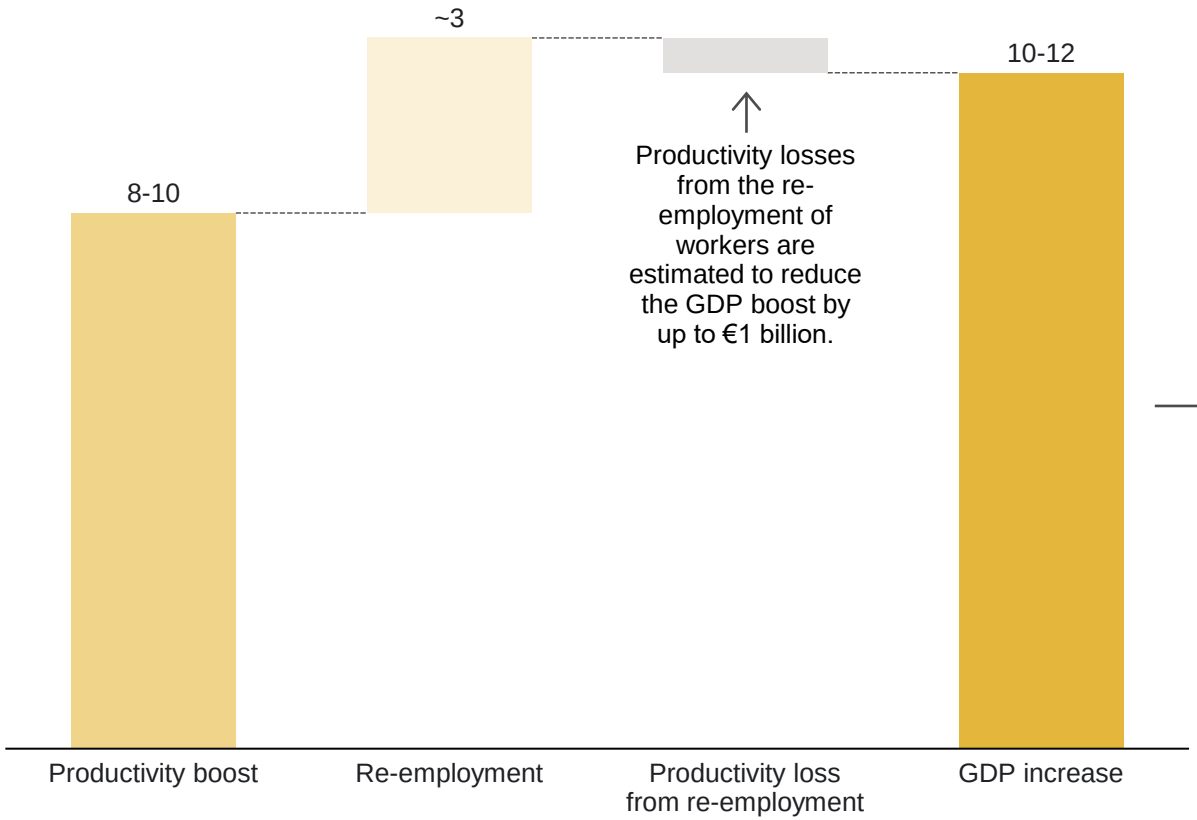
- AI has evolved rapidly with the recent breakthrough of generative AI. Due to its user-friendly nature, generative AI is expected to greatly accelerate the potential of AI to create economic impacts.
- Generative AI is only a part of AI's overall economic potential. Some studies estimate with some uncertainty that generative AI accounts for around one-third of the total effect of AI.
- This report estimates the macroeconomic potential of generative AI while recognising the significant economic potential of other types of AI.

Source: Implement Economics based on Brynjolfsson et al. (2019), Acemoglu et al. (2022), Andersen et al. (2023), Alderucci et al. (2022), Rammer, Czarnitziki, and Fernández (2022), Damioli, Roy, and Vertesy (2022), Zhai and Liu (2023).

Generative AI could increase Greece's GDP by 6% in ten years

GDP potential of generative AI in Greece

€ billion annual increase from baseline GDP over a ten-year horizon



+6% GDP

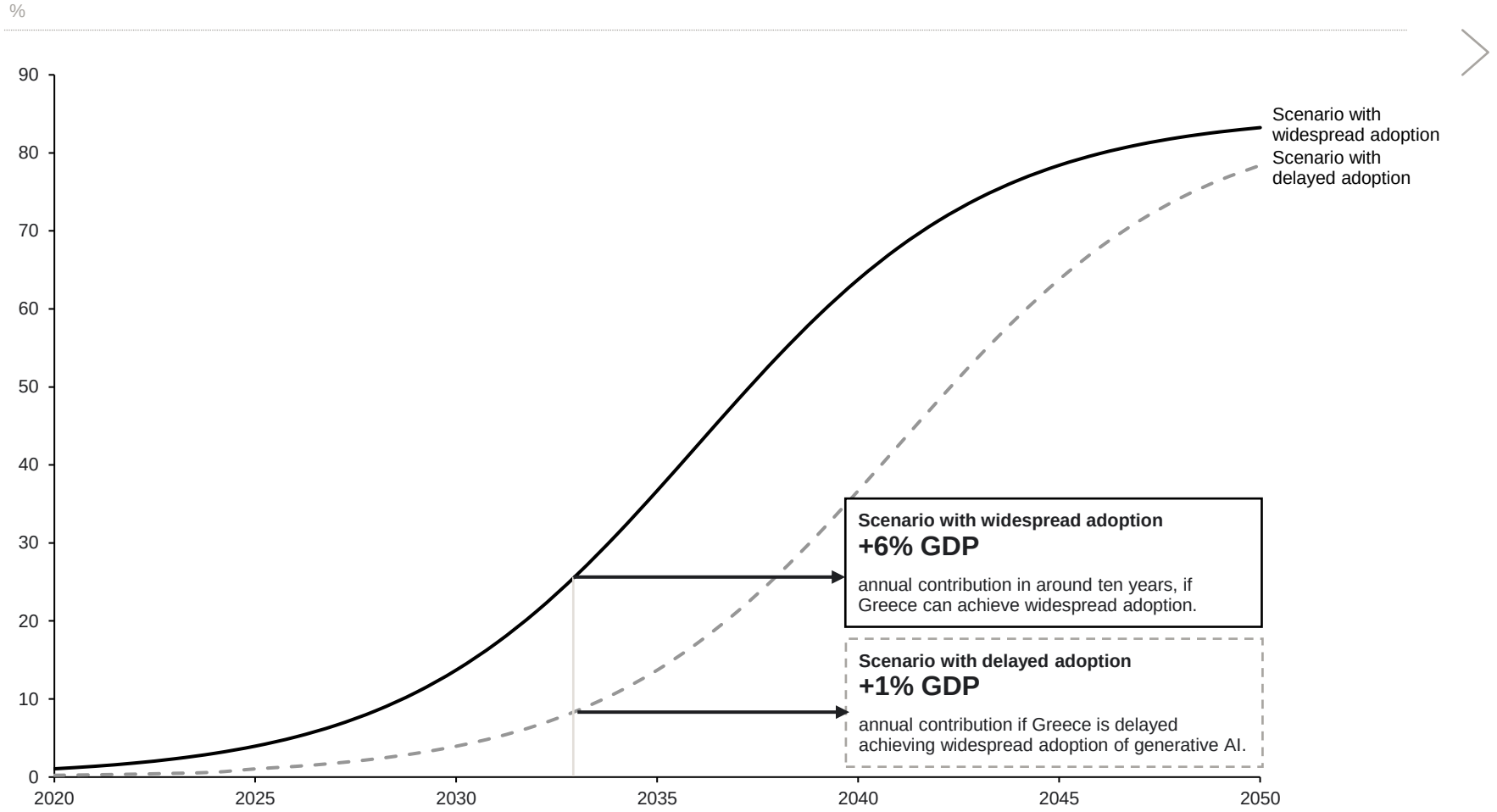
annual contribution if Greece achieves widespread adoption of AI.

- We estimate a potential increase in GDP of €10-12 billion in around ten years, corresponding to 6% of Greece's GDP.
- The GDP impact over ten years is lower than more advanced economies due to Greece's lower level of AI readiness, which precipitates a slower adoption period.
- Over a longer horizon, the economic potential of generative AI in Greece is comparable to other more digitally advanced countries (+8% GDP over 10-15 years).
- The dominant impact of generative AI is a productivity boost to the majority of workers (62%) by augmenting their capabilities, quality and efficiency, which is estimated at €8-10 billion in Greece.
- The estimate includes impacts of re-employment of a small share of workers (5%), where generative AI is freeing up a significant share of work for other tasks. This is estimated at around €3 billion in Greece.
- The estimate accounts for the possible productivity loss associated with re-employment to other occupations. This reduces the estimate for Greece by up to €1 billion.
- At its peak, the productivity effect of generative AI in Greece is estimated to be equivalent to 1.2% annually.

Note: There is much uncertainty around the capability and adoption timeline of generative AI. The size of the productivity boost depends on the difficulty level of tasks that generative AI will be able to complete and the number of jobs it can automate. GDP is in 2022 levels. The average number of work activities that potentially can be performed by generative AI across all types of tasks for both complemented and highly exposed workers corresponds to 20-25%. Our estimate is the isolated potential of generative AI around ten years from now, when the impact is assumed to peak in leading countries. The estimated boost from generative AI may not be fully additive to GDP trends, as the GDP forecast already assumes a growth contribution from new technologies and generative AI may substitute some of that. Also, the boost from generative AI may be partially offset by an underlying growth slowdown.
Source: Implement Economics based on Eurostat, Bureau Fédéral du Plan, O*Net, Briggs and Kodnani (2023a), BNP Paribas (2023), and Dell'Acqua et al. (2023).

A five-year delay in the adoption of generative AI could reduce Greece's potential GDP gains from 6% to 1%

Adoption of generative AI

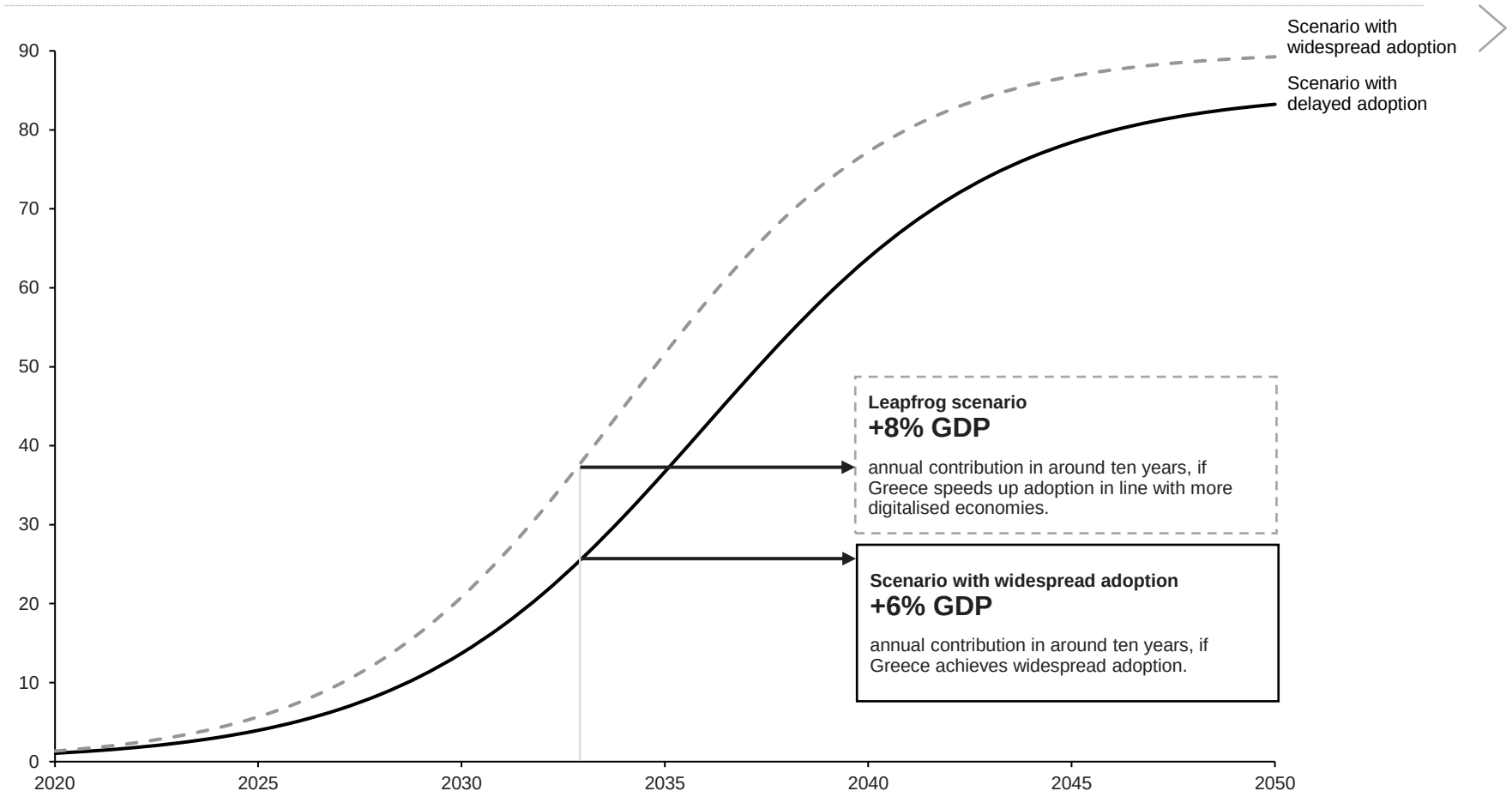


- Generative AI is a new general-purpose technology and will take time to adopt.
- Our estimate of Greece's GDP potential from generative AI is reliant on the gradual adoption and development of the new AI technology within the next ten years.
- A five-year delay in capturing the benefits of generative AI is estimated to reduce the annual GDP contribution in ten years from 6% (€10-12 billion) to only 1% (€1-2 billion).
- Greece can increase the welfare and GDP contribution of generative AI by ensuring that policies are in place to capture the benefits in line with leading countries (see section 6).

Note: GDP figures are expressed in 2022 levels. The figure shows generative AI adoption expressed as a share of economywide firms exposed to AI automation. The estimate is made for a ten-year adoption period to align with the time-horizon for widespread adoption by the most advanced countries apart from the US. The "widespread adoption" scenario assumes adoption in line with "other developed markets" in Briggs and Kodnani (2023b). Note that the impact of generative AI may take longer than ten years before reaching its peak impact in less digitalised countries such as in Greece.
Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a&b) .

A leapfrog scenario could increase Greece's potential from generative AI from 6% to 8%

Adoption of generative AI



- Compared to other historical technological innovations, generative AI is more user-friendly and easier to adopt.
- This presents a significant opportunity for less digitalised countries to leapfrog development by skipping one generation of technology and going straight to the new generation of generative AI tools.
- To gauge the potential, we consider a *leapfrog scenario* where Greece succeeds in adopting generative AI at the same speed as most digitalised European economies.
- If Greece can capture the benefits of generative AI earlier, the economic potential in ten years is estimated to increase from 6% (€10-12 billion) to 8% (€12-14 billion).
- This scenario only captures part of the leapfrogging potential, as there is also a possibility that generative AI could not only be adopted faster but also provide more powerful boosts to productivity in Greek industries that are lagging behind their more digitalised European peers. This potential positive effect could be significant but is not quantified here.
- Leapfrogging would require a focused effort to significantly elevate key AI drivers in a short timeframe.

Note: GDP figures are expressed in 2022 levels. The figure shows generative AI adoption expressed as a share of economywide firms exposed to AI automation. The estimate is made for a ten-year adoption period to align with the time horizon for widespread adoption by the most advanced countries apart from the US. The "widespread adoption" scenario assumes adoption in line with "advanced emerging markets" while the "leapfrog" scenario assumes adoption in line with "other developed markets" in Briggs and Kodnani (2023b).
Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a&b) .

Generative AI models have the potential to boost SME AI adoption to new levels, but regulatory uncertainty and lack of skills can stand in the way

SMEs lag behind larger corporations on AI adoption

SMEs in Greece account for
~85% of total employment

Like other European countries, Greek SMEs are slower to adopt AI compared to large enterprises.

14%
of large enterprises in Greece had adopted AI in 2023.

4%
of SMEs in Greece had adopted AI in 2023.

The gap in AI adoption between SMEs and large enterprises reflects a **general challenge** among EU countries:

30%
of large enterprises in the EU had adopted AI in 2023.

7%
of SMEs in the EU had adopted AI in 2023.

Generative AI could boost SME AI adoption …

No or low data requirements means that SMEs can readily use generative AI for many tasks without any further work needed

Ease of use in plain language means that SMEs can use many generative AI models without the need for coding skills.

Free online availability means that SMEs do not need to invest in new computing power or new infrastructure to use generative AI

… but SME uptake can be slowed down because …

Lack of broader skills required to fully leverage the potential of new generative AI technologies can hamper uptake.

Regulatory uncertainty around generative AI can increase implementation risks and compliance costs, notably for SMEs lacking in-house legal capabilities.

Note: According to the classification by the European Commission, SMEs are defined as enterprises with 1-249 employees, and large enterprises are defined as enterprises with 250+ employees.
The percentage of total employment accounted for by SMEs is based on 2022 data.
Source: Implement Economics based on the European Commission and OECD (2024).

03

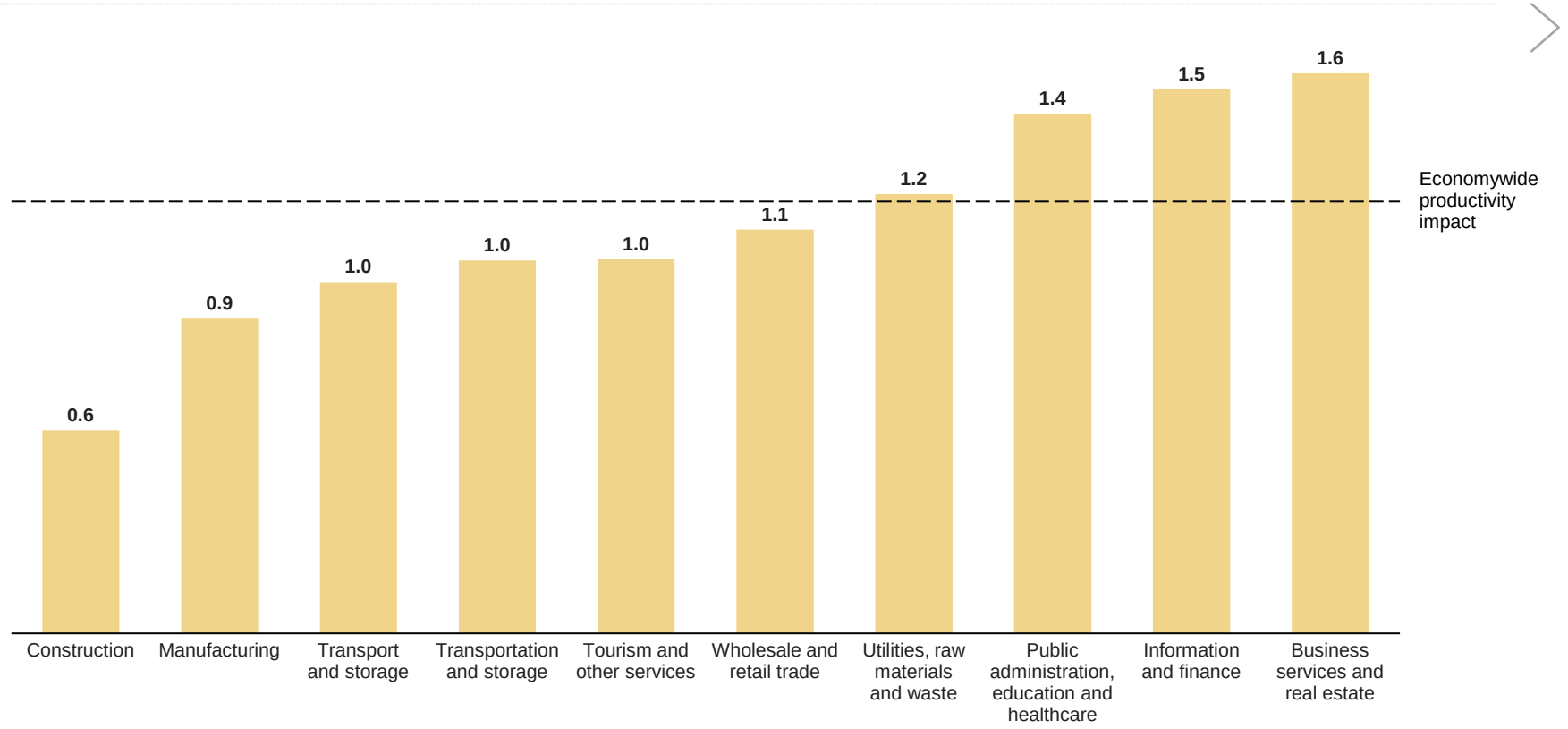
Key sectors benefitting from AI

Some sectors are expected to gain more from generative AI, mostly owing to the types of tasks performed.

AI can boost productivity across all sectors – exceeding historical levels

Productivity boost from generative AI

% productivity growth p.a. at peak



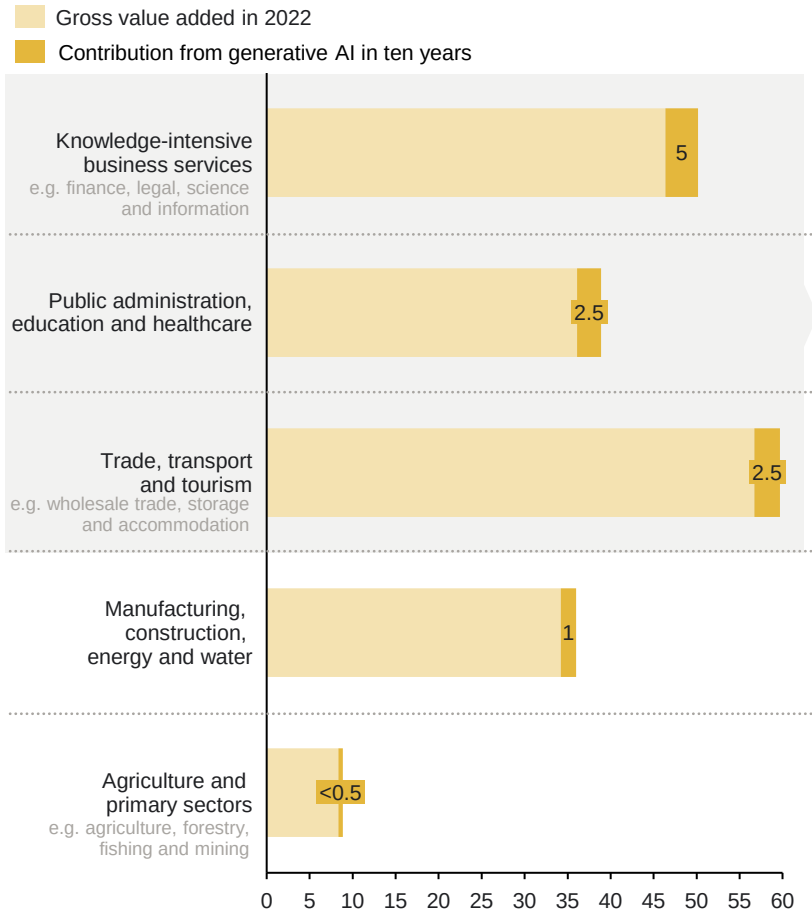
- The complementary role of generative AI prevails in most industries, meaning that most occupations are estimated to use AI to augment and improve human capabilities.
- In contrast to past automation, such as robots, generative AI has the ability to boost productivity in the service sector.
- This is estimated to provide a much-needed boost to productivity in Greece, which has been slow in recent years in key sectors, such as services and construction. According to the OECD and the Greek Centre of Planning and Economic Research (KEPE), Greek productivity growth was negative on average in the period 2010-2020 and has only improved in recent years.
- Displacement mainly occurs where administrative and repetitive knowledge-based tasks make up a large part of the work activities.
- Generative AI has the potential to increase annual productivity growth in the tourism sector by 1% at its peak – a significant boost to one of Greece's largest sectors, making up 18% of GDP and employing 800,000 people.

Note: Sectors are aggregated according to NACE categorisation. "Information and finance" is a combination of information, communication, financial and insurance activities. "Tourism and other services" comprises accommodation, food and other services. Labour productivity gains are mapped one-to-one to GDP if total employment (as here) is assumed constant and the capital stock increases to match productivity improvements. The estimates take into account that the growth impact of generative AI may not be fully additive to the current GDP trend. First, AI-related gains may substitute for growth that would otherwise occur in a non-AI baseline. Second, underlying productivity growth has slowed over the past decades. The estimated boost from generative AI may be partially offset by an underlying growth slowdown.
Source: Implement Economics based on Eurostat, OECD, Statista, Centre of Planning and Economic Research, O*Net and Briggs and Kodnani (2023a).

80-85% of generative AI's economic potential lies in service sectors

Gross value added by sector in Greece

€ billion



80-85% of potential

Generative AI has the potential to boost value added in knowledge-intensive business services by around **€5 billion**, e.g. by generating content, assisting in research and automating complex data processing. The impact of other types of AI in these sectors is limited to automating repetitive tasks.

Generative AI can benefit the public sector with an estimated **€2.5 billion**, e.g. through personalised tutoring in education, diagnostic support and patient interactions in healthcare and automatic document handling and preparatory decision-making in public administration. Other types of AI also have potential in the public sector.

Although the trade, transport and tourism sector has a small percentage impact from generative AI, it still presents a significant economic potential of an estimated **€2.5 billion**, of which tourism makes up €0.8-1.0 billion. The sector can benefit from enhanced translation and communication capabilities for global tourism, 24/7 chatbots and personalised recommendations.

Generative AI has the potential to increase productivity in manufacturing and construction by around **€1 billion** although the percentage impact is assessed to be smaller than in other sectors. Other types of AI are expected to have a significant impact on these sectors, e.g. through supply chain optimisation and automation of manual processes for specific tasks.

Generative AI can, for example, facilitate predictive maintenance by processing operational reports and predicting potential system failures, thereby supporting an estimated potential of up to **€0.5 billion.**

Note: Sectors are aggregated as follows: "Knowledge-intensive business services": NACE sectors J-M. "Public administration, education and healthcare": NACE sectors O-R, U. "Trade, transport and tourism": NACE sectors G-I, N, S-T. "Manufacturing, construction, energy and water": NACE sectors C-F. "Agriculture and primary sectors": NACE sectors A-B.
Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a).

04

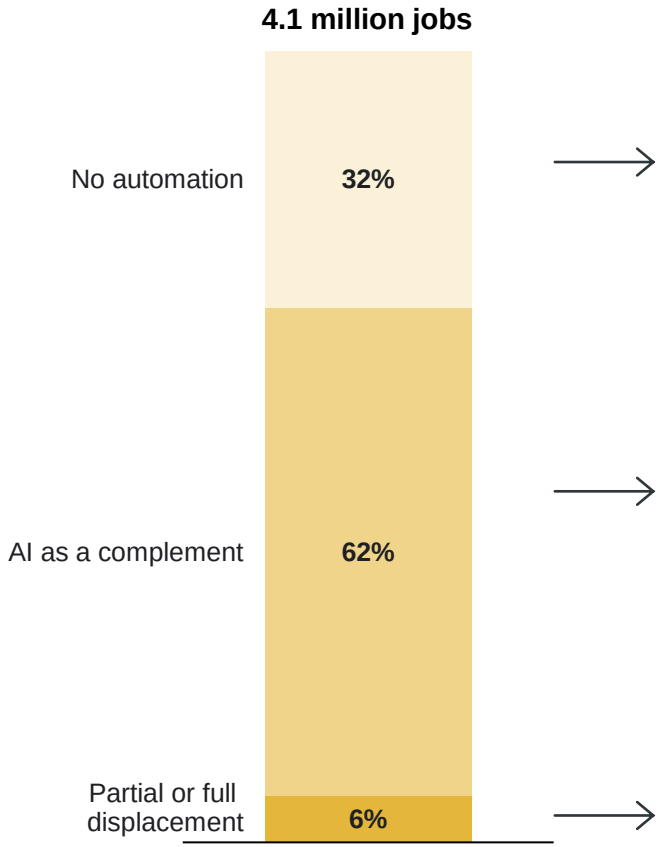
Job implications of AI

Generative AI will introduce job changes in Greece – the nature and degree of which depend on economic and demographic factors.

Generative AI augments most jobs

Share of jobs exposed to automation by generative AI in Greece

% of total employment in Greece



~ 1.3 million jobs are unlikely to be exposed to automation

An estimated 32% of jobs in Greece are likely to remain largely unaffected by generative AI. These jobs include manual labour, outdoor tasks, such as construction and cleaning, and human-to-human tasks, such as personal care and food services.

~ 2.6 million jobs are likely to be augmented by generative AI

Most jobs (62%) are expected to be assisted by generative AI by automating a limited share of their tasks and helping to create content (text, code and images), collaborating with workers on complex problems and contributing to product design.

Unlike previous waves of automation that mainly impacted manual workers, generative AI is expected to primarily affect office-based professionals.

~ 250,000 jobs are likely to be fully or partially displaced

A small share of jobs (6%) are expected to have over half of their work activities exposed to automation by generative AI, e.g. in occupations such as clerical support workers, contact centre salespersons and translators. These workers are likely to see their jobs fundamentally change and may need to be re-employed in new occupations.

Note: Based on Q3 2023 employment data. In accordance with Briggs and Kodnani (2023a), "No automation" are occupations with less than 10% exposure, "AI as a complement" are occupations with 10-49% exposure and "partial or full displacement" are occupations with exposure of or above 50%. Note that percentages and absolute numbers are rounded.
Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a).

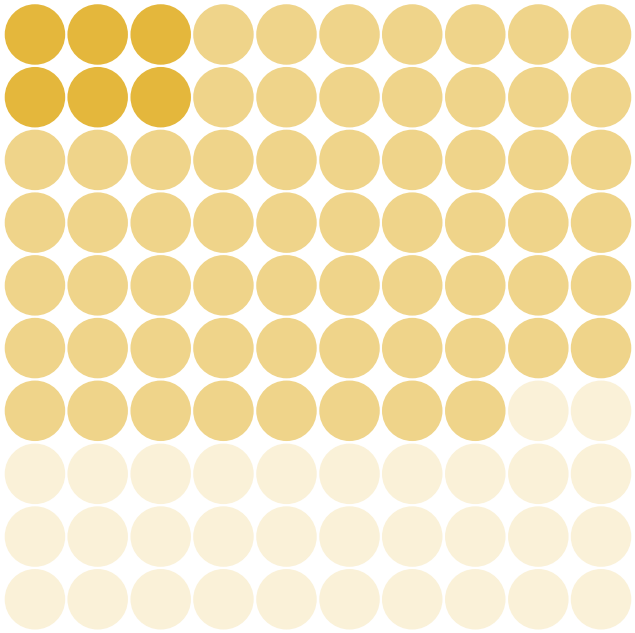
The AI-powered economy is expected to create new jobs and ensure full re-employment of potentially displaced workers

Share of jobs exposed to automation by generative AI in Greece

% of total employment in Greece

Partial or full displacement | AI as a complement | No automation

6% of Greek jobs are estimated to be highly exposed to generative AI, leading to some job closures.



At the same time, 62% of jobs will see a boost in productivity. This will create new jobs due to:

I

Increase in general demand for goods and services

With higher GDP growth, the AI-powered economy will demand more labour across a wide range of occupations and skill levels.

II

New tasks and jobs created

Widespread use of AI will also create new jobs such as AI prompt engineers, AI content creators and data trainers – and create jobs we cannot preconceive.

III

Demand within occupation

Generative AI will also make highly exposed occupations, such as translators, more efficient, and hence at lower costs, which in turn can increase the demand for those occupations.

Even with accelerated and broad adoption of generative AI over a ten-year period, only around 12,500-25,000 persons in highly exposed jobs are estimated to need re-employment per year, which is small compared to the 200,000 expected future job openings each year towards 2035 according to CEDEFOP (see page 23).

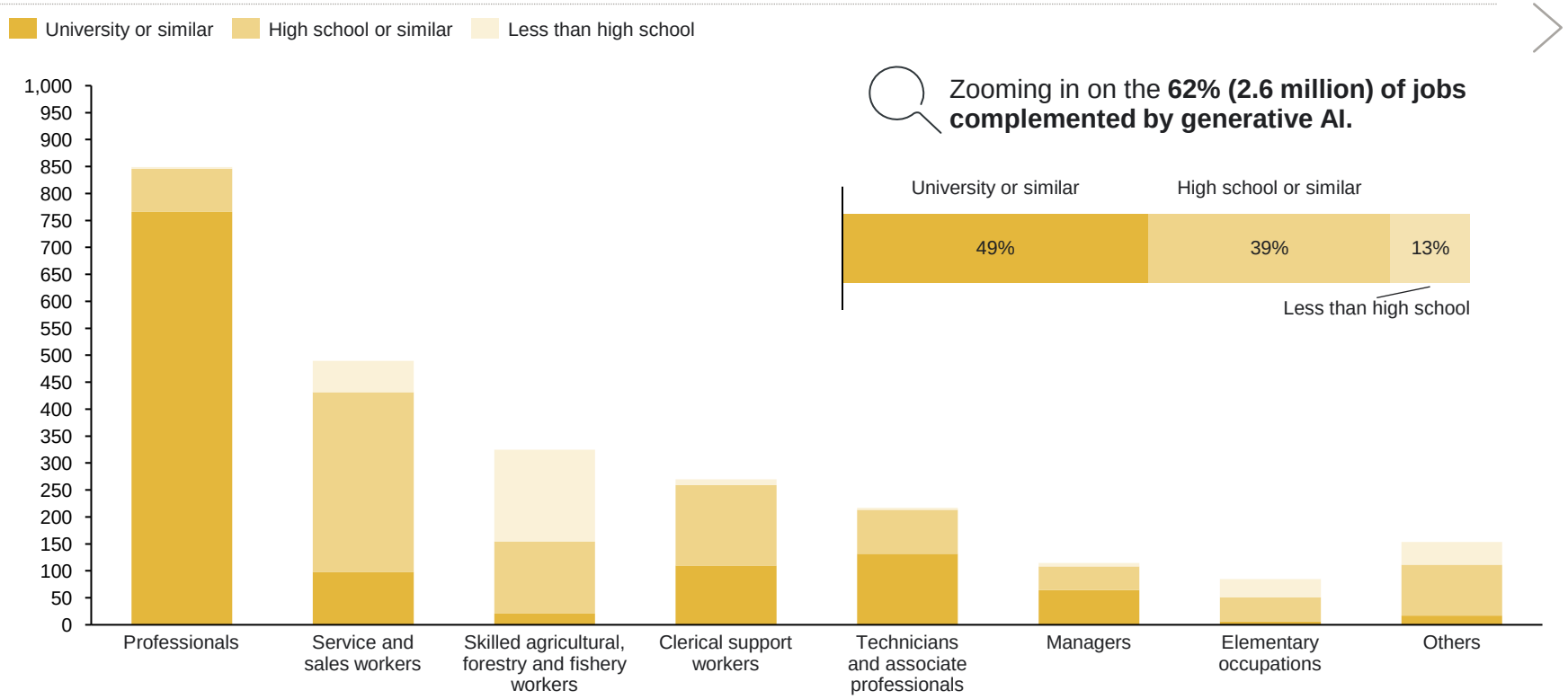
- The job development in Greece over the next decades will depend on a range of factors.
- The isolated impact of generative AI depends on the speed of adoption and the size of the productivity boost relative to the size of the displacement effect for the jobs that are highly exposed to generative AI.
- This report assumes full re-employment of displaced workers over a ten-year horizon. This means no net change in total employment or unemployment.
- This assumption builds on the large size of the productivity boost compared to a relatively small share of displaced jobs. This suggests that the demand for new jobs will be sufficiently strong to create jobs for those exposed.
- Furthermore, economic theory suggests that long-term employment is determined by labour supply and skill mix of the workforce.
- The short-term job impacts will depend, among other things, on the flexibility of the labour market as well as re-training and skilling opportunities for workers.

Note: The assumption that labour supply predetermines employment is widely applied by economists. See, for example, *Principles Of Economics* by N. Gregory Mankiw (2020).
Source: Implement Economics based on based on Eurostat, O*Net, Briggs and Kodnani (2023a) and CEDEFOP.

2.6 million Greek jobs are expected to be complemented by AI – mainly highly educated professionals

Jobs complemented by generative AI in Greece

Thousand jobs



Examples of jobs include:	Research, analysis and advising services (including legal)	Caterers, housekeepers and travel agents	Livestock and farm workers, fishery and forestry workers	Secretaries, record keepers and information suppliers	Engineering technicians, robot controllers and air traffic safety technicians	Executives and supply and general managers	Cleaners, washers and delivery	Police services and machinery operators

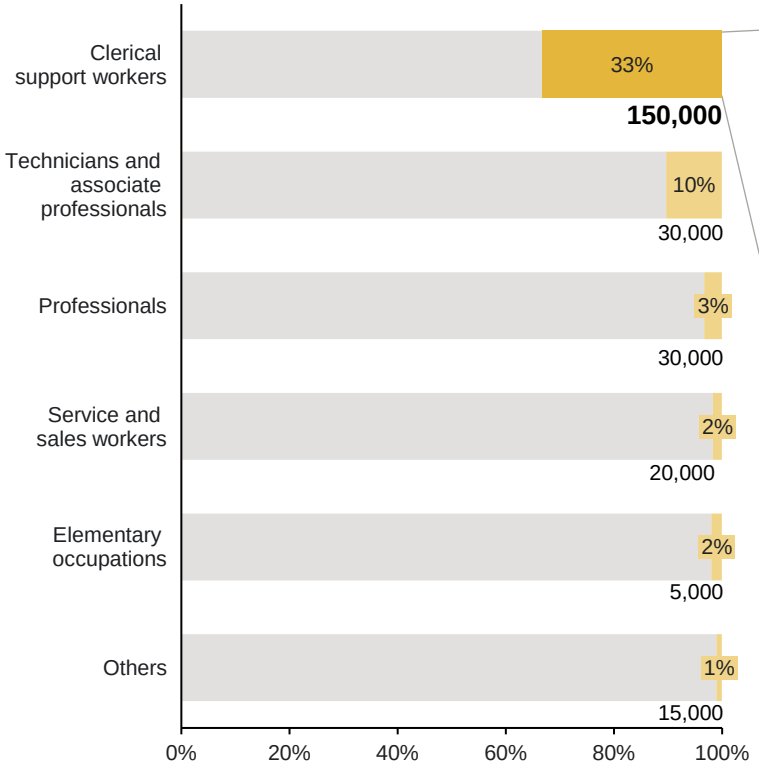
- Generative AI is estimated to augment the capabilities of around 2.6 million jobs in Greece at full adoption and around half of these over a period of 10-15 years.
- Of the complemented workers, 49% are estimated to hold higher educational attainment such as lawyers, scientists and engineers.
- Greece faces a significant challenge with the emigration of highly educated workers seeking opportunities abroad. Tackling this issue will be key to Greece's ability to fully leverage the potential gains of generative AI.
- Generative AI can perform complex cognitive tasks and complement human abilities, creating opportunities for individuals to work with generative AI to create new content and free up time for other tasks.
- Unlike previous waves of automation, generative AI is less relevant in jobs carried out by those with lower levels of educational attainment.

Note: Based on Q3 2023 employment data.
Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a).

Around 250,000 Greek jobs are highly exposed to generative AI, but the AI-powered economy will help create new jobs

Jobs highly exposed to generative AI in Greece

Share of jobs in occupation exposed



Highly exposed jobs in total ~ 250,000

***Example*: Greek clerical support workers and job transition**

Of the 150,000 highly exposed clerical support workers, only around half are assumed to be affected by generative AI over 10-15 years, and all of these are assumed to be employed either outside or within the occupation.

Most are expected to be re-employed in other occupations due to:

I **Increase in general demand for goods and services** due to increased income in the AI-powered economy leading to job opportunities in other sectors.

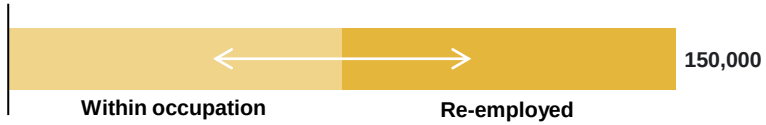
II **New tasks and jobs created**, arising from the introduction of generative AI.

A smaller share is expected to be employed *within* occupation because:

III **Not all highly exposed workers will be displaced**. Some will continue to hold employment with new tasks replacing the exposed tasks.

Increased demand within occupation due to the increase in productivity and lower costs.

The proportions of employment within occupations and in new occupations are uncertain.



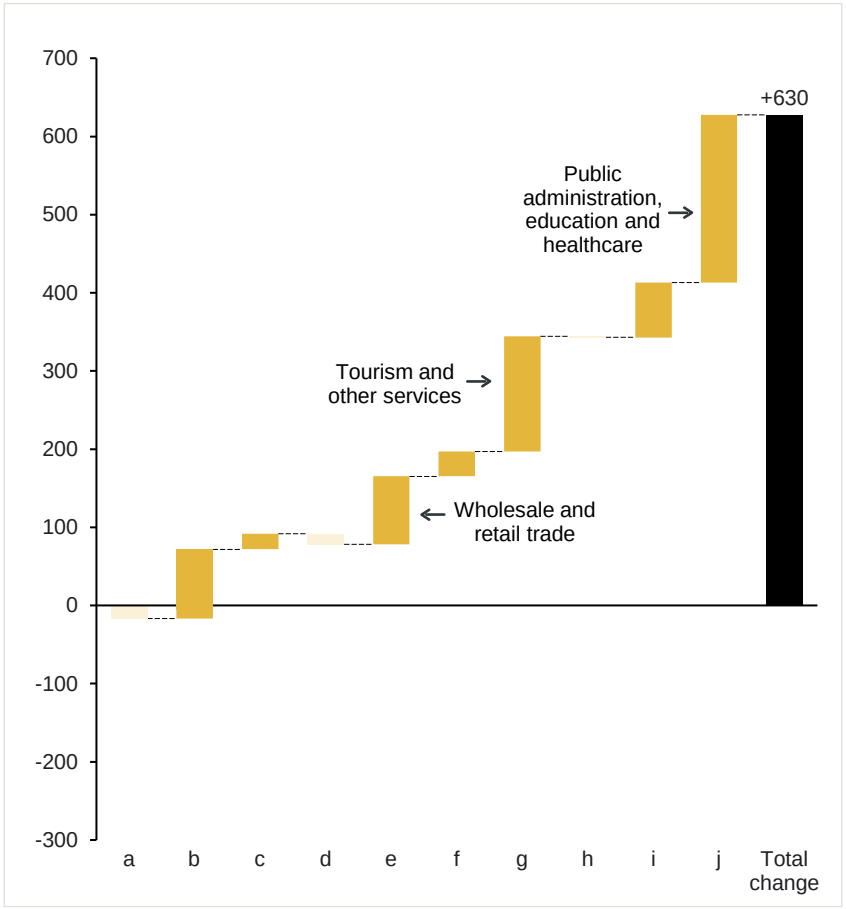
- Around 250,000 jobs in Greece are estimated to be highly exposed to generative AI at full adoption, and around half of these are expected to be affected over a ten-year period.
- This report assumes full re-employment of displaced workers. This means no net change in total employment or unemployment.
- The Greek economy is thus assumed to be able to sustain at least the current level of employment in the coming 10-15 years as also predicted by EU forecasts from CEDEFOP.
- Clerical support workers, technicians and service and sales workers are highly exposed to generative AI and up to a third of these jobs are expected to see significant change.
- The transition is likely to be gradual, allowing workers time to adapt to new tasks and skills.
- Through three channels, the AI-powered economy will gradually lead to new jobs and support employment within the occupation or re-employment in other sectors.
- Historically, worker displacement from automation has been offset by the creation of new jobs, and the emergence of new occupations following technological innovations accounts for the vast majority of long-run employment growth.

Note: Based on Q3 2023 employment data. High exposure to AI does not automatically imply full displacement of all workers in that occupation. In the GDP estimates we conservatively assume low automation potential to avoid over-estimating GDP impacts. In the job exposure and potential displacement assessment, we show the full size of the potential displacement to avoid underestimating the job implications. The size of each re-employment channel is uncertain and depends on how the technology is adopted and the interplay between increased efficiency and how unmet demand translates into increased or decreased employment in various occupations.
Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a).

Job changes from generative AI are small compared to expected future job openings

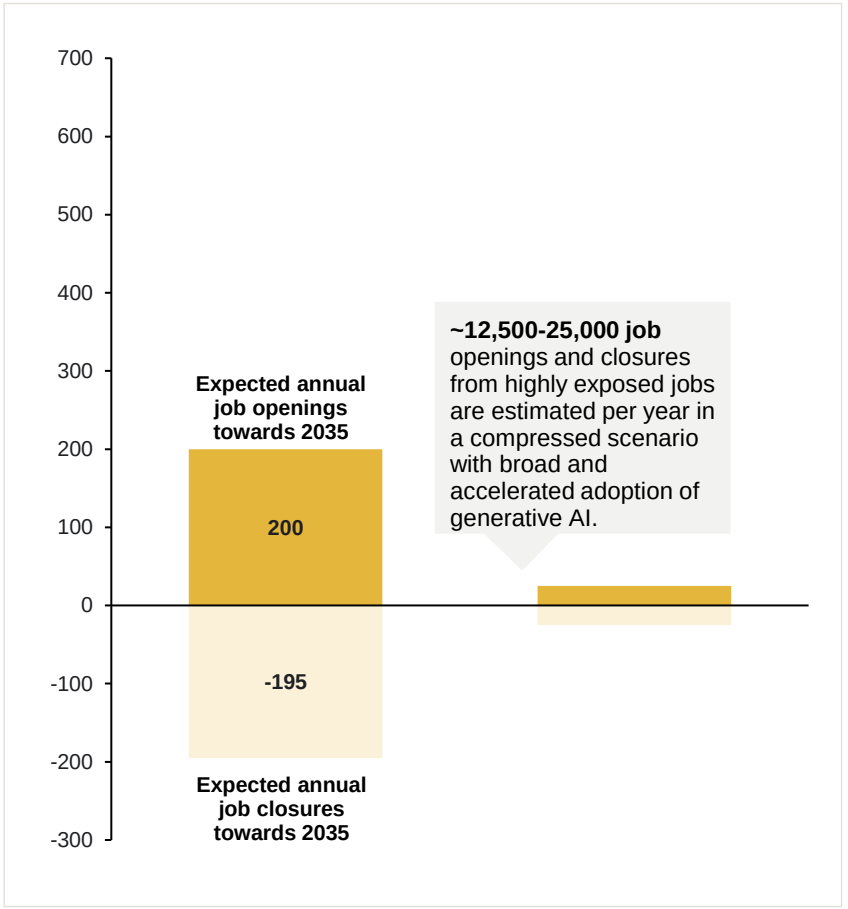
Change in employment across Greek sectors, 2013-2022

Thousand jobs



Estimated annual re-employment in Greece from generative AI

Thousand jobs



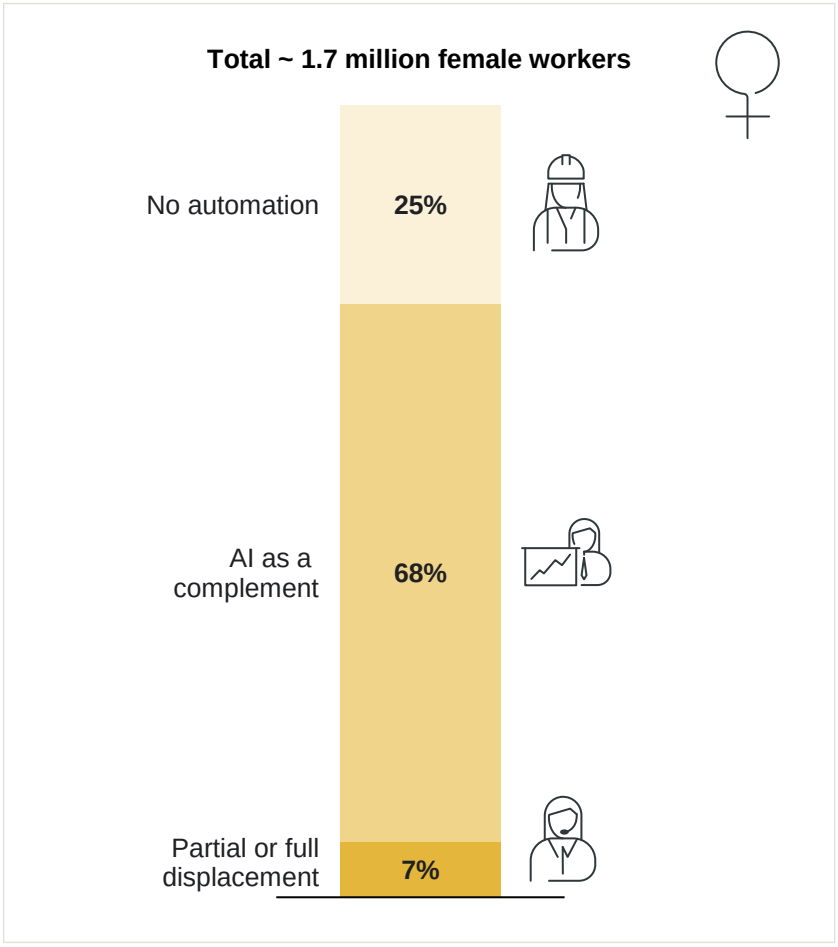
- The Greek labour market was highly affected by the global financial crisis in 2008. The labour market saw a drastic contraction in the following years, and unemployment increased dramatically – the aftermath of which is still felt today, with the labour market worse off than it was in 2008.
- However, over the last ten years, the Greek economy has added around 630,000 jobs, and unemployment has fallen significantly. Most sectors have added new jobs, e.g. tourism, retail and the public sector.
- In addition, numerous new jobs are being created and closed every year *within* each sector to adapt to changing needs and demands.
- According to CEDEFOP, the Greek economy is expected to see around 200,000 job openings and 195,000 job closures every year until 2035.
- We estimate that the jobs that are highly exposed to generative AI can lead to 12,500-25,000 annual job openings and closures over a ten-year period. This is around 10% of the expected future annual number of job openings in Greece.
- The labour market effects stemming from generative AI's impact on highly exposed jobs are thus small compared to expected future levels of job changes.

Note: a. Agriculture and primary sectors; b. Manufacturing; c. Utilities, raw materials and waste; d. Construction; e. Wholesale and retail trade; f. Transport and storage; g. Tourism and other services; h. Information and finance; i. Business services and real estate; j. Public administration, education and healthcare. Our GDP estimate makes conservative assumptions about the scope of tasks for generative AI and the speed of adoption as in the base scenario in Briggs-Kodnani (2023a). To avoid underestimating the possible job impacts of generative AI, these estimates stem from a compressed scenario with broader and more accelerated adoption of generative AI than in our estimates of the GDP impacts. The *compressed scenario* used to gauge the potential job market implications assumes faster adoption (full adoption over ten years) and/or more broad application of generative AI (as in the Briggs-Kodnani scenario with "more labour displacement").
Source: Implement Economics based on Eurostat, World Bank and ECB.

A higher share of female workers are estimated to be affected by generative AI – both in terms of potentially positive and negative impacts

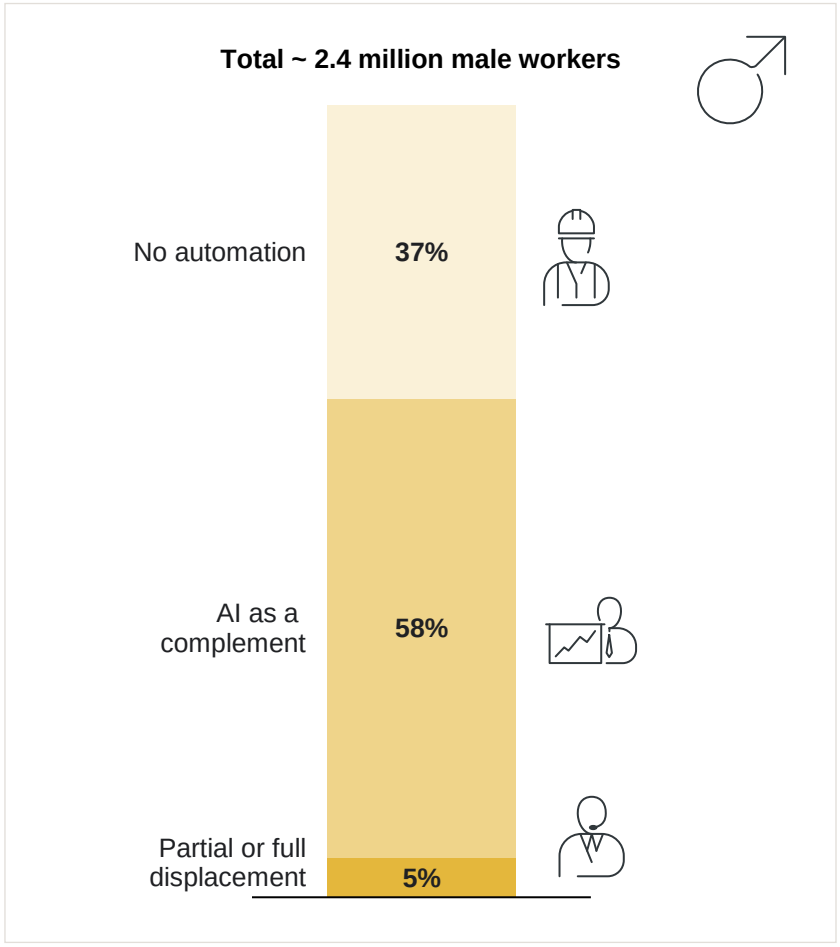
Share of female jobs exposed to automation by generative AI

% of total employment among female workers



Share of male jobs exposed to automation by generative AI

% of total employment among male workers



No automation

- 25% of female workers and 37% of male Greek workers are in jobs with limited exposure to generative AI. These are, for example, manual, outdoor and human-to-human jobs.

Complemented jobs

- 68% of female workers are expected to see generative AI complement their current job, whereas the share is only 58% for male workers. Female workers are, to a higher degree than men, employed in jobs such as teachers and lawyers, where generative AI is expected to augment human capabilities and make workers more productive.

Potentially displaced jobs

- 7% of female workers and 5% of male workers in Greece are currently in jobs such as clerical work, call centre workers and technicians, which are likely to be highly exposed to automation by generative AI and hence more at risk of seeing their current job being fully or partially displaced by the new technology.

Note: Based on Q3 2023 employment data. In accordance with Briggs and Kodnani (2023), "No automation" are occupations with less than 10% exposure, "AI as a complement" are occupations with 10-49% exposure, "Partial or full displacement" are occupations with exposure of or above 50%. Note that percentages and absolute numbers are rounded.
Source: Implement Economics based on Eurostat, O*Net and Briggs and Kodnani (2023a).

Workers in Greece need a broad set of skills for effective use of generative AI

Multiple skills are needed to leverage generative AI …

Skill needs in the age of AI (incl. both generative and traditional) OECD

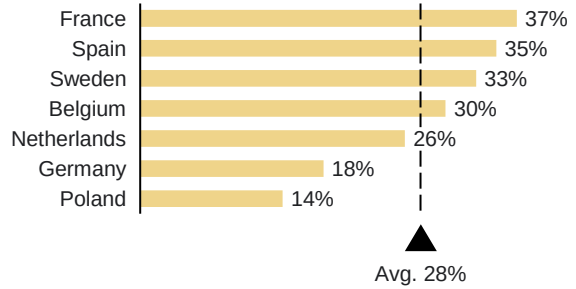
Skills …	*Type of skills*	*Examples*
… for developing and maintaining AI systems.	Specialised AI skills	Machine learning capabilities and knowledge
	Data science skills	Data analysis and visualisation, cloud computing, programming
	Other cognitive skills	Create problem-solving
	Transversal skills	Social skills and management skills
… for adopting, using and interacting with AI applications.	Elementary AI knowledge	Principles of machine learning
	Digital skills	Ability to use computer/smartphone
	Other cognitive skills	Analytical skills, critical thinking and problem-solving
	Transversal skills	Creativity, communication, teamwork, multitasking

… and European workers express a need for re-skilling

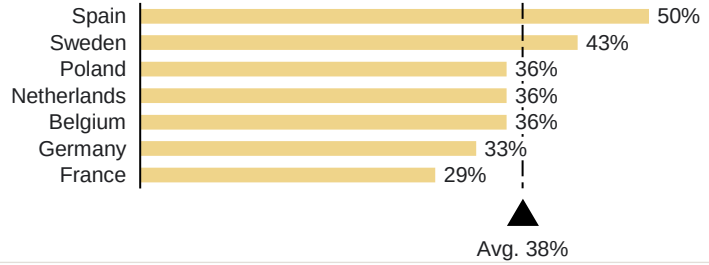
What will you do in the next five years as a result of AI?

% of respondents who are employed and say that AI will slightly or completely transform the way they do their job

I will have to re-skill or take some type of course



I will have to learn how to use AI



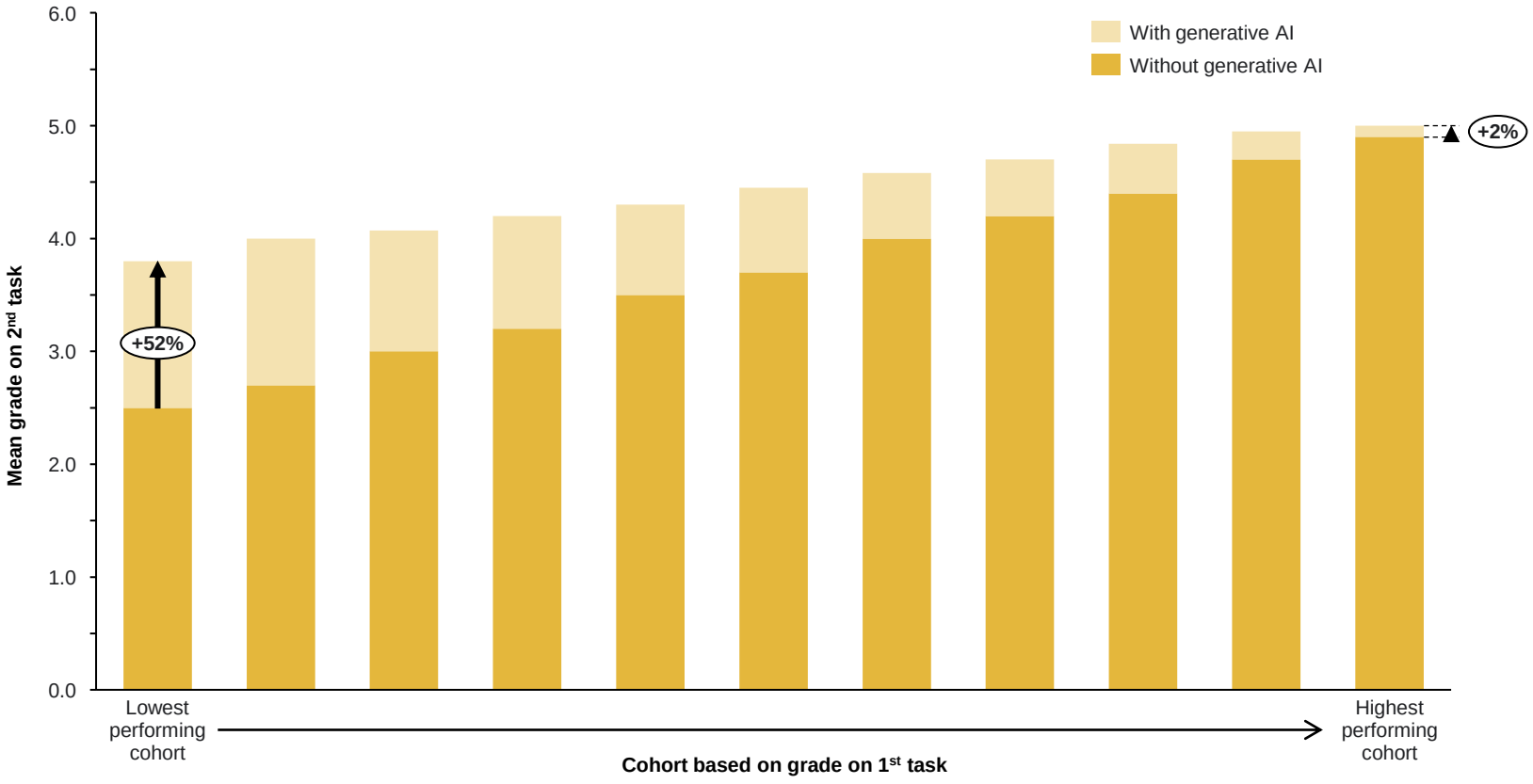
- Generative AI adoption and usage requires limited digital skills relative to earlier advancements in information and communication technology (ICT) due to its ability to understand and interact in language, sound and images on human terms.
- However, fully leveraging generative AI requires skills beyond basic digital skills, i.e. creative, managerial and analytical skills.
- Of the polled European workers indicating that AI will completely or slightly change their job, an average of 28% expect to have to re-skill or take some type of course within the next five years as a result of AI.
- In 2023, 73% of Greek workers had basic digital skills, but it was required in more than 90% of professional roles.
- OECD studies suggest that companies that provide ICT training for their employees on average have 3-5% higher growth in their annual labour productivity.
- The literature highlights that companies that combine technology/ICT adoption with employee training have higher implementation and financial success.

Source: Implement Economics based on OECD, the European Commission, Ipsos Survey, Mosiashvili and Pareliussen (2020), Borowiecki et al. (2021), Gal et al. (2019), Andrews et al. (2016), Jiang et al. (2020) and Ouyang et al. (2022).

Generative AI can help close the skills gap for those with the lowest skill levels

Grades with and without generative AI

Estimated mean grade on 2nd task



- AI requires a broad skill set to reap the benefits. However, AI as a tool can itself augment the performance of human skills.
- Furthermore, generative AI can help close the skills gap by increasing the performance of those with the lowest skill levels.
- An experimental study by Noy and Zhang (2023) tested candidates' writing skills with and without access to generative AI.
- The results showed that, on average, all candidates were able to boost their grades on a written task with the use of generative AI – in this case, a large language model.
- The AI augmentation effect was highest among those with the lowest performance on the first task.
- The lowest-performing group increased their average grade by more than 50% when allowed to interact with a large language model, whereas the best-performing group increased performance by 2%.
- This study is an early indication that generative AI has the potential to boost skills for everyone *and* reduce skill inequalities in the labour market.

Note: The graph shows mean estimates for cohorts.
Source: Implement Economics based on Noy and Zhang (2023), Brynjolfsson et al. (2023) and Dell'Acqua et al. (2023).

05

AI’s impact on societal challenges

AI can help with some of Greece’s most pressing societal challenges.

AI significantly improves the capabilities to predict, prepare for and respond to environmental impacts

AI has the potential to …

Improve **prediction capabilities** by forecasting environmental challenges such as wildfires, floods and droughts.

Leverage synthetic data and simulations to **assess environmental impacts**, aiding planning and mitigation efforts.

Leverage historical data and real-time input to provide **early warnings**, enabling timely evacuations and precautions.

Optimise resource management and response coordination, improving intervention effectiveness during environmental crises.

- The prevalence of local environmental events, such as wildfires, floods and droughts, is intensifying, presenting a critical concern for ecosystems and communities alike.
- AI is a key tool already being used to predict, prevent and mitigate environmental impacts, using predictive analytics to inform effective response strategies.
- The advent of generative AI has expanded the horizons of predictive accuracy and data synthesis, significantly enhancing AI's role in managing environmental impacts.

The European Flood Awareness System (EFAS)

- EFAS deploys AI for the analysis of hydrological data and weather predictions to ascertain flood risks in Europe with heightened precision.
- The continuous refinement of predictive models through AI enables more effective strategies for flood preparedness and response by utilising the most current data and historical event analyses.

Google's Wildfire Boundary Map

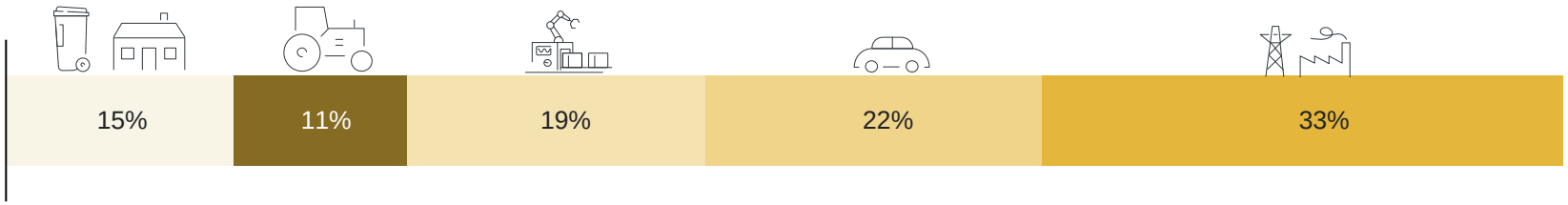
- Google's Wildfire Boundary Map uses AI to analyse satellite data in real time, providing up-to-date information on the extent of wildfires.
- The AI system also incorporates user reports and data from local authorities to continuously improve the accuracy and timeliness of its wildfire boundary updates.

Norway's Use of AI in Landslide Prediction

- Varsom, Norway's AI-based system for landslide prediction analyses geological data, rainfall records and satellite imagery to identify potential landslide risks.
- By continuously updating AI-based risk models, the system improves the ability to predict landslides, supporting more proactive safety measures and effective evacuation planning.

AI can play a key role in addressing climate change

Greece's gross greenhouse gas emissions, 2021
$MtCO_2e$



Gross GHG emissions
77
$MtCO_2e$

Decarbonisation initiatives enabled by AI and other digital technologies
(non-exhaustive)

Buildings and waste
- Smart buildings
- Transition to heat pumps
- Improved energy efficiency

Agriculture
- Efficiency improvements from precision farming
- Reduced food waste
- Changes in land use

Manufacturing
- Smart factory with AI systems
- Efficiency improvements
- Electrification of lighter processes

Domestic transport
- Electric cars, vans, buses and small trucks
- Efficient and eco-friendly driving
- Reduced travel by use of digital tools (working from home and video conferences)

Energy supply
- Expansion of renewable energy
- Electrification
- Smart grid
- Flexible electricity demand

- Greece has set a target to achieve carbon neutrality by 2050. AI and other digital solutions are expected to play a key enabling role in achieving these targets.
- AI and other digital technologies can play a significant role in decarbonising the energy sector by supporting the transition to flexible energy utilisation and smart grids.
- Large gains also arise from facilitating the electrification of vehicles, where AI and other digital solutions are crucial to optimising the charging of EVs, providing a cleaner and cheaper solution for consumers.
- In manufacturing, AI and other digital solutions can help optimise energy efficiencies as well as reduce overproduction by more accurately forecasting demand.
- Agricultural emissions can also be reduced by AI and other digital solutions, where machine learning algorithms allow precision farming practices that are more eco-friendly and reduce consumption of, for example, fertilisers.
- AI and other digital solutions, e.g. Google's Environmental Insights Explorer, can also improve emissions tracking capabilities, enabling the optimisation of city planning to reduce emissions.

Note: Data on net greenhouse gas emissions and removals sent by countries to UNFCCC and the EU Greenhouse Gas Monitoring Mechanism (EU Member States). This data set reflects the GHG inventory data for 2021 as reported under the United Nations Framework Convention for Climate Change. CRF inventory categories: Energy supply: CRF 1A1 (energy industries) + 1B (fugitives); Industry and manufacturing: CRF 1A2 (manufacturing industries and construction) + CRF 2 (industrial processes and product use); Domestic transport: CRF 1.A.3; Residential and commercial: CRF 1A4a (commercial) + CRF 1A4b (residential); Agriculture: CRF 1A4c (agriculture, forestry and fishing) + CRF 3 (agriculture); Waste: CRF 5 (waste); LULUCF: CRF 4 (LULUCF); Other combustion (CRF1A5a + CRF1A5b + CRF indirect CO2).
Source: Implement Economics based on the European Environment Agency (EEA), Implement Economics Digital Decarbonisation studies and Boston Consulting Group.

AI can free up resources in the Greek healthcare sector and improve patient treatment

Greece is one of the most rapidly ageing countries in the world. By 2050, it is projected that approximately one-third of the country's population will be over the age of 65.

Due to these demographic factors, Greece is challenged in its capacity to sustainably deliver high-quality care and address the evolving needs of its population.

Greece also has some of the highest inpatient care costs in the EU, coupled with low spending on preventative care, which puts pressure on both long-term health budgets and health outcomes.

More hands are needed

- The number of doctors in Greece has grown over the last two decades and is far above the EU average. However, the vast majority of these doctors are specialists, with general practitioners (GPs) accounting for only 6% of all doctors.
- The shortage of GPs puts pressure on primary care.
- The scarcity in critical resources also leads to lower quality services, incl. longer wait times and overworked professionals.

Better and more preventative treatment and care is needed

- An ageing population requires more healthcare services and specialised care.
- Growing living standards drive up societal expectations for healthcare services – especially related to preventative health measures.
- Chronic diseases are becoming more challenging and rare diseases more common.

Healthcare is identified as a focal policy focus area in the Greek National Strategy for AI (2020). Among other use cases, the strategy recognises the role of AI and other digital tools in relieving workforce pressures.

AI also shows promise in optimising Greece's inpatient services, cutting costs on inpatient care, and facilitating opportunities for greater preventive healthcare.

AI can help free up resources and alleviate bottlenecks

- Automation of tasks in healthcare administration, e.g. appointment scheduling.
- Faster screening and decisions by physicians.
- Recording and synthesising appointment notes, referral information and care plans.
- Enabling physicians to undertake remote consultations.

AI can improve how we treat patients

- Analysis and enhancement of medical images and earlier and more accurate detection of diseases and injuries.
- Improved detection of complex and rare diseases with training data sets and smarter diagnostic tools.
- Prediction of individual treatment response by analysing different patient data.
- Development of targeted therapies.
- Remote monitoring via wearable devices and sensors, faster identification of health issues and accidents.

Source: Implement Economics based on the Greek Strategic Action Plan for Artificial Intelligence, ENI CBC Med, the Greek AI Coalition, Public First survey and OECD/European Observatory on Health Systems and Policies.

06

AI readiness in Greece

Greece’s capacity to leverage the potential of AI can be evaluated based on several factors and compared to European and global frontrunners.

In assessing Greece's AI readiness, we compare with other comparable EMEA countries

- In assessing Greece's AI readiness, we can compare Greece to a comparable group of economies, namely Portugal, Italy, Spain, Bulgaria, Israel, Cyprus, Malta and Romania.
- Big, digitally advanced economies, such as the United States, have an advantage when it comes to scale, i.e. absolute AI capacity, including the amount of commercial activity, availability of funding and volume of R&D.
- Common indicators, such as the Tortoise Global AI Index, compound both **scale** and **intensity** (AI capacity relative to population or GDP).
- As a small country, Greece cannot compete on scale on, for example, the absolute amount of AI-related R&D investment. Greece will be dependent on EU-wide initiatives.
- Therefore, Greece should work towards EU-level initiatives, especially in the areas of R&D investment, regulation and digital infrastructure.

Comparable EMEA countries on AI readiness

Malta
#6 in DESI in 2022

Spain
#7 in DESI in 2022

Portugal
#15 in DESI in 2022

Italy
#18 in DESI in 2022

Cyprus
#20 in DESI in 2022

Greece
#25 in DESI in 2022

Bulgaria
#26 in DESI in 2022

Romania
#27 in DESI in 2022

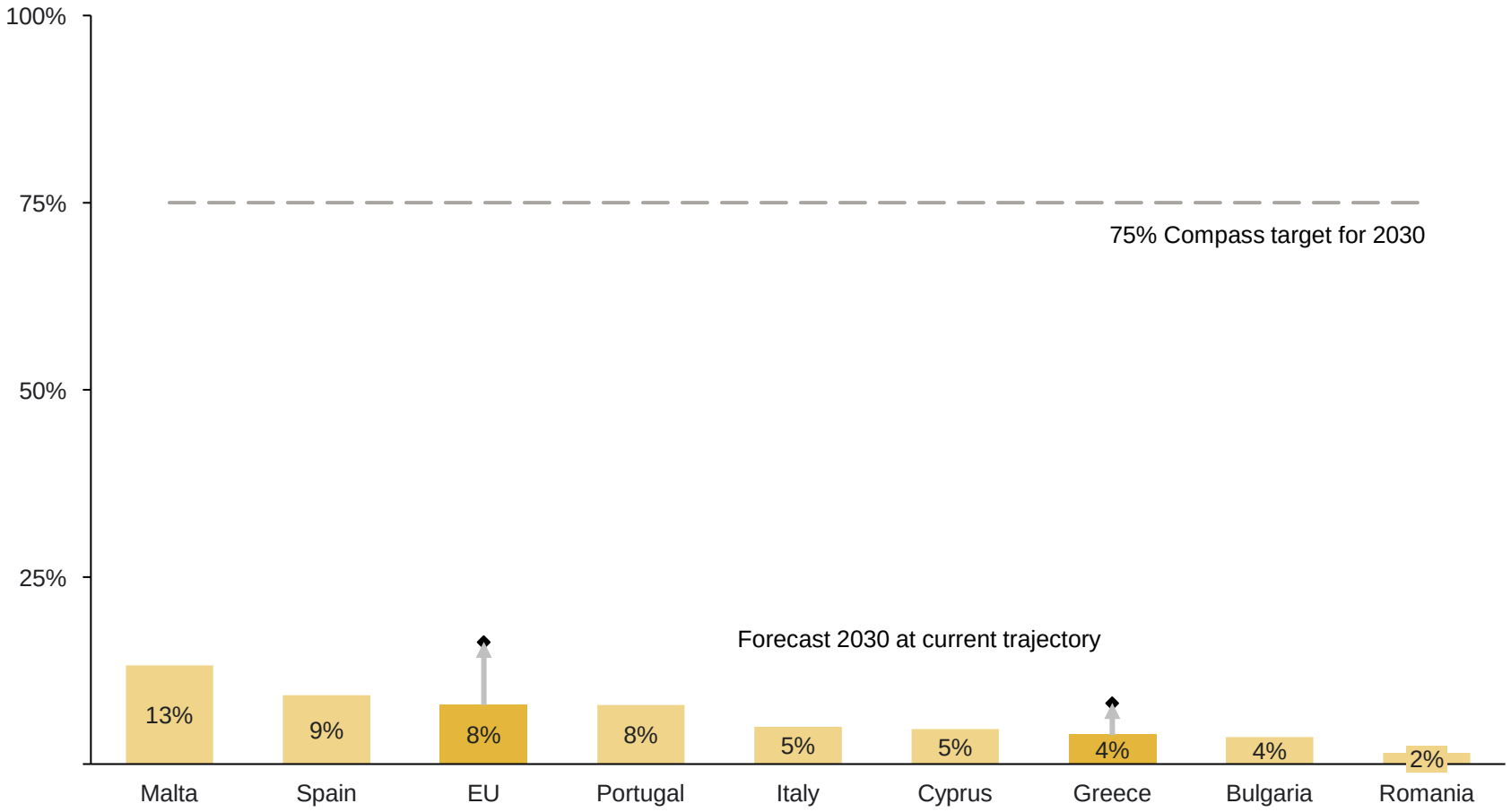
Israel
Not in DESI

Source: Implement Economics based on the European Commission

Greek enterprises should seek to accelerate AI uptake to unlock the economic potential of AI

Adoption of AI in 2023

% of enterprises using at least one type of AI technology



- Greece ranks third from last among the comparable countries when it comes to AI adoption. 4% of Greek companies had adopted at least one type of AI technology in 2023.
- In its most recent assessment, the European Commission concludes that the EU is set to fall significantly short of its target on AI adoption by 2030.
- If we assume the same pace of adoption as the EU average, there is a high risk that Greece will fall short of the 2030 target.
- Firm-level adoption data underestimates actual use in business settings (see page 7) as many instances of individual-level AI use are not captured.

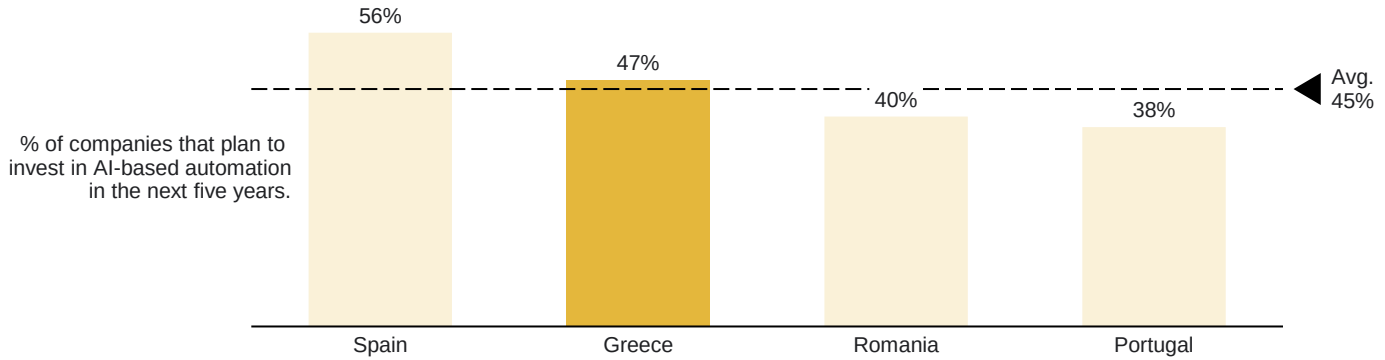
Note: Current adoption is from 2023 and includes enterprises with ten or more employees, excluding financial services. Forecast for 2030 is based on European Commission-forecasted AI adoption.
Source: Implement Economics based on Eurostat, the European Commission and Deloitte.

New survey data points to accelerated adoption but not enough to reach full potential

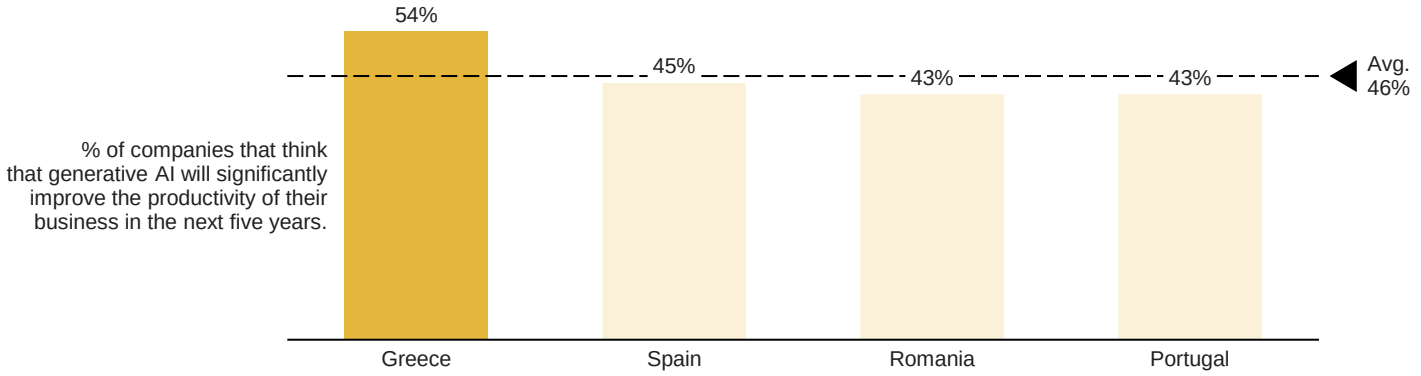
Survey responses from companies on their five-year outlook on generative AI

% weighted average of enterprises, 2024

Planned firm-level adoption of AI automation



Expected productivity boost from generative AI



- According to survey data by Public First, 47% of companies in Greece claim that they plan to invest in AI-based automation in the next five years, which is slightly higher than the average for comparable countries.
- 54% of Greek companies anticipate significant productivity impacts on their business in the next five years, which again surpasses the average of comparable countries.
- While this generally suggests a fast pace of adoption, AI adoption is still in an early phase, and more complementary innovations, investments and commercial ventures in AI are needed to capture its full economic potential.

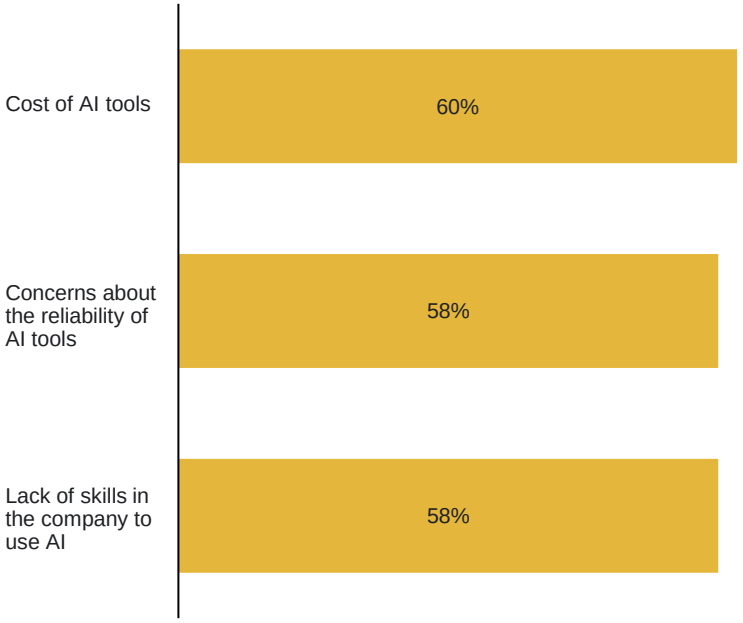
Note: Public First survey conducted in Q1 2024 for Greece and in summer 2023 for Spain, Romania and Portugal. Nationally representative consumer and business polling. The average across the comparable countries is computed as an arithmetic mean.
Source: Implement Economics based on Public First country surveys.

60% of Greek companies point to costs as a barrier to AI adoption, and 31% recognise the need for upskilling in AI strategy and implementation to leverage its full potential

Greek companies see costs, reliability and lack of skills as the main barriers to AI adoption

What are the barriers to your business making more use of AI?

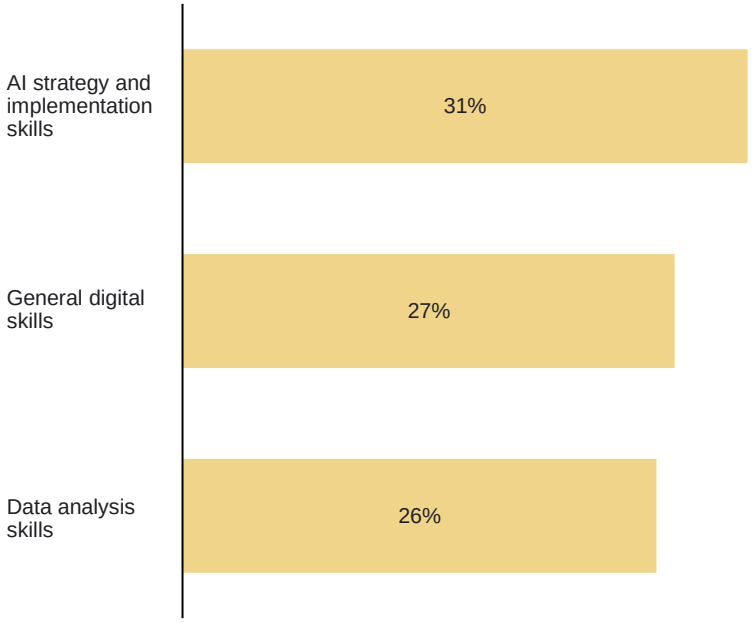
% weighted average of enterprises, 2024



Greek companies believe that they need more specific skills to fully leverage AI's potential

What skills would you say your business needs more of to take full advantage of AI?

% weighted average of enterprises, 2024



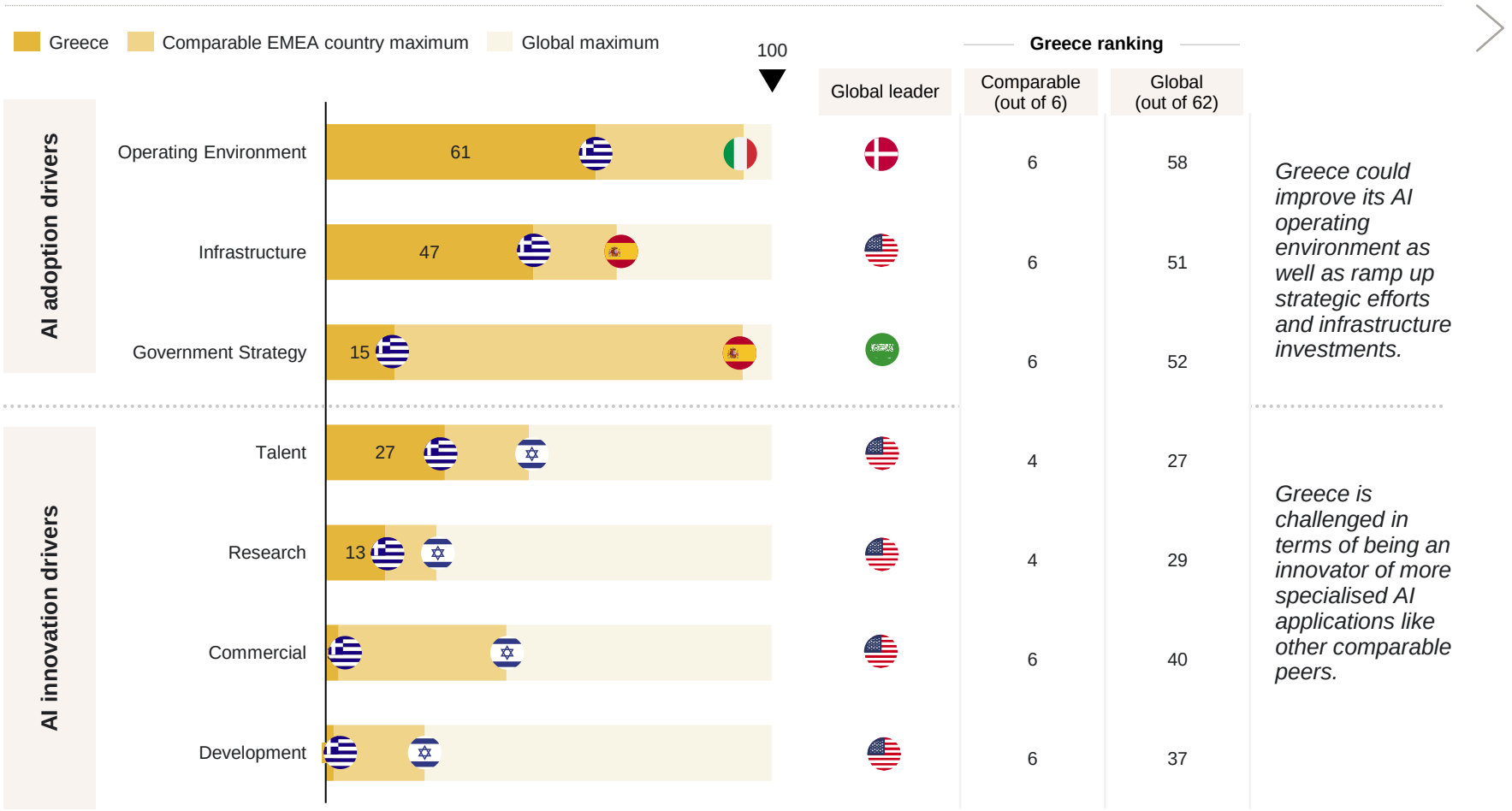
- Polling conducted by Public First shows that 60% of Greek companies see the cost of AI tools as a barrier to AI adoption. Furthermore, 58% of Greek companies identify concerns about the reliability of AI tools and lack of internal skills as additional barriers.
- 31% of Greek companies believe that they need better AI strategy and implementation skills to take full advantage of AI. Greek companies also cite a greater need for general digital skills and data analysis skills.
- Another survey by Deloitte (a consultancy company) on firm-level AI adoption in Greece points to regulatory uncertainty, security issues and a lack of internal skills and knowledge about the applicability of AI tools as the biggest obstacles to AI adoption.

Source: Implement Economics based on Public First country survey.

Greece is at a relatively weak starting point and will need to increase its strategic efforts, investing in skills and innovation to capture the economic opportunity of AI

Greece's AI capacity according to the Tortoise Global AI Index

Global AI Index, score out of 100 (global leader)



- Greece lags behind comparable countries in foundational AI adoption drivers, and could benefit from stronger strategies, improvements in its data and AI operating environment and further investments in digital infrastructure.
- Additionally, more specialised AI applications and the realisation of full productivity gains will require a cohesive and competitive innovation ecosystem that is conducive to development and commercial uptake.
- Similar to comparable countries, Greece lags globally when it comes to attracting and developing AI-related talent and skills.
- However, the substantial pool of Greek talent residing abroad presents a special opportunity for Greece to quickly boost their talent base.
- Likewise, a significant amount of high-quality AI research is being published by Greek researchers at foreign universities. Activating this pool of knowledge could also fast-track complementary AI innovations and investments in Greece and bring leading research from, for example, the US.
- All in all, there are both risks and opportunities for Greece. To maximise the opportunities, Greece would need to ramp up its strategic focus, invest in skills and support a rapid diffusion of the newest AI innovations.

Note: The Global AI Index looks at seven sub-pillars for AI capacity: talent (availability of skilled practitioners in AI solutions, including IT and STEM graduates, data scientists, AI professionals etc.), infrastructure (download speed, supercomputing capabilities etc.), operating environment (regulation, cybersecurity etc.), research (AI publications and citations etc.), development (fundamental platforms and algorithms etc.), government strategy (national funding commitments to AI etc.) and commercial ventures (AI start-up activity, investments etc.). Only 6 of the 9 comparable countries are represented in the index.
Source: Implement Economics based on Tortoise Media and Greek National Productivity Board.

07

The way forward to capture the benefits of AI

Greece can consider several choices to capture the benefits and navigate the dilemmas of AI.

Potentials, pitfalls and paradoxes

Artificial intelligence (AI) has the potential to be the most powerful technology in decades

- AI enables us to do things better and work more efficiently. It also enables us to do better things. With AI, we can focus on the best parts of our jobs and leave the rest to AI. Yet, AI is still in its infancy and how it is applied is highly uncertain.
- To make AI benefit humans and society as a whole will require pursuing the potentials, avoiding the pitfalls and navigating the paradoxes.
- The future of AI should *not* be reduced to a simple one-dimensional question: Should we have more AI or less AI — or even ban AI?
- AI is not a fixed thing with a predetermined future that can come quickly or slowly. AI is new, **uncertain** and malleable and will require wise choices by all stakeholders across business, governments and civil society.

Potentials

- The estimated economic potential assumes **widespread adoption** of generative AI within ten years.
- The estimate includes both narrow **labour-saving** impacts and broader **value-creating** impacts that enable workers to do something novel or powerful.
- It assumes that AI lives up to its promise of being the most radical **technological breakthrough** in decades.
- Moreover, we estimate that AI will **complement the majority of workers** and free up time to spend on non-routine, creative and inventive tasks.
- The result is an economy not simply at a higher level of productivity, but at a **permanently higher growth rate**.

Pitfalls

- Displaced workers might end up in **less productive jobs** (than already assumed).
- AI may end up being **less promising** or less ready to bring to market than initially hoped.
- Time to market may be **challenged by a legal regime** not designed for AI.
- Companies may **miss out on the benefits** of AI due to a lack of competences or failure to change organisations and habits.
- National regulators, driven by any number of concerns, may **impose strict regulations** that slow the speed of AI development.
- **Regulatory uncertainty** and lack of clarity on future rules may delay the uptake.

Paradoxes

- How can policies encourage the types of AI that complement human labour and best prepare those at risk of losing a job to AI?
- What choices will encourage the development of AI that companies of all sizes can access instead of just the largest ones?
- What kind of investment in AI research and development might unleash the most interesting new ideas, innovations and applications in support of overall societal value?
- What kind of high-performance computer infrastructure is needed to power the new technology, and how is that best provided?

Note: For more background AI policies and principles, see **OECD**, **IMF** and **Google**.

Unlocking the AI opportunity by creating trust and preserving the incentive to invest

The benefits of new waves of technology do not come automatically. As with past waves of technology, it takes time for people to trust the technology. Regulators across the world are set to ensure the safety of the technology while achieving its benefits. The EU's AI Act aims to lead on this. In the urgent efforts to achieve broad-based trust, regulators may create fragmentation, misalignment and uncertainty about future rules, which can hamper investment and adoption.

Developers and early technology adopters will need clarity on future rules. Clarity is needed regarding, for example, the requirements for transparency in the functioning of the generative AI models, the data used to train them, issues of bias and fairness, potential intellectual property issues, possible privacy violations as well as security concerns.

To navigate these choices, this report offers five perspectives:

Enable innovation and invest in AI research and development

- Invest in long-term public AI research and encourage private investment in basic and applied research at national and EU level.
- Foster industry, government and university innovation partnerships to undertake pre-commercial AI research projects.
- Support innovation on top of already developed foundational models and findings, e.g. by leveraging the new EU AI innovation package.
- Make AI tools available to entrepreneurs and scientists so they can use AI in support of other discoveries and innovations.
- Support international research collaboration, technology transfer and international movement of researchers.

Create a conducive and aligned AI regulation

- Avoid siloed approaches to AI regulation to minimise the risk of misalignment and fragmentation by increased international co-operation.
- Ensure copyright rules that support innovation and creativity and preserve the incentive to generate new content.
- Adopt a risk-based approach to AI regulation to provide clarity to developers, adopters and users about which uses are disallowed.
- Encourage privacy and security principles so that individuals' personal data is safeguarded.

Promote widespread adoption and universal accessibility

- Promote widespread adoption and universal accessibility by helping governments, small businesses and all sectors of the economy adopt and use AI.
- Lead with the public sector adoption of AI solutions, which may require overcoming procurement roadblocks that often appear when public entities aim to adopt new technologies.
- Create a national strategy to spur AI adoption across all industries and all sizes of businesses.
- Give small businesses an "AI jumpstart" through technical assistance, training and guidance to help them understand and leverage AI for their businesses.

Build human capital and an AI-empowered workforce

- Build an AI-empowered workforce by investing in human capital, education and training systems. This means treating AI as a core component of the education system.
- Focus training and upskilling on areas where AI enhances and augments the capabilities of workers so that workers are trained to work together with the new technology. The aim should be to improve the marginal productivity of workers rather than replace them.
- In those selected types of jobs where AI risks displacing workers, efforts should be devoted to re-skilling workers for other jobs.
- Ensure a flexible labour market and continuous lifelong training enabling new opportunities in the labour market.

Invest in AI infrastructure and compute power

- Ensure the right incentive and regulation for public and private entities to invest in AI infrastructure and compute capacity such as graphics processing and supercomputers needed to drive the powerful AI models.
- Enable trusted cross-border data flows in trade agreements and ensure regulatory interoperability and non-discrimination in the EU.
- Support the building of cross-border AI infrastructure and subsea cables through initiatives such as the G7 partnership for global infrastructure and investment.
- Reduce electricity emissions from data centres by promoting ambitious decarbonisation strategies such as 24/7 Carbon-Free Energy.

Note: For more details on policies, see OECD AI principles, OECD AI Observatory, EU's ethic guidelines for trustworthy AI, EU's AI innovation package, Google's AI principles and paper on "An Opportunity Agenda for AI". For more details on carbon-free energy and digital decarbonisation, see the European perspective and global perspective.

Greece can draw on policy choices of frontrunners in South Europe

Greece can draw on best practice initiatives from Southern European frontrunners

Indicator	Operating environment	Infrastructure	Talent	Research	Development	Commercial
South European leaders						
Best practice	Italy excels in creating a robust AI operating environment underpinned by comprehensive strategies and ethical frameworks. **Example:** National Strategy on Artificial Intelligence • The strategy highlights Italy's investment in AI through the expansion of public funding and public-private ventures, aiming to integrate AI solutions in public administration and key sectors. • It has introduced regulatory sandboxes to test innovative AI products, ensuring that development aligns with ethical and societal needs.	Spain is enhancing digital and AI infrastructure, promoting data platforms, and supporting sustainable technology initiatives. **Example:** Digital Spain 2026 • This agenda aims to make Spain a digitally advanced nation by 2026, focusing on high-performance computing, AI and next-generation connectivity. • It includes significant investments in the digitalisation of public services and business sectors, fostering an interconnected, efficient and innovative digital ecosystem.	Israel is advancing AI capabilities through a cohesive national strategy, focusing on nurturing AI talent through education, innovation and international partnerships. **Example:** National AI Program • This flagship initiative encompasses efforts to enhance AI research, education and industry collaboration. • It aims to develop a highly skilled AI workforce, establish AI centres of excellence and engage in international collaborations to ensure Israel's competitive edge in AI technology.	Italy has a strong position in AI research in Southern Europe, leveraging research and its historical strengths to foster innovation. **Example:** Strategic AI Program 2022-2024 • The Strategic AI Program aims to bolster Italy's AI innovation through increased funding, attracting top talent, and promoting STEM careers. • Initiatives include the Turin AI Center, designed to enhance the country's AI research capabilities, especially in priority sectors such as automotive and aerospace.	Israel is renowned for its vibrant tech ecosystem, often dubbed the "Startup Nation," and has established itself as a global hub for artificial intelligence (AI) innovation. **Example**: The Israel Innovation Authority (IIA) • IAA plays a pivotal role in supporting R&D and innovation across various sectors, including AI. • It offers grants, incentives, and support programmes for startups at different stages from seed to expansion.	The influx of capital and the attention from global tech giants highlight Israel's status as a significant player in the global tech landscape driven by its innovative startups and attractive investment opportunities. **Example**: Singapore – Israel Industrial R&D Programme • A collaboration between EnterpriseSG and the Israel Innovation Authority (IIA) to support joint R&D projects between Singapore and Israeli companies across industries. • The programme offers funding and support for projects with strong market potential.

Notes: Israel is leading on AI research, but Italy has been highlighted due to its best practice policies and initiatives.

Enhancing the competitive edge in technology and digitalisation requires a balanced set of choices

Grow R&D by local innovators

Enable **innovation** and invest in AI **research and development**

Dilemma

Ensuring performance of AI technology in a Greek context

and

Driving application of leading global AI technology

Recommendation

- Greece lags behind Southern European peers in AI R&D. This gap is exacerbated by the absence of a comprehensive AI infrastructure and no coherent government strategy focusing on research.
- To address its R&D lag, Greece should establish a clear AI strategy that builds essential infrastructure, leverages the new "DAEDALUS" supercomputer and directs funding towards AI research in key sectors such as tourism, shipping and agriculture. Inspiration can be drawn from the Spanish National AI Strategy, focusing on HPC-investments and strategic research funding in selected sectors.

Accelerate commercial uptake

Promote widespread **adoption** and universal accessibility

Dilemma

Encouraging AI-based business models in tech-focused startups

and

Facilitating AI adoption in traditional, established companies

Recommendation

- There is a notable gap in Greek AI adoption and commercialisation compared to regional peers, largely due to uncertainty around AI regulations and a widespread lack of AI know-how in SMEs, employing the majority of the Greek workforce.
- A national AI strategy should prioritise tailored support initiatives targeted SMEs, leveraging initiatives such as the Hellenic Artificial Intelligence Society (EETN) and the National Documentation Centre (EKT). Israel's Innovation Authority (IIA), offering support and funding for AI initiatives in startups and SMEs, could serve as inspiration.

Retrain and upskill workforce

Build **human capital** and an AI-empowered workforce

Dilemma

General AI upskilling across the population

and

Targeted reskilling of groups affected by AI

Recommendation

- Greece harbors a vast, untapped potential in the form of highly skilled professionals and researchers currently living abroad. In addition, the country's researchers are excelling in AI as part of foreign research institutions in places like the US.
- By investing in establishing an attractive AI ecosystem that fosters innovation and public-private collaboration, Greece could incentivise its global talent pool to contribute domestically, potentially accelerating the transfer of leading research and complementary AI innovations back to Greece while driving further AI adoption.

Note: For more details on policies, see OECD AI Observatory and Google's policy paper on "AI Opportunity".

08

Annex

Modelling the impacts of generative AI in Greece.

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Modelling the economic opportunity for Greece

Overview of the methodological approach to calculating economic growth and productivity impact from generative AI

The economic effects are calculated in the following steps

1. **Automation potential of work activities:** First, the exposure to generative AI is calculated by breaking down the automation potential of 39 different work activities/tasks in the occupational task database O*NET. The database includes an estimate of the share of each activity (e.g. getting information, performing administrative activities etc.) that can be automated by generative AI (if the activity is above level 4 on an O*NET-defined scale of difficulty 1-7, no automation potential is assumed).

2. **Mapping automation potential of work activities to occupations:** The automation potential of the work activities is mapped in ten European industry aggregates in two sub-steps. First, the 39 work activities for 900 US occupations are mapped using importance-average activities for each occupation, providing an estimate of the share of each occupation's total workload that AI has the potential to automate. Secondly, this number is projected from US to European occupations through the European Commission's crosswalk between ESCO and O*NET and finally compiled into aggregated occupations (using the sub-occupation employment). This leaves us with the three shares that describe how big a share of the work activates for each occupation is expected to see: No automation, AI complement and Likely replacement.

3. **Quantifying productivity gains in each sector:** Generative AI is assumed to affect the productivity of the work activities for each occupation as follows (see section 3 for further details). The "No automation" share of work activities is assumed to be unaffected by generative AI. "AI complement" work activities experience a productivity boost from automation. "Likely replacement" is the share of work activities in a sector that is expected to be entirely automated/replaced. These workers are expected to be re-employed in slightly less productive jobs. The three effects are calculated across sectors and scaled by each sector's value added to determine the full productivity potential/generation of new jobs from generative AI across the economy, once the technology adoption peaks.

4. **Aggregate GDP impact:** Based on the estimated increase in labour productivity resulting from AI adoption, the result is aggregated to an overall GDP. Only part of the total long-run productivity increases from generative AI is expected to materialise in the economy during the initial ten-year period of technology adoption following an S-curve adoption trajectory.

- The method used to calculate productivity and GDP effects of generative AI in this paper is in line with the methodology developed by Briggs and Kodnani (2023a) in "The Potentially Large Effects of Artificial Intelligence on Economic Growth".

Note: Methodology is based on Briggs and Kodnani (2023a).
Source: Implement Economics based on the European Commission, Eurostat, O*Net and Briggs and Kodnani (2023a).

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