Policy Debate of the Hour

AI and Trade

Why Europe Cannot Afford to Lag on Adoption*

Key Messages

- AI boosts productivity, but gains depend on how fast countries adopt it into their core activities
- Most EU economies are trailing behind AI adoption leaders, with the risk of compounding growth divergence over time
- AI is a global trade shock: foreign productivity gains lower import prices but sharpen competition for EU producers
- Foreign AI gains bring cheaper imports but erode competitiveness; Europe cannot free-ride its way to growth
- Openness and domestic adoption are complements; Europe needs both to fully capture AI's growth potential

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Artificial intelligence (AI), and generative AI in particular, is poised to transform productivity across a broad range of activities, with the strongest effects concentrated in knowledge-intensive services such as finance, professional services, and ICT. Its economic impact will nevertheless depend on how quickly countries adopt and integrate it into their economies. Evidence points to substantial cross-country differences in adoption, particularly within Europe. Yet AI is not only a domestic transformation; it is also a productivity shock transmitted through international trade. Productivity gains abroad lower import prices and reshape competitiveness across countries and sectors. Our analysis shows that these forces interact: countries can benefit from foreign AI progress through cheaper imports, but without sufficient domestic adoption, they risk losing competitiveness in AI-exposed sectors. The global diffusion of AI therefore makes domestic adoption capacity and openness to trade complementary determinants of future growth.

* This article builds on the methodology and results presented in Filippucci, Gal, Laengle, Schief and Yıldırım (2026) and introduces a Europe-focused analysis through additional model simulations. I am indebted to Francesco Filippucci, Peter Gal, Katharina Laengle, and Matthias Schief for their valuable comments.

Artificial Intelligence in an Interconnected World

AI is projected to transform economic growth by raising productivity across a broad range of activities, from professional services and finance to retail and public administration (Aghion and Bunel 2024; Acemoğlu 2025; Filippucci, Gal and Schief 2024). Much of the current policy debate focuses on how countries can foster AI innovation, invest in computing infrastructure, or accelerate domestic adoption. Yet this perspective overlooks a central feature of modern economies: production and consumption are deeply embedded in global trade networks (Baqaee and Farhi 2024; Çakmaklı, Demiralp, Kalemli-Özcan, Yeşiltaş and Yıldırım, in press).

In an integrated world economy, productivity gains generated by AI in one country alter relative prices, reshape patterns of specialization, and affect competitiveness across global markets. Consumers and producers benefit from cheaper imported goods and services made possible by AI-driven productivity gains abroad. But countries may also face stronger competition from trading partners that adopt the technology more rapidly.

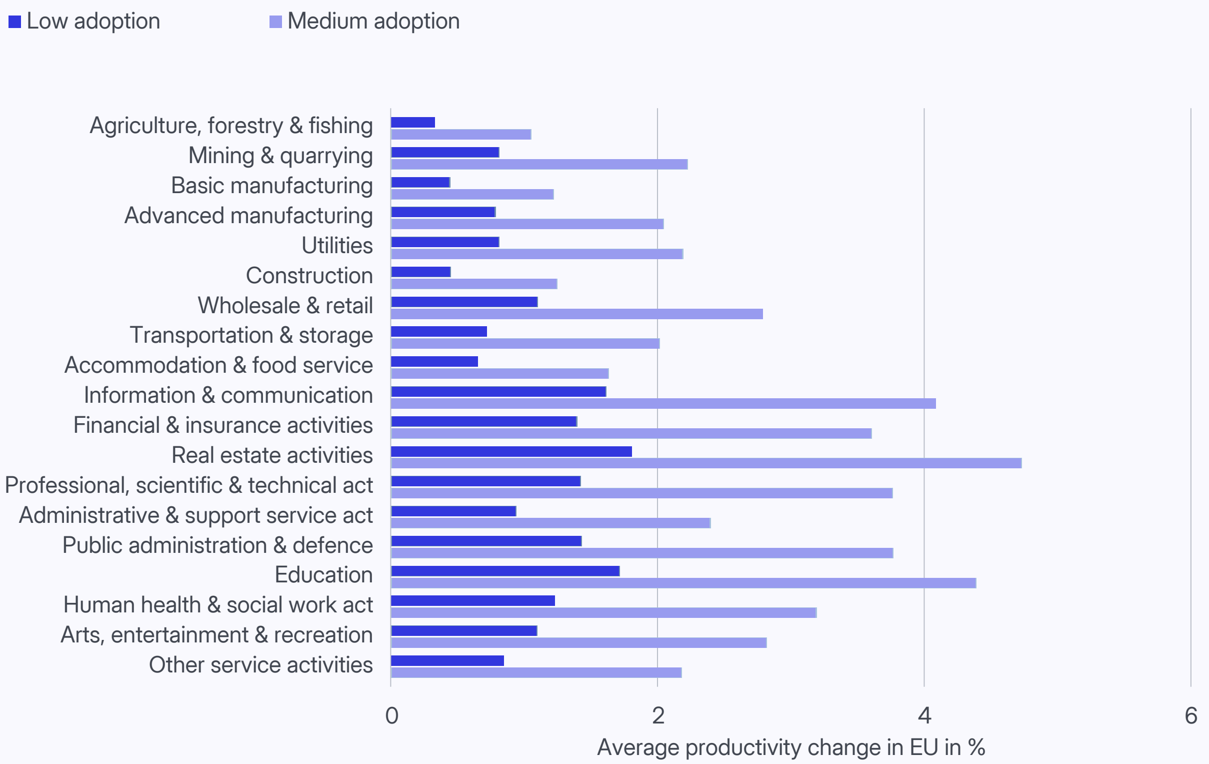
These international linkages are particularly relevant for Europe. While European economies are highly open and deeply integrated into global value chains, Filippucci et al. (2026) document that progress in adopting AI across firms and sectors remains uneven compared with leading adopters. Building on their theoretical framework and empirical results, this article focuses on how these gains are distributed across European economies.

Adoption, Sectoral Exposure, and Uneven Gains from AI

The economic effects of AI depend on how micro-level productivity improvements translate into economy-wide outcomes. Generative AI primarily enhances tasks involving prediction, information processing, and routine cognitive work, allowing firms to automate certain functions while augmenting others. Drawing on experimental evidence that finds productivity gains for AI-exposed tasks of between 14 percent and 55 percent (Brynjolfsson, Li and Raymond 2025; Gambacorta, Qiu, Shan and Rees 2024), we estimate country-sector productivity gains by combining these micro-level estimates with sector-level measures of task

Figure 1

Aggregate AI-Driven Productivity Gains Across Industries in EU Countries over the Next Ten Years[a]



[a] The low adoption scenario assumes an S-curve following the diffusion of electricity, whereas the medium adoption scenario follows the diffusion of the internet and PCs. See source for scenario details.
Source: Filippucci et al. (2026).

exposure and country-level adoption rates. These gains vary widely across occupations and industries depending on task composition (Filippucci et al. 2024), producing sector-specific efficiency gains rather than a uniform productivity shock. We then feed these country-sector productivity gains into a general equilibrium trade model to assess their distribution across economies, as described in Filippucci et al. (2026).

Experience with earlier general-purpose technologies shows that productivity gains emerge gradually and unevenly, reflecting differences in adoption and industrial structure (Brynjolfsson, Rock and Syverson 2021). Adoption levels differ substantially across economies due to variations in digital infrastructure, skills, and firms' ability to reorganize production. Because diffusion typically follows an S-shaped pattern, even modest initial differences can turn into wide gaps in adoption at later stages of the adoption process (Comin and Mestieri 2018). To capture this uncertainty, we consider three adoption scenarios calibrated to the historical diffusion of electricity (slow), computers and the internet (medium), and mobile phones (fast), with the slow and medium scenarios forming the basis of the results presented here.

Sectoral composition further shapes exposure to generative AI. Productivity gains are concentrated in activities relying heavily on cognitive and information-processing tasks (Filippucci et al. 2024). As Figure 1 shows, information and communication, financial and insurance activities, and professional and scientific services are projected to see the largest gains, while agriculture, construction, and accommodation and food services experience more modest improvements. Countries where high-exposure sectors represent a larger share of value added are therefore more strongly affected by AI-driven productivity improvements. Using a first-order approximation, projected increases in annual productivity growth range from modest gains in some economies to close to one percentage point in others (Filippucci, Gal, Laengle and Schief 2025), depending on industrial composition and the pace of adoption.

These sectoral differences feed into country level adoption differences as well. Economies such as Luxembourg, Sweden, Belgium, and Ireland combine strong exposure to knowledge-intensive activities with advanced digital ecosystems, positioning them to benefit disproportionately from faster adoption. These economies are projected to see productivity gains approaching or exceeding the world average across all adoption scenarios. By contrast, economies such as Cyprus, Bulgaria, Romania, and Croatia are projected to fall below the world average. The gap between low and medium adoption scenarios is itself uneven: countries already well-positioned to adopt AI stand to gain most from faster diffusion, while laggards see smaller differences between scenarios, suggesting that adoption dynamics risk compounding existing differences rather than narrowing them.

Differences in adoption capacity, industrial composition, and firm-level readiness suggest that AI will generate uneven growth paths across countries. Understanding this mechanism is essential before considering how international trade propagates these sectoral productivity shocks globally.

AI as a Trade Shock: How Global Linkages Shape the Distribution of Gains

Because countries are linked through trade in goods, services, and intermediate inputs, productivity improvements generated by AI in one economy alter prices and competitiveness far beyond its borders (Baqaee and Farhi 2024). Two distinct channels shape how these effects are distributed.

A first transmission channel operates through imports. Productivity gains lower production costs and reduce the price of traded goods and services, allowing importing countries to benefit from cheaper intermediate inputs and consumption goods. For many European economies that are deeply embedded in global value chains, this channel provides gains even when domestic adoption progresses more slowly.

A second channel works through global competitiveness. As adoption accelerates in leading economies, firms that adopt AI gain cost advantages in international markets. Countries specialized in knowledge-intensive services and advanced manufacturing therefore face shifting market shares depending on their relative pace of adoption. Moreover, countries whose dominant sectors are more easily substitutable, such as base metal or fossil fuel industries, may need to adjust prices downward to remain competitive.

Crucially, these channels operate differently. The import channel is largely passive: countries benefit automatically from cheaper goods and inputs as trading partners adopt AI, regardless of their own adoption pace. The competitiveness channel is conditional: gains accrue only to countries that match or exceed their trading partners' or competitors' adoption pace in AI-exposed sectors. This asymmetry means that the net effect of trade on any given country depends critically on where it sits in the global adoption distribution, and underscores why domestic adoption cannot be treated as optional.

Europe's Economic Position in the AI-Transforming Global Economy

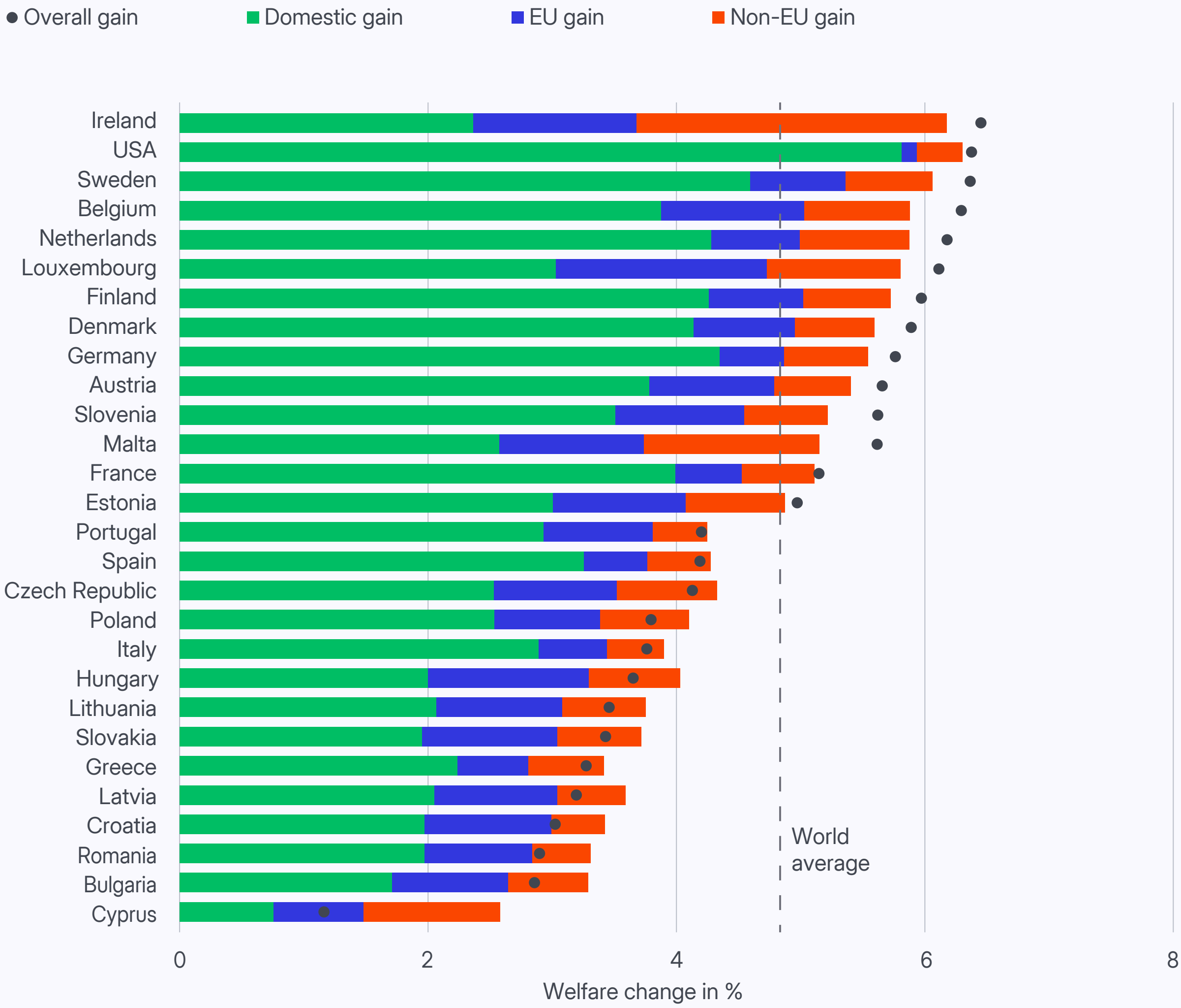
Europe's position in the emerging AI economy reflects the interaction between adoption capacity, sectoral specialization, and trade integration; the risks and opportunities these create are not evenly shared.

Several European economies combine advanced digital ecosystems with large knowledge-intensive service sectors highly exposed to AI. Where adoption progresses successfully, these characteristics can support significant productivity gains and reinforce competitive advantages in globally traded services. However, the same exposure increases sensitivity to technological leadership elsewhere. If adoption proceeds more slowly than in frontier economies, productivity improvements abroad may erode competitiveness in precisely the knowledge-intensive sectors that have driven European growth in recent decades, namely finance, professional services, and advanced manufacturing.

To understand how AI-driven productivity gains propagate across borders, we rely on a general equilibrium model of world trade (Baqaee and Farhi 2024; Çakmaklı et al., in press).

Figure 2

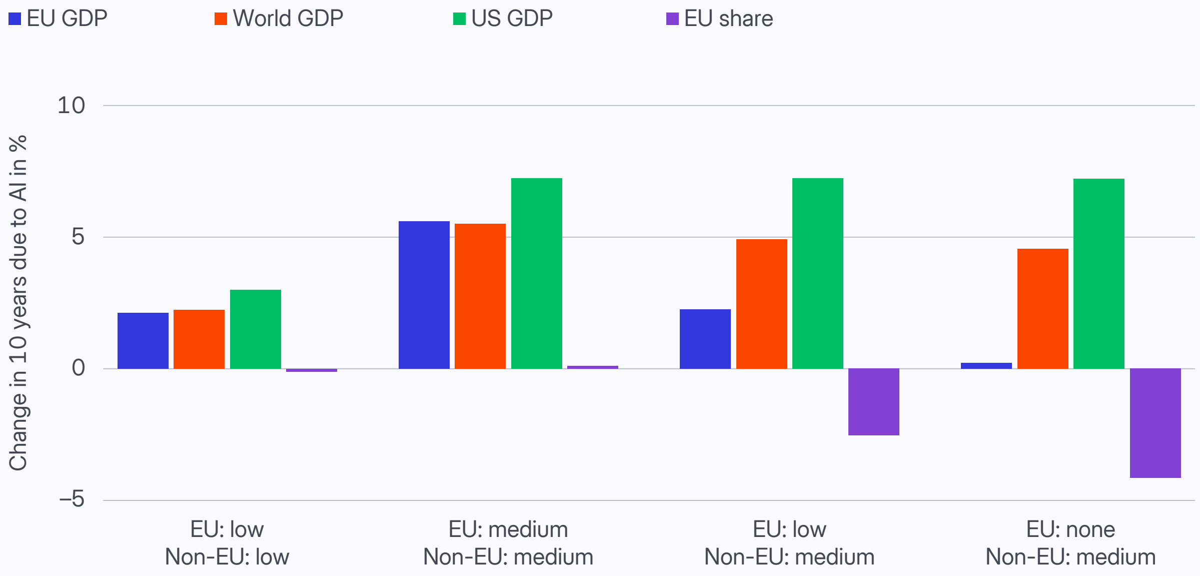
Expected Welfare Gains in Ten Years for EU Countries and the US in the Medium Adoption Scenario[a]



[a] Welfare gains for the medium adoption scenario are computed as equivalent variation in a general equilibrium trade model that incorporates AI-driven productivity gains at the country-sector level, following Filippucci et al. (2026). Values for the USA are included for comparison. Overall gains are decomposed into domestic gains, gains from other EU countries, gains from the rest of the world, and a competition (allocation) effect. The overall gain is the sum of these four components; the competition effect can be positive or negative depending on whether a country's adoption pace exceeds or falls short of the world average and is not shown separately in the figure. The details of the decomposition can be found in Filippucci et al. (2026).
Source: Filippucci et al. (2026) and own calculations.

Figure 3

Quantifying the Effects of Differential Adoption of AI in the EU After Ten Years[a]



Source: Authors' calculations.

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Figure 2 shows that once international trade exposure is taken into account, welfare gains differ markedly across EU economies. Countries more strongly integrated into global production networks benefit more from foreign productivity improvements, even when domestic adoption progresses more gradually, but this channel cannot fully offset differences in adoption and sectoral exposure. Ireland leads the EU, surpassing even the United States, reflecting its highly open economy and concentration in knowledge-intensive services. Sweden, Belgium, the Netherlands, and Luxembourg also capture above-average gains. By contrast, several Eastern European economies, including Cyprus, Bulgaria, Romania, and Croatia, remain below the world average even under medium adoption, suggesting that trade integration alone cannot offset weaker sectoral exposure and lower adoption readiness.

We decompose welfare gains into three components: gains from domestic adoption, gains from foreign adoption, and an allocation (competitiveness) effect. The gains from foreign adoption can be further divided into gains from other EU countries and gains from the rest of the world. This decomposition is exact for certain global value chain structures and accounts for network effects. For example, a productivity improvement in the German steel industry lowers input costs for the Slovak car industry, whose output can in turn be purchased by German consumers – in this case, the downstream benefits are attributed to Germany's domestic adoption. The allocation effect arises from the more realistic economic structure of the model and reflects competitiveness: for countries adopting below the world average, this effect is negative. Foreign adoption gains vary markedly across countries, reflecting differences in trade openness and the extent to which trading partners are themselves adopting AI. For Ireland, foreign adoption gains are almost as large as domestic gains, reflecting its highly open economy, and Ireland has more exposure to non-EU gains. For France, by contrast, the foreign component is small, consistent with its larger and more self-sufficient economic structure.

Can Europe rely on foreign AI gains? It is worth noting that Europe's relatively slower adoption partly reflects deliberate policy choices around safety, privacy, and regulatory frameworks rather than passive inaction. The EU AI Act represents a significant investment in AI governance from which other economies may themselves benefit, and there are legitimate reasons to prioritize getting the regulatory environment right before scaling adoption rapidly. However, our analysis raises the question of whether these regulatory benefits offset the economic costs of slower diffusion. Figure 3 compares outcomes across four scenarios, ranging from symmetric adoption, where the EU and its trading partners adopt at the same pace, to a counterfactual in which AI diffusion accelerates abroad while European adoption remains limited. When the EU maintains an adoption pace comparable to its trading partners, its global income share remains broadly stable. However, when the EU lags, its global income share falls by an estimated 2.5 percent to 4.1 percent – a striking result that underscores the stakes involved. The cost of slower adoption therefore rises not only in absolute terms but relative to a global economy that continues to grow with or without European participation.

These results confirm that foreign productivity gains generate positive spillovers through trade, but these benefits are insufficient to offset competitiveness losses from slow domestic diffusion. Europe's future competitiveness will depend less on frontier innovation abroad than on its ability to translate AI into widespread adoption within an open economic system.

Policy Implications: Supporting Adoption in an Open Economy

Our analysis suggests that the economic impact of AI will depend less on frontier innovation alone than on how effectively countries integrate it into existing economic structures while remaining open to global markets. For Europe, this creates a genuine trade-off. The EU's emphasis on safety, privacy, and regulatory governance reflects legitimate priorities, and the AI Act may generate benefits for trading partners that adopt Europe's standards. But slower adoption carries measurable costs: a lag in diffusion relative to trading partners could reduce Europe's global income share by 2.5 percent to 4.1 percent. The policy challenge is therefore not whether to regulate AI, but how to pursue robust governance without sacrificing the pace of adoption needed to remain competitive.

Three Priorities Follow

First, EU-level coordination is essential. The heterogeneity documented in Figures 1 and 2 is striking: slower-adopting economies face structural constraints in infrastructure, skills, and firm readiness that national policy alone cannot address in time. Common EU investments in digital infrastructure, coordinated skills frameworks, and knowledge-sharing mechanisms across member states could help narrow the gap before differences compound. Given that AI benefits diffuse through trade networks spanning the entire single market, the returns from coordinated action are likely to exceed those of national strategies alone.

Second, maintaining open trade and digital integration remains critical. Openness provides meaningful gains even for slower adopters, but these are maximized when combined with domestic capability building. Openness and adoption are complements, not substitutes.

Third, policies should account for sectoral exposure. Economies specializing in knowledge-intensive services face both faster potential gains and stronger competitive pressures. Supporting diffusion across sectors and regions can ensure productivity improvements translate into broad-based growth. Better measurement of AI adoption at the firm and sector level would help governments track diffusion and evaluate policy effectiveness – an area where current data remains limited.

Artificial intelligence is reshaping the global economy through technological innovation, international trade, and sectoral specialization simultaneously. Openness ensures access to global progress, but sustained competitiveness requires domestic diffusion. Europe's challenge is to pursue both – building the adoption capacity needed to participate fully in AI's productivity gains while maintaining the open economic system that amplifies them. •

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