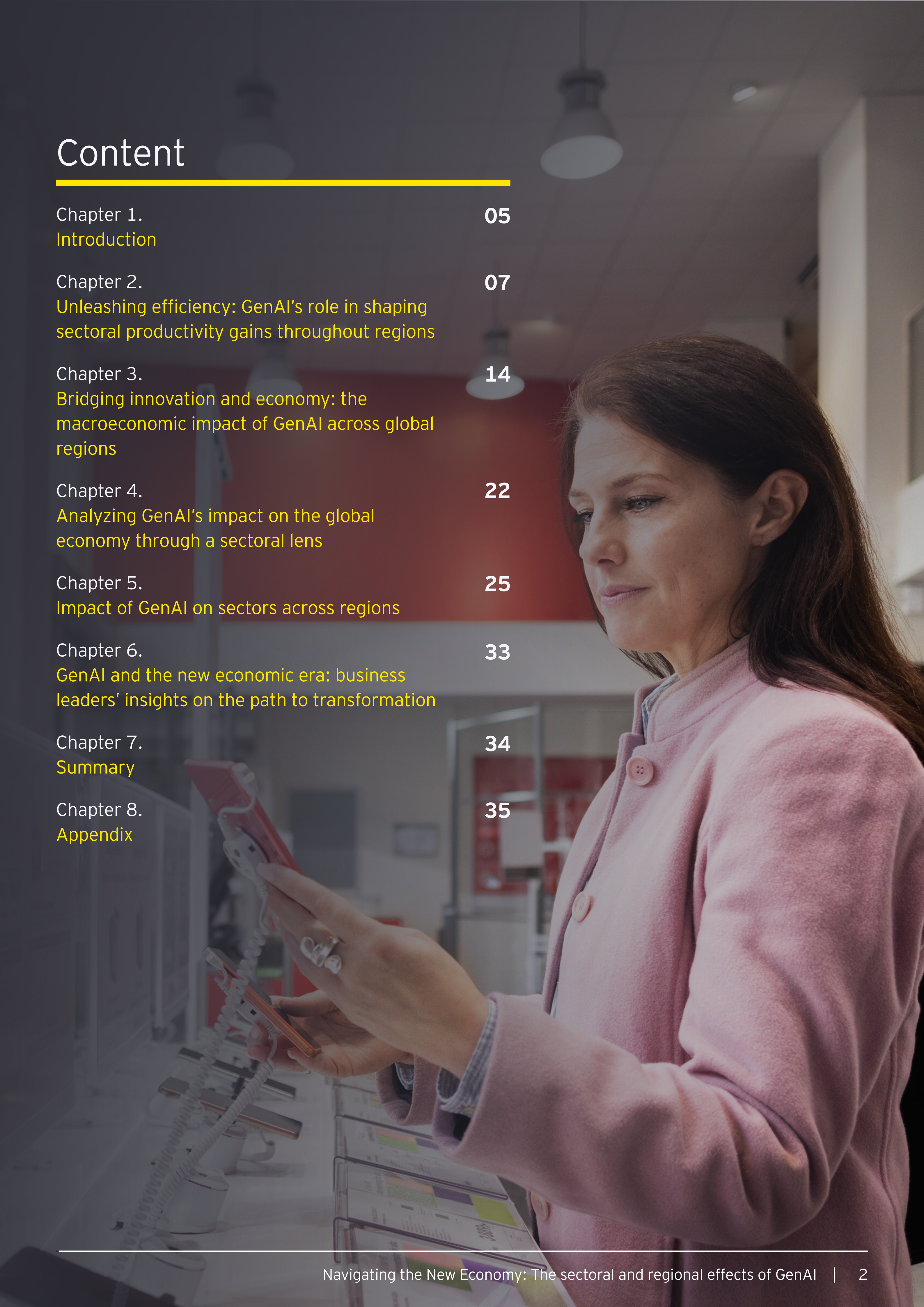
Navigating the New Economy: The sectoral and regional effects of GenAI

EY

Building a better working world



Content

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This report offers insights into the role of generative AI (GenAI) in shaping economic outcomes across regions and sectors. Our objective is to assess the extent to which GenAI is set to reshape region and sector specific productivity and thus, international competitiveness, trade, capital flows and finally GDP.

In brief:

- We expect GenAI to significantly impact productivity; however, the outcomes will be region- and sector-dependent.
- GenAI productivity gains have the potential to significantly affect international competitiveness, especially in regions where we expect adoption rates to be high. This will be of crucial importance for sectors highly involved in global trade.
- Uneven adoption of GenAI technologies across regions may lead to shifts in global investment activity, contingent on barriers to cross-border capital flows and investor home bias.
- The total impact of GenAI on the global economy will originate from both productivity enhancements and shifts in trade and investment patterns.

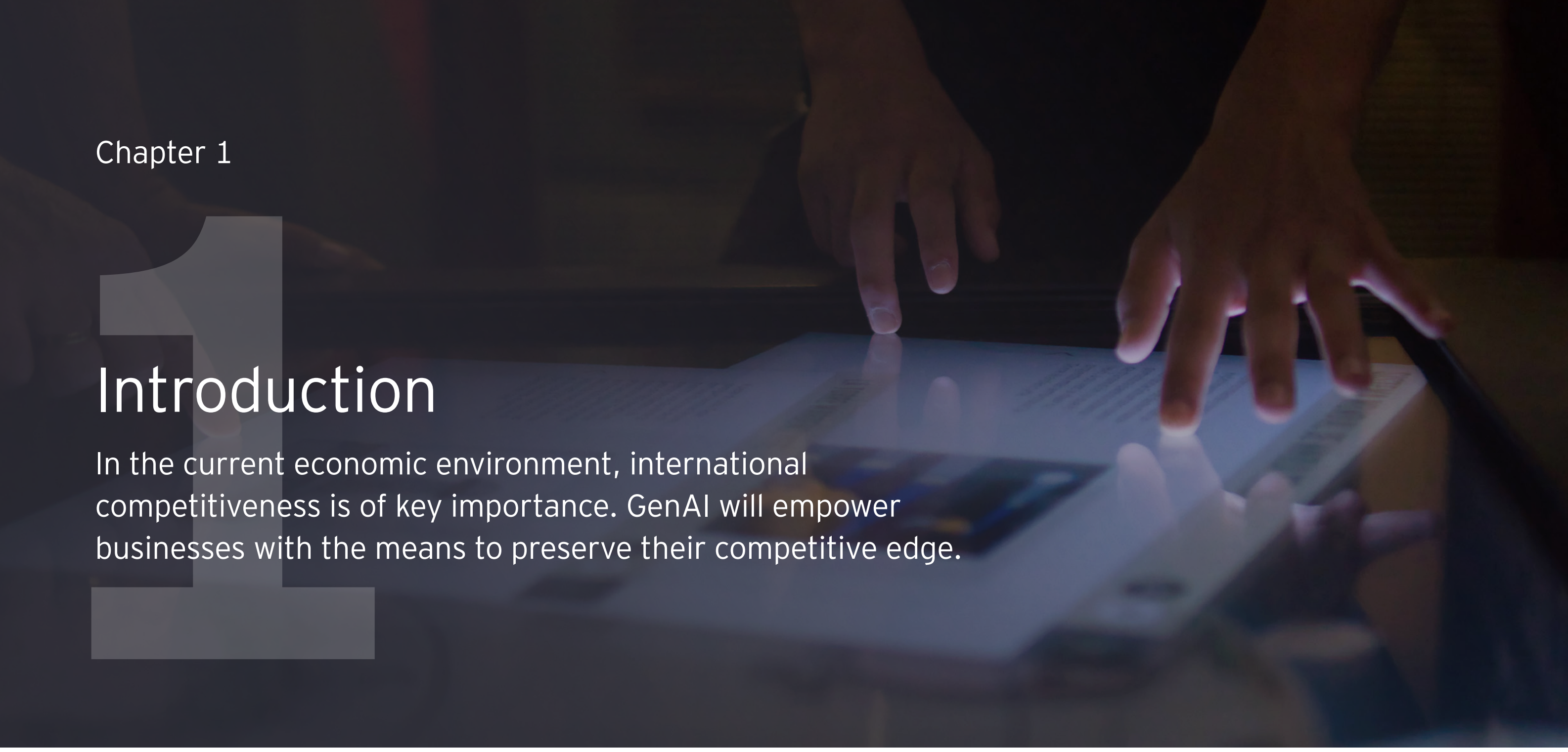
Building upon previous EY studies on the impact of GenAI on i) capital investment and ii) total factor productivity, in this report we analyze what these changes mean for global trade and investment flows, as well as sectoral outcomes in different regions.[1] Our analysis begins with an overview of how we expect GenAI to enhance sectoral productivity growth across regions.

1 In this report, we account for 11 regions: Western Europe, Southern Europe, Central and Eastern Europe (CEE), the Middle East and North Africa (MENA), and Sub-Saharan Africa, as mentioned in our previous articles. Additionally, we include the USA and Canada, Developed Asia and Oceania, Latin America, the Association of Southeast Asian Nations (ASEAN), South Asia, and the Rest of Europe and Central Asia. Details on the composition of these regions are in the Appendix.

Next, we apply the EY UPGRADE computable general equilibrium (CGE) model to quantify the economic impact of GenAI adoption across sectors and regions, using AI-driven productivity enhancements and capital investment as inputs to the model. Based on our modeling results, we present the expected macroeconomic effects of GenAI, focusing on cross-border trade and capital flows. We then discuss the anticipated sectoral outcomes in different regions, drawing upon both sector-specific impacts and indirect effects stemming from broader macroeconomic changes due to GenAI deployment.

Key findings:

- **GenAI is set to deliver significant productivity enhancements across sectors.** We expect health care and advanced manufacturing to lead the way, with estimated global Total Factor Productivity (TFP) gains by 2033 ranging from 1.2% to 2.5% and 1.0% to 2.4%, respectively, depending on the AI adoption scenario.
- **We expect GenAI to boost economic growth,** particularly in Developed Asia and Oceania, Western Europe and the USA and Canada, with a global real GDP increase of up to 1.4% by 2033. GenAI's impact on productivity will shape this growth both directly and indirectly through shifts in global trade and investment activity.
- **Following significant TFP gains,** the health care sector is likely to receive the most significant boost from GenAI in terms of output, with its global output anticipated to increase by up to 2.5%. Sectors such as education, public administration and professional services are also to benefit, while those with limited GenAI adoption, including agriculture and construction, may see smaller gains.
- **GenAI-driven productivity gains do not ensure output growth at the region- and sector-level,** given that shifts in comparative advantage and capital flows affect such growth. Highly traded sectors are particularly vulnerable to these economic shifts, while domestically oriented services, such as health care, will be less exposed to GenAI-driven changes in comparative advantage. Moreover, the additional demand for Information and Communication Technology (ICT) hardware that supports GenAI solutions is likely to stimulate growth along the supply chain, especially in the USA and Canada.



Chapter 1

1 Introduction

In the current economic environment, international competitiveness is of key importance. GenAI will empower businesses with the means to preserve their competitive edge.

The current state of the global economy presents various challenges to businesses, impacting their growth and international competitiveness. Regions differ in their policy responses to these challenges, with some also grappling with geopolitical tensions that disrupt trade and investment. These issues pose risks and push businesses to find ways to stay resilient and competitive. Additionally, tight labor markets and demographic shifts are driving up costs. To navigate these difficulties, business leaders seek strategies to boost efficiency, competitiveness and growth. In this context, GenAI emerges as a potential ally, offering to elevate productivity and trim expenses, thereby equipping businesses to overcome these challenges.

In this report, we build upon previous EY studies on the economic impact of GenAI and analyze the effects of GenAI on global trade, capital flows and investment patterns, as well as its impact on various sectors across different regions. Importantly, our research accounts for the divergence in GenAI adoption rates between regions and shows how it may shift comparative advantages. We also investigate the potential redirection of global capital flows due to disparate GenAI diffusion rates and how this could reshape regional macroeconomic landscapes and sectoral performance.

As such, this report provides a broad analysis in which we not only consider how GenAI will affect the productivity of specific industries, but also look at how GenAI-driven changes in global trade and investment further affect differences in the performance across sectors and regions. Such a broad approach has been possible thanks to the use of the EY UPGRADE computable general equilibrium (CGE) model, which takes into account global inter-industry dependencies and international capital flows.[2] It has allowed us

2 The EY UPGRADE CGE model, developed by EY Economic Analysis Team, is based on the GTAP modeling framework and incorporates the latest version of the GTAP database. It also features extensions to expand the modeling capabilities. In this study, the extensions involved the introduction of upward-sloping labor supply curves to capture employment effects, as well as a dedicated investment module which allowed us to model shifts in investment spending across sectors (e.g., higher investment in ICT hardware due to the deployment of GenAI technologies). Development of this customized module was in line with the investment modeling methodology developed by the European Commission's Joint Research Centre, published in Tamba et al (2022). Although our simulations involved the use of a recursive-dynamic model, for simplicity, we present all outcomes as cumulative deviations from the baseline scenario in 2033, which is the final year of our projections.

to examine the interplay between international competitiveness, investment distribution and regional economic traits in shaping the effects of GenAI for various sectors in the global and regional economies.

We have structured this report as follows:

- Chapter 2 describes the expected changes in productivity due to uneven GenAI diffusion rates across sectors and regions, which serve as inputs to the EY UPGRADE CGE model.
- Chapter 3 provides an overview of the macroeconomic impacts quantified using the EY UPGRADE CGE model, focusing on the role of regional international competitiveness, trade and cross-border capital flows.
- Chapter 4 describes the simulated impact on global sectors, drawing upon both the macroeconomic impacts described in Section 4, as well as sector-specific productivity changes.
- Chapter 5 dives deep into distinct factors affecting how sectoral impacts may differ between regions.
- Chapter 6 provides recommendations for business leaders and concludes the report.

Chapter 2

Unleashing efficiency: GenAI’s role in shaping sectoral productivity gains throughout regions

GenAI is driving significant productivity gains in health care and advanced manufacturing sectors, heralding a new phase of economic growth.

In our previous publication, we explored the effect of GenAI on Total Factor Productivity (TFP) within the EMEA regions[3] under two distinct GenAI adoption scenarios.[4] Our conservative estimate suggests that by 2033, economy wide TFP gains could vary from 0.05% to 0.9% across these regions. However, with more widespread adoption of GenAI, these gains could double, with potential increases of between 0.1% and 1.8%.

While GenAI versatility makes it applicable across diverse economic sectors, its impact on productivity is more pronounced in certain industries. To understand GenAI’s sector-specific potential, we must consider two key factors:

- The degree to which tasks within a sector can be automated or augmented by AI
- The proportion of labor costs within a sector’s total expenses

The first factor considers AI’s ability to transform a sector by taking over or enhancing tasks currently completed by humans. The second factor looks at the financial benefits of such technological change. By making workers more productive, AI reduces firms’ expenditure on wages for the same level of output. These savings are more notable in sectors where wages represent a larger portion of total costs. Therefore, sectors that are both more open to AI integration and have higher labor costs are likely to experience a more significant boost in overall productivity.

Building on this framework, we have analyzed the findings from our earlier research for 27 distinct economic sectors, detailed in Figure 1. As with our past analyses, we consider both conservative and widespread AI adoption scenarios.

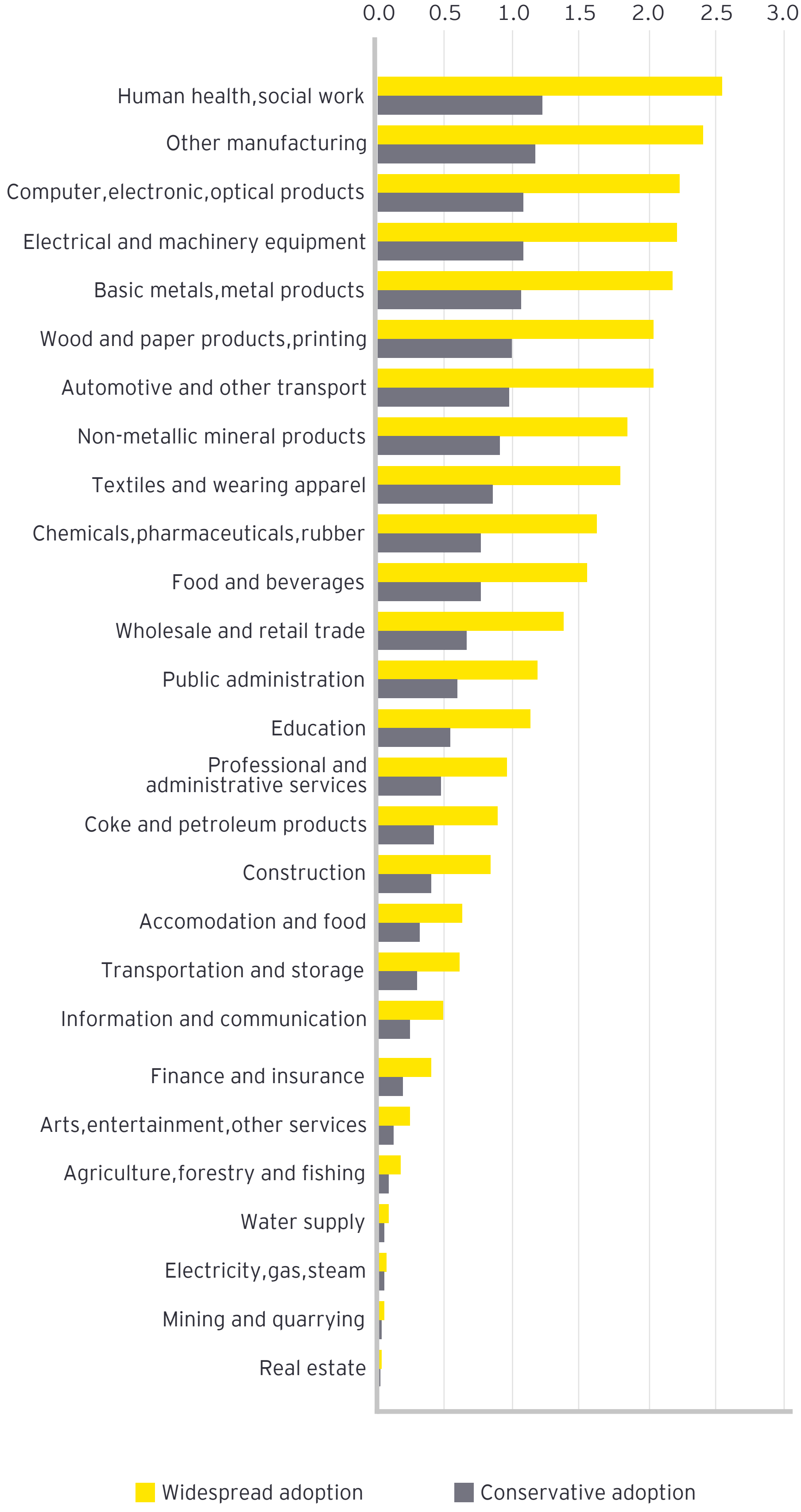
3 We centered our analysis on EMEA regions: Western Europe, Southern Europe, Central and Eastern Europe (CEE), the Middle East and North Africa (MENA), and Sub-Saharan Africa. To construct proxy shocks for other countries, we considered their levels of economic development, labor market structure and similarities to other regions covered in our EMEA analyses.

4 Widespread AI adoption scenario assumes adoption of at a similar pace as ICT (information and communications technology) during 1990s–2000s. The conservative scenario assumes 60% slower integration (based on the existing relationship between AI and ICT adoptions)

Riding the AI wave: forecasting productivity growth across industries

Globally, over the coming decade, the health care sector stands out as the frontrunner for AI-induced productivity leaps, with expected TFP increases of between 1.2% and 2.5%, depending on the extent of AI adoption. The maximum projected gain is comparable to the cumulative economy-wide TFP growth experienced by Western European economies during 1995–2021, which stood at 2.9% according to the Penn World Table data. Advanced manufacturing is another area set to benefit significantly, especially in innovative fields such as computer equipment and medical devices, often grouped under "other manufacturing." Here, we foresee TFP gains ranging from 1.0% to 2.4%. These industries are deeply rooted in Western economies, making them prime candidates to reap the rewards of AI integration.
In contrast, industries such as textile production, more common in less developed regions, are likely to see more modest TFP enhancements from AI. We also expect AI to drive notable TFP growth in trade-related sectors.

Figure 1 Impact of GenAI on TFP, percentage change from the baseline level in 2033, conservative and widespread AI adoption scenarios, global perspective



Source: EY EAT.

Health care and high-tech: pioneers of the productivity frontier

We can attribute increased TFP within the health care sector to the employment of highly skilled professionals who have considerable exposure to AI. The fact that wages constitute a significant share of costs in this sector suggests that AI-driven cost reductions will lead to notable TFP improvements. Current trends and empirical research support our forecasts for significant AI-driven TFP gains in the health industry.

For example, AI can enhance the accuracy of disease diagnosis and quality of interactions between health specialists and patients. A study from 2023 found that AI chatbots not only provided higher quality responses but also exhibited greater empathy than human doctors. Additionally, there is growing evidence that AI can improve clinical workflows by facilitating better patient risk stratification. For instance, a 2024 study published in Nature demonstrated an AI model's ability to detect early-stage breast tumors with a high likelihood of becoming invasive, well before traditional methods. Beyond clinical applications, AI also has the potential to improve hospital management, reflecting the broader impact we expect it to have on management and coordination in various sectors.

AI and the art of precision: transforming manufacturing

Findings from MIT Technology Review Insights highlight a robust trend towards AI adoption in the manufacturing sector. They envision AI transforming factories into highly automated and intelligent hubs of production.

Within these environments, AI enhances robotics, bringing unprecedented precision and adaptability to assembly lines. It also enhances real-time production monitoring, allowing for on-the-spot adjustments that boost efficiency and minimize waste. Additionally, AI supports predictive maintenance and quality control, spotting production irregularities with greater accuracy. Its influence extends to supply chain optimization, improving demand forecasting, inventory management and planning. Furthermore, AI expedites product design processes, enabling customization to meet varied requirements with greater speed.

Trade's tech transformation: GenAI as the new competitive edge

The trade sector has already embraced automation, but AI is set to take this to new heights. AI systems in this domain leverage historical data analysis to identify trends, facilitating predictions of market dynamics, which translate into cost and time efficiencies for wholesalers. Moreover, AI enhances efficiency in administrative areas such as procurement and sales, addressing the challenge of skilled labor shortages. The automation of document processing stands out as a particularly promising application of AI. Beyond administrative efficiencies, AI empowers sales teams by identifying opportunities for upselling and cross-selling and by optimizing pricing strategies.

Navigating the AI landscape: a shift in global competitiveness

Our projections suggest that while AI is set to boost productivity across all regions, the lion's share of these gains is expected to accrue to Western economies, see Figures 2 and 3. Despite variations in the magnitude of TFP boosts, there is a notable consistency in the sectoral distribution of these gains.

In Western economies, we anticipate average TFP gains ranging between 0.9% and 1.8% by 2033, depending on the AI adoption scenario. The health care sector emerges as the primary beneficiary of these enhancements, followed by manufacturing sectors.

We project average TFP gains in CEE, as well as in Latin America, ASEAN and the Rest of Europe and Central Asia of between 0.3% and 0.7%, contingent upon the rate of AI adoption. We anticipate that manufacturing and trade sectors in these regions will experience the most notable TFP improvements. Our projections also suggest that the MENA region will see a similar magnitude and distribution of TFP gains.

In South Asia and Sub-Saharan Africa, we expect a modest increase in TFP due to AI and project estimated gains of between 0.05% and 0.1% at the aggregate level. The manufacturing sectors in these regions are likely to be the primary beneficiaries of this productivity enhancement.

As AI continues to evolve, the uneven distribution of productivity gains across sectors and regions is likely to reshape the competitive balance worldwide, influencing the future economic landscape. Furthermore, we expect regions and sectors that benefit most from AI-driven productivity increases to attract more investment. Such capital inflows could amplify the competitive realignment, accentuating the disparities between regions.

Figure 2 Impact of GenAI on TFP, percentage change from the baseline level in 2033, conservative scenario

	Western Europe	US & Canada	Developed Asia & Oceania	Southern Europe	Central and Eastern Europe	Latin America	Rest of Europe and Central Asia	ASEAN	MENA	South Asia	Sub-Saharan Africa
Human health, social work	1.7	1.7	1.7	0.8	0.3	0.3	0.3	0.3	0.3	0.0	0.0
Textiles and wearing apparel	1.5	1.5	1.5	1.3	0.8	0.8	0.8	0.8	0.2	0.1	0.1
Basic metals, metal products	1.5	1.5	1.5	1.3	0.7	0.7	0.7	0.7	0.3	0.2	0.1
Electrical and machinery equipment	1.4	1.4	1.4	1.3	0.8	0.8	0.8	0.8	0.3	0.1	0.1
Other manufacturing	1.4	1.4	1.4	1.2	0.9	0.9	0.9	0.9	0.5	0.2	0.1
Public administration	1.4	1.4	1.4	1.3	0.8	0.8	0.8	0.8	0.5	0.1	0.1
Education	1.3	1.3	1.3	1.1	0.7	0.7	0.7	0.7	0.3	0.2	0.0
Wholesale and retail trade	1.3	1.3	1.3	1.2	0.7	0.7	0.7	0.7	0.5	0.2	0.1
Computer, electronic, optical products	1.3	1.3	1.3	1.4	0.7	0.7	0.7	0.7	0.3	0.2	0.0
Automotive and other transport	1.2	1.2	1.2	0.9	0.6	0.6	0.6	0.6	0.4	0.1	0.1
Wood and paper products, printing	1.0	1.0	1.0	0.7	0.4	0.4	0.4	0.4	0.4	0.1	0.1
Food and beverages	0.9	0.9	0.9	1.1	0.7	0.7	0.7	0.7	0.2	0.1	0.1
Chemicals, pharmaceuticals, rubber	0.8	0.8	0.8	0.4	0.3	0.3	0.3	0.3	0.6	0.0	0.0
Water supply	0.8	0.8	0.8	0.7	0.5	0.5	0.5	0.5	0.1	0.0	0.0
Accommodation and food	0.7	0.7	0.7	0.6	0.3	0.3	0.3	0.3	0.4	0.1	0.0
Finance and insurance	0.6	0.6	0.6	0.3	0.1	0.1	0.1	0.1	0.2	0.0	0.0
Electricity, gas, steam	0.6	0.6	0.6	0.5	0.2	0.2	0.2	0.2	0.8	0.1	0.0
Professional and administrative services	0.4	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Non-metallic mineral products	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.0
Transportation and storage	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Arts, entertainment, other services	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Real estate	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Information and communication	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.0
Coke and petroleum products	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture, forestry and fishing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining and quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: EY EAT.

Figure 3 Impact of GenAI on TFP, percentage change from the baseline level in 2033, widespread adoption scenario

	Western Europe	US & Canada	Developed Asia & Oceania	Southern Europe	Central and Eastern Europe	Latin America	Rest of Europe and Central Asia	ASEAN	MENA	South Asia	Sub-Saharan Africa
Human health, social work	3.6	3.6	3.6	1.7	0.7	0.7	0.7	0.7	0.6	0.1	0.0
Textiles and wearing apparel	3.0	3.0	3.0	2.9	1.7	1.7	1.7	1.7	0.6	0.3	0.1
Basic metals, metal products	3.0	3.0	3.0	2.8	1.6	1.6	1.6	1.6	0.6	0.4	0.1
Electrical and machinery equipment	2.9	2.9	2.9	2.7	1.6	1.6	1.6	1.6	0.6	0.2	0.1
Other manufacturing	2.9	2.9	2.9	2.5	1.9	1.9	1.9	1.9	1.1	0.4	0.2
Public administration	2.9	2.9	2.9	2.7	1.7	1.7	1.7	1.7	1.0	0.3	0.1
Education	2.8	2.8	2.8	2.4	1.5	1.5	1.5	1.5	0.7	0.5	0.1
Wholesale and retail trade	2.7	2.7	2.7	2.6	1.5	1.5	1.5	1.5	1.0	0.3	0.1
Computer, electronic, optical products	2.7	2.7	2.7	2.9	1.4	1.4	1.4	1.4	0.8	0.4	0.1
Automotive and other transport	2.5	2.5	2.5	2.0	1.2	1.2	1.2	1.2	1.0	0.3	0.1
Wood and paper products, printing	2.1	2.1	2.1	1.5	0.8	0.8	0.8	0.8	0.8	0.2	0.3
Food and beverages	1.9	1.9	1.9	2.4	1.4	1.4	1.4	1.4	0.4	0.3	0.1
Chemicals, pharmaceuticals, rubber	1.6	1.6	1.6	0.9	0.6	0.6	0.6	0.6	1.4	0.1	0.1
Water supply	1.6	1.6	1.6	1.6	1.1	1.1	1.1	1.1	0.3	0.1	0.1
Accommodation and food	1.5	1.5	1.5	1.3	0.6	0.6	0.6	0.6	0.9	0.1	0.1
Finance and insurance	1.2	1.2	1.2	0.7	0.2	0.2	0.2	0.2	0.5	0.0	0.1
Electricity, gas, steam	1.2	1.2	1.2	1.0	0.5	0.5	0.5	0.5	1.7	0.3	0.1
Professional and administrative services	0.9	0.9	0.9	0.6	0.2	0.2	0.2	0.2	0.3	0.1	0.0
Non-metallic mineral products	0.9	0.9	0.9	0.7	0.4	0.4	0.4	0.4	0.5	0.1	0.1
Transportation and storage	0.6	0.6	0.6	0.6	0.2	0.2	0.2	0.2	0.2	0.0	0.1
Arts, entertainment, other services	0.6	0.6	0.6	0.3	0.1	0.1	0.1	0.1	0.2	0.0	0.1
Real estate	0.4	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.2	0.0	0.0
Information and communication	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.1
Coke and petroleum products	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Construction	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
Agriculture, forestry and fishing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining and quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0

Chapter 3

Bridging innovation and economy: the macroeconomic impact of GenAI across global regions

By 2033, GenAI is set to ignite an economic upswing across global regions, reshaping trade, investment and employment patterns.

To accurately measure the impact of shifts in international competitiveness across various sectors on economic trajectories, we need a detailed economic model that tracks trade connections for each industry. Additionally, as we mentioned in our earlier article, GenAI may alter investment patterns by increasing expenditure on hardware and software essential for GenAI implementation, particularly in information and communication technology (ICT) investment. To study how GenAI adoption influences different industries and regions, we used the EY UPGRADE computable general equilibrium (CGE) model. This approach allows us to examine the effects of GenAI on real GDP, cross-border capital flows, investment, international trade and employment. In the following section, we will delve into the specific effects of GenAI on individual sectors.

Our approach

Our modeling approach starts by feeding two key inputs into the EY UPGRADE CGE model: the extent of GenAI adoption by sector and region. We then simulate this data to forecast the anticipated shifts in both sector-specific and broader economic indicators. The inputs to our CGE model comprise year-on-year changes in the following variables:

1. Total factor productivity (TFP) resulting from GenAI adoption, differentiated by sectors and regions, as detailed in Chapter 2
2. ICT investment spending relative to real GDP for each region, necessary for GenAI deployment, as discussed in our earlier article

The first input captures the comparative impact of GenAI adoption on productivity across various sectors and regions. It illustrates the potential for firms to lower production costs while maintaining output levels by integrating GenAI technologies. The second input reflects the additional investment in ICT infrastructure required for GenAI implementation, such as advanced cloud computing resources, graphics processing units (GPUs) and enhanced security systems. This capital expenditure spurs additional demand within the

ICT hardware sector, leading to a ripple effect that increases the demand for production inputs from related industries, such as electrical equipment, metal products, glass, rubber and plastic. We then incorporated these inputs, which form the basis for the economic shifts driven by GenAI adoption, into our CGE model to quantify the sectoral and macroeconomic effects.

Additionally, our CGE-based analysis considers the influence of international capital flows on regional investment spending due to GenAI. We expect high productivity growth in regions that quickly adopt GenAI to create additional demand for capital. This should lead to an increase in the price of capital, which would attract additional foreign savings, enabling increased investment spending. However, the scale of these capital inflows depends on the level of international capital mobility, which various formal and informal barriers influence. Formal barriers include government-imposed capital controls, taxation of foreign capital and stringent reporting requirements. Informal barriers encompass cultural differences, mistrust in foreign markets and most notably home bias —investors' preference for domestic over foreign investments. Furthermore, state support programs designed to foster local GenAI initiatives may also reduce capital outflows, making them less sensitive to international rates of return.

Taking these factors into account, our analysis explores the effects of GenAI adoption under two distinct scenarios — widespread and conservative — and further examines each scenario under two conditions of international capital mobility:

1. **High international capital mobility,** allowing capital to freely move towards regions offering the highest returns
2. **Low international capital mobility,** where regional shares of global capital remain fixed and investors are not responsive to regional variations in rates of return

The variation in outcomes between the two capital mobility scenarios underscores the potential influence of international capital flows on the macroeconomic impact of GenAI.

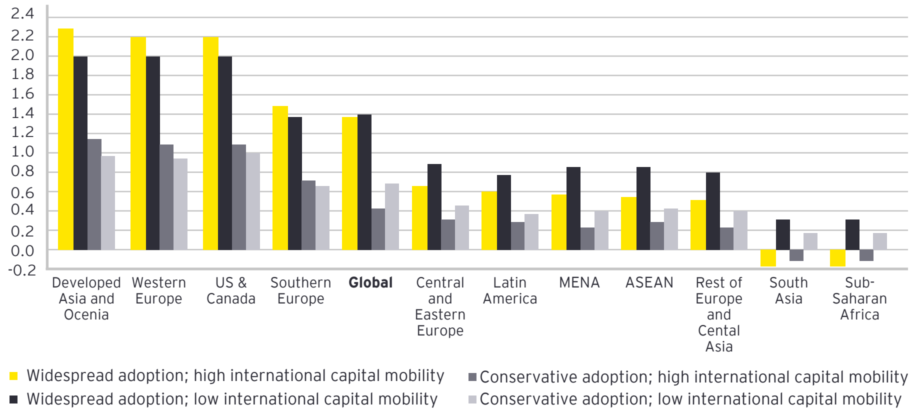
CGE models incorporate feedback loops where initial sectoral effects shape macroeconomic outcomes, which in turn affect industry demand and supply. Consequently, we begin our discussion of results with an overview of the macroeconomic impacts of GenAI across regions, outlining the evolution of the global economy in response to these technological advancements. Subsequently, Chapters 4 and 5 will integrate these macroeconomic findings with sector-specific effects to provide a comprehensive view of how we expect the full spectrum of GenAI-induced economic changes to reshape regional industries.

For clarity, we present all results as percentage deviations from a baseline scenario that assumes no GenAI adoption. Thus, in the following discussions, we will describe the extent to which we project that GenAI adoption will influence various economic variables relative to their baseline levels by 2033, marking the end of our analysis period.

Real GDP: projecting the economic upswing

Our simulation results suggest that regions with the largest AI-driven productivity gains will see the most significant increases in real GDP. Globally, we expect GenAI to boost real GDP by between 0.4% and 1.4% relative to the baseline level in 2033, with variations depending on the adoption scenario and international capital mobility. We project the most substantial impacts for Developed Asia and Oceania (1.0%–2.3%), Western Europe (1.0%–2.2%) and the USA and Canada (1.9%–2.2%), see Figure 4.

Figure 4 Impact of GenAI on real GDP, percentage change from the baseline level in 2033



Source: EY analysis based on EY UPGRADE CGE model.

Crucially, unlike our previous articles that focused primarily on the contribution of productivity growth to real GDP changes, the EY UPGRADE CGE model incorporates a broader range of economic effects. Specifically, it accounts for the impact of capital flow variations, driven by differences in rates of return on capital, investment spending, and consequently, real GDP. These mechanisms may lead to even greater regional disparities in real GDP outcomes, as illustrated in Figure 4, which shows the variation in real GDP effects under different capital mobility scenarios. Furthermore, in certain regions such as South Asia and Sub-Saharan Africa, high capital mobility may even result in a decline in investment and a subsequent reduction in real GDP. There is a detailed discussion of how shifts in capital flows can affect investment spending and real GDP in the subsequent sections.

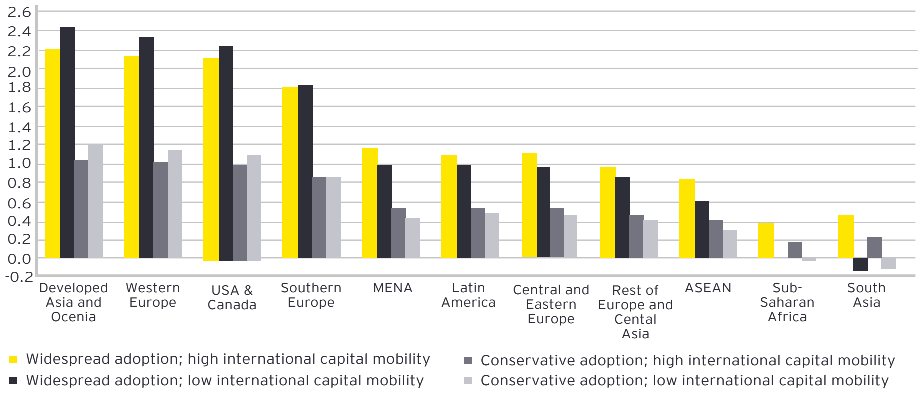
Additionally, the regional GDP effects quantified using a CGE model reflect shifts in sectoral specialization. Countries that rapidly adopt GenAI are likely to reallocate resources, such as labor and capital, towards GenAI-augmented industries, particularly over the long term. This reallocation could result in resource scarcity for less GenAI-intensive sectors within fast-adopting regions, leading to increased production costs. Consequently, consumers and producers in these countries might seek cheaper alternatives from regions with slower GenAI adoption, such as South Asia and Sub-Saharan Africa, boosting demand for their goods. Such shifts in comparative advantage at the sectoral level are part of the driving forces behind the real GDP changes shown in Figure 4. We provide a further description of sector-level changes across regions due to GenAI adoption in Chapter 5.

Investment shifts: an interplay between investment demand and international capital mobility

As GenAI adoption accelerates, its impact on investment trends is twofold. Firstly, businesses are likely to increase spending on critical infrastructure such as servers, cloud computing and GPUs to support GenAI operations. Secondly, the broader economic shifts driven by GenAI could reshape overall investment patterns across the world. In this discussion, we will explore the potential global investment shifts, drawing on the insights from the EY UPGRADE CGE model.[5]

As discussed above, we expect GenAI to boost economic growth in advanced economies through improved productivity and cost savings. A key outcome of this growth will be a heightened demand for capital, a crucial input for numerous industries. This increased demand is likely to drive up both the price and the rate of return on capital. Figure 5 illustrates this effect, showing that we anticipate regions with the most significant real GDP growth from GenAI, such as Developed Asia and Oceania, Western Europe and the USA and Canada, experiencing the largest hikes in in the cost of capital.

Figure 5 Impact of GenAI on the cost of capital, percentage change from the baseline level in 2033



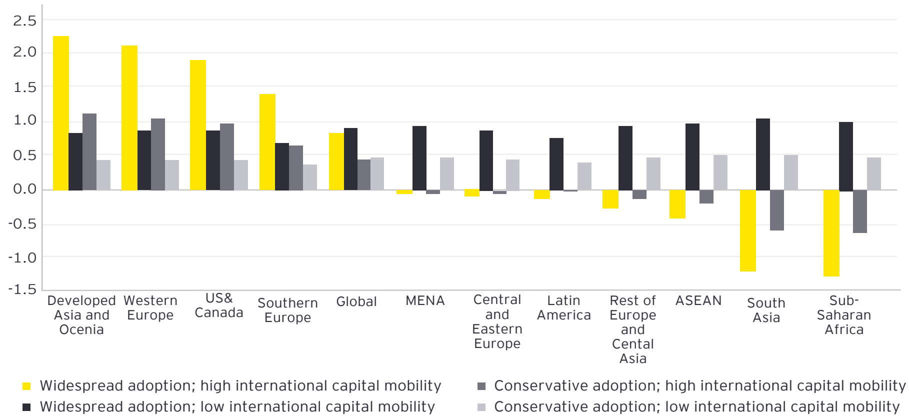
Source: EY analysis based on EY UPGRADE CGE model.

Under high international capital mobility, regions with the most significant projected increases in returns on capital — such as Developed Asia, Oceania, the US, Canada and Western Europe — are likely to draw foreign investment, as shown in Figure 6. This capital inflow will come at the expense of emerging markets such as Sub-Saharan Africa and South Asia, where lower relative returns on capital could lead to capital outflows. Consequently, investment spending is forecast to climb due to GenAI by between 1.1% and 2.2% in Developed Asia and Oceania, 1.0% and 2.1% in Western Europe and between 1.0% and 1.9% in the USA and Canada, while South Asia and Sub-Saharan Africa might see decreases of between 0.6% and 1.2% and 0.6% and 1.3%, respectively.

In contrast, variations in low capital mobility present a different picture. Here, changes in investment across regions are less about the redistribution of capital due to shifting relative returns. Instead, growth of savings, fueled by GenAI-driven increases in real income and GDP facilitates new regional investment spending. Therefore, unlike the high mobility case where South Asia and Sub-Saharan Africa face declining investment, under conditions of restricted capital flows, these regions could see investment increases of between 0.5% and 1.0%.

5 For a detailed treatment of the direct impact of GenAI on investment, see our article.

Figure 6 Impact of GenAI on investment, percentage change from the baseline level in 2033



Source: EY analysis based on EY UPGRADE CGE model.

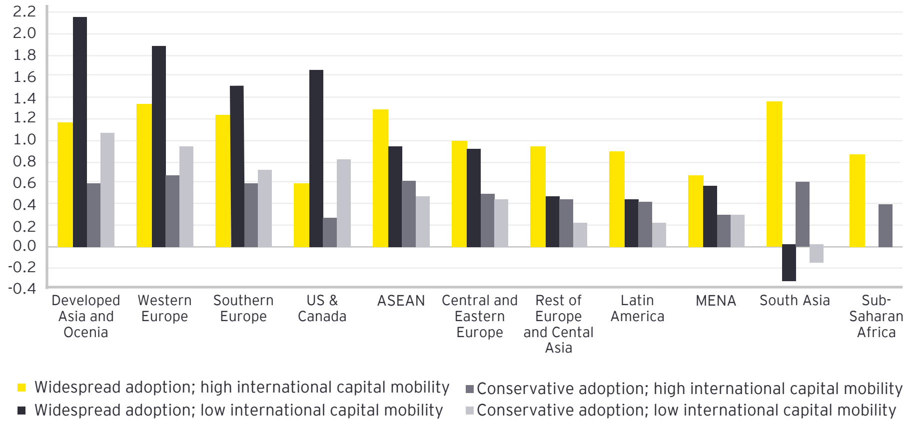
The resultant changes in investment spending across regions, under each international capital mobility variant, are key factors affecting the expected real GDP change, shown in Figure 4 above. Regions where GenAI adoption will be slower, such as South Asia and Sub-Saharan Africa, best illustrate this effect. Under conditions of high cross-border capital mobility, such regions will experience an outflow of capital and a decline in investment, thus leading to a small decline in real GDP despite GenAI-driven productivity growth. However, prevailing lower international capital mobility, which may involve, for example, home bias or publicly funded GenAI investment programs, leads to no significant outflow of capital from these regions. Thus, investment increases and contributes to the rise in real GDP. Such differences in results across mobility variants therefore illustrate the role that capital flow restrictions and home bias play in understanding the impact of GenAI on total investment and real GDP.

GenAI and international trade: the interplay of changes in TFP, investment demand and international competitiveness

The impact of GenAI on trade is a result of multiple economic effects simultaneously occurring in the global economy. To break these down, we start with a description of the low capital mobility variant. Then, we will explore a scenario in which capital can move freely and discuss how this shift in investment flows can shape international trade.

In the variant of low international capital mobility, variations in real GDP impacts across regions are more a consequence of disparities in GenAI-induced productivity growth than shifts in capital flows. In such an environment, regions that quickly integrate GenAI – such as Developed Asia, Oceania, the USA, Canada and Western Europe – gain a competitive edge through heightened cost efficiency. This advantage leads to lower prices for their goods and services, which boosts export potential. Conversely, regions anticipated to experience slower GenAI adoption, such as South Asia, may see their exports dwindle as they struggle to maintain price competitiveness (see Figure 7). This underscores the pivotal role of GenAI for international competitiveness and export volumes.

Figure 7 Impact of GenAI on total exports, percentage change from the baseline level in 2033



Source: EY analysis based on EY UPGRADE CGE model.

The effects under high capital mobility differ significantly from those in the low mobility variant. While GenAI still boosts productivity and lowers production costs in regions that adopt it quickly, the influx of investment in these areas drives up aggregate demand, contributing to an increase in prices. This offsetting effect means that the gap in price competitiveness between fast and slow adopters of AI will be less pronounced than in the low mobility scenario.[6] As a result, the (weak) correlation between rapid GenAI adoption and export growth becomes less distinct, leading to a more even distribution of export increases across regions, regardless of their GenAI adoption rates.[7]

An important finding under the high mobility scenario is that GenAI leads to increased exports in all regions. This boost in exports is due to the overall growth in the world economy, as shown by the rise in global real GDP in Figure 4, which in turn increases global trade volumes. Interestingly, we see a similar increase in real GDP also in the low cross-border capital mobility variant. However, in this variant, the shifts in regional price competitiveness dominate, resulting in uneven growth in trade among different countries.

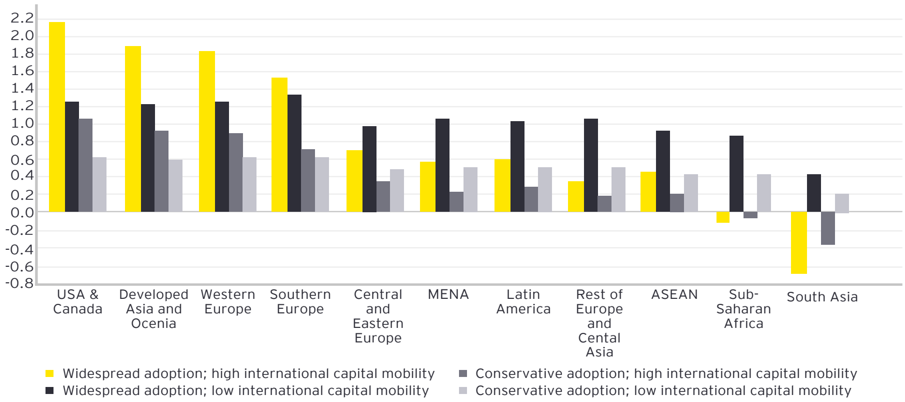
On the import side, the intuition that explains the results is related to that described above but works in a slightly different direction. In the variant of low international capital mobility, we expect GenAI diffusion to lower production costs and prices in regions that adopt it quickly (such as Developed Asia, Oceania, Western Europe and the USA and Canada) compared to those adopting it slowly (like South Asia and Sub-Saharan Africa). Consequently, consumers and producers in the fast-adopting regions may wish to reduce their reliance on goods and services from the slower-adopting regions, favoring domestic sources or imports from other fast adopters.

However, the additional economic growth in fast-adopting regions due to GenAI deployment also means greater affordability of imports. Such an effect will, according to our estimates, offset the import substitution described above. This will result in a net increase in total imports to fast-adopting countries, including from regions that are not as quick to deploy GenAI (as shown in Figure 8). For detailed projections of how GenAI may alter trade flows between regions, refer to the heatmaps in the Appendix.

6 In addition to these effects, investment leads to a long-run accumulation of capital. This expands the productive capacity of economies and allows them to produce more goods and services for exports.

7 A good example of this effect is South Asia. In this region, under low capital mobility we observe a decline in exports, due to slow productivity growth and constraints on price competitiveness. Under high mobility, the significant decline in investment activity would contribute to a reduction in prices (bringing them lower relative to other regions), leading to an increase in exports.

Figure 8 Impact of GenAI on total imports, percentage change from the baseline level in 2033



Source: EY analysis based on EY UPGRADE CGE model.

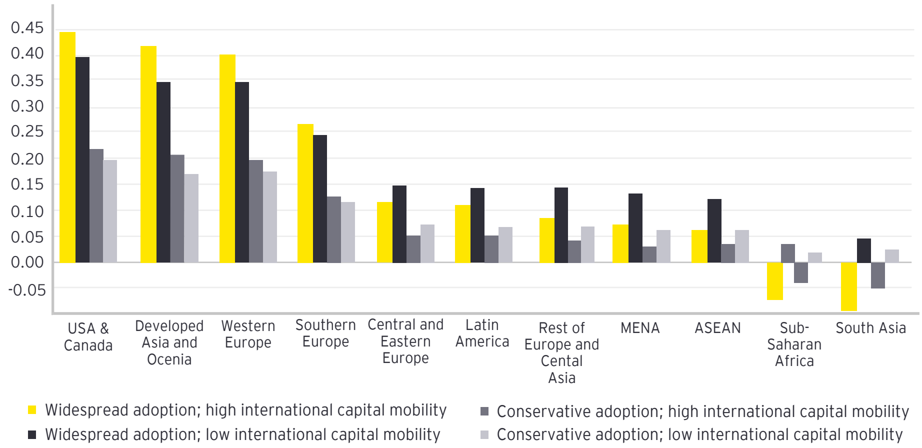
With high cross-border capital mobility, price adjustments driven by shifts in investment demand supplement the previously mentioned effects. Although we expect productivity gains in fast-adopting countries to lower the prices of their goods and services, increased capital inflows and investment can counteract this by driving prices up. This means that the relative prices of domestic and foreign goods and services in fast-adopting countries will fall, although to a lower extent than those subject to the low mobility variant, meaning that imports will remain attractive.

Moreover, as in the low mobility variant, we expect expanding real GDP in advanced economies to increase the affordability of imports. Both these effects mean that GenAI is likely to cause a more pronounced increase in imports to regions like the USA and Canada, Developed Asia and Oceania and Western Europe when international capital mobility is high. In contrast, Sub-Saharan Africa and South Asia may see a decrease in imports due to reduced investment demand, which lowers domestic prices and encourages a shift towards local goods.

The race between man and machine: implications of GenAI for employment

Turning our attention to the implications of GenAI adoption for employment, it is worth addressing the common apprehension that such technology might lead to job losses through automation. Notably, the insights from our modeling exercise offer a more optimistic scenario. Although productivity growth results in a reduction in costs and lower workload per task, we expect the overall level of output across most industries and regions to increase significantly. This rise in economic activity should create demand for more workers, as illustrated in Figure 9. The pattern of employment shifts is likely to reflect the changes in real GDP presented in Figure 4, with regions that quickly embrace GenAI, such as Developed Asia and Oceania, the USA and Canada and Western Europe, seeing the most substantial boosts in employment. Only in the high cross-border capital mobility scenario do we see a marginal dip in employment for South Asia and Sub-Saharan Africa. However, potential decreases in real GDP from dwindling investment in these regions explain this, rather than automation or a reduction in demand from overseas markets. It is important to note that this employment effect does not occur in the low capital mobility scenario.

Figure 9 Impact of GenAI on employment, percentage change from the baseline level in 2033



Source: EY analysis based on the EY UPGRADE CGE model.

The relationship between GenAI adoption and employment is consistent with historical trends seen during past phases of business automation. Acemoglu's research illustrates that technological advancements typically do not just eliminate jobs but they also create new roles and opportunities. For example, the rise of software and computing did not just automate tasks once performed by white-collar workers; it also gave birth to numerous new professions. Remarkably, about half of the job growth between 1980 and 2015 occurred in areas where the work itself or the job titles were newly developed. Similarly, we expect the rapid development of AI technologies to generate novel positions, especially within the service industry. Nonetheless, Acemoglu raises a valid concern that recent technological innovations may disproportionately focus on substituting human labor, rather than creating new opportunities for employment. Although widespread automation could be advantageous given the aging population and a contracting workforce, it is crucial for governments to implement policies that mitigate the risk of a biased technological impact on the labor market.

Chapter 4

Analyzing GenAI's impact on the global economy through a sectoral lens

GenAI will lead to transformative impacts across global sectors by 2033, with health care experiencing a boom and wholesale and retail trade as well as manufacturing undergoing nuanced shifts.

Having analyzed the macroeconomic consequences of divergences in GenAI adoption rates across regions, we now turn to sectoral outcomes at the global level.

Direct and indirect impacts of GenAI on sectoral outcomes

Our analysis using the EY UPGRADE CGE model focuses on two types of effect that drive sectoral outcomes at the global level:

1. **Direct productivity impact:** The adoption of GenAI can directly enhance sectoral productivity through industry-specific applications, potentially leading to increased output because of reduced production costs.
2. **Macroeconomic influence:** GenAI adoption can also lead to broader economic shifts that affect industries in terms of supply and demand, including changes in consumer spending, investment patterns, production costs and demand from downstream sectors.

As such, the insights we provide here are based on a holistic view of the global economy, capturing the interplay between these two types of effect. For example, even if GenAI significantly reduces costs within a specific industry, if the industry's main producers are situated in countries facing capital outflows, as discussed in Chapter 3, this could moderate the positive impact on production on a global scale.

Therefore, the sectoral outcomes we discuss are not just reflections of global trends in GenAI adoption. They also incorporate the effects of regional economic shifts induced by GenAI.

From health to agriculture: predicting the varied effects of GenAI

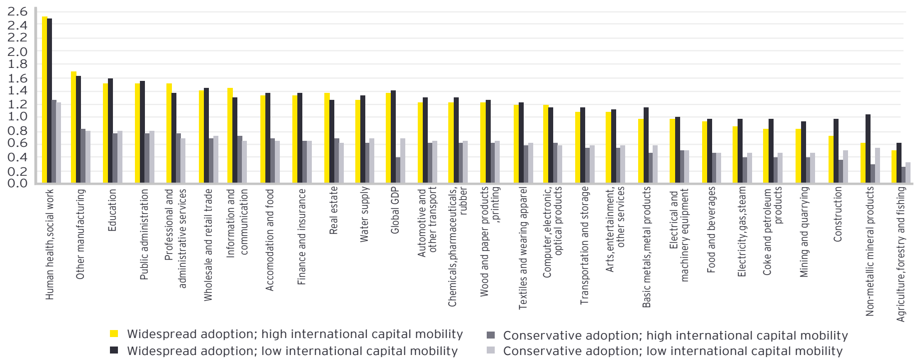
Globally, the health care sector stands to gain the most from the adoption of GenAI technologies. By 2033, depending on how quickly and widely the sector embraces GenAI (as outlined in our conservative vs. widespread diffusion scenarios), we expect its output to grow by between 1.2% and 2.5% (see Figure 10). The main reason for this growth is the substantial boost in productivity that GenAI brings to health care. The connection between

GenAI and productivity is clear: the technology's diverse applications, which include the optimization of electronic health records and the advancement of data analytics, directly contribute to more efficient and effective health care services, thereby driving the sector's productivity upward.

We are also expecting major impacts of GenAI on output in sectors such as education, public administration and professional services. For professional services and public administration, GenAI will help cut down on routine tasks, freeing up time for more complex and valuable work. In education, GenAI is set to revolutionize learning by making it more personalized and adaptable, which will improve the quality of education.

Furthermore, as GenAI drives up incomes and expenditure, governments will see an increase in tax revenue, leading to more government spending. Education and public administration, which heavily rely on government funding, will see a boost in output from this increased expenditure. Additionally, as GenAI becomes more widespread, there will be a growing demand for research and development, further driving the need for educational courses and resources to support this innovation.

Figure 10 Impact of GenAI on global sectoral production, percentage change from the baseline level in 2033



Source: EY analysis based on the EY UPGRADE CGE model.

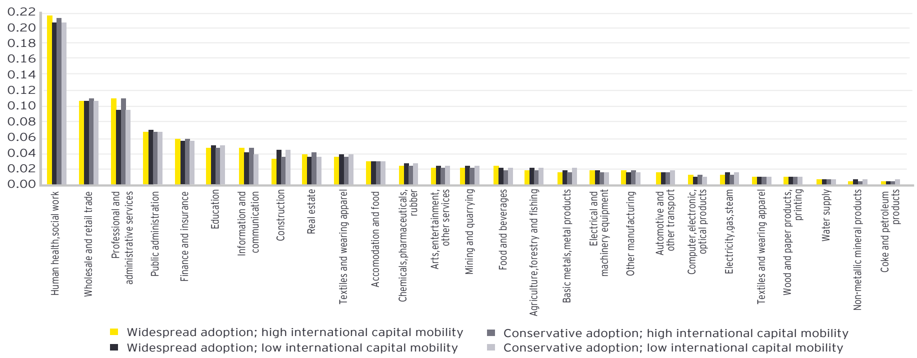
We expect sectors with lower exposure to Gen AI to see a more modest impact on output. Agriculture, non-metallic mineral products and construction are likely to experience the slowest production increase due to GenAI, with anticipated additional growth of between 0.2% and 1.0%. It is important to note that the performance of non-metallic mineral products and construction sectors is dependent on the assumptions regarding international capital mobility, as these sectors have a large share in total investment spending. Under low mobility, investment activity tends to remain in countries where the share of construction in investment spending is higher and the share of non-metallic mineral products in construction is more significant, resulting in better performance of these sectors.

We also expect that industries not significantly enhanced by GenAI, such as the water supply and real estate, will still see advantages from the widespread adoption of GenAI in the economy. This is because sectors that rely on such services (e.g., manufacturing) will boost their output thanks to GenAI. Moreover, growing household spending due to additional AI-driven economic growth will also boost the demand for real estate and water supply. This illustrates how industries that with little AI enhancement can still reap rewards from the economic shifts that GenAI brings about.

Sectoral contributions to GenAI-driven GDP growth

We are looking into how changes in output across different industries due to the adoption of GenAI technology can impact the overall growth of the global economy. In doing so we are paying special attention to the size of each industry in relation to the global economy. As illustrated in Figure 11, we expect the human health sector to contribute more than 20% to the GenAI-driven growth in the global economy. Our findings also show that the retail and wholesale trade sector, because of its considerable scale, will have a significant positive effect on the global economy as it adopts GenAI solutions. On the other hand, the "other manufacturing" sector — which includes a wide range of products from medical devices to musical instruments and furniture — may see a smaller boost in economic growth. This is despite GenAI affecting its output, simply because this sector is smaller in comparison to others.

Figure 11 Sectors' contribution to global GenAI-driven real GDP growth (% of additional real GDP growth due to GenAI up to 2033)



Source: EY analysis based on the EY UPGRADE CGE model.

Although the global results present several key impact channels of GenAI on sector performance, they do not show important inter-regional differences that may take place even within the same industry. Therefore, in the following section, we analyze the cross-regional sectoral outcomes and outline several crucial mechanisms that determine how sectors perform based on their region of operations.

Chapter 5

Impact of GenAI on sectors across regions

GenAI is reshaping the global business landscape, with an array of impacts that will differ from sector to sector and region to region, all hinging on the interplay of productivity, competition, capital flows and supply chain evolution.

GenAI solutions are set to transform industries worldwide, but the effects will vary greatly. We expect to see significant differences between sectors within the same region, as well as within the same industry across different regions. A range of factors will influence these variations, including differences in productivity growth due to GenAI, shifts in international competitiveness, movements of global capital and changes in supply chain dynamics.

Our EY UPGRADE CGE model, which in this study involves 27 sectors across 11 regions, measures these complex interactions and determines the overall impact on each sector and region. As we delve into the data, it will become clear that some local industries will thrive, making the most of the new efficiencies GenAI brings, while others may struggle to keep up with the rapid changes.

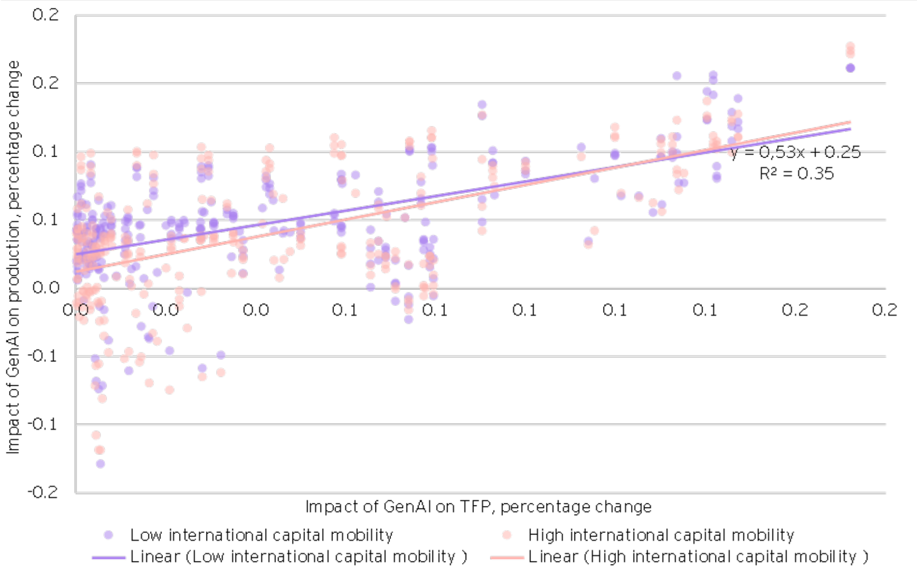
In the following sections, we will explore the main ways in which GenAI affects industries in specific areas and share examples from our model. We detail the results for each region and sector in Figures 13–16.

Productivity growth and sector expansion

When TFP rises, it usually leads to lower costs and allows industries to produce more. For example, the human health and social work sector is predicted to see the highest productivity gains in Western Europe, the USA and Canada and Developed Asia and Oceania, as shown in Figures 2 and 3. We expect this boost in productivity to lead to the largest increase in output for this sector in these regions, a trend that holds true under different scenarios of cross-border capital mobility, as detailed in Figures 13–16. However, the situation is different in the MENA region, where the human health and social work sector is not projected to benefit from GenAI as much as other local industries and is not expected to see increases in output as large as those in other sectors. This contrast underscores how productivity gains driven by GenAI can vary by region and sector, significantly influencing the growth of industry output.

The link between productivity gains from GenAI and increased output is not always direct or clear cut. Take the non-metallic mineral products industry in the USA and Canada as an example. Even though it is the fourth highest in productivity improvements thanks to GenAI, it only comes in 10th when we look at the increase in output (under the scenario of widespread GenAI adoption with high capital mobility). This discrepancy shows that other economic factors also play a role in determining how much an industry grows, not just productivity improvements.[8]

Figure 12 Impact of GenAI on total factor productivity (TFP) vs. production (gross output), percentage change from the baseline level in 2033, conservative scenario with low and high international capital mobility



Source: EY analysis based on EY UPGRADE CGE model.
Note: points on the chart represent sector-region pairs.

Relative productivity growth and comparative advantage

Productivity gains from GenAI do not always lead to straightforward increases in output (see Figure 12). This becomes particularly evident when we consider how productivity improvements vary across regions within the same industry. For instance, while a sector in region A might become more cost-efficient due to productivity gains, the same sector in region B could see an even larger boost from GenAI. This can shift the competitive balance, with region B potentially outperforming region A, leading to stagnant or even reduced output in region A as it faces tougher competition from the more rapidly advancing GenAI adopters.

This pattern is particularly noticeable in the manufacturing sectors of South Asia and Sub-Saharan Africa. Despite achieving significant productivity improvements compared to other local industries, these sectors may find it challenging to sustain their production levels. They are set to face stiff competition from international producers, which we expect to leverage GenAI more effectively, highlighting the importance of considering global competitive forces alongside productivity changes.

Moreover, GenAI may also prompt a strategic reallocation of labor and capital. As fast-adopting regions pour resources into GenAI-centric sectors, they will rely more on imports for their agricultural and mining needs, offering an

8 In fact, our analysis suggests that, on average, productivity gains alone, as illustrated in Figure 12, explain only about one-third of the variation in output changes across sectors and regions.

opening for countries in South Asia and Sub-Saharan Africa to step in (unless regional policies dictate otherwise). Therefore, slow adopters of GenAI may shift their focus to traditional sectors like agriculture and mining, capitalizing on demand from regions where GenAI is rapidly transforming industries.

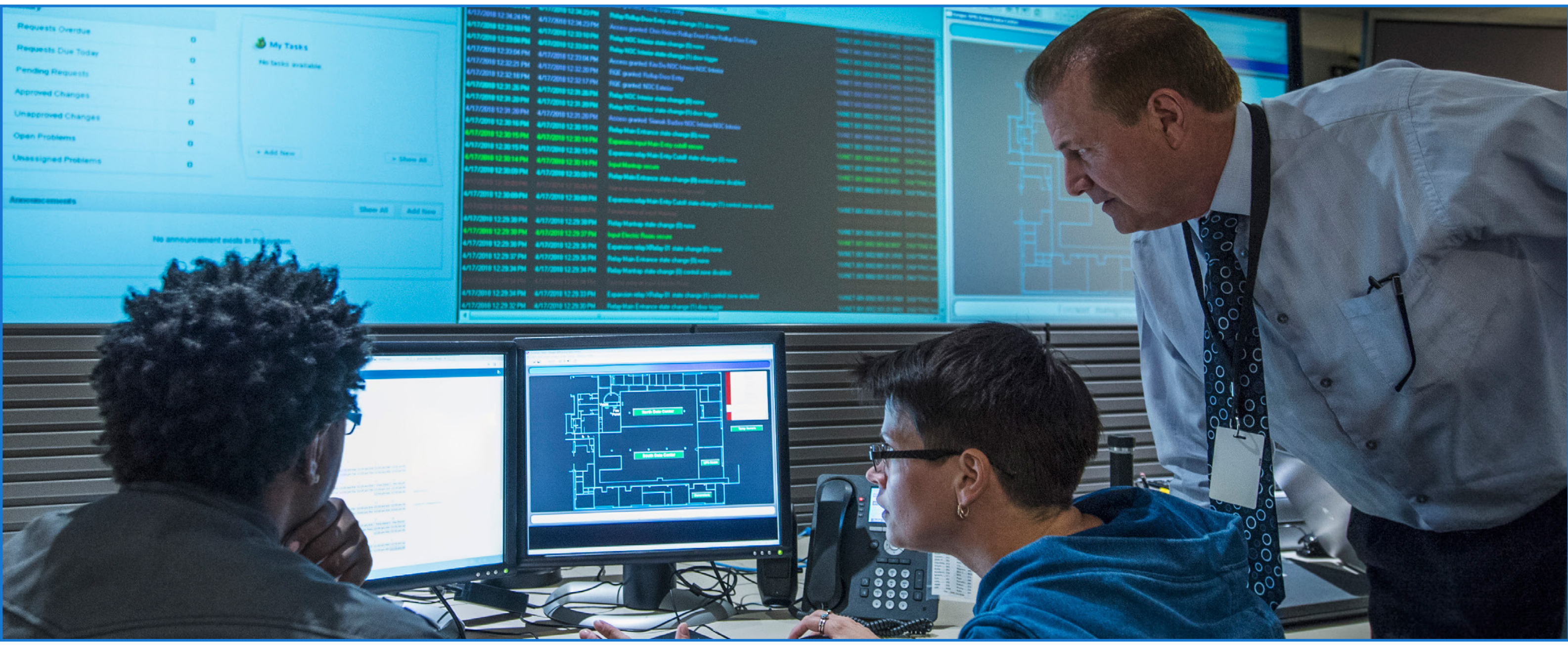
Vulnerability of highly traded sectors

We expect the international comparative advantage shifts described above to have pronounced economic impacts on sectors highly involved in global trade. For example, in industries such as metal products and electrical equipment, small productivity differences between regions can lead to significant changes in foreign demand and production levels. On the other hand, sectors such as human health, social work, education and public administration, which cater to local markets, are less affected by such shifts.

The situation in Sub-Saharan Africa under a scenario of low capital mobility illustrates this point. While we expect productivity gains in both metal products and human health sectors, we also anticipate the final change in output to be negative. The metal products industry, being heavily traded, is likely to see a drop in exports and production due to minor productivity improvements compared to other regions. Conversely, the human health sector, which serves primarily the domestic market, is likely to grow. The sector's resilience to international productivity shifts drives this growth, in addition to the anticipated increase in domestic spending due to GenAI's overall positive effect on the region's real GDP.

Sectors at risk of capital flight

The impact of investment shifts becomes clear when contrasting high and low international capital mobility scenarios. Take South Asia's automotive sector, which is heavily reliant on investment spending. Under low capital mobility, the sector benefits from increased productivity and demand, leading to growth. In contrast, under high capital mobility, this sector faces a decline as investment drops with the outflow of capital, which offsets the positive effect of AI-driven productivity gains.



AI Investment wave and its beneficiaries

In our study, we also account for intensified investments in sectors associated with the deployment of GenAI solutions.[9] This may lead to an additional surge in demand for ICT hardware required to support GenAI technologies, such as graphics processing units and cloud infrastructure. This increase in ICT hardware production will generate additional demand along its supply chain, which involves electrical equipment, metal products, wires, glass, as well as professional services related to device design, especially in the USA. This effect is clearly visible through rising output in the computers, electronic and optical products sector, particularly in the USA and Canada. In the case of upstream industries, the above results present a combined effect of both rising demand from ICT hardware producers, as well as GenAI-driven productivity growth occurring in these sectors.

We present quantitative results encompassing the full spectrum of region- and sector-specific outcomes in Figures 13–16, where we detail the findings for each of the four scenarios analyzed in this report. In the next section, we outline key implications for business leaders.

9 As explained in Chapter 3, one of the inputs to the EY UPGRADE CGE model involved an increase in ICT investment share in GDP due to firms' decisions to invest in GenAI technologies. We estimated the change in ICT investment share in GDP due to GenAI deployment in our previous article on the impact of GenAI on capital investment.

Figure 13 Impact of GenAI on production, percentage change from the baseline level in 2033, conservative scenario with high international capital mobility

	Western Europe	US & Canada	Developed Asia & Oceania	Southern Europe	Central and Eastern Europe	Latin America	Rest of Europe and Central Asia	ASEAN	MENA	South Asia	Sub-Saharan Africa
Human health, social work	1.75	1.72	1.78	0.96	0.41	0.41	0.39	0.34	0.39	-0.15	-0.10
Textiles and wearing apparel	1.28	1.11	1.12	0.72	0.10	-0.04	0.02	0.21	-0.29	-0.50	-1.18
Basic metals, metal products	1.26	1.37	1.25	0.66	0.24	0.23	0.17	0.24	0.08	-0.46	-0.81
Electrical and machinery equipment	1.24	1.00	1.22	0.57	-0.08	-0.10	-0.16	0.17	-0.65	-0.69	-1.18
Other manufacturing	1.12	1.04	1.07	0.43	0.95	0.42	0.61	1.27	0.27	0.03	-0.47
Public administration	1.12	1.11	1.18	0.75	0.31	0.30	0.26	0.25	0.21	-0.18	-0.23
Education	1.11	1.11	1.16	0.69	0.39	0.39	0.37	0.34	0.70	-0.05	0.01
Wholesale and retail trade	1.07	1.04	1.08	0.79	0.37	0.38	0.35	0.36	0.48	-0.09	0.01
Computer, electronic, optical products	1.06	1.00	1.12	0.70	0.24	0.23	0.18	0.14	0.21	-0.04	-0.35
Automotive and other transport	1.05	1.02	1.08	0.63	0.18	0.03	0.01	-0.06	-0.02	-0.51	-0.55
Wood and paper products, printing	1.05	0.99	1.11	0.66	0.09	-0.02	-0.08	-0.13	0.00	-0.54	-0.56
Food and beverages	1.00	1.07	1.09	0.85	0.34	0.17	0.10	0.25	0.11	-0.39	-0.71
Chemicals, pharmaceuticals, rubber	0.99	0.90	1.01	0.67	0.33	0.28	0.25	0.27	0.15	-0.10	-0.12
Water supply	0.98	0.97	1.05	0.63	0.33	0.24	0.19	0.38	0.37	0.21	-0.07
Accommodation and food	0.95	0.88	1.04	0.62	0.33	0.35	0.27	0.38	0.37	-0.02	-0.01
Finance and insurance	0.94	0.86	0.98	0.65	0.51	0.39	0.40	0.37	0.56	0.13	0.22
Electricity, gas, steam	0.93	0.89	0.86	0.53	0.28	0.22	0.23	0.10	0.32	0.08	0.02
Professional and administrative services	0.92	0.89	1.03	0.66	0.36	0.25	0.26	0.33	0.27	0.59	-0.21
Non-metallic mineral products	0.90	0.85	0.99	0.63	0.34	0.25	0.22	0.27	0.17	-0.13	-0.23
Transportation and storage	0.87	1.24	0.84	0.33	0.00	0.22	0.02	0.27	-0.62	-0.74	-1.07
Arts, entertainment, other services	0.87	0.90	0.96	0.59	0.29	0.26	0.22	0.39	0.30	-0.11	-0.06
Real estate	0.86	0.81	0.90	0.97	0.61	0.35	0.25	0.59	-0.33	0.07	-0.24
Information and communication	0.84	0.77	0.98	0.58	0.31	0.30	0.24	0.27	0.31	-0.14	-0.01
Coke and petroleum products	0.81	0.86	0.94	0.60	0.39	0.30	0.29	0.35	0.37	-0.11	-0.01
Construction	0.70	0.61	0.82	0.52	0.36	0.40	0.32	0.37	0.23	-0.02	-0.03
Agriculture, forestry and fishing	0.46	0.38	0.41	0.39	0.26	0.31	0.23	0.17	0.37	0.07	0.08
Mining and quarrying	0.24	0.36	0.19	0.44	0.45	0.37	0.33	0.43	0.41	0.40	0.44

Source: EY analysis based on EY UPGRADE CGE model.

Figure 14 Impact of GenAI on production, percentage change from the baseline level in 2033, widespread scenario with high international capital mobility

	Western Europe	US & Canada	Developed Asia & Oceania	Southern Europe	Central and Eastern Europe	Latin America	Rest of Europe and Central Asia	ASEAN	MENA	South Asia	Sub-Saharan Africa
Human health, social work	3.57	3.51	3.63	2.03	0.86	0.84	0.80	0.69	0.89	-0.27	-0.15
Textiles and wearing apparel	2.58	2.24	2.23	1.58	0.22	-0.06	0.05	0.42	-0.46	-0.96	-2.33
Basic metals, metal products	2.55	2.80	2.52	1.44	0.51	0.50	0.36	0.48	0.34	-0.88	-1.57
Electrical and machinery equipment	2.50	2.01	2.46	1.28	-0.14	-0.16	-0.30	0.35	-1.19	-1.33	-2.32
Other manufacturing	2.27	2.25	2.39	1.59	0.65	0.62	0.53	0.51	0.52	-0.33	-0.43
Public administration	2.26	2.26	2.36	1.47	0.81	0.81	0.75	0.69	1.57	-0.07	0.06
Education	2.24	2.10	2.16	0.94	2.00	0.91	1.28	2.64	0.72	0.13	-0.88
Wholesale and retail trade	2.19	2.13	2.19	1.70	0.76	0.80	0.73	0.73	1.08	-0.16	0.07
Computer, electronic, optical products	2.13	2.03	2.25	1.50	0.51	0.49	0.37	0.28	0.57	-0.03	-0.67
Automotive and other transport	2.12	2.06	2.17	1.36	0.38	0.05	0.01	-0.13	0.05	-1.03	-1.09
Wood and paper products, printing	2.12	1.99	2.23	1.41	0.17	-0.05	-0.19	-0.30	0.09	-1.10	-1.14
Food and beverages	2.01	1.83	2.03	1.43	0.69	0.59	0.51	0.54	0.38	-0.17	-0.21
Chemicals, pharmaceuticals, rubber	2.01	2.15	2.20	1.82	0.70	0.36	0.21	0.49	0.37	-0.75	-1.38
Water supply	1.99	1.97	2.13	1.32	0.66	0.50	0.37	0.76	0.85	0.46	-0.10
Accommodation and food	1.94	1.79	2.10	1.31	0.68	0.71	0.55	0.76	0.82	0.00	0.03
Finance and insurance	1.92	1.75	1.99	1.35	1.05	0.81	0.82	0.75	1.21	0.31	0.51
Electricity, gas, steam	1.88	1.82	1.75	1.11	0.57	0.45	0.47	0.21	0.74	0.19	0.07
Professional and administrative services	1.85	1.79	2.08	1.39	0.74	0.50	0.53	0.66	0.63	1.26	-0.36
Non-metallic mineral products	1.81	1.71	2.00	1.33	0.71	0.51	0.45	0.55	0.44	-0.22	-0.42
Transportation and storage	1.76	2.51	1.68	0.78	0.03	0.48	0.08	0.56	-1.08	-1.41	-2.10
Arts, entertainment, other services	1.75	1.82	1.94	1.24	0.60	0.54	0.44	0.79	0.69	-0.18	-0.06
Real estate	1.74	1.64	1.81	2.07	1.29	0.74	0.52	1.21	-0.58	0.21	-0.40
Information and communication	1.70	1.55	1.98	1.22	0.64	0.63	0.49	0.55	0.72	-0.24	0.02
Coke and petroleum products	1.64	1.74	1.90	1.26	0.79	0.62	0.58	0.71	0.82	-0.19	0.02
Construction	1.41	1.24	1.66	1.10	0.75	0.82	0.64	0.74	0.54	0.00	-0.01
Agriculture, forestry and fishing	0.95	0.78	0.83	0.79	0.54	0.64	0.48	0.34	0.81	0.16	0.18
Mining and quarrying	0.48	0.73	0.39	0.89	0.93	0.74	0.67	0.87	0.85	0.86	0.94

Source: EY analysis based on EY UPGRADE CGE model.

Figure 15 Impact of GenAI on production, percentage change from the baseline level in 2033, conservative scenario with low international capital mobility

	Western Europe	US & Canada	Developed Asia & Oceania	Southern Europe	Central and Eastern Europe	Latin America	Rest of Europe and Central Asia	ASEAN	MENA	South Asia	Sub-Saharan Africa
Human health, social work	1.62	1.62	1.62	0.90	0.53	0.51	0.55	0.53	0.56	0.21	0.21
Textiles and wearing apparel	1.53	1.56	1.42	0.81	1.26	0.49	0.66	1.35	0.41	-0.35	-0.38
Basic metals, metal products	1.40	1.22	1.17	0.78	0.22	-0.06	0.08	0.36	-0.03	-0.28	-1.28
Electrical and machinery equipment	1.29	1.08	1.19	0.62	-0.06	-0.23	-0.12	0.17	-0.58	-0.37	-0.74
Other manufacturing	1.24	1.44	1.24	0.68	0.30	0.25	0.21	0.16	0.14	-0.60	-0.71
Public administration	1.00	1.03	1.03	0.65	0.49	0.45	0.48	0.48	0.83	0.11	0.22
Education	1.00	1.01	1.03	0.77	0.45	0.44	0.43	0.49	0.59	0.20	0.23
Wholesale and retail trade	0.99	1.56	1.11	0.35	0.03	0.04	-0.09	0.21	-0.48	-0.45	-0.68
Computer, electronic, optical products	0.98	0.97	0.99	0.69	0.45	0.41	0.46	0.46	0.42	0.16	0.08
Automotive and other transport	0.97	0.96	1.10	0.78	0.30	0.01	0.19	0.43	0.23	0.12	-0.51
Wood and paper products, printing	0.96	0.98	1.01	0.68	0.28	0.25	0.23	0.31	0.42	0.07	-0.16
Food and beverages	0.94	0.87	0.84	0.55	0.35	0.24	0.28	0.11	0.42	0.09	0.14
Chemicals, pharmaceuticals, rubber	0.93	0.92	1.01	1.04	0.71	0.35	0.21	0.64	-0.13	0.04	-0.13
Water supply	0.89	0.82	0.88	0.65	0.44	0.36	0.38	0.43	0.46	0.16	0.16
Accommodation and food	0.88	0.83	0.90	0.63	0.61	0.40	0.46	0.45	0.60	0.26	0.32
Finance and insurance	0.85	0.81	0.90	0.58	0.46	0.40	0.40	0.53	0.53	0.27	0.24
Electricity, gas, steam	0.83	0.78	0.91	0.61	0.45	0.31	0.33	0.42	0.35	0.06	-0.08
Professional and administrative services	0.81	0.90	0.83	0.56	0.34	0.28	0.36	0.36	0.37	0.25	0.14
Non-metallic mineral products	0.80	0.79	0.84	0.55	0.44	0.30	0.36	0.50	0.48	0.38	0.17
Transportation and storage	0.74	0.80	0.83	0.58	0.48	0.37	0.40	0.50	0.50	0.15	0.18
Arts, entertainment, other services	0.72	0.75	0.77	0.54	0.43	0.36	0.41	0.55	0.47	0.20	0.23
Real estate	0.72	0.68	0.82	0.53	0.44	0.39	0.40	0.44	0.49	0.21	0.23
Information and communication	0.69	0.74	0.77	0.56	0.49	0.35	0.39	0.51	0.47	0.62	0.10
Coke and petroleum products	0.66	0.62	0.78	0.52	0.47	0.42	0.37	0.48	0.37	0.18	0.15
Construction	0.55	0.54	0.49	0.41	0.44	0.38	0.45	0.48	0.49	0.46	0.44
Agriculture, forestry and fishing	0.54	0.50	0.51	0.48	0.34	0.34	0.29	0.22	0.41	0.13	0.17
Mining and quarrying	0.35	0.44	0.43	0.67	0.63	0.40	0.34	0.53	0.46	0.42	0.42

Source: EY analysis based on EY UPGRADE CGE model.

Figure 16 Impact of GenAI on production, percentage change from the baseline level in 2033, widespread scenario with low international capital mobility

	Western Europe	US & Canada	Developed Asia & Oceania	Southern Europe	Central and Eastern Europe	Latin America	Rest of Europe and Central Asia	ASEAN	MENA	South Asia	Sub-Saharan Africa
Human health, social work	3.31	3.32	3.31	1.91	1.09	1.06	1.13	1.08	1.17	0.41	0.41
Textiles and wearing apparel	3.09	3.18	2.89	1.72	2.63	1.02	1.34	2.78	0.95	-0.73	-0.80
Basic metals, metal products	2.84	2.47	2.37	1.69	0.44	-0.11	0.14	0.72	-0.03	-0.59	-2.65
Electrical and machinery equipment	2.62	2.18	2.41	1.38	-0.13	-0.44	-0.25	0.32	-1.16	-0.79	-1.56
Other manufacturing	2.52	2.95	2.52	1.47	0.62	0.53	0.42	0.31	0.40	-1.28	-1.49
Public administration	2.05	2.12	2.11	1.37	1.01	0.94	0.98	0.98	1.79	0.22	0.44
Education	2.05	2.08	2.10	1.64	0.92	0.91	0.89	1.00	1.27	0.40	0.47
Wholesale and retail trade	2.00	1.98	2.02	1.45	0.91	0.84	0.92	0.93	0.89	0.32	0.15
Computer, electronic, optical products	2.00	3.17	2.25	0.81	0.06	0.10	-0.18	0.42	-0.93	-0.95	-1.44
Automotive and other transport	1.96	1.95	2.24	1.69	0.60	0.03	0.37	0.87	0.53	0.22	-1.09
Wood and paper products, printing	1.95	2.00	2.05	1.45	0.58	0.51	0.46	0.61	0.93	0.13	-0.35
Food and beverages	1.91	1.76	1.71	1.15	0.72	0.49	0.57	0.22	0.90	0.19	0.28
Chemicals, pharmaceuticals, rubber	1.88	1.88	2.07	2.21	1.47	0.73	0.41	1.30	-0.27	0.06	-0.29
Water supply	1.82	1.67	1.79	1.36	0.90	0.75	0.76	0.87	0.95	0.31	0.32
Accommodation and food	1.80	1.69	1.84	1.31	1.24	0.82	0.93	0.91	1.25	0.52	0.64
Finance and insurance	1.74	1.65	1.83	1.21	0.93	0.82	0.80	1.07	1.09	0.54	0.49
Electricity, gas, steam	1.68	1.58	1.84	1.28	0.92	0.63	0.66	0.84	0.73	0.11	-0.19
Professional and administrative services	1.64	1.61	1.71	1.15	0.88	0.60	0.71	0.99	1.02	0.75	0.33
Non-metallic mineral products	1.63	1.81	1.67	1.19	0.70	0.57	0.73	0.71	0.76	0.49	0.26
Transportation and storage	1.52	1.62	1.68	1.21	0.98	0.75	0.80	1.02	1.04	0.29	0.36
Arts, entertainment, other services	1.46	1.39	1.66	1.10	0.89	0.80	0.80	0.89	1.02	0.42	0.45
Real estate	1.45	1.53	1.56	1.12	0.86	0.74	0.81	1.11	0.97	0.39	0.46
Information and communication	1.41	1.50	1.57	1.17	0.99	0.71	0.78	1.03	0.96	1.24	0.18
Coke and petroleum products	1.34	1.26	1.59	1.09	0.95	0.86	0.75	0.97	0.77	0.36	0.28
Construction	1.11	1.08	0.99	0.83	0.88	0.77	0.90	0.96	0.99	0.92	0.88
Agriculture, forestry and fishing	1.11	1.01	1.03	0.99	0.69	0.70	0.59	0.43	0.88	0.26	0.34
Mining and quarrying	0.72	0.90	0.89	1.37	1.27	0.81	0.68	1.06	0.94	0.85	0.85

Source: EY analysis based on EY UPGRADE CGE model.

Chapter 6

GenAI and the new economic era: business leaders’ insights on the path to transformation

Key strategies for business leaders: (1) adopt GenAI for competitive edge, (2) be aware of potential investment shifts and related policies, (3) integrate into the GenAI supply chain and (4) innovate with GenAI in services.

Given the significant impact of GenAI on global trade and investment, it is essential for business leaders to consider these insights in their strategic planning:

1. **GenAI and international competitiveness:** Business leaders should be aware that the deployment of GenAI technologies may be essential to maintain international competitiveness and help their businesses grow. In sectors highly active in global trade, such as manufacturing activities, divergences in GenAI adoption across countries may lead to significant changes in exports and production levels. Therefore, it is crucial for businesses operating in the global market to stay up to date with the latest GenAI technologies and incorporate them rapidly.
2. **The role of international capital flows:** Understand that high GenAI adoption rates in certain regions may create significant investment opportunities, potentially leading to shifts in global capital flows. Watch out for various domestic programs and funding schemes that may support GenAI adoption in your home country.
3. **GenAI supply chain:** Seek opportunities related to participation in the GenAI supply chain, which will become even more active in upcoming years and involve multiple stakeholders across advanced manufacturing and professional services industries.
4. **GenAI augmentation in services:** Executives across various service sectors, especially health care, should recognize the large scale of potential benefits stemming from GenAI adoption. GenAI engineers should recognize the opportunity to develop innovative solutions for successful application across industries with the greatest potential for GenAI adoption.

Chapter 7

Summary

In this study, we have explored the economic impact of GenAI adoption on global trade and investment flows, international competitiveness and broader sectoral outcomes. We anticipate that at the global level, service sectors such as healthcare, education, administration and professional services will be among the most positively affected by the implementation of GenAI technologies. Moreover, our findings emphasize the impact of GenAI on international competitiveness, with industries highly active in global trade, such as metal products and electrical equipment, expected to gain or lose depending on how rapidly they adopt GenAI solutions. Additionally, the report highlights that uneven GenAI deployment across the world may bring significant shifts to investment activity, though this will further depend on the extent of international capital mobility, which is subject to home bias and institutional factors. As such, the report provides a contribution to the current GenAI debate by quantifying how both productivity growth and global sectoral linkages will shape the worldwide economic effects of GenAI adoption.

References:

1. AI model identifies certain breast tumor stages likely to progress to invasive cancer | MIT News | Massachusetts Institute of Technology
2. Automation and New Tasks: How Technology Displaces and Reinstates Labor (aeaweb.org)
3. Comparing Physician and Artificial Intelligence Chatbot Responses to Patient Questions Posted to a Public Social Media Forum – PubMed (nih.gov)
4. Taking AI to the next level in manufacturing | MIT Technology Review
5. Tamba et al (2022). Economy-wide impacts of road transport electrification in the EU. Technological Forecasting and Social Change (182)

Chapter 8

Appendix

Composition of analyzed regions

Table 1 Regions applied in this report and corresponding countries and regions available in the GTAP database.

Regions applied in this report	Corresponding countries and regions available in GTAP database
Western Europe	Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Luxembourg, Netherlands, Sweden, United Kingdom, Switzerland, Norway, Iceland, Liechtenstein
USA & Canada	Canada, United States of America
Developed Asia and Oceania	Australia, New Zealand, Japan, Republic of Korea
Southern Europe	Cyprus, Greece, Italy, Malta, Portugal, Spain
Central and Eastern Europe	Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania Poland, Romania, Slovakia, Slovenia, Albania, Serbia, Ukraine, Republic of Moldova, Bosnia and Herzegovina, North Macedonia
Latin America	Mexico, Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador, Belize, Dominican Republic, Haiti, Jamaica, Puerto Rico, Trinidad and Tobago
Rest of Europe and Central Asia	Mongolia, Belarus, Russian Federation, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, Armenia, Azerbaijan, Georgia, Türkiye, Yemen, Rest of the World
ASEAN	Brunei, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Vietnam
MENA	Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Algeria, Egypt, Morocco, Tunisia, Libya

Source: EY EAT.

Impact of GenAI on bilateral trade flows

Figure A1 Impact of GenAI on bilateral trade flows, percentage change from the baseline level in 2033, widespread scenario with high international capital mobility (rows: exporting region, columns: importing region)

	US & Canada	Latin America	Western Europe	Southern Europe	Central and Eastern Europe	MENA	Sub-Saharan Africa	Rest of Europe and Central Asia	South Asia	ASEAN	Developed Asia and Oceania
US & Canada	1.83	0.43	1.70	0.83	0.12	0.09	-1.21	-0.07	-2.02	-0.02	1.47
Latin America	1.48	0.30	1.56	1.02	0.19	-0.26	-1.13	-0.13	-1.71	-0.03	1.61
Western Europe	2.46	0.99	2.25	1.86	0.97	0.84	-0.12	0.66	-0.22	0.46	2.20
Southern Europe	1.99	0.56	1.84	1.35	0.46	0.47	-0.46	0.20	-0.87	-0.01	1.67
Central and Eastern Europe	1.52	0.02	1.42	1.08	0.08	0.05	-0.84	-0.13	-1.52	-0.19	1.47
MENA	3.17	1.08	1.70	1.26	0.21	-0.13	-0.77	-0.53	-1.08	0.01	2.24
Sub-Saharan Africa	2.73	0.70	1.52	1.85	0.13	-0.31	-1.12	0.95	-0.30	1.25	1.52
Rest of Europe and Central Asia	1.94	0.65	1.94	1.25	0.43	0.46	-0.50	0.25	-1.15	0.12	1.89
South Asia	2.32	0.62	2.22	1.22	0.26	0.48	0.12	0.65	-0.31	0.67	2.45
ASEAN	2.24	0.54	2.31	1.83	0.52	0.84	-0.14	0.51	-0.49	0.31	2.06
Developed Asia and Oceania	2.73	1.21	2.54	2.07	1.10	1.17	0.27	0.86	-0.97	0.68	2.07

Figure A2 Impact of GenAI on bilateral trade flows, percentage change from the baseline level in 2033, conservative scenario with high international capital mobility (rows: exporting region, columns: importing region)

	US & Canada	Latin America	Western Europe	Southern Europe	Central and Eastern Europe	MENA	Sub-Saharan Africa	Rest of Europe and Central Asia	South Asia	ASEAN	Developed Asia and Oceania
US & Canada	0.91	0.22	0.84	0.38	0.05	0.02	-0.60	-0.03	-1.01	0.00	0.73
Latin America	0.71	0.13	0.76	0.46	0.08	-0.16	-0.57	-0.08	-0.86	-0.03	0.79
Western Europe	1.22	0.50	1.12	0.89	0.49	0.40	-0.05	0.34	-0.10	0.23	1.09
Southern Europe	0.96	0.25	0.89	0.62	0.20	0.19	-0.24	0.08	-0.44	-0.03	0.80
Central and Eastern Europe	0.74	0.00	0.69	0.49	0.02	-0.01	-0.43	-0.07	-0.76	-0.10	0.71
MENA	1.53	0.50	0.80	0.58	0.08	-0.13	-0.42	-0.30	-0.55	0.00	1.11
Sub-Saharan Africa	1.31	0.31	0.72	0.85	0.03	-0.20	-0.59	0.45	-0.18	0.61	0.72
Rest of Europe and Central Asia	0.95	0.31	0.95	0.58	0.20	0.19	-0.26	0.12	-0.59	0.05	0.93
South Asia	1.09	0.25	1.04	0.52	0.07	0.18	0.01	0.28	-0.19	0.29	1.16
ASEAN	1.10	0.26	1.14	0.87	0.25	0.39	-0.07	0.26	-0.25	0.15	1.01
Developed Asia and Oceania	1.36	0.61	1.27	1.00	0.56	0.57	0.15	0.45	-0.47	0.35	1.03

Figure A3 Impact of GenAI on bilateral trade flows, percentage change from the baseline level in 2033, widespread scenario with low international capital mobility (rows: exporting region, columns: importing region)

	US & Canada	Latin America	Western Europe	Southern Europe	Central and Eastern Europe	MENA	Sub-Saharan Africa	Rest of Europe and Central Asia	South Asia	ASEAN	Developed Asia and Oceania
US & Canada	2.23	1.51	2.12	1.60	1.35	1.65	0.80	1.63	0.49	1.53	1.92
Latin America	0.45	0.07	0.77	0.63	0.03	0.11	-0.12	0.27	-0.52	0.40	1.03
Western Europe	2.21	1.62	2.18	2.02	1.59	1.95	1.55	1.93	1.80	1.53	1.98
Southern Europe	1.77	1.15	1.70	1.48	1.01	1.51	1.19	1.38	1.21	1.05	1.49
Central and Eastern Europe	0.99	0.39	0.96	0.94	0.37	0.81	0.74	0.85	0.31	0.60	0.92
MENA	1.86	0.74	0.87	0.84	0.02	0.16	-0.01	-0.23	-0.34	0.33	1.74
Sub-Saharan Africa	0.78	-0.23	-0.07	0.74	-0.82	-0.70	-0.87	0.39	-0.13	0.60	-0.04
Rest of Europe and Central Asia	0.67	0.13	0.97	0.58	0.05	0.52	0.14	0.29	-0.47	0.16	0.99
South Asia	0.04	-0.88	-0.11	-0.86	-1.58	-0.51	-0.21	-0.36	-0.60	-0.42	0.18
ASEAN	1.41	0.33	1.48	1.21	0.39	1.15	0.76	1.00	0.55	0.55	1.18
Developed Asia and Oceania	2.83	2.18	2.75	2.54	2.08	2.58	2.38	2.54	1.21	2.08	2.25

Figure A4 Impact of GenAI on bilateral trade flows, percentage change from the baseline level in 2033, conservative scenario with low international capital mobility (rows: exporting region, columns: importing region)

	US & Canada	Latin America	Western Europe	Southern Europe	Central and Eastern Europe	MENA	Sub-Saharan Africa	Rest of Europe and Central Asia	South Asia	ASEAN	Developed Asia and Oceania
US & Canada	1.10	0.75	1.05	0.77	0.67	0.81	0.39	0.81	0.25	0.76	0.95
Latin America	0.21	0.03	0.38	0.29	0.01	0.05	-0.06	0.13	-0.24	0.19	0.51
Western Europe	1.08	0.79	1.07	0.98	0.79	0.96	0.76	0.95	0.89	0.76	0.98
Southern Europe	0.84	0.53	0.81	0.68	0.46	0.71	0.56	0.65	0.57	0.49	0.70
Central and Eastern Europe	0.49	0.19	0.47	0.45	0.18	0.40	0.36	0.42	0.16	0.30	0.45
MENA	0.90	0.35	0.41	0.39	0.00	0.06	-0.02	-0.12	-0.16	0.17	0.86
Sub-Saharan Africa	0.39	-0.10	-0.02	0.35	-0.39	-0.33	-0.41	0.21	-0.05	0.31	-0.01
Rest of Europe and Central Asia	0.33	0.07	0.48	0.27	0.03	0.25	0.07	0.15	-0.23	0.09	0.49
South Asia	0.03	-0.42	-0.04	-0.43	-0.76	-0.24	-0.09	-0.16	-0.28	-0.19	0.10
ASEAN	0.69	0.16	0.73	0.58	0.20	0.57	0.38	0.50	0.27	0.27	0.58
Developed Asia and Oceania	1.39	1.07	1.35	1.23	1.03	1.27	1.16	1.25	0.60	1.03	1.11

Quantifying the economic impact of GenAI: differences between economic models

AI will influence economies around the globe in multiple ways and we can analyze its impact through a range of economic analysis tools, each offering unique insights. The Computable General Equilibrium (CGE) model and the macro econometric model suggest different effects of GenAI on economic landscapes. In this note, we explain the differences in the results depending on the chosen modeling approach.

The CGE model highlights the structural changes within industries, demonstrating how GenAI can lead to a shift in sectoral advantages. As companies integrate GenAI, it enhances productivity, prompting a reallocation of production resources. Some countries gain a competitive edge in GenAI-enhanced sectors, attracting investment and spurring economic growth. This creates an opportunity for other economies to develop the competitiveness of alternative sectors. As economies heavily impacted by GenAI redirect resources towards GenAI-centric industries, the demand for other products and services remains, which countries with less focus on AI sectors can now meet more competitively.

The macro econometric model, conversely, emphasizes current economic relationships, including geo-economic dependencies. It is a statistical tool that bases predictions on dependencies that have historically occurred, assuming that, for example, international value chains will maintain a similar shape. This model forecasts the impact of GenAI by extrapolating from past economic relationships and trends, with the expectation that historical patterns of trade and production will continue to hold true in the face of new technological disruptions.

A good example of the differing interpretations offered by each model is the reaction of Central and Eastern European economies to the introduction of GenAI in Western Europe. According to the macro econometric model, Central and Eastern Europe are experiencing growth in GenAI-related sectors as a response to the increased productivity in GenAI sectors in Western Europe. The strong links between Eastern European economies and their Western trade partners facilitate this growth. For instance, we project the integration of GenAI in German industries to boost the demand for intermediate goods from countries like Poland, which in turn fosters the development of the Polish economy. In contrast, the CGE model suggests that while Central and Eastern European countries may not be advancing as rapidly, they could still experience growth in sectors not heavily impacted by GenAI. These sectors, now more competitive, can satisfy the demand left by Western economies that are reallocating their resources to GenAI-intensive industries.

By integrating insights from both models, one can gain a more nuanced understanding of AI's potential effects. The CGE model captures the dynamic shifts in sectoral productivity and international competitiveness in certain aspects, while the macro econometric model offers projections based on historical data, emphasizing the immediate and medium-term effects of AI within the existing geo-economic framework. It is important to recognize that both effects highlighted by the CGE and macro econometric models will occur simultaneously. Considering the results from both models allows for an even more informed approach to both the transformative potential of AI and the exploitation of established economic trends.

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