# The Impact of Artificial Intelligence and Digitalization on Productivity and Economic Growth in the Mediterranean Region

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Artificial intelligence (AI) and digitalization are revolutionizing global economic systems, redefining how businesses produce, governments operate and workers engage with technology. For the Mediterranean region – with its population of about 530 million, average per capita GDP of more than $25,000 (PPP), and diverse blend of advanced, emerging and developing economies – the opportunities and risks associated with AI adoption are highly differentiated. The United States, European Union and China serve as global benchmarks, with distinct strategies for leveraging AI for growth, competitiveness and governance.

In the Mediterranean region, while countries such as France, Spain, Italy and Israel are capitalizing on AI to boost innovation and productivity, others like Algeria, Libya and the Syrian Arab Republic are constrained by weak infrastructure, skills gaps and institutional fragility.

This paper examines the actual and potential impacts of AI and digitalization on productivity (labour and total factor productivity [TFP]), income growth and labour markets across all Mediterranean countries, as well as global comparators. Drawing on recent empirical literature, institutional indexes and forecasts from the International Monetary Fund (IMF), Organisation for Economic Co-operation and Development (OECD), World Bank, United Nations Conference on Trade and Development (UNCTAD) and leading academic institutions, the report highlights AI readiness, sectoral intensity, projected growth effects and tailored policy priorities. A key finding of these studies consistently shows that while AI holds great potential to boost productivity and growth, actual impact is determined by readiness, skills, sectoral structure and public policy.

## AI and Digitalization: Mechanisms for Economic Transformation

AI and digitalization are general-purpose technologies (GPTs)[1] that fundamentally alter how economies function. At the firm level, they reduce information asymmetries, lower transaction costs and automate routine operations. At the macro level, they accelerate innovation, boost efficiency and shift labour toward higher-value tasks. Labour productivity improves as AI augments workers' capabilities or replaces repetitive functions entirely. Recent research described in this paper shows that TFP rises when firms integrate AI into value chains, resulting in smarter logistics, predictive maintenance, algorithmic trading and optimized manufacturing.

[1] General purpose technologies (GPTs) are transformative technologies that have the potential to significantly impact and reshape entire economies and societies. They are characterized by their broad applicability across various sectors and their ability to spur innovation and productivity growth. Essentially, GPTs are foundational technologies that drive long-term economic progress and societal change. Examples include: the steam engine, which, as a new source of power, fuelled the Industrial Revolution; electricity, which enabled the development of numerous electrical applications and industrial processes; the computer, which revolutionized information processing, communication and automation across various fields; and the Internet, which transformed communication, information access and commerce.

**Artificial Intelligence Impacts on Productivity**

Empirical studies show that AI holds significant potential to enhance performance, particularly among early adopters. Before the rise of generative AI, most research focused on firm-level impacts, with estimated productivity gains ranging from 0 to 11 percent – figures broadly comparable to those of earlier digital innovations.

With the advent of generative AI, attention has shifted toward task-specific and worker-level effects. Controlled experiments and enterprise surveys now show productivity improvements of between 10 percent and 56 percent, particularly in areas such as text generation, coding and customer service. These findings highlight the role of generative AI in boosting task efficiency, albeit mostly in routine and codifiable activities.

Despite encouraging micro-level outcomes, the macroeconomic evidence remains muted. Acemoglu (2024) estimates that AI adoption contributed to only a 0.66 percent increase in total factor productivity (TFP) over the past decade, with future gains projected to remain under 0.53 percent. These modest returns reflect the early phase of deployment, where benefits depend heavily on complementary intangible investments – such as data, software and organizational restructuring – that are often poorly captured by conventional economic statistics.

Like past general-purpose technologies, AI typically requires structural adaptation, skill upgrading and significant time before translating into aggregate productivity growth. Much of today's investment remains concentrated in intangible assets, particularly data, that are undervalued or unmeasured in national accounts, obscuring AI's true impact.

In developing countries, the empirical evidence on AI's productivity impact is far more limited. Adoption levels remain low, particularly outside major urban centres, and the enabling infrastructure (such as broadband, cloud computing and digital skills) is often underdeveloped. Studies indicate that firms in developing economies using AI tend to experience lower productivity gains than their counterparts in advanced economies, often under 5 percent, primarily due to weak absorptive capacity, skill mismatches and limited organizational readiness. Unlike advanced economies, where AI supplements high-skill labour, AI in developing contexts often substitutes routine work without sufficient gains in output quality or scale. This highlights the importance of foundational digital investments and targeted upskilling programmes to unlock meaningful productivity improvements.

Source: Author based on Acemoglu (2024); Brynjolfsson and Hitt (2003); Brynjolfsson, Rock, and Syverson (2018); Filippucci et al. (2024); Gal et al. (2019); OECD (2023, 2024).





The transformation is non-linear and uneven, however. According to endogenous growth theory,[2] technologies like AI that enhance learning-by-doing and spillover effects can shift the long-term growth path of an economy. However, the impact depends on absorptive capacity, which is affected by digital infrastructure, workforce skills, institutional quality and innovation ecosystems. Countries with robust connectivity, a digitally literate workforce, strong research networks and agile governance frameworks reap the benefits of AI more quickly and broadly. Conversely, countries without these attributes risk deepening existing productivity and income gaps.

Digitalization also reconfigures the spatial and sectoral structure of growth. Smart cities, cloud platforms and mobile finance allow remote regions to participate in global value chains, while e-government and telemedicine improve public service delivery. These dynamics are especially relevant to the Mediterranean region, where economic geography, infrastructure deficits and demographic pressures vary dramatically.

## A Brief Review of Recent Literature

Over the past decade, an extensive body of theoretical and empirical research has explored how AI and digitalization impact productivity, employment and growth. The IMF, OECD, World Bank, UNCTAD, International Labour Organization (ILO) and leading academic institutions such as the Massachusetts Institute of Technology (MIT), Stanford and National Bureau of Economic Research (NBER) have all produced high-quality reports analysing the economic transformations induced by AI.

Florian et al. (IMF, 2025),[3] who focus on the impact of AI in Europe, show that AI adoption has the po-

[2] Endogenous growth theory argues that economic growth over the long run is primarily driven by factors internal to the economy, such as technological progress and human capital accumulation, rather than external (or exogenous) forces like exogenous technological change, which is one of the main assumptions in neoclassical growth models.

[3] https://doi.org/10.5089/9798229006057.001.

TABLE 8 **Comparison of Framework, Assumptions and Conclusions of Selected Studies**

| Dimension | Acemoglu (2024) | Aghion & Bunel (2024) | Aghion-Jones-Jones (2017) | IMF (2024) | OECD (2025) | Goldman Sachs (2025) | World Bank (2025) |
|---|---|---|---|---|---|---|---|
| **Framework** | Task-based | Historical/ task-based | Endogenous growth | Empirical | GPT Analysis | Econometric | Comparative |
| **TFP Impact** | ≤0.55% over 10 yrs | ~0.68% to 1.3% annually | Variable, sustained | ~1.1% annually | ~1.5% annually | ~1.2% annually | 0.7-1.0% annually |
| **Growth Dynamics** | Modest | Robust | Balanced, moderate | Strong in digital economies | High, sector-wide | Strong, conditional on policies | Moderate |
| **Inequality Risk** | Significant | Policy-amenable | High | Considerable | Moderate, manageable | High, conditional on policies | High, conditional on policies |
| **Key Risks** | Complexity limit | Market concentration | Cost disease, AI dominance | Adoption disparities | Regulatory uncertainty | Diffusion speed | Digital divide |
| **Policy Prescriptions** | Competition, caution | R&D, competition, skills | Competition, training | Infrastructure, inclusive diffusion | Harmonized regulation | Infrastructure, digital literacy | Inclusive strategy |

Source: Compiled by the author.

tential to raise labour productivity by 0.2 percent to 0.8 percent annually. This aligns with Calvino et al. (OECD, 2024),[4] who focus on a taxonomy of sectoral AI use and find potential gains of up to 1.3 percentage points per year in the G-7 under high-adoption scenarios. Klapper et al. (World Bank, 2025)[5] finds that digital services now outpace traditional sectors in contributing to GDP in many middle-income economies.

Countries with robust connectivity, a digitally literate workforce, strong research networks and agile governance frameworks reap the benefits of AI more quickly and broadly

The OECD Sectoral AI Intensity Index (see Calvino et al., 2024) identifies finance, information and communications technology (ICT), and advanced services as the most AI-intensive sectors, lagging behind which are agriculture, hospitality and construction. ILO's 2025 update identifies clerical and administrative jobs as the most exposed to generative AI.[6] Without social protection, such disruption risks labour displacement and polarization.

MIT and Stanford researchers have quantified productivity improvements from AI in service jobs, with Brynjolfsson et al. (2024) finding 14 percent output gains for call centre workers using GenAI tools. Autor and Thompson (2025, NBER) argue that AI rewires professional tasks, displacing routine cognitive functions but augmenting judgment-heavy roles.

UNCTAD (2024) and the IMF World Economic Outlook (2024) both emphasize structural inequality in AI readiness. High-income countries with cloud infrastructure, Science, Technology, Engineering and Mathematics (STEM) talent, and agile governance benefit quickly, while developing economies face bottlenecks in digital infrastructure, financing and absorptive capacity.

*Some Key Differences and Overlaps*

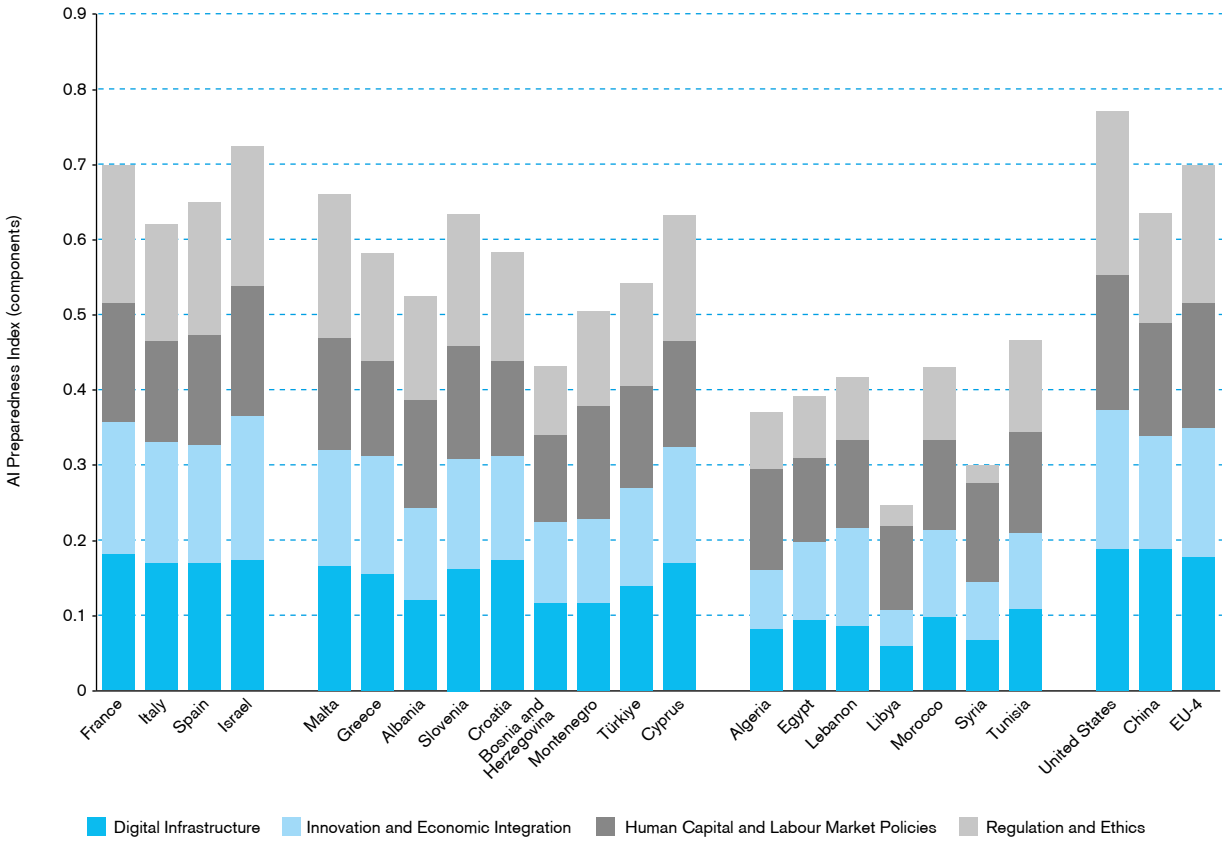
– *Impact Scale:* OECD most optimistic (~1.5% annually), IMF and Goldman Sachs moderate (~1.1%-1.2%), Acemoglu conservative (≤0.55% total).

[4] www.oecd.org/content/dam/oecd/en/publications/reports/2025/06/macroeconomic-productivity-gains-from-artificial-intelligence-in-g7-economies_dcf91c3e/a5319ab5-en.pdf.

[5] The Global Findex Database 2025 http://hdl.handle.net/10986/43438.

[6] Generative AI refers to a subset of artificial intelligence models – typically based on deep learning – that are designed to produce new and original content by learning the underlying patterns, structure and distributions of existing data. These models generate outputs such as text, images, audio, video or code that are not simply retrieved from memory, but rather created dynamically, often in response to a user prompt. (See Annex F for examples and references).

CHART 12 **AI Preparedness Index and Components across Mediterranean Region and Global Comparators, 2024**




Source: IMF AI Preparedness Index by Country. www.imf.org/external/datamapper/datasets/AIPI and author estimates for EU4.
AIPI varies between 0 and 1; its components vary between 0 and 0.25

– *Innovation Channel:* Acemoglu task-focused, Aghion+Bunel integrate history and task efficiency, Aghion-Jones-Jones emphasize idea creation; OECD highlights GPT potential.
– *Market Structure:* All studies emphasize competition and diffusion, Goldman Sachs and IMF stress digital infrastructure, World Bank and OECD advocate inclusive adoption strategies.

*Implications for Mediterranean & Framework*

AI Watch Europe and World Bank studies of Mediterranean digital development show that countries like Cyprus, Malta and Slovenia are outperforming on digital readiness, despite their small size. In contrast, Algeria, Libya and the Arab Republic of Syria face persistent connectivity and regulatory challenges. Bosnia and Herzegovina, Croatia and Montenegro are digitalizing through e-government, but lag behind in AI-specific enterprise use. Key policy implications are:

– *Realistic Productivity Expectations:* Mediterranean countries should target moderate yet achievable TFP growth (~0.7-1.2% annually) with effective policy implementation.
– *Institutional Capacity:* Strengthening regulatory frameworks to enhance AI adoption and avoid market concentration risks.
– *Inclusive Growth:* Prioritize infrastructure and digital literacy initiatives to prevent widening inequality and foster inclusive economic gains.
– *Policy Integration:* Combine infrastructure development, skills training, and balanced competition policies into national AI strategies.

These findings consistently show that while AI holds great potential to boost productivity and growth, ac-

tual impact is determined by readiness, skills, sectoral structure and public policy.

**AI and Digital Readiness: Comparative Assessment of the Mediterranean Region**

AI readiness varies widely across the Mediterranean region. To assess countries' preparedness for adopting and integrating AI into their economies, I use the IMF AI Adoptability Index, which includes four dimensions: digital infrastructure, human capital, innovation capacity and governance. Higher scores indicate better conditions for successfully deploying AI at scale. The United States and Israel lead globally and regionally, respectively, while countries like Libya and Syria remain in the early stages of digital transformation.

Differentiated policy approaches are essential to ensure that AI does not widen the economic divide within the Mediterranean region

Based on the IMF's Index of AI Preparedness (2025), Mediterranean countries can be grouped into three policy cohorts: high, middle and low AI readiness. Each group faces distinct challenges and requires tailored policy responses.

*High AI Preparedness Countries (France, Israel, Italy, Spain, Slovenia)*

The high scores of these countries on the IMF AI Readiness Index reflect strong digital ecosystems, skilled labour and sectoral exposure to AI applications. However, their key challenge is maximizing diffusion and balancing productivity gains with labour inclusion. This might be accomplished through:

- Scaling up support for small and medium enterprises (SMEs) to adopt generative AI tools and platforms.
- Investing in public sector AI pilots (health, justice, education) to build spillovers.
- Focusing on regulatory agility – encouraging innovation while safeguarding data and rights.
- Addressing regional disparities in AI deployment (for example, north-south divides in Italy and Spain).

*Middle AI Preparedness Countries (Algeria, Croatia, Cyprus, Greece, Türkiye)*

These countries possess moderate digital infrastructure and workforce capability but struggle with diffusion, SME access and fragmented regulatory frameworks. Their growth potential is high but will remain unrealized without targeted investment and institutional reform. This might require:

- Prioritizing foundational infrastructure (broadband, cloud access) for underserved regions.
- Creating national AI strategies with measurable targets and SME incentives.
- Launching regional AI labs or innovation hubs to support applied research and local startups.
- Harmonizing AI-related regulations with EU frameworks to boost confidence and investment.

*Low AI Preparedness Countries (Algeria, Arab Republic of Egypt, Libya, Morocco, Tunisia)*

These countries rank low on the IMF index due to limited infrastructure, talent shortages and nascent private sector AI adoption. They risk technological exclusion and productivity stagnation unless international partnerships and capacity building are scaled up. This might require:

- Focusing on AI-for-development priorities (agriculture, logistics, education).
- Expanding vocational and tertiary STEM programmes, with AI modules.
- Leveraging multilateral funding (World Bank, EU, United Nations Development Programme) for national digital readiness initiatives.
- Promoting open-source AI and south-south knowledge transfer platforms to reduce dependency on foreign firms.

Differentiated policy approaches are essential to ensure that AI does not widen the economic divide within the Mediterranean region. By calibrating interventions to readiness levels and structural conditions, countries can unlock inclusive, resilient and sustainable productivity growth from the AI revolution.

## Sectoral AI/Digital Intensity: Patterns across Economies

The degree to which AI and digital technologies penetrate different sectors varies widely across countries. According to OECD's 2024 Sectoral AI Intensity Index, sectors such as ICT, finance and professional services exhibit very high levels of AI integration, driven by data abundance, competitive pressure and cloud infrastructure. In contrast, agriculture, tourism and construction are among the sectors that are least AI integrated, particularly in developing economies with limited connectivity.

Here we evaluate digital and AI intensity across six core sectors – ICT, Finance, Manufacturing, Healthcare, Agriculture and Tourism – for 18 Mediterranean countries, alongside benchmarks from the United States, China and the EU.

Rankings are based on composite scores derived from World Bank (2024) and OECD (2025) data sets. The analysis highlights digital divides and sectoral strengths, and offers tailored policy recommendations.

The region exhibits a stark north-south divide in AI readiness. Southern Europe (France, Italy, Spain, Slovenia) ranks highly across all sectors, particularly tourism and manufacturing. Eastern Mediterranean countries (Israel, Cyprus) show high ICT and healthcare capabilities. North African countries (Egypt, Tunisia, Morocco) lag behind, especially in healthcare and digital finance, though tourism and agriculture exhibit some progress.

The region exhibits a stark north-south divide in AI readiness. Southern Europe ranks highly across all sectors, particularly tourism and manufacturing. Eastern Mediterranean countries show high ICT and healthcare capabilities. North African lag behind, especially in healthcare and digital finance

## Brief Country Profiles and Comparative Analysis of AI Readiness Levels

Each country in the Mediterranean region exhibits distinct AI readiness levels, sectoral specialization and policy capacity. The following summaries offer

TABLE 9 **AI and Digital Intensity across Six Core Sectors for Selected Mediterranean Countries, Plus China, the United States and the EU (average)**

| Country | ICT | Finance | Manufacturing | Healthcare | Agriculture | Tourism | Total Score |
|---|---|---|---|---|---|---|---|
| Israel | Very High | Very High | High | Very High | Medium | Medium | 19 |
| France | Very High | High | High | High | Medium | High | 18 |
| Italy | High | High | High | Medium | Medium | Very High | 17 |
| Spain | Very High | Medium | Medium | High | Medium | Very High | 17 |
| Cyprus | High | High | Medium | Medium | Medium | Very High | 16 |
| Slovenia | High | High | High | Medium | Medium | High | 16 |
| Croatia | Medium | Medium | Medium | Low | Medium | High | 12 |
| Albania | Medium | Medium | Medium | Low | Medium | High | 12 |
| Greece | Medium | Medium | Medium | Low | Low | High | 11 |
| Türkiye | Medium | Medium | Medium | Low | Low | Medium | 10 |
| Montenegro | Medium | Medium | Medium | Low | Low | Medium | 10 |
| Morocco | Low | Low | Low | Low | Medium | Medium | 8 |
| Tunisia | Low | Low | Low | Low | Medium | Medium | 8 |
| Bosnia and Herzegovina | Low | Low | Low | Low | Medium | Medium | 8 |
| Egypt, Arab Republic of | Low | Low | Low | Low | Medium | Medium | 8 |
| **Memo items:** | | | | | | | |
| China | Very High | High | High | High | Medium | High | 18 |
| EU Average | High | High | Medium | Medium | Medium | Medium | 14 |
| United States | Very High | Very High | High | High | Medium | High | 19 |

Source: Compiled by the author based on OECD 2025 and the World Bank (2024). Rankings reflect scoring by the author (from 1 to 4; 1=low, 2=medium, 3=high, 4=very high) based on 2024 OECD benchmarks (and AI capabilities index) www.oecd.org/en/publications/2025/06/introducing-the-oecd-ai-capability-indicators_7c0731f0/full-report.html; and World Bank sectoral digital data: https://openknowledge.worldbank.org/server/api/core/bitstreams/efe8cda1-824d-4634-8680-ce1cae67b6f2/content6.

snapshots of each country's AI landscape and growth potential:

*France:* Strong AI ecosystem with investments in public-private R&D, high SME digitalization, and a national AI strategy. Gains driven by manufacturing and health AI applications.

*Italy:* AI adoption led by logistics, tourism and cultural sectors. Southern regions lag behind, requiring digital infrastructure investments and SME support.

*Spain:* Leader in AI-enhanced public administration and smart transport. Strong digital startup scene. Challenges include labour polarization and funding fragmentation.

*Portugal:* Focused on smart mobility, tourism and education digitalization. Public-private collaboration and cloud adoption expanding.

*Israel:* Global AI innovation hub with high R&D intensity. Scaling generative AI in health, defence, fintech and agriculture. Strong skills pipeline but limited inclusivity.

*Türkiye:* Expanding AI use in manufacturing and logistics. Digital divide persists between metro and rural regions. Investments in skills and open data are growing.

*Egypt:* Digital Egypt strategy is advancing AI in government services. Generative AI is used in banking and telecoms. Constraints: broadband, education alignment and startup finance.

*Morocco:* Early AI pilots in agri-tech and logistics. Cloud infrastructure is expanding. Institutional capacity and tech entrepreneurship are still developing.

*Tunisia:* High IT graduate output with strong software sector. AI used in business process outsourcing (BPO) and fintech. Barriers: regulation, funding and broadband access.

*Algeria:* Low AI intensity. Focus on e-government, national AI education roadmap and digitalizing the energy sector. Infrastructure and institutional gaps limit scale.

*Lebanon:* Adoption limited by crisis. Active diaspora-led tech networks and e-health pilots. Needs donor investment in digital public goods.

*Libya:* Post-conflict infrastructure rebuilding phase. AI is seen in humanitarian tech, mobile health and civil registration systems.

*Syria:* Low readiness, high fragility. Opportunity for AI in aiding logistics and education for displaced populations.

*Bosnia and Herzegovina:* E-gov and digital health are AI entry points. AI strategy development under way. Regional skills and cross-border ICT cooperation improving.

*Montenegro:* Promising AI use in tourism and services. Challenges include limited R&D, data policies and connectivity gaps.

*Croatia:* AI diffusion accelerating in retail and logistics. National AI strategy supports SMEs and digital exports.

*Slovenia:* Strong R&D base, good governance and EU integration. AI integrated into health tech, energy and governance.

*Cyprus:* AI adoption growing in fintech and maritime. Policy push on digital citizenship and tech entrepreneurship.

*Malta:* Advanced in digital banking, AI regulation and blockchain. Small scale, but high policy alignment with EU.

*Situation in Leading Global Comparators*

*China:* AI leader in manufacturing, surveillance and consumer platforms. Strong investment, but regulatory divergence from democratic norms.

*United States:* Global leader in AI R&D and applications. Challenges include regional disparity, skill mismatch and regulatory fragmentation.

*EU:* Unified regulatory approach via the AI Act. Strong on ethics, inclusivity and AI for good public sector deployment.

*Broad Policy Implications for the Mediterranean Region*

- Expand digital infrastructure and broadband access in underserved areas, especially rural North Africa.
- Scale up national AI strategies in lower-ranked countries with EU and OECD support.
- Promote public-private partnerships for digital health, agriculture tech and fintech.
- Build regional AI and data governance frameworks to facilitate cross-border cooperation.
- Invest in AI skills development and digital inclusion, especially for youth and women.

## Productivity Performance in the Mediterranean Region

Between 1995 and 2007, most Mediterranean countries experienced moderate to high growth in

both TFP and labour productivity, driven by market liberalization, EU accession or association processes, FDI inflows, and labour market reforms. Post-2008, productivity growth stagnated or declined in many countries, especially in southern Europe and North Africa, due to the financial crisis, political instability, conflict (in Syria and Libya) and structural rigidities. In recent years (2014-2024), modest recovery is observed, often driven by digitalization, tourism rebound, investment in infrastructure and gradual structural reforms (Charts 13a and 13b).

TABLE 10 **Key Factors behind Europe's AI Backwardness (relative to US and China)**

| Dimension | Europe | United States | China |
|---|---|---|---|
| Private AI Investment | ~$10B | ~$70B | ~$45B |
| Cloud Adoption | 36% | 68% | 55% |
| AI Adoption in Firms | 10-11% | 25-28% | 20-22% |
| Frontier Model Development | <5 models | >30 models | ~15 models |
| AI PhD Output | ~2,000/year | ~5,000/year | ~3,000/year |
| AI Talent Density | 4/10k workers | 11/10k | 8/10k |
| Public AI R&D | €1.8B | $5.5B | $4.1B |
| Compute Access (Global Share) | 4.8% | 74.4% | 14.1% |

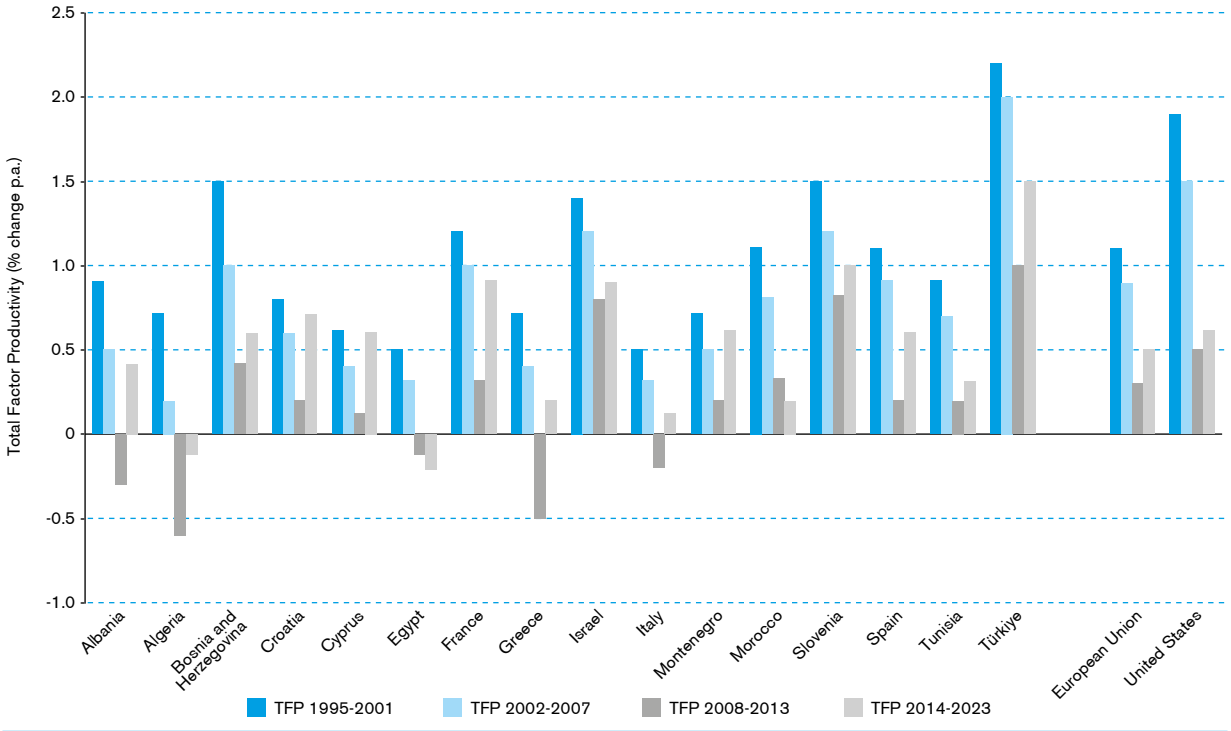
Source: Compiled by the author, based on the OECD, IMF and World Bank data; and Shamir and Negele (2025).

TABLE 11 **Economic and Productivity Impacts of AI Backwardness**

| Indicator | Europe | United States | China |
|---|---|---|---|
| AI Contribution to GDP Growth (2020-2025) | 0.3-0.5 pp | 1.2-1.5 pp | 1.0-1.2 pp |
| Labour Productivity Growth (2020-2024 avg.) | 0.9% | 1.8% | 1.5% |
| TFP Growth Rate | 0.5% | 1.3% | 1.0% |
| AI-related Job Creation (% of new jobs) | 5-8% | 15-18% | 10-14% |
| Job Displacement from Automation | 12-14% | 9-11% | 15-18% |

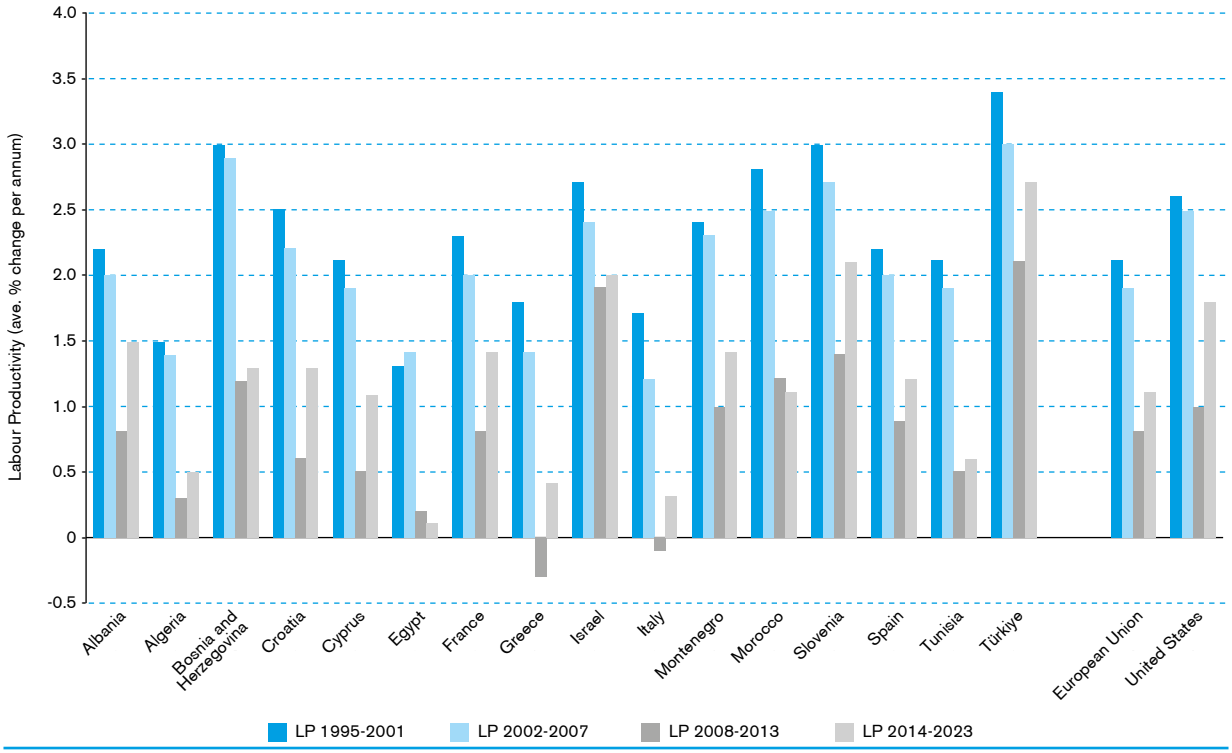
Source: Compiled by the author, based on the OECD, IMF and World Bank data; and Shamir and Negele (2025).

CHART 13a **Total Factor Productivity Growth: Mediterranean Region, the EU and the United States 1995-2024**




Source: Compiled by the author based on OECD, IMF and World Bank databases.

CHART 13b **Labour Productivity Growth: Mediterranean Region, the EU and the United States 1995-2024**




Source: Compiled by the author based on OECD, IMF and World Bank databases.

Throughout the period under consideration, 1995-2023, both labour productivity and Total Factor Productivity have been growing slower in the EU region (on average) than in the United States and China.

As of mid-2025, Europe significantly lags behind the United States and China in artificial intelligence (AI) adoption, deployment and economic impact. This relative backwardness is evident across multiple dimensions, including private and public investment, cloud and computer infrastructure, AI talent retention, enterprise adoption, and digital readiness. These weaknesses have led to weaker productivity growth, lower AI-driven job creation and reduced contributions of AI to GDP compared to global peers.

A recent RAND Corporation (2025)[7] study has emphasized a particularly acute weakness: Europe's share of global computer infrastructure, especially AI-ready supercomputing capacity, is critically low. The EU accounts for only ~4.8% of global AI compute, compared to 74.4% for the US and 14.1% for China. This deficit not only limits innovation and productivity growth but also risks the EU's economic sovereignty, industrial competitiveness and cybersecurity.

While the EU has led in AI ethics and regulatory governance (e.g., the AI Act), the cumulative effect of fragmented markets, stringent compliance regimes and underinvestment has left Europe unable to scale cutting-edge AI applications or compete in frontier model development. US firms benefit from higher compute access, deeper capital markets and more flexible labour environments, while China combines strong state support, strategic infrastructure investment and focused industrial policy. (Tables 10 and 11).

To close this gap, Europe must adopt an integrated strategy that boosts R&D investment, simplifies AI regulation for SMEs, deepens digital infrastructure and rapidly upskills the workforce. Crucially, policymakers should treat computing infrastructure as strategic, with targets tied to a global share (e.g., 15% by 2030), and supported by secure, scalable architectures that permit reform. Without these shifts,

[7] Shamir, A. and Maximilian Negele (2025).

TABLE 12 **Average Projected Gains in TFP, Labour Productivity and Cumulative Real GDP for 2025-2035**

| Country | TFP Gain (range) | Labour Productivity Gain (range) | 10-Year Real GDP Gain (range) |
|---|---|---|---|
| France | 0.8-1.0 | 1.4-1.8 | 10-12 |
| Italy | 0.7-0.9 | 1.3-1.5 | 8-10 |
| Spain | 0.9-1.1 | 1.5-1.9 | 9-11 |
| Greece | 0.6-0.8 | 1.2-1.4 | 6-8 |
| Portugal | 0.6-0.8 | 1.2-1.4 | 6-8 |
| Israel | 1.1-1.3 | 2.2-2.8 | 12-14 |
| Türkiye | 0.8-1.0 | 1.4-1.7 | 8-10 |
| Egypt, Arab Rep. | 0.5-0.6 | 1.0-1.2 | 4-6 |
| Morocco | 0.4-0.4 | 0.9-1.1 | 3-5 |
| Tunisia | 0.3-0.3 | 0.8-1.0 | 2-4 |
| Algeria | 0.3-0.3 | 0.8-1.0 | 2-4 |
| Lebanon | 0.2-0.2 | 0.6-0.8 | 1-3 |
| Libya | 0.2-0.2 | 0.5-0.7 | 1-3 |
| Syrian Arab Republic | 0.1-0.1 | 0.5-0.6 | 0-2 |
| Bosnia & Herz. | 0.4-0.4 | 0.9-1.1 | 3-5 |
| Montenegro | 0.4-0.4 | 0.9-1.1 | 3-5 |
| Croatia | 0.5-0.7 | 1.2-1.4 | 5-7 |
| Slovenia | 0.6-0.8 | 1.3-1.5 | 6-8 |
| Cyprus | 0.6-0.8 | 1.2-1.4 | 6-8 |
| Malta | 0.6-0.8 | 1.2-1.4 | 6-8 |
| **Memo items:** | | | |
| China | 0.7-0.9 | 1.4-1.8 | 7-9 |
| United States | 0.5-0.7 | 1.1-1.3 | 14-16 |
| EU Average | 0.5-0.7 | 1.2-1.4 | 11-13 |

Source: IMF (2025) www.imf.org/-/media/Files/Publications/WP/2025/English/wpiea2025067-print-pdf.ashx: Provided baseline and scenario-based estimates of AI-driven productivity and TFP gains by country and region. OECD (2024-2025 www.oecd.org/ai/publication: Offered updated empirical results on AI's impact on sectoral and macroeconomic productivity in OECD and partner economies. World Bank (2024) https://openknowledge.worldbank.org/handle/10986/39790: Used for contextual digital readiness indicators and to benchmark AI adoption potential in developing economies. UNCTAD (2025) https://unctad.org/system/files/official-document/tir2025_en.pdf: Used to cross-check AI-driven growth projections in emerging and developing economies

TABLE 13 **Interpretation of Projections by Column**

| Column in Table | What It Represents | Interpretation Guidance |
|---|---|---|
| TFP Gain (%/yr) | Average annual growth in Total Factor Productivity attributable to AI adoption | Yearly efficiency improvement due to AI across labour and capital |
| Labour Productivity Gain (%/yr) | Average annual growth in labour productivity (output per worker) due to AI | Annual increase in output per worker directly linked to AI-enabled tools and systems |
| 10-Year Real GDP Gain (%) – cumulative | Cumulative additional GDP growth over 2025-2035 due to AI | Total increase in GDP over 10 years, relative to a baseline without AI impact |

Europe risks missing the next wave of AI-driven growth and productivity acceleration.

With the EU as a whole lagging behind in AI, it may hinder the European Mediterranean countries in their efforts to move forward.

## Quantitative Estimates of AI Impact on Productivity and Growth

This section revisits and updates projections for average annual gains in Total Factor Productivity (TFP), labour productivity and cumulative real GDP growth across countries in the Mediterranean region for the period 2025-2035 (Table 12).

The projections are based on the latest reports by the IMF, World Bank, OECD and UNCTAD, and have been adjusted for consistency and presented in ranges instead of point estimates. The projected impact of AI adoption on economic performance varies by country depending on AI exposure, sectoral distribution and institutional readiness. Labour productivity and TFP are the two principal channels through which AI influences growth, while GDP growth also reflects the pace of investment, employment transition and global competitiveness.

Table 13 explains how to interpret the projected figures presented for AI productivity and growth in Table 12. Each column measures a different dimension of potential economic impact, and it is essential to distinguish between annual growth rates and cumulative effects over time.

Annual rates (TFP, labour productivity) track continuous efficiency improvements, while the cumulative GDP figure is a summary metric that is useful for assessing the total macroeconomic return from AI adoption over a decade.

*Implications of Projections*

The projected productivity and growth gains from AI adoption in the Mediterranean region reveal both the opportunities and the deep structural divides that persist across countries. Advanced economies in the region – such as France, Spain, Italy and Israel – are poised to capture substantial benefits due to strong digital infrastructure, innovation ecosystems and policy readiness. By contrast, many southern and eastern Mediterranean economies face constraints ranging from weak institutional capacity and skill shortages to political instability and inadequate connectivity. While AI can act as a catalyst for structural transformation, these projections underscore that technology alone will not close the gap; complementary investments in education, governance, infrastructure and innovation are critical to translate potential into sustained gains.

Looking ahead to 2025-2035, the region's trajectory will depend on the speed and inclusiveness of AI diffusion. High performers must focus on broadening adoption beyond frontier sectors to SMEs, rural areas and public services, while medium and low performers should prioritize foundational digital investments, regulatory readiness and targeted skills development. Cross-border collaboration, both within the Mediterranean and with global partners, can help share best practices and pool resources.

*What Needs to Be Done to Address the Risk of Widening Divides*

Given that these projections point toward a further widening of the digital and productivity gap between high-performing and lagging economies, policy responses must be both urgent and coordinated. For

## Europe significantly lags behind the United States and China in artificial intelligence (AI) adoption, deployment and economic impact

leading countries, the priority is to actively transfer knowledge and capabilities to lower-performing peers through regional partnerships, joint training programmes and technology-sharing frameworks. For lagging economies, immediate focus should be on building enabling conditions – reliable broadband, affordable devices, digital literacy and strong governance systems – to create the foundations for AI readiness. International financial institutions, EU programmes and regional development banks should target resources to infrastructure, education reform and SME digitalization in lower-capacity countries. Without deliberate redistribution of AI's benefits and proactive policy intervention, these projections could harden existing economic divides, reinforcing a two-speed Mediterranean economy. A shared vision for inclusive AI adoption – anchored in transparency, equity and cooperation – will be essential to ensure that AI becomes a unifying force rather than a driver of further fragmentation.

### Policy Frameworks: Enhancing AI's Positive Impact and Mitigating Risks

The productivity benefits of AI and digitalization depend not only on sectoral exposure and labour composition, but also on a supportive policy environment that encourages diffusion and upskilling. The IMF, OECD and European Central Bank warn of the dangers of regulatory overreach or inertia, which limit AI adoption. The World Bank and JPMorgan point to the transformative potential for SMEs and public services if inclusion, access and capacity building are prioritized.

For Mediterranean countries, this implies a need to: (i) focus on SME digital enablement; (ii) bridge infrastructure and skills gaps; (iii) promote regional AI frameworks aligned with EU and OECD best practices; and (iv) scale AI-focused public-private partnerships. Such measures are critical to ensuring AI serves as a productivity equalizer rather than a divider

across the Mediterranean Basin. To harness the productivity benefits of AI and mitigate risks of exclusion, inequality and misuse, Mediterranean countries must adopt forward-looking policy frameworks.
Key policy pillars:

- *Infrastructure:* Expand fibre, mobile internet and cloud access
- *Skills:* Invest in AI curricula, re-skilling and certification
- *Regulation:* Align with OECD and EU ethical AI norms
- *SME Enablement:* Provide AI sandboxes, subsidies and advisory services
- *Inclusion:* Prioritize gender, rural and youth participation
- *Public Use:* Leverage AI in education, health, justice and tax
- *Regional Coordination:* Deepen digital and innovation cooperation across Europe, the Middle East and North Africa (MENA) region, and Africa.

Strategic recommendations for inclusive AI-led growth:

- Accelerate foundational digital infrastructure projects with equity focus
- Integrate AI skills at all levels of education and public training
- Foster trust through responsible AI frameworks and explainability
- Mobilize blended finance for AI-enabled SMEs and innovation zones
- Launch cross-border AI R&D initiatives with the EU, Africa and MENA
- Institutionalize AI observatories to track labour and productivity impacts

**Conclusion and Outlook**

The regional productivity landscape reflects deep structural asymmetries and divergent outcomes across the Mediterranean. While countries like Israel, Slovenia and Türkiye have demonstrated sustained gains in TFP and labour productivity, many others – specially conflict-affected or reform-stalled economies – have faced lengthy periods of stagnation or decline. The global financial crisis, Arab Spring, Covid-19 and regional military conflict and instability have all influenced these outcomes.
The diffusion of digital technology and AI has so far had an uneven impact. OECD countries show early benefits, particularly where innovation systems and human capital are strong. In contrast, the productivity impact of digitalization in non-OECD Mediterranean states has been more modest, constrained by infrastructure gaps and institutional limitations.
To accelerate productivity, countries must invest in enabling environments for innovation and AI adoption, strengthen educational systems, build digital infrastructure and improve macroeconomic resilience. Where state capacity is fragile, priority should be given to restoring institutional trust and public service delivery. Across the board, scaling up productivity-enhancing reforms is essential for inclusive and sustainable growth.

Without deliberate redistribution of AI's benefits and proactive policy intervention, these projections could harden existing economic divides, reinforcing a two-speed Mediterranean economy

AI and digitalization are redefining productivity, public service delivery and economic competitiveness in the 21st century. A key finding that is repeated across many of the recent studies is that while AI holds great potential to boost productivity and growth, actual impact is determined by readiness, skills, sectoral structure and public policy.
The Mediterranean region stands at a critical inflection point. France, Israel, Italy, Slovenia and Spain are already positioned to capture substantial productivity gains through AI integration. Their national AI strategies, investment in R&D and education reforms offer lessons for the wider region.
In contrast, lower-income Mediterranean countries – such as Algeria, Libya and Syria – face foundational challenges in digital infrastructure and governance. Countries in the Western Balkans and eastern Mediterranean, including Bosnia and Herzegovina, Lebanon and Montenegro, show progress in e-govern-

ment and public sector AI use, but need coordinated support to build scale, interoperability and trust.

In North Africa, Egypt, Morocco and Tunisia demonstrate strong potential with growing talent pools, entrepreneurial ecosystems and digital public service pilots. But realizing long-term productivity gains will require improvements in broadband infrastructure, regional collaboration and institutional capacity.

Cyprus and Malta represent high-performing small states with digital maturity, yet they face scale and workforce pipeline constraints. They can serve as regulatory sandboxes and innovation testbeds for the region.

Across the board, the AI opportunity is tangible – but it is not guaranteed. The Mediterranean region must invest in digital public goods, inclusive upskilling and ethical AI governance. If done right, these efforts can not only yield GDP and productivity dividends, but also enhance institutional trust, regional integration and shared prosperity in an increasingly digital world. A key finding that is repeated across many of the recent studies is that while AI holds great potential to boost productivity and growth, actual impact is determined by readiness, skills, sectoral structure and public policy.





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