Emerging Impacts of the EU's Digital Regulations on Startups and SMEs

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Executive Summary

In the past few years, the European Union has adopted a suite of digital regulations aimed at shaping the behaviors of a wide range of businesses, such as global technology companies, financial service providers, and small businesses that interact with their customers online. Some of the latest regulations to enter into force in 2024-26 include the Digital Markets Act, an *ex ante* digital competition policy framework; the Digital Operational Resilience Act (DORA), impacting financial service providers and their information and communications technology (ICT) vendors; and the Artificial Intelligence (AI) Act, which affects firms developing and deploying AI systems. Several leading Asian economies are today contemplating or advancing similar EU-style digital regulations – so it is time to ask, have the EU's digital regulations served Europeans? Will the new regulations promote what Asian countries are all going for – an innovative and competitive economy with vibrant startups and small and medium-sized enterprises (SMEs), digital transformation, and productivity?

This paper seeks to answer these questions through a review of data on the performance between Europe and the U.S., as a benchmark, in producing startups and digitizing SMEs, and assessing the potential impacts of the DMA, DORA, and AI Act on Europe's economy and startup ecosystem. The paper catalogs a significant divergence between the EU and the U.S. in terms of innovation and startup formation, one that will likely be exacerbated by the new digital regulations. The paper calls for Asian policymakers to pursue alternative regulatory frameworks that can address legitimate policy concerns in the digital economy, while also enabling innovation, investment, and inclusive growth.

The main findings are as follows:

There is a significant divergence between Europe and the U.S. in startup formation and venture capital, R&D, and firms' technology adoption, all of which undermine Europe's economic growth. The U.S. has eight times more unicorns, or companies with a valuation over $1 billion, than Europe, and of the world's 50 leading technology companies, only four are European, and none of these were created in the past 50 years.[1] European unicorns also gallop away: between 2008 and 2021, nearly 30 percent of Europe's unicorns relocated their headquarters abroad, mostly to the U.S..[2] As the AI era unfolds, the U.S. outpaces Europe about four to one in producing AI startups and eight to one in providing VC funding in AI startups. Europe also lags behind the U.S. in digitizing businesses that are in traditional industries (manufacturing, mining, professional services, and so on). In addition, U.S. firms across size categories also invest more in R&D, a key driver of productivity growth, than European firms.[3]

A considerable body of academic literature traces Europe's lackluster performance in technology adoption and commercialization over the past three decades to its labor, business, and digital regulations that cost companies, lower the payoffs from technology investments, and limit companies' ability to optimize their labor force. As Europe's digital regulations come into effect, they risk exacerbating these problems while doing little to promote technology adoption and startup activity in Europe.

European Union leaders themselves are expressing concerns about the negative effects of the continent's burgeoning regulatory stock on innovation and startups. In January 2025, the European

Commission published the Competitiveness Compass that outlines steps to drastically reduce the regulatory and administrative burdens, especially for SMEs, and in May 2025, the European Commission considered postponing the implementation of the AI Act due to industry concerns about its lack of clarity.[4]

The various new digital regulations, as they are rolled out, entail immediate compliance costs and potential fines for firms targeted by them, amounting, conservatively, to 0.2-0.5 percent of European GDP. Per-firm compliance costs with the DORA, discovered in surveys with financial services firms, are by now €500,000-1 million for firms with more than 500 employees. McKinsey estimates that the largest financial entities would spend €5 million-€15 million each in DORA compliance.[5]

Compliance costs are disproportionately higher for SMEs and startups. These costs can hit startups hardest: a recent interview-based study with 23 European AI startups found that these firms anticipate annual compliance costs with the standards-related activities of 10-20 percent of the management's time and some €100,000 per year in dedicated compliance personnel, a significant expense for a startup with, say €1 million capital raised.[6]

There can also be various second- and third-order effects from the DMA, DORA, and AI Act that have far-reaching implications for European businesses, such as:

- **Reduced incentives for firms to invest in technologies and R&D**, both because of expectation of lower returns from technology and because of diminished resources left to invest. For example, in an indicative survey of 200 European financial services firms for this report, the surveyed businesses expect to reduce their non-DORA-related technology expenses on average by 1-5 percent and their R&D by 6-10 percent to deal with the costs of DORA compliance. A larger share of small firms report steep spending cuts than do large firms – which could suggest that DORA sets back especially smaller firms' innovation.

- **New barriers to entry to startups and SMEs – which face higher fixed costs of implementing, for example, a quality management system and standards to deal with the AI Act**. Smaller financial services firms that may rely more heavily on third-party IT vendors than large financial firms face a new task of verifying that these vendors are in compliance with DORA.

- **Higher prices for the targeted companies' customers**. For example, the majority of the 200 financial services firms surveyed plan to raise the prices they charge their customers due to the costs of dealing with DORA, typically by 3-5 percent. Costs may also be indirect and unexpected. For example, because of the DMA, a Google Search for hotels in Europe now elevates third-party aggregators in search results instead of highlighting direct links to hotels, European hotels have experienced 30-40 percent drop in bookings coming through their own sites as opposed to bookings via aggregators – which implies a transfer of revenue in the form of commissions from hotels to the aggregators. [7]

- **Lower quality and variety of services available to the customers and users of digital services.** For example, in a new survey with 5,000 European consumers, 61 percent report

having to search up to 50 percent longer for relevant online content than before the DMA, and as many as 59 percent would pay to regain direct access to targeted firms' own services, including rich shopping results that enable product and price comparisons. The DMA is also impacting advertisers that may face new challenges in building specific audiences or running personalized advertising campaigns. In the survey, some 39 percent of Europeans report less personalized ads after the DMA came into effect. A new study finds that these various search frictions and lowered personalization are costing European SMEs across sectors, with annual revenue losses per worker up to €1,122.[8]

Asian policymakers should be mindful of these effects that risk weighing on Europe's innovation and competitiveness, and that now also concern Europe's own policymakers. Rather than rushing to adopt EU-style laws simply because the EU has pursued them, governments should first identify whether there is a problem in their economy that needs to be addressed, and if so, whether it should be addressed through regulation instead of using other alternative approaches.

For example, in the area of digital competition policy, Asian policymakers should thoroughly assess whether their domestic markets actually face the same competitive challenges that prompted the EU's actions that resulted in the DMA. Asia's digital markets are still evolving, with local players competing effectively against global tech companies, suggesting that heavy-handed regulation might stifle innovation and economic growth rather than promoting it.

In financial services, there are already meaningful templates to follow: the Financial Stability Board's toolkit for financial institutions and the Basel Committee on Banking Supervision's consultative document are the key ones.[9] These address third-party risk management, for example, through risk assessments, due diligence, contracting, monitoring, and termination. In addition, many financial hubs, such as New York, have published risk management rules and principles that are more targeted and risk-based than DORA.

In the area of AI, EU-style regulations should also be seen as just one plausible model. For example, Japan's May 2025 AI law, which calls for collaboration between the government, businesses, and researchers to promote the development of AI in Japan, is a very useful alternative model to the prescriptive EU AI Act. Another model is presented by Singapore, which has pursued a balanced AI regulation, promoting companies' adoption of AI standards and expanding compute and data for use in R&D. The UK similarly has promoted pro-AI innovation regulation, including through its ambitious 2025 AI Opportunities Action Plan and the pragmatic and pro-innovation approach to the use of data to promote AI – such as promoting sandboxes and consensual audits of high-risk businesses on how they use personal data for AI.[10]

1. Introduction

In recent years, the EU has adopted far-reaching digital regulations aimed at shaping the behaviors of a wide range of businesses, such as global technology companies, financial service providers, and small businesses that interact with their customers online. Some of the latest regulations to enter into effect in the 2024-26 timeframe include the DMA, a sweeping digital competition policy framework; the DORA impacting financial service providers and their information and communications technology (ICT) vendors; and the AI Act that affects both high-risk AI systems and general-purpose AI. Additional regulations include the Data Act, which entered into effect in January 2024 and shapes B2B data flows, and the potential Internet Levy that would tax internet service providers to benefit telecommunications companies.

Several leading Asian economies, such as India, Indonesia, and Korea, are today contemplating or advancing similar EU-style digital regulations, and it is important for them to consider the impact of such an approach to regulations and on certain specific regulations on domestic innovation, and in particular on SMEs and startups.

There are growing concerns at the highest levels in Europe about the negative effects of the continent's burgeoning digital regulations on economic growth, startup formation and growth, and SME digital transformation. In January 2025, the European Commission published the Competitiveness Compass that outlines steps to drastically reduce the regulatory and administrative burdens, especially for SMEs.[11] In May 2025, the European Commission considered postponing the implementation of the AI Act due to industry concerns about a lack of clarity in the rules.[12]

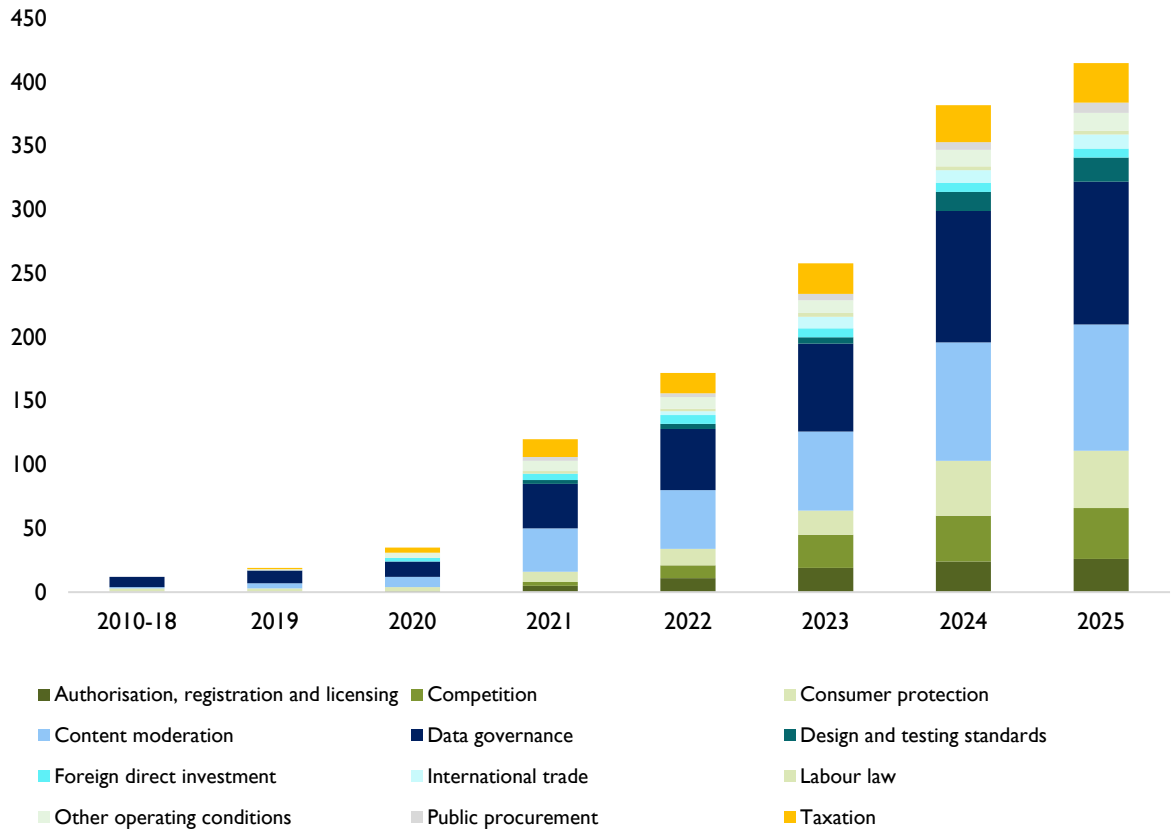
This paper looks at the EU's record of promoting innovation and startup activity compared with that of the U.S., examines the potential impact of the DMA, DORA, and the AI Act on the EU's economy and SMEs and startups, and seeks to draw lessons for Asian governments that are thinking about adopting a similar approach.

The paper is organized as follows. Section 2 reviews the remarkable increase in digital regulations in the EU and the various laws it has enacted or is actively considering. Section 3 assesses Europe's performance of the EU vis-à-vis a benchmark country, the U.S., across such metrics as innovation, startup formation, and competitiveness in AI. Section 4 gauges the potential effects of the three flagship EU digital regulations – the DMA, DORA, and the AI Act – on European economies, SMEs and startups, and consumers. Section 5 reviews similar regulations being considered in India, Indonesia, and Korea, while Section 6 reviews policy recommendations for Asian economies, proposing alternative regulatory pathways and consultative processes that promote innovation, investment, and economic development goals.

2. The Proliferation of Digital Regulations in the EU

The European Union and its Member States have adopted a wide range of digital regulations that impact companies' online behaviors and the operations of technology companies. According to the Digital Policy Alert (DPA), since 2010, the EU and its Member States have adopted 422 digital regulations at national, supranational, and subnational levels. The majority of these are in data governance (112), content moderation (99), and consumer protection (45) (figure 1).

Figure 1 – Digital Regulatory Stock by European Union members, by policy area



Source: Digital Policy Alert. The data contains laws and orders that are in effect. Each national implementation of any EU directives is counted as one, unless specifically noted in the DPA as adopted by all EU economies at once.

The 2018 General Data Protection Regulation (GDPR) is perhaps the most memorable and visible regulation to date; however, it was preceded by several important frameworks, such as the Audiovisual Media Services Directive (AVMSD) that aims to create a single market for audiovisual media services and promote European content; the Consumer Rights Directive (CRD), which creates uniform consumer protection in ecommerce; and the Directive on Misleading and Comparative Advertising, shaping how online advertising is regulated.

More recently, there have been numerous encompassing digital regulations, such as:

- **The Digital Markets Act** (entered into force in 2024)**,** which created an *ex-ante* competition policy framework for digital platforms. The DMA requires so-called gatekeepers – large digital services providers – to adhere to *ex-ante* competition policy rules that preempt supposed anticompetitive practices before they occur. The DMA contrasts sharply with the traditional antitrust enforcement mechanism – investigations and enforcement after anti-competitive practices are believed to have taken place. For now, the European Commission has designated Alphabet, Amazon, Apple, Booking, Meta, Microsoft, and TikTok parent Bytedance as gatekeepers, and targeted 24 of these companies' "core platform services" such as Google Maps by Alphabet and Instagram by Meta. Gatekeepers are, among other things, required to enable external services and hardware providers to interoperate with the services provided by the gatekeeper.[13] They are also prevented from "self-preferencing," deemed to consist of using their data to promote their own services and products on their platforms. Failure to comply can result in fines of up to 10 percent of gatekeepers' global turnover.[14]

- **The EU's AI Act** (to be in effect on 2 Aug 2026) that creates harmonized rules on artificial intelligence in Europe, regulating AI systems by their level of risk, and includes a prohibited category of AI. Entirely prohibited AI practices include, for example, social scoring and emotion recognition, while highly regulated use cases are ones that pose serious risks to health, safety, or fundamental rights, such as AI safety components in critical infrastructures and AI solutions used in educational institutions. European companies in sectors that are seen as falling under the high-risk category include education, finance and insurance, health, IT, technical/scientific activities, social work, and critical infrastructure. Non-compliance with prohibited practices can result in fines of up to €35m or 7 percent of the total worldwide annual turnover (whichever is higher), and with other provisions can lead to fines of up to €15m or 3 percent.[15] For SMEs, the threshold will be the lower of the two amounts.

- **The Digital Operational Resilience Act (DORA)** (in effect since 17 January 2025) that aims to ensure that banks, insurance companies, investment firms, and other financial entities can withstand, respond to, and recover from ICT disruptions, such as cyberattacks or system failures.[16] Financial entities that outsource ICT systems must also ensure the providers comply with DORA. Some ICT providers can be designated as "critical" based on their systemic impact; these must comply with a rigorous oversight framework. DORA affects over 22,000 financial institutions and ICT service providers in Europe alone.[17] Institutions breaching DORA may face fines of up to 2 percent of their total annual worldwide turnover or 1 percent of their average daily turnover worldwide. Critical third-party ICT providers face even higher fines.[18]

- The **Data Act** that entered into force on 11 January 2024 and became applicable on 12 September 2025 and focuses on industrial business-to-business (B2B) data, as opposed to the GDPR, which focuses on personal data. Among other things, the Data Act mandates data sharing among data holders of connected products (such as an Internet of Things device manufacturer or a data processor) by the users of these connected products with third parties.[19] For example, a user of a smart home device will be able to share the data produced by the device with third parties and discontinue the relationship with the prior data holder. The Act restricts international data transfers and allows foreign governments access to non-personal

data, thus favoring businesses that operate and process data in Europe. The penalties for violating the act can include administrative fines up to €20 million, or up to 4 percent of the total worldwide annual turnover of the preceding financial year, whichever is higher.[20]

- **European Telecommunications Network Operators (ETNO)** that have renewed attempts to make online content and application providers, such as video streaming platforms, pay for network usage.[21]

- **Copyright Directive of 2019** that aims to balance the rights of creators and copyright holders with the interests of users and the functioning of the digital single market – ensure that copyright holders, such as authors, performers, and press publishers, receive remuneration for the use of their works by digital platforms.

- **Cybersecurity Act of 2019** that aims to enhance the cybersecurity of products, services, and processes within the single market and create a framework for the cybersecurity certification of ICT products, services, and processes.

- **General Product Safety Regulation (GPSR) of 2023,** which seeks to ensure the safety for products placed on the EU market, whether they are sold online or offline, through obligations for economic operators (manufacturers, importers, distributors, and online marketplaces), market surveillance, and remedies for consumers.

- **Digital Services Act (DSA) of 2022,** which aims to make online intermediaries and platforms, such as social media platforms and marketplaces, take responsibility for the content they disseminate and the services they offer. Very Large Online Platforms (VLOPs) and Very Large Online Search Engines (VLOSEs) face the most stringent requirements.

- **EU's Digital Fairness Act** that is expected to be submitted to public consultation in 2025 and is aimed at addressing the use of dark patterns in online advertisements, such as presumed addictive design of digital products and online profiling.[22]

3. Europe's Competitiveness Concerns in the Digital Era

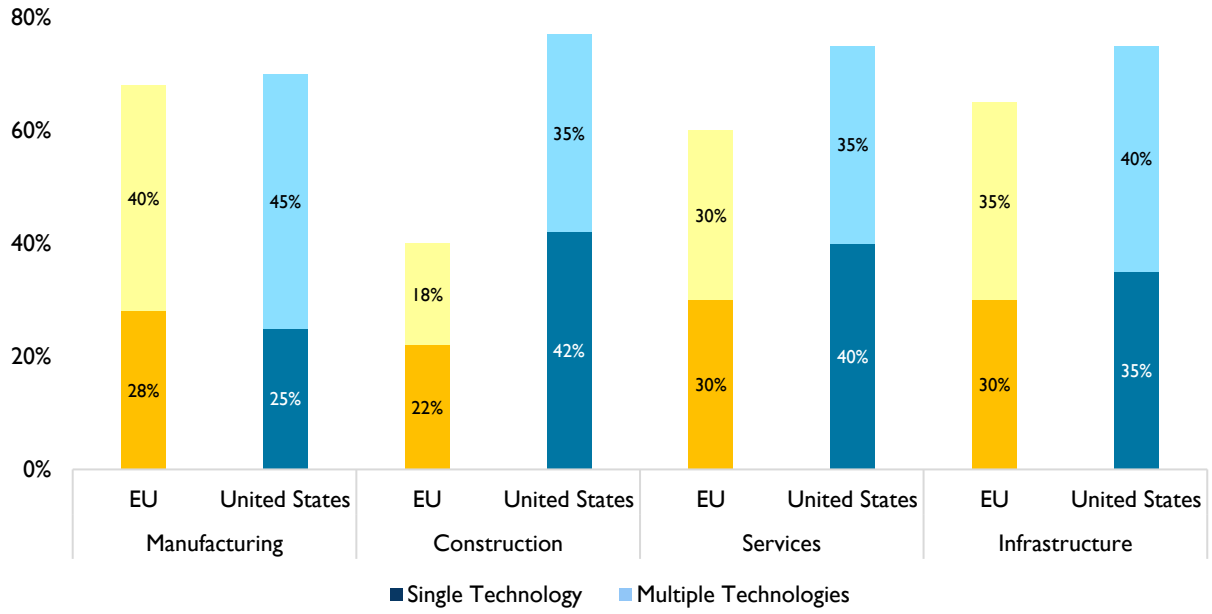
The proliferation of digital regulations in Europe has raised concerns about overregulation, which can hinder innovation and Europe's competitiveness, especially in new emerging areas like AI. This section analyzes the EU's performance on innovation, startup formation, and competitiveness in AI, benchmarked against the U.S., and explores literature on the notion that Europe's digital regulations are undercutting its economic performance.

A. How Europe lags behind the U.S. in innovation and technology adoption

Europe's lagging behind the U.S. on a number of digitization- and innovation-related indicators is quite well known – this following explores some key data and findings.

U.S. companies' technology adoption outpaces that of EU companies across sectors (figure 2). U.S. firms across size categories also invest more in R&D, a key driver of productivity growth, than European firms.[23] European businesses make up only about 5% of global R&D spending in software and internet technologies (even if they make up 20% of global R&D), compared to 70% by U.S. companies.[24]

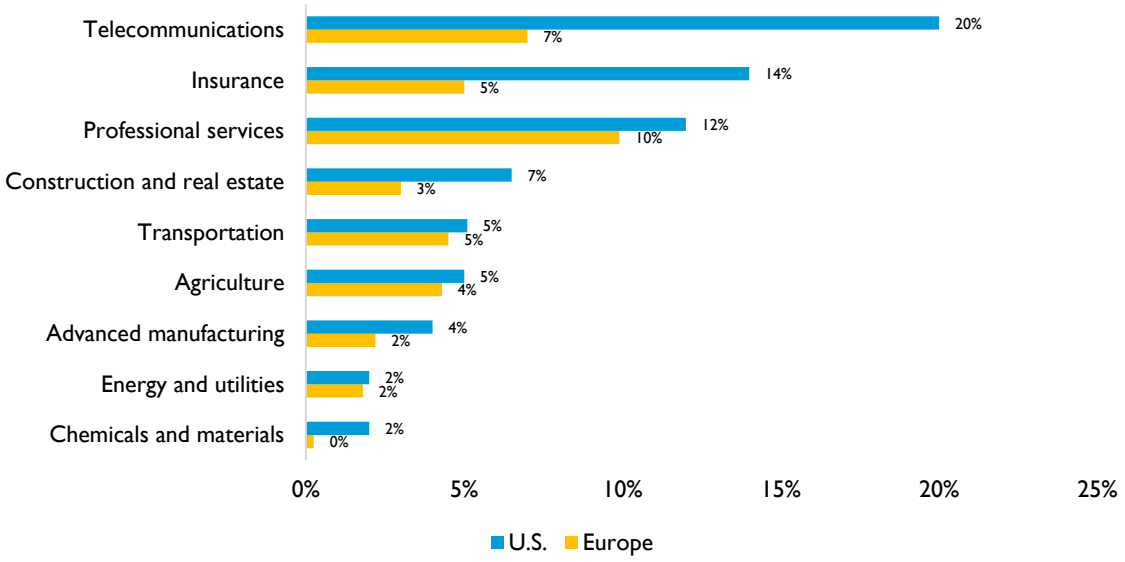
Figure 2 – Technology adoption by U.S. and European companies (% of firms with a single or multiple technologies)



Source: European Investment Bank (2021), p.252

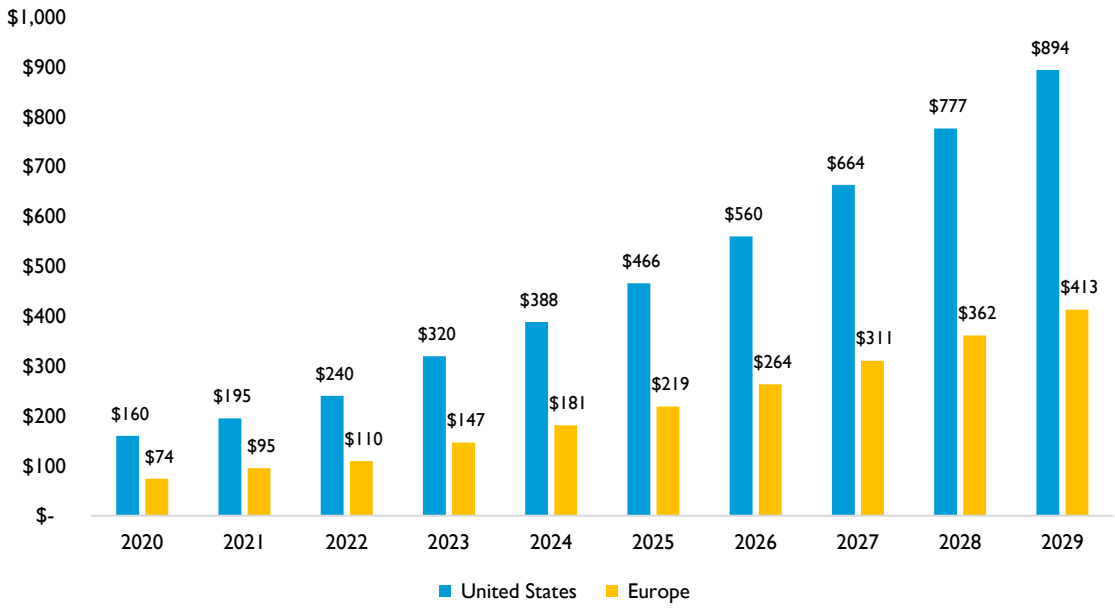
This divergence is stark also in AI spending across sectors. U.S. firms consistently allocate a higher share of their sales to AI than their European counterparts, particularly in technology-intensive industries like telecommunications (20% vs. 7%), insurance (14% vs. 5%), and professional services (12% vs. 9.9%) (figure 3). As for the size of the cloud market, a proxy for firms' cloud adoption, the U.S. public cloud market has rapidly outpaced Europe's, growing from $160 billion in 2020 to $466 billion, double the amount in Europe, and is projected to reach $894 billion by 2029, more than double the forecast for Europe's $413 billion (figure 4).

Figure 3 – AI and IT Spending by European and US firms as a share of sales, by sector



Source: Worldwide AI and Generative AI Spending Guide, IDC, February 2024; McKinsey Analysis

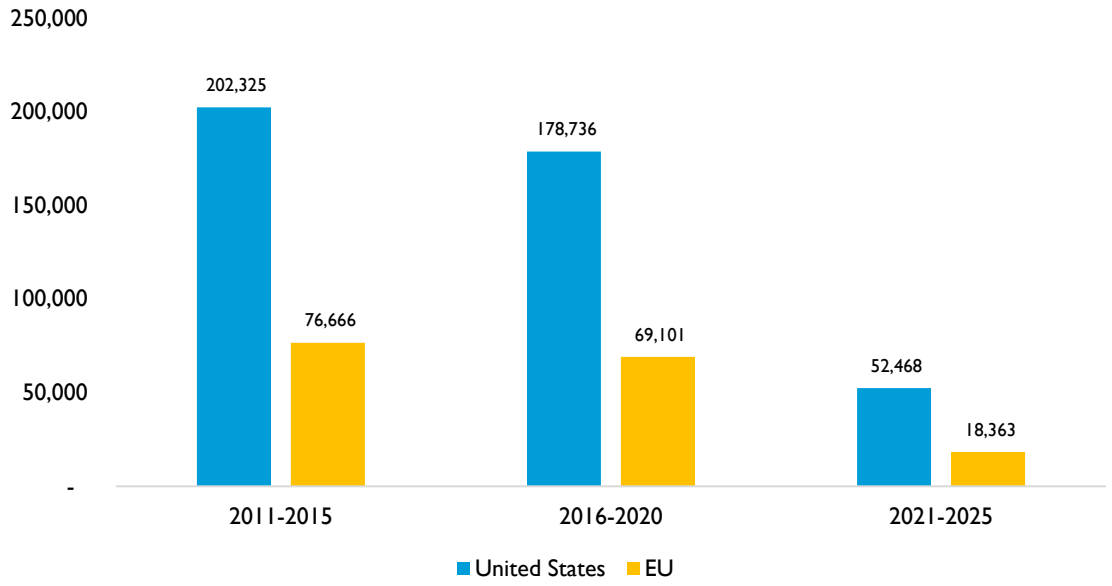
Figure 4 – Revenue in the public cloud market in the U.S. and Europe[25]



Source: Statista Technology Market Insights (2025).

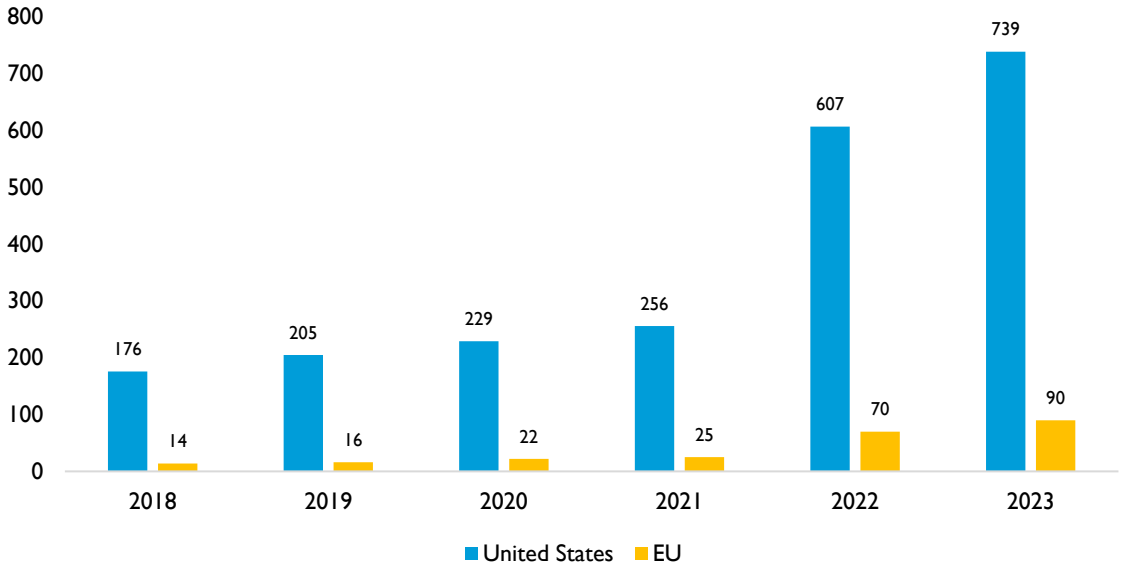
There is also a gap in developing and commercializing innovations and producing leading-edge technology companies.[26] Per Crunchbase, which catalogs the formation of new, especially technology-driven firms, over 433,000 startups were formed in the U.S. in 2011–2025, compared to some 164,000 in Europe (figure 5). In 2023, the U.S. had eight times more unicorns, or companies with a valuation over $1 billion, than Europe (figure 6).[27] Faced with regulatory barriers to scaling in Europe, European unicorns also gallop away: between 2008 and 2021, nearly 30 percent of Europe's unicorns relocated their headquarters abroad, mostly to the U.S..[28]

Figure 5 – Number of U.S. and European startups, 2011-25



Source: Crunchbase, https://www.crunchbase.com/

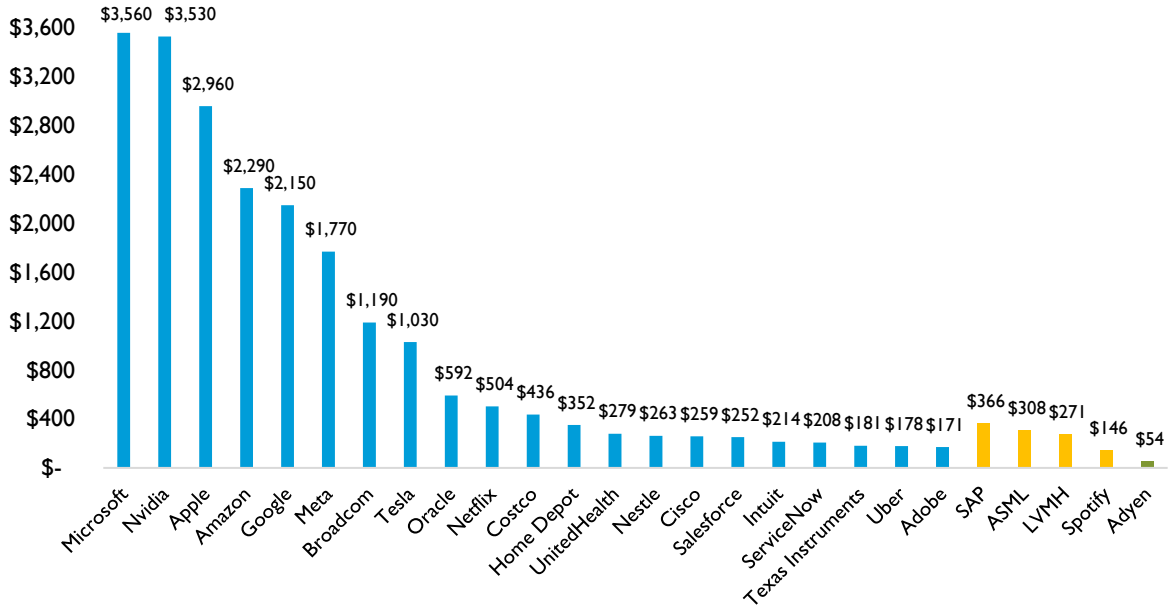
Figure 6 – Number of U.S. and European unicorns, 2018-23



Source: European Commission (2023). *The Future of European Competitiveness: In-depth Analysis and Recommendations*.

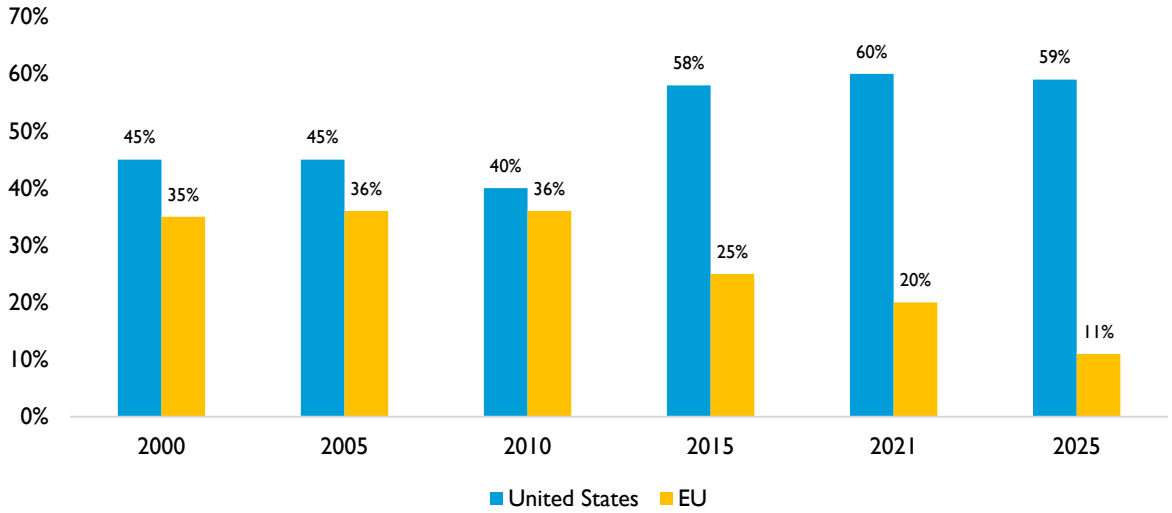
Some unicorns grow to become giant technology companies. MIT's Andrew McAfee points to a 70:1 ratio between the U.S. and EU in the market capitalization of publicly traded entities that started from scratch and now have over $10 billion valuation (figure 7). Strikingly, as the Centre for European Policy Studies (CEPS) has found, of the world's 50 leading technology companies, only four are European, and none of these were created in the past 50 years.[29] The gap is also reflected in the growth of the number of U.S. publicly listed companies among the world's top-100 largest companies (in terms of market capitalization), from 45 percent in 2000 to 59 percent in 2025, and the dwindling in the number of European firms in the top-100 from 35 percent to 11 percent in 2025 (figure 8).

Figure 7 – Public from-scratch US and EU companies' market capitalization in June 2025 (in billions USD)



Source: For the top firms: Andrew McAfee, MIT https://ioplus.nl/en/posts/eu-faces-huge-innovation-gap-mits-andrew-mcafee-highlights-a-stark-disparity-with-the-us; Nextrade analysis of market capitalization values.

Figure 8 - Share of the world's top-100 companies (in terms of market capitalization)

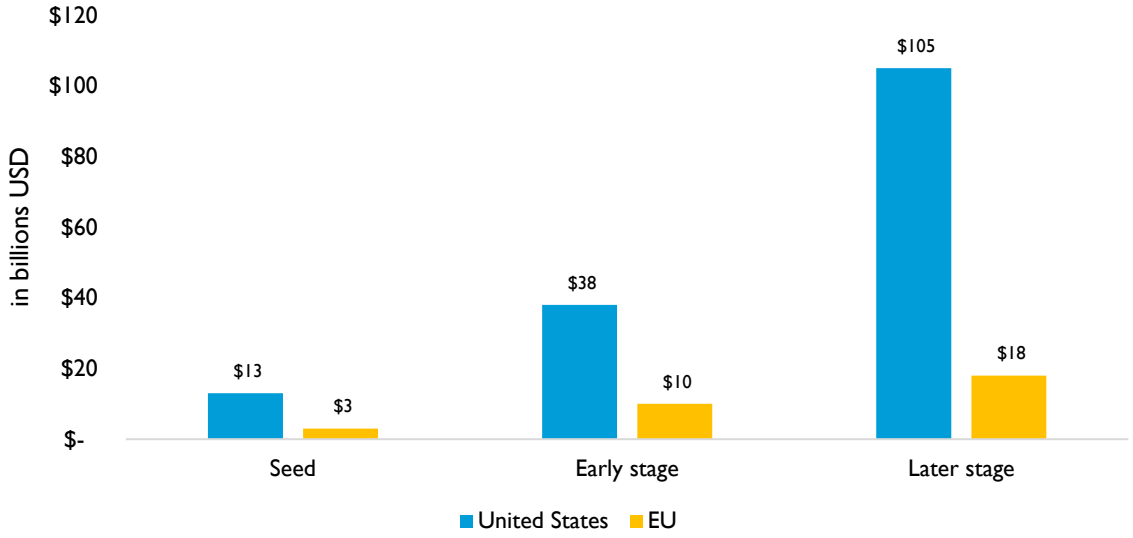


Source: "The Land That Ambition Forgot—Europe is Now a Corporate Also-Ran. Can It Recover Its Footing?" The Economist, June 5, 2021, https://www.economist.com/briefing/2021/06/05/once-a-corporate-heavyweight-europe-is-now-an-also-ran-can-it-recover-its-footing. 2025 numbers are from a June 2025 list at from https://companiesmarketcap.com/

The differences between the EU and the U.S. in startup formation and scaling can, to a good extent, be traced to differences in the availability of venture capital. The funding gaps are notable in each stage – seed, early stage, and later-stage. U.S. companies amassed 583 percent more capital in 2023 than

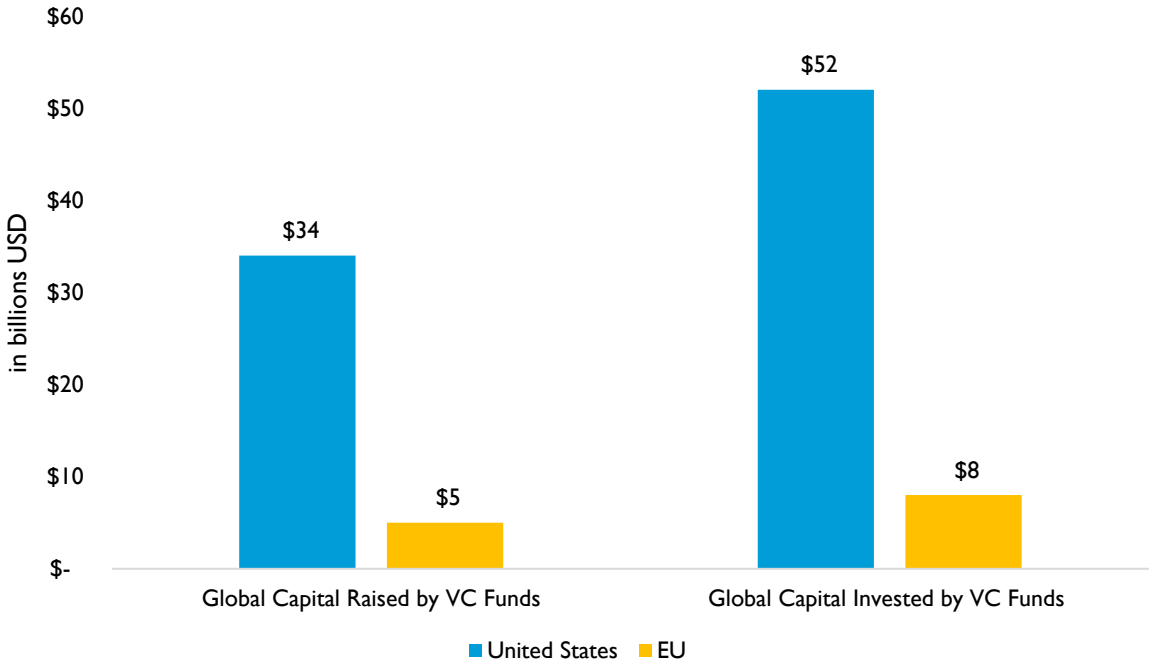
European companies – and thus were much likelier to be able to scale (figure 9). Limited partners are also seven times more likely to invest in U.S. venture capital funds than in European ones (figure 10). VC investment in 2023 made up 0.056 percent of U.S. GDP, compared to 0.016 percent for Europe.[30]

Figure 9 – Seed, early stage, and later stage investments in U.S. and European startups, 2023



Source: European Commission (2023). *The Future of European Competitiveness: In-depth Analysis and Recommendations*.

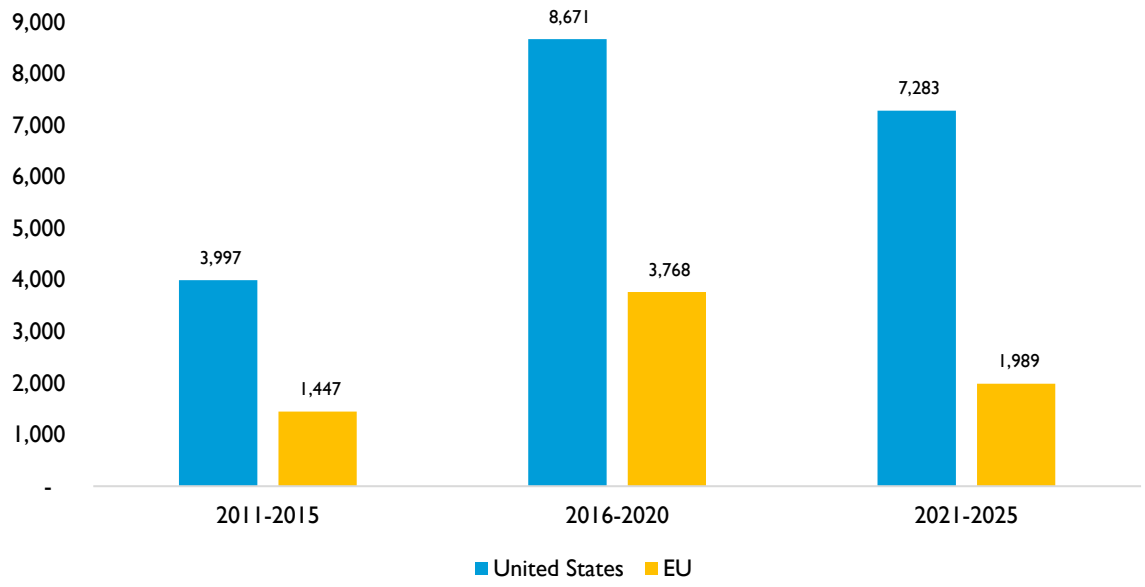
Figure 10 – Global VC funds raised and invested cumulative in 2013-23, U.S. and European VCs (in billions USD)



Source: European Commission (2023). *The Future of European Competitiveness: In-depth Analysis and Recommendations*.

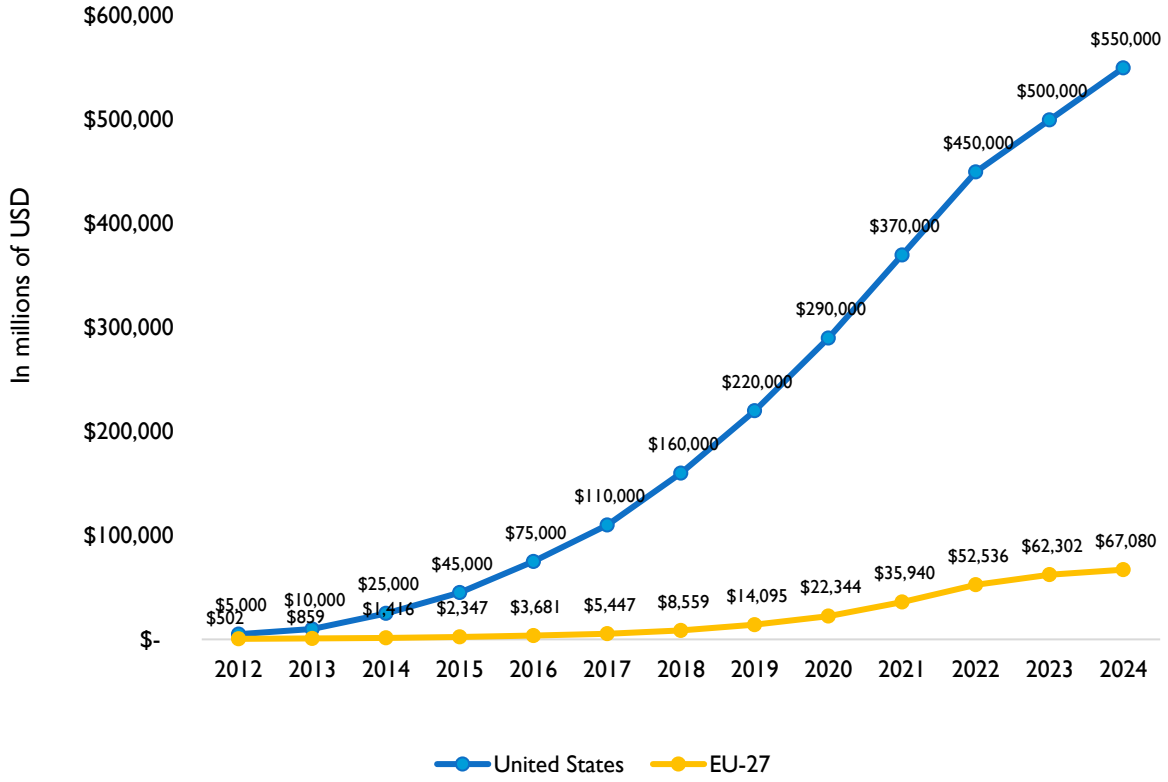
These gaps risk widening as the AI era opens. The U.S. outpaces Europe four to one in producing AI startups (figure 11). The U.S.–EU gap in VC funding in AI startups in 2012-24 is eight to one, with U.S. AI startups gaining $550 billion, versus $67 billion for Europe (figure 12). The U.S. is better poised to produce skills for the AI era than Europe, having a third of the world's top-100 universities in disciplines key to AI-driven businesses – computer science, engineering, and business and economics.[31] The U.S. also leads in producing machine learning models (40 notable models in 2024 and 3 for Europe) (figure 13). This innovation lead is further reflected in AI patenting activity. The U.S. granted over five patents per 100,000 inhabitants in 2023, compared to less than 1.3 in Germany and under 1 in other leading European economies like France and Sweden.[32] The U.S. also outclasses all European economies in the share of workers with AI skills, based on LinkedIn data.[33]

Figure 11 – AI startups in the U.S. and Europe, 2011-25



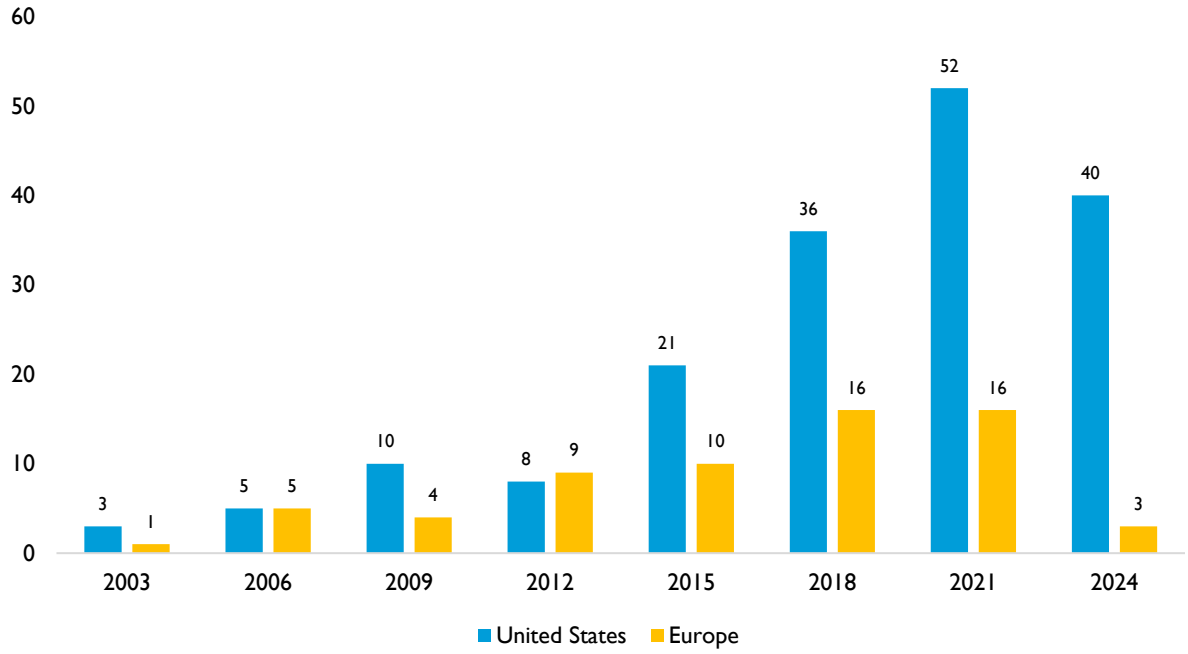
Source: Nextrade Group on the basis of Crunchbase (2025).

Figure 12 – VC investments in U.S. and European AI startups in 2012-24 (cumulative, in millions USD)



Source: OECD.AI (2025), visualizations powered by JSI using data from Preqin, accessed on 4/3/2025, www.oecd.ai.

Figure 13 - Number of notable AI models in Europe and the U.S., 2003-24



Source: Stanford University AI Vibrancy Report 2025.

The various gaps explored here are also growing with China. Europe needs to change to bridge them – the next part discusses plans to do so.

B. Regulations hampering technology adoption and startup ecosystems in Europe

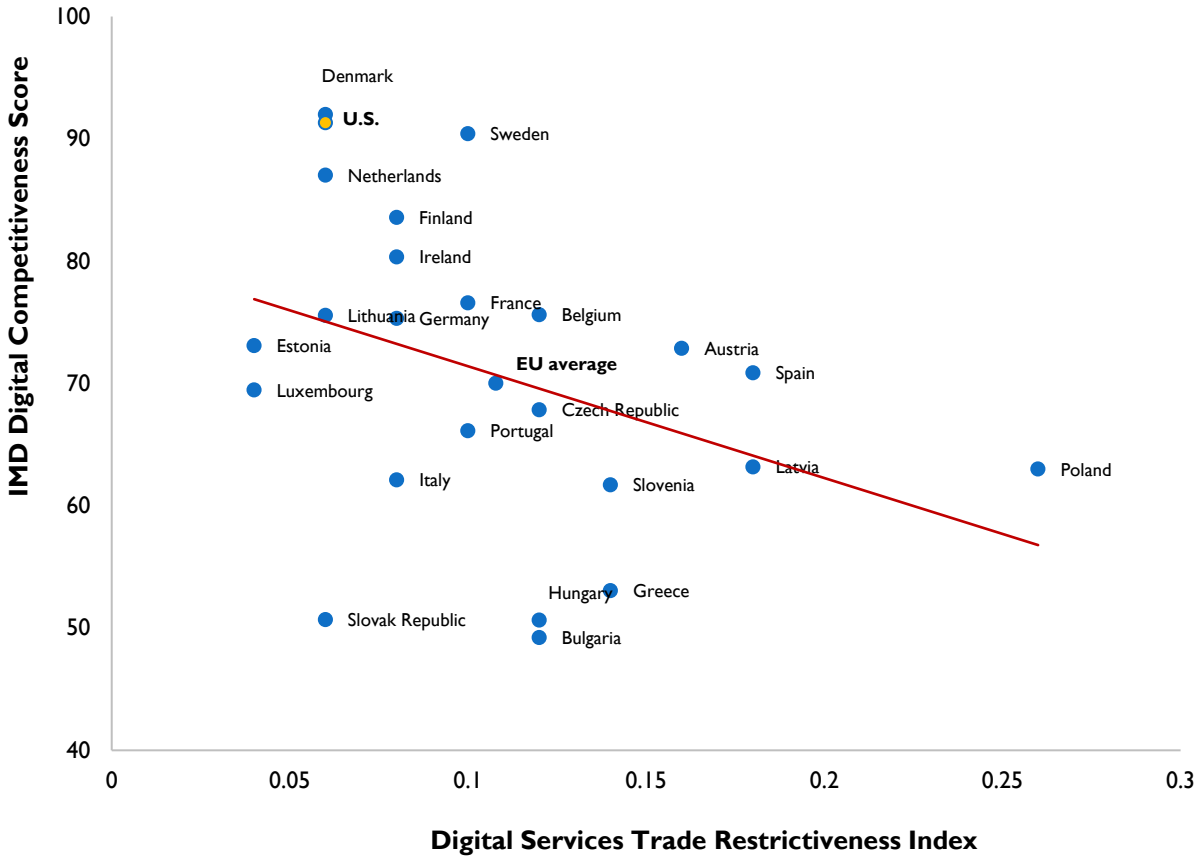
A body of literature has long traced Europe's lackluster performance in growing its economy and developing, adopting, and commercializing technologies. For example, Gordon (2020) finds that the U.S. productivity growth spurt in 1995-2005 was driven by ICT-intensive industries.[34] Europe's growth stagnated during the period in part because of the lower investment in ICT across industries and lower payoff to the ICT investment. The OECD (2019), studying European firms, finds that differences in technological adoption drive differences in productivity gains, especially in manufacturing and routine-intensive activities.[35]

A related body of literature has linked Europe's low ICT adoption and startup formation to various business and labor market regulations. For example, van Ark et al. (2008) discuss the slower rise of a knowledge economy in Europe compared to the U.S. as resulting from European labor market policies and extensive product market regulation.[36] More recently, the IMF discusses a range of domestic and EU-level reforms in labor, insolvency, tax, and other regulations as hampering Europe's productivity. [37]

A growing number of studies find that Europe's digital regulations undercut Europe's economic performance. As an older and sweeping regulation, the GDPR has been especially widely analyzed. For example, in reaction to the GDPR, which raised the cost of targeted firms' data storage, European firms decreased their data storage by 26 percent and data processing by 15 percent relative to comparable U.S. firms, thereby becoming less data-intensive.[38] By similar logic, by raising costs, especially on high-risk AI applications, the EU's AI Act is expected to reduce AI-related investments.[39]

Global indices speak to regulatory frictions as well. In the IMD's World Digital Competitiveness Rankings, which measures 59 variables around knowledge, technology, and future readiness for the digital era, only Denmark outdoes the U.S.[40] Only six EU economies – Estonia, Denmark, Lithuania, Luxembourg, the Netherlands, and Slovakia – outperform the U.S. on the OECD's Digital Services Trade Restrictiveness Index (DSTRI) that measures a wide range of digital policies that limit digital transactions (but omits so far policies like the DMA, and AI Act) and correlates inversely with the Digital Competitiveness Ranking (figure 14).[41]

Figure 14 – OECD's Digital Services Trade Restrictiveness Index (DSTRI) and IMD Digital Competitiveness Scores, European Union Members and the U.S.



C. Europe's growing concerns about its declining digital competitiveness

The findings about Europe's declining competitiveness have catalyzed concerns among senior European policymakers, epitomized by the high-profile 2024 report commissioned by the President of the European Commission and authored by the former Italian prime minister and European Central Bank president Mario Draghi.[42] The Draghi report notes that "a wide gap in GDP has opened up between the EU and the US, driven mainly by a more pronounced slowdown in productivity growth in Europe. Europe's households have paid the price in foregone living standards. On a per capita basis, real disposable income has grown almost twice as much in the US as in the EU since 2000."[43] Some of these outcomes, the Draghi report argued, could be traced to the burdens created by regulations, including digital regulations:

> *"The EU's extensive and stringent regulatory environment (exemplified by policies based on the precautionary principle) may, as a side effect, restrain innovation…. while the ambitions of the EU's GDPR and AI Act are commendable, their complexity and risk of overlaps and inconsistencies can undermine developments in the field of AI by EU industry actors…. the EU faces now an unavoidable trade-off between stronger ex ante regulatory safeguards for fundamental rights and product safety, and more regulatory light-handed rules to promote EU investment and innovation, e.g., through sandboxing, without lowering consumer standards."*[44]

European think-tanks and business associations have echoed these concerns. For example, a 2025 ECIPE report argues that the sheer number of digital regulations hampers the adoption of technologies in Europe and arrests productivity growth.[45] Industry associations like DigitalEurope cite concrete examples of overlapping and contradictory regulatory requirements.[46] European Research Council (2025) states bluntly that Europe needs to "replace growth-hampering regulation by smart regulation, reform EU governance, streamline decision-making, cut bureaucracy, and create conditions for innovators to thrive."[47]

The European Commission has sought to react to these concerns. The January 2025 Competitiveness Compass aims to operationalize the Draghi report's recommendations to cut red tape and reinvigorate the EU economy.[48] The Compass promotes the diffusion of technologies across companies and small businesses, discussing the need to drastically reduce the regulatory and administrative burdens, especially for SMEs, and promote AI. In addition, the European Commission has announced five legislative initiatives to simplify EU laws in the course of 2025 to promote investment and innovation.[49]

A further key component of the competitiveness drive is the EU Start-up and Scale-up Strategy, aimed at promoting startup formation and scalability through simplified corporate, tax, insolvency, and labor laws. The Compass has, however, been criticized – mostly for not doing enough, for example, to promote European startups, counter China's technology leadership, or reduce reliance on Russian sources of energy.[50]

There are today concerns that the Compass does not do much to reduce the burdens created by the DMA, AI Act, and other digital regulations.[51] Indeed, faced with confusion from the EU's AI startups about the AI Act's requirements, in May 2025, the European Commission considered postponing the implementation of the AI Act due to industry concerns about a lack of clarity of the rules.[52]

What then could be the costs of the various digital regulations as they come into effect? The next section explores.

4. Potential first- and second-order effects of the key laws in Europe

What would the various EU laws cost the European economy? There are various ways to assess this, from immediate compliance costs facing the targeted entities to potential fines they may incur, and second- and third-order impacts on businesses and consumers using the targeted entities' services. The following discusses these in turn.

A. Compliance costs of the EU's digital regulations

Companies subject to the EU's laws face compliance costs and potential fines. Let's consider the DMA, which impacts seven companies with a 2023 global turnover of $1.6 trillion in 2023.

- The DMA's compliance costs are coming to light, as companies have sought to come into compliance for about two years. In a recent event, Apple reportedly discussed having spent tens of thousands of hours of time meeting the DMA's demands, while Meta reported involving 11,000 employees and 600,000 engineering hours.[53] Assuming each of the 11,000 staff spend on average just 10 days working on DMA compliance, the total compliance cost per firm could rise well past $200 million. This makes the EU's regulatory impact assessment of a somewhat lighter version of the DMA, where the targeted companies were expected to have to engage 16 full-time equivalent employees to implement the DMA, seem very low.[54]

- In addition, the compliance cost calculations omit many of the DMA's impacts, such as lost network effects, losses in scale economies due to lost interlinked services, or costs due to the limitations on using data to develop new goods and services.

- If, furthermore, the designated gatekeepers had just a 10-20 percent chance of being fined under the DMA, with the fine being 10 percent of their total global turnover, they would collectively incur a €16.4–€32.7 billion fine.

DORA could have similar impacts, including some of the same gatekeepers that are ICT providers to large banks:

- Per-firm compliance costs with the DORA have, in surveys, been found to be €500,000-1 million for 30 percent of targeted European firms and over €1 million for 38 percent of targeted firms.[55] Taking just three industries – financial services, activities auxiliary to financial services, and information services activities – that fall in DORA's scope, there were, per Eurostat, altogether 2,132 such firms with 250 or more employees in Europe in 2023.[56] Using the €1 million figure as a proxy for per-firm compliance cost, the total compliance cost would for these largest firms rise to €2.1 billion, or some 0.2 percent of their total net turnover of €900 billion.[57] In addition, there are some 20,000 additional firms (of the 927,573 firms with fewer than 250 employees in the three industries) in scope. If each is to spend €200,000-€500,000, the costs would rise by €4 billion-€10 billion.[58]

- These estimates likely underestimate the total expense firms face due to DORA: for example, in a McKinsey study, the largest financial entities were expected to spend in total €5 million-€15

million in DORA compliance.[59] In addition, the fixed compliance costs can be higher for smaller firms that may be less digitized and/or have a longer road ahead to understand how to comply. An indicative Nextrade Group survey with 200 financial services firms of different sizes in Europe indicated that firms have engaged on average 3-4 staff on DORA implementation for 2-3 months each – and also that small firms below 50 employees face higher fixed costs as they had engaged just about the same number of staff as large firms.

- Institutions found in breach of DORA may face fines of up to 2 percent of their total annual worldwide turnover. Taking the available net turnover of the industries in scope, just a 10-20 percent chance of being fined under DORA could cost the in-scope companies collectively €2.8 billion-€5.6 billion. This, however, *does not* account for the many financial services firms, for example, in the UK, or the global ICT companies that service European financial services firms that would also be impacted by DORA.

The AI Act would also have extra-territorial reach and cost both European and global companies:

- The European Commission expects the AI Act to entail compliance costs of €100 million-€500 million by 2025, expecting the high-risk applications to be 5-15% of all applications and the compliance cost to equal some 4-5% in AI investments.[60] Verification costs are expected to add 2-5% of the investment in high-risk AI. CEPS expects the AI Act to impact some 10% of the sectors where there are expected to be high-risk systems, such as education, finance/insurance, health, IT, technical/scientific activities, social work, and critical infrastructure.[61] CEPS also estimates that firms subject to the AI Act would set up an entirely new Quality Management System (QMS) at a cost of €193,000–€330,000 per firm, with an additional €71,400 for annual maintenance.[62] This, CEPS calculates, would in 2025 entail a total compliance cost of €6.6 billion for the global AI industry and €1.45 billion for the European AI industry.[63]

- These estimates may be underestimating the true compliance costs: astute observers have noted that European companies may seek to reduce regulatory ambiguity and err on the side of caution and seek to comply even if they might not currently be classified as high-risk.[64] But firms lack clarity. In a November 2024 McKinsey study, more than 50% of survey respondents said they are not clear on AI Act requirements and are unsure of the risk classifications for their AI use cases.[65] There are also costs associated with the need to hire specialized personnel for the project governance of high-risk systems. In June 2025, European startups and VCs called for a pause because of confusion with the Act's compliance requirements.[66] In September, Mario Draghi echoes these concerns, calling for a pause on the Act's implementation.[67]

- In addition, the AI Act's legal requirements for high-risk systems are operationalized by adherence to certain technical European AI standards.[68] A recent interview-based study with 23 European startups found that AI providers report anticipated annual compliance costs with the standards-related activities of 10-20 percent of the management's time and about €100,000 per year in dedicated compliance personnel, a significant expense for a startup with, say €1 million capital raised.[69]

In total, these conservative estimates of targeted companies' compliance costs and potential fines with the DMA, DORA, and AI Act amount to 0.2–0.5 percent of European GDP, or €39 billion-€90 billion (appendix figure 1-5).

B. Second- and third-order effects of the EU's laws on SMEs and consumers

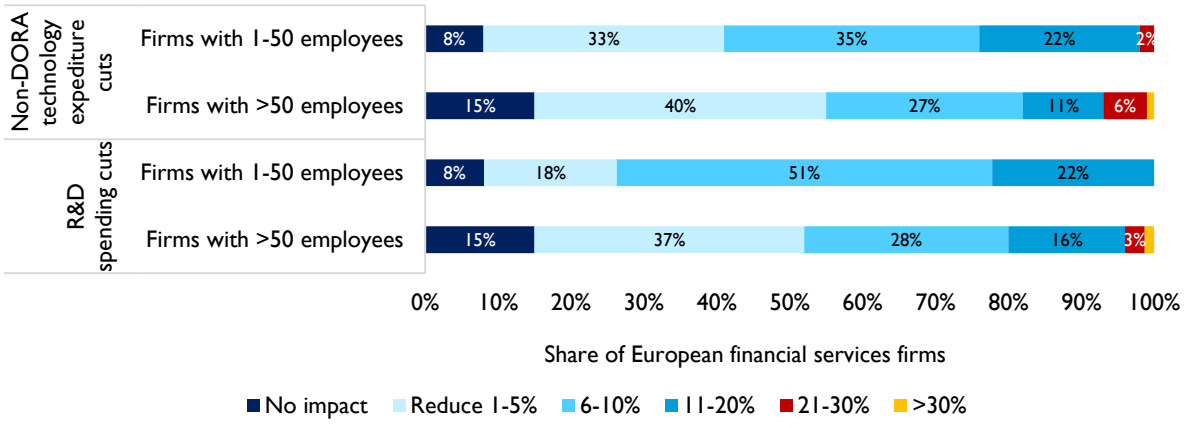
Compliance costs with the new laws are only one part of the total cost. There are at least five ways in which the laws and compliance with them can translate into second- and third-order effects that can have far-reaching effects on Europe's competitiveness.

First, the companies in scope of the DMA, DORA, and the AI Act – and smaller firms in particular – may reduce their technology and R&D investments due to the new laws, thus dampening their growth, scalability, and competitiveness. One reason firms may cut their technology and R&D investments in response to the new laws is that they may expect lower returns from technology investments in the presence of heavy regulations – just as has occurred to European firms' data-storage expenditures in the face of the GDPR.[70] Another reason for reducing their technology and R&D expenditures is that they have less to invest in compliance.

The impacts can be disproportionate for startups and small firms. For example, high-risk AI startups interviewed about AI Act compliance argue that compliance requirements affect their ability to scale, and may result in a loss of market share to firms in markets like the US that have a lower regulatory burden.[71]

And, in an indicative survey with 200 individuals from European financial services firms ranging from 11 to more than 500 employees, DORA compliance appears to create a greater opportunity cost for small firms: 57 percent of firms with up to 50 staff would cut their non-DORA tech expenses by five percent or more and 77 percent would cut their R&D spend by five percent or more to be able to pay for DORA compliance, while, respectively, 44 percent and 51 percent of large firms with 250 or more staff plan to make cuts as deep (figure 15). This means that the firms forgo investments in innovation and technologies like AI.

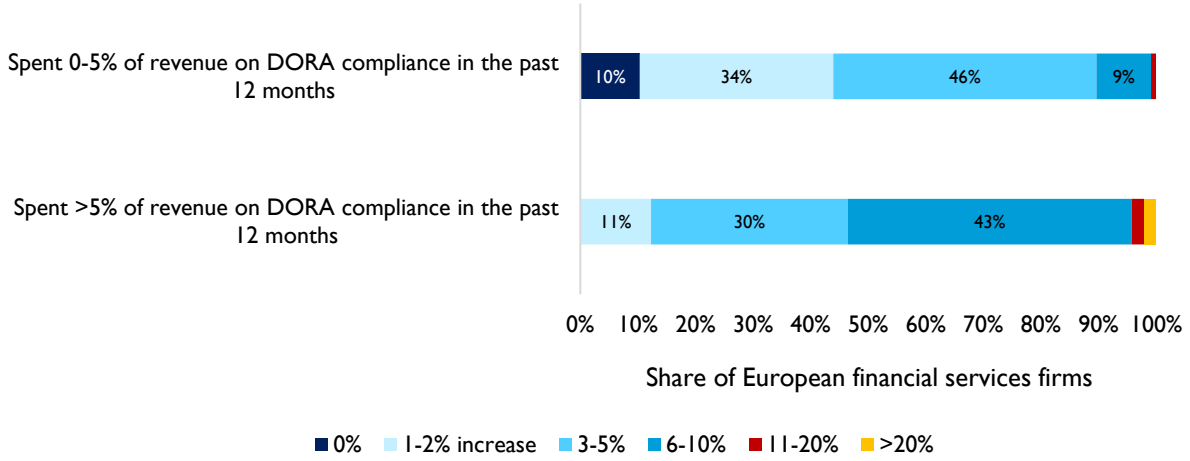
Figure 15 - Reduction of non-DORA-related technology expenditures and R&D investments due to cost to meet DORA, by firm size



Source: Nextrade Group survey with 200 European financial services firms on 14-16 June 2025.

Second, companies subject to the various digital regulations may pass part of the compliance cost onto their customers. For example, in the indicative Nextrade survey, most firms reported being subject to the DORA plan to raise the prices they charge their customers due to the costs of dealing with DORA. Of firms that have spent considerably or more than five percent of their revenue on DORA compliance, 43 percent have raised or will raise their prices by 6-10 percent, and another 30 percent will raise fees by 3-5 percent (figure 16). The cost increases are more moderate for firms that have spent up to five percent on compliance – but still 46 percent expect to raise their prices by 3-5 percent.

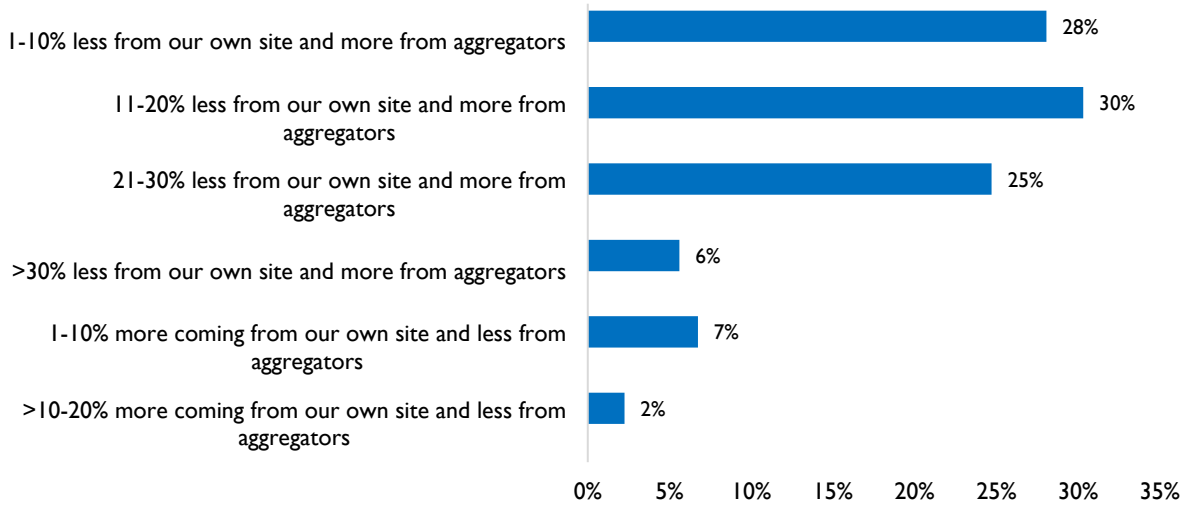
Figure 16 – Financial services firms' planned or realized cost increases to customers in reaction to DORA, by firms' level of spending on DORA compliance



Source: Nextrade Group survey with 200 European financial services firms on 14-16 June 2025.

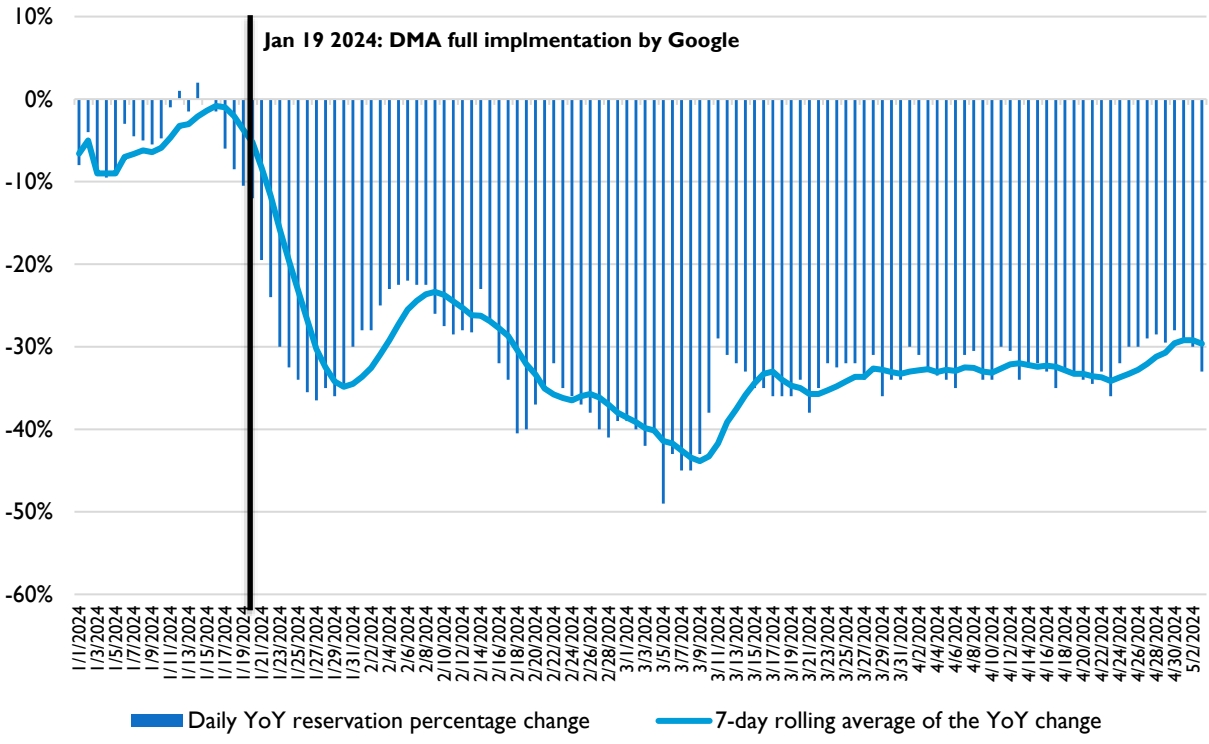
Cost increases to the customers of firms subject to the EU's digital regulations may also occur indirectly and in an unexpected fashion. For example, due to the DMA, Google Search for flights and hotels in Europe now elevates third-party aggregators in search results instead of highlighting direct links to hotels (case 1).[72] As a result, European hotels report average reductions of 11-20 percent of bookings coming through their own sites and an increase in bookings via aggregators that charge hotels a commission for each booking, implying a transfer of revenue from hotels to the aggregators (figure 17). This result is in line with earlier estimates where hotels in regions affected by the DMA experienced a 36 percent drop in the volume of direct bookings following the DMA's implementation by Google, compared to non-DMA jurisdictions (figure 18).[73] European hotels have lobbied against this DMA-created change as it favors intermediary aggregators that take a commission for brokering flights and rooms.[74]

Figure 17 – Sources of hotel bookings after the DMA



Source: Nextrade Group survey with 150 European hotels, 14-16 June 2025.

Figure 18 – Google Hotels reservations following DMA implementation, EU hotels compared to extra-EU hotels



Source: Mirai. Traffic volume comparison of 3450 hotels between DMA and Non-DMA markets from 01.01.24 to 22.04.24. 24. https://www.mirai.com/blog/dma-implementation-sinks-30-of-clicks-and-bookings-on-google-hotel-ads/

Case 1: Unintended consequences of the DMA on the European travel industry

The various digital regulations can have unexpected effects that undermine economic sectors presumably not targeted by the regulations.

One example is the detrimental impact of the DMA on Europe's travel industry. To ensure it meets the DMA, Google has removed the Google Flights feature that aggregates flight information from its search page and replaced it with groups of links to third-party aggregators. The same applies to Google's hotel comparison tools.

This means European consumers will now need to take an extra step to find flights and hotels: they would Google, for example, "flights to Paris" first and then click on a link for a site like Kayak and Expedia.

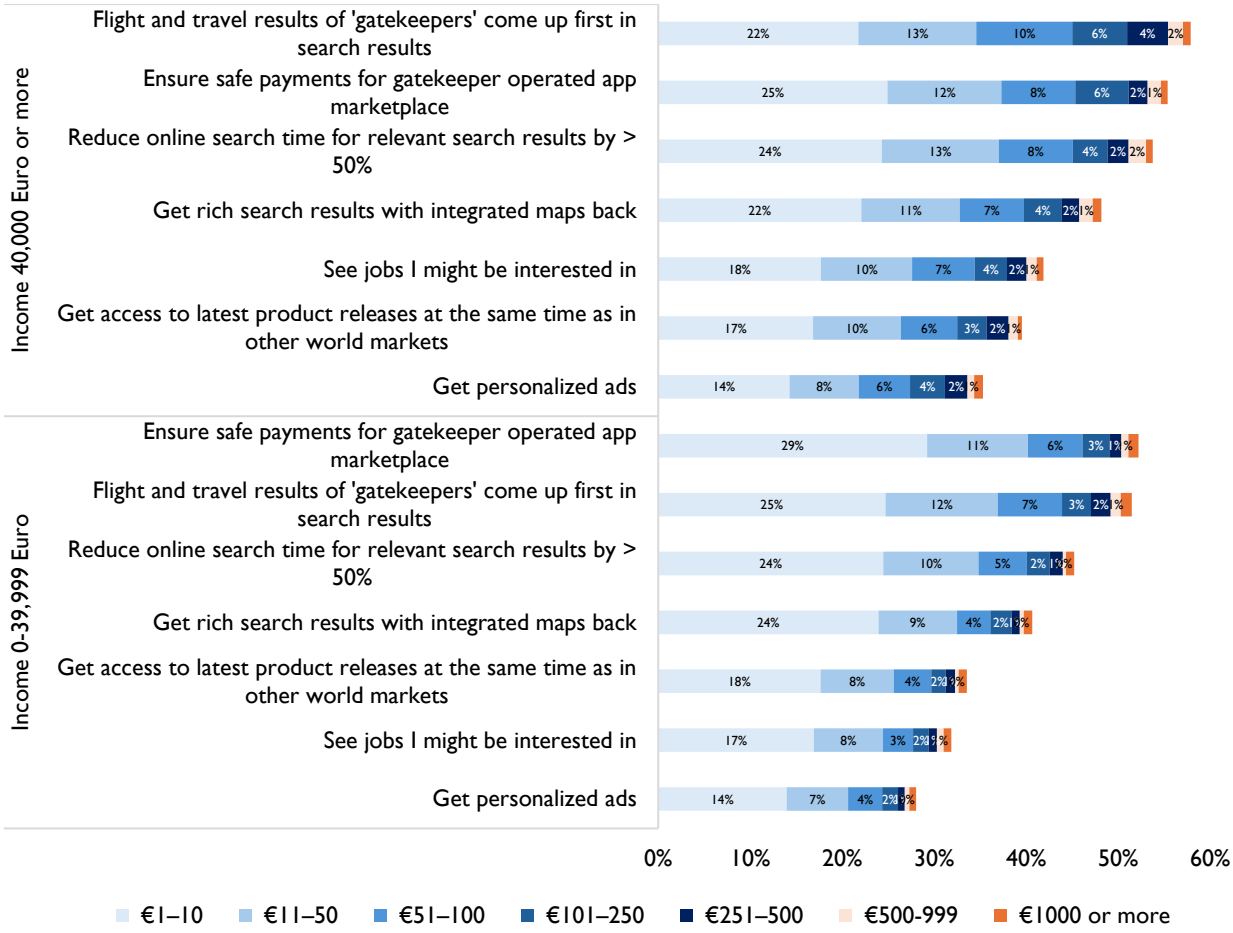
European hotels and prominent CEOs like Sebastian Bazin of Accor have lobbied against the change in favor of intermediary aggregators that take a commission for brokering flights and rooms.[75]

In a survey with 5,000 European consumers, 23 percent feel that travel search is now less personalized, and 42 percent of travelers who search at least once a month say that search results for flights and hotels are worse than a year ago, 58 percent of higher-income and 52 percent of lower-income consumers would be willing to pay for gatekeepers' flight and travel results to come up first in search.[76]

Third, Europe's digital regulations can also undermine the quality and variety of services available to the customers and users of the targeted digital services, and undercut services' revenues. For example, a new survey with 5,000 Europeans on the impacts of the DMA shows that 61 percent of Europeans report having to search up to 50 percent longer for relevant online content than before the DMA.[77] Europeans also find that online services have become less personalized since the DMA came into effect. For example, 39 percent see online ads and 30 percent see video content as less personalized, and 25 percent find it more difficult to find relevant, personalized job leads than pre-DMA. As many as 59 percent of European consumers would pay to regain direct access to targeted firms' own services and rich shopping results that enable product and price comparisons. 40-50 percent of Europeans would also be willing to pay to get back efficient online search, pre-DMA flight and travel results, and integrated maps (figure 19).[78]

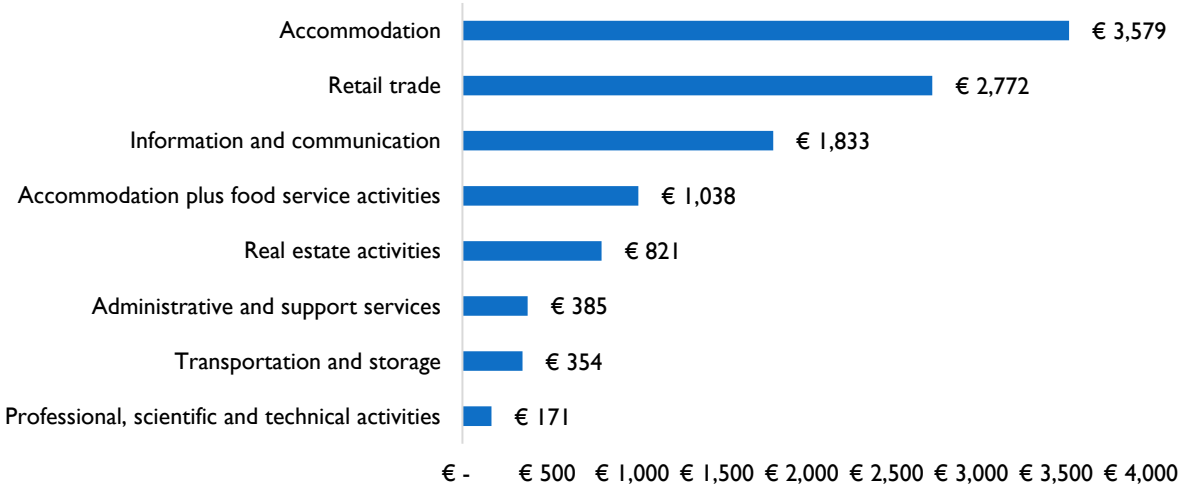
A May 2025 study found that the DMA would entail a 0.64% annual loss on European firms' turnover as a result of what consumers experience – lower visibility, more limited personalization, reduced reach, higher transaction costs, and the loss of valuable platform integrations.[79] The most impacted sectors include accommodation and retail, with annual revenue losses per worker up to €1,122, depending on the intensity of digital service use (figure 20). The accommodation sector, which uses platforms intensively, would be especially impacted.

Figure 19 - Share of Europeans prepared to pay yearly for pre-DMA services



Source: Nextrade Group survey with 5,000 European consumers.

Figure 20 – Annual costs of DMA provisions on EU businesses (as revenue per worker)



Source: LAMA Economic Research (2025).

Fourth, the costs of compliance with the various digital regulations may create market entry barriers and favor large companies. This concern has emerged especially in relation to the AI Act's implementation, due to the fixed costs associated with the quality management systems and standards compliance that hit SMEs disproportionately hard, and due to the challenges for small firms to dictate what the AI standards should be.[80] Complying with DORA also requires significant investments in technology, personnel, and processes that can be challenging for smaller financial firms and for firms with legacy systems.[81] Smaller firms are also particularly reliant on third-party vendors, but harder-pressed than large firms to ensure vendors are DORA-compliant.[82] These impacts would go right against the ideas of the Competitiveness Compass and the promotion of dynamic European startups.

Fifth, digital regulations can affect Europeans' cybersecurity and intellectual property. For example, limiting the in-scope gatekeepers' ability to combine data across different core platform services and their visibility across their services, the DMA can impede the targeted companies' access to cross-platform data to detect and shut down threats. It can also expose users to fraud, as they may now use alternative payment methods that lack the protections of app stores' own payment systems.[83]

5. How should Asian economies rethink their regulatory proposals?

European-style digital regulations, such as the DMA, DORA, and AI Act, are now being considered in various Asian economies – such as India and Korea (table 3):[84]

A. How do Asian versions compare?

- India had a draft Digital Competition Bill similar to the DMA but it was withdrawn in July 2025 due to intense resistance by local technology companies.

- Indonesia is contemplating digital competition and AI regulations.

- Korea has already adopted a December 2024 AI Basic Act, which is similar in some respects to the EU's AI Act. The Ministry of Science and ICT is set to outline detailed regulations by 2025. Korea is also contemplating a DORA-type law. In addition, Korea's new government is intent on reviving the drive for an EU-style digital competition law.[85]

Table 3 – Selected Asian laws and bills similar to those of EU's digital regulations

	Digital Markets Act (DMA)	AI Act	Digital Operational Resilience Act (DORA)	Data Act
EU Version	Aims to ensure fair and contestable markets in the digital sector by imposing obligations on large online platforms, designated as "gatekeepers", to prevent unfair practices and promote competition.	Seeks to ensure safe and ethical development and use of AI systems; categorizes AI systems based on risk levels and imposes corresponding obligations to protect health, safety, and fundamental rights.	Aims to strengthen the ICT security of financial entities for them to better withstand ICT-related disruptions and threats.	Mandates data sharing among a data holder of connected products (such as an Internet of Things (IoT) device manufacturer or a data processor) by the users of these connected products with third parties.
India	Draft Digital Competition Bill of 2024 was withdrawn in 202 due to resistance from local technology sector.	Currently does not have AI-specific regulations, and is examining gaps in existing frameworks and strengthen them to address AI-related risks.	Regulated entities are expected to have full oversight, monitoring, and control all its IT outsourced activities, which include auditing their IT vendors, reviewing of VAPT reports, SBOM, effective access to data related to outsourced activities, and assessing for concentration risks	The draft National Data Governance Framework policy proposes access to non-personal data held by the government, for research and academic purposes. There is no mention of access to private sector data.
Indonesia	Ministry of Communication and Informatics is working on anti-monopoly regulations for digital markets. Indonesia is expected to adopt these regulations in the form of a Government Regulation (PP) supporting regulation for the Information and Electronic Transactions Law.	Indonesia is taking significant steps toward drafting a comprehensive regulation to govern the use and control of AI.[86]		
Korea	Korea Fair Trade Commission (KFTC) announced in September 2024 plans to amend the existing Monopoly Regulation and Fair Trade Act to address digital competition issues, as opposed to pursue a new law as previously planned.	December 2024 AI Basic Act, which like the EU's AI Act is risk-based. The Ministry of Science and ICT is set to outline detailed regulations by 2025.	On August 13, 2024, Financial Services Commission (FSC) announced plans to introduce a direct oversight regime for third-parties, including CSPs, as a safeguard following DORA in EU and CTP in UK.	

As they seek to combat challenges in the digital economy, such as cyberfraud or irresponsible uses of AI, Asian governments should carefully consider whether the sweeping digital regulatory frameworks adopted in Europe are fit for purpose – the right tools and suitable for the various Asian economies' circumstances. They should also take a step back and consider whether and why the proposed regulations are needed to begin with – what is the problem to be solved, and how dire is it, and does it even exist?

Asian policymakers should see EU-style regulations as just one plausible regulatory model. There are no good reasons for Asian economies to rush to copy-paste EU-style laws, simply because the EU has

pursued them, especially as useful alternatives exist (table 4).

- For AI, one positive alternative is Japan's May 2025 AI law (Act on the Promotion of Research, Development and Utilization of Artificial Intelligence-Related Technologies) that takes a "soft law" approach to AI governance, and stresses a collaborative approach between government, businesses, and researchers to promote AI development and address potential risks.[87] The Act still responds to concerns about false information generated by AI tools by allowing the government to disclose the names of malicious businesses in the event of a crime involving AI.

- For cybersecurity in financial services, the Financial Stability Board Third-Party Risk Management Toolkit and the Basel Committee on Banking Supervision's Principles for the Sound Management of Third-Party Risk enable financial institutions to identify critical third-party services and manage potential risks throughout the lifecycle of a third-party service relationship, and help supervisors identify how financial institutions manage third-party risk. There are also such models calibrated to different sizes of firms as the New York State Department of Financial Services New York Codes, Rules and Regulations (NYCRR) Part 500 regulation, where companies can tailor cybersecurity measures based on their size, complexity, and specific risk profile, and offer exemptions for small firms. [88]

Table 4 – Selected alternative approaches to EU's AI Act, DMA and DORA

EU approach	Selected alternative models	Key features	Benefits
AI Act is mandatory and prescriptive, especially for "high-risk" systems, and mandates risk classification AI Act mandates compliance, certification, and risk classification	Japan's May 2025 AI Law	• Soft law framework • Promotes collaboration between government, business, academia • Transparency in AI misuse (naming firms involved in crimes)	• Encourages AI adoption • Lowers barriers to innovation • Reflects Japan's shift away from restrictive AI proposals
	UK's 2025 AI Opportunities Action Plan signals UK's shift away from the EU model to a pro-innovation stance, in 50 initiatives to promote AI infrastructure, innovation, adoption, open data, and talent.	• Signals UK's move to a pro-innovation stance, stressing innovation, adoption, open data, and talent • The Information Commissioner's Office's 2024 report promotes sandboxes and consensual audits of high-risk businesses on how they use personal data for AI	• Access to data can propose new AI innovations • Enables public and private sector to learn and cocreate regulatory models together
	Singapore's AI governance approach	• Voluntary AI governance standards • Government support for compute and data access • Focus on R&D and industry guidance	• Boosts AI R&D capacity and commercial applications • Encourages AI experimentation
DORA creates a mandatory, uniform regulatory framework across the EU, in order to reduce the susceptibility to cyber threats across the entire value chain of the financial sector	Financial Stability Board Third-Party Risk Management Toolkit	• Tools for financial institutions identify critical third-party services and manage potential risks throughout the lifecycle of a third-party service relationship. • Tools for supervising how financial institutions manage third-party risk, and for identifying, monitoring risks	• Reduces compliance cost • Avoids micromanaging firms' cybersecurity architecture • Based on firm size and risk
	Basel Committee on Banking Supervision's Principles for the Sound Management of Third-Party Risk	• High-level principles for banks to manage third-party risks • Guidance for prudential supervisors	
	New York's NYCRR Part 500	• Risk-based, scalable • Flexible implementation • Small business exemptions	

As they consider digital competition policy, AI, and other digital law proposals, Asian governments should also:

- Carefully vet the various digital regulatory proposals through consultations and rigorous impact assessments that measure the various proposed regulations' compliance costs and second- and third-order effects on economic growth, innovation, SMEs, and consumer welfare.

- Consider options to the proposed regulations discussed also in the Draghi report, such as recent AI and digital competition regulations passed in Japan, regulatory sandboxes to test technologies in a controlled setting, and sunsetting practices as in the UK's DMCC.

- In the case of laws that have already been passed, like the Korean Basic AI Act, opt for flexible implementation and public-private dialogues to ensure pragmatic implementation.

6. Conclusion

The European Union's digital regulatory agenda – including, most recently, the Digital Markets Act, Digital Operational Resilience Act, and AI Act – seeks to shape the digital economy in ways that address Europe's policy concerns. However, the data in this paper suggests that these regulations have a price: they risk exacerbating Europe's longstanding challenges in fostering innovation, startup formation, and SME digital transformation. The growing divergence between Europe and the U.S. in technology adoption, R&D, and the creation of high-growth firms underscores the unintended costs of regulatory overreach.

While European policymakers themselves are recognizing these adverse effects and considering steps to reduce regulatory burdens, Asian governments contemplating EU-style digital regulations should proceed with caution. Rather than adopting regulations simply because they are emerging from Europe, policymakers in Asia should critically assess Europe's track record in producing innovative tech ecosystems, startups, and digitized SMEs. They should also ask whether similar problems exist in their domestic markets, and, if so, whether prescriptive regulations developed in a completely different economy are the most effective way to address them.

Alternative approaches, such as targeted frameworks that prioritize enabling innovation while managing risks – as exemplified by Japan, Singapore, and the United Kingdom – may better serve the goals of fostering competitive, dynamic, and inclusive digital economies. Ultimately, regulation should be designed not only to solve today's policy concerns, but also to ensure that the Asian technology ecosystem grows and innovates, and that SMEs and the broader business community is keen to invest in technologies and R&D.

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[13] The thresholds are: At least €7.5 billion ($7.5 billion) in annual average revenue over the past three years or an average market capitalization of at least €75 billion ($75 billion) in the last financial year;
Activities in at least three EU economies; At least 45 million monthly active end users; and
At least 10,000 yearly active business users in the European Union in the last year.

[15] There are also fines of up to €7.5m or 1.5 percent of the total worldwide annual turnover of the preceding financial year for the supply of incorrect, incomplete or misleading information to notified bodies and competent national authorities in reply to a request.
[16] https://www.eiopa.europa.eu/digital-operational-resilience-act-dora_en
[17] https://www.pwc.co.uk/industries/financial-services/insights/dora-and-its-impact-on-uk-financial-entities-and-ict-service-providers.html
[18] https://n2ws.com/blog/dora-regulation
[19] https://digital-strategy.ec.europa.eu/en/policies/data-act#:~:text=Entry%20into%20application,become%20applicable%20in%20September%202025.
[20] https://www.wilmerhale.com/en/insights/blogs/wilmerhale-privacy-and-cybersecurity-law/20231221-details-of-the-eu-data-act-3-enforcing-the-data-act#:~:text=It%20is%20up%20to%20EU,in%20preparing%20this%20blog%20post.
[21] The European Telecommunications Network Operators' Association (ETNO) warned Brussels that "a large and growing share of network traffic is generated and monetized by large technology platforms." See Mathieu Pollet, "French operators urge large platforms to contribute to network costs," Euractiv, February 4, 2022, https://www.euractiv.com/section/digital/news/french-operators-suggest-big-content-providers-contribute-to-network-costs/.
[22] https://www.digital-fairness-act.com/
[23] See https://www.dallasfed.org/research/economics/2024/0213 on relationship between R&D investment by government and productivity. See for example https://www.sciencedirect.com/science/article/pii/S2468227624000814
[24] https://cepr.org/voxeu/columns/enablers-firms-use-digital-technologies-technological-innovation-and-digital
[25] Statista; Statista Technology Market Insights. Per Statista, the public cloud is defined as the digital infrastructure and computing resources that are managed by a service provider. Examples of public cloud computing resources include virtual machines, storage, and services, all of which are available for purchase with flexible (e.g., pay as you go and subscription) business models. Such payment options make it possible for customers to access, scale, and utilize resources as needed. Public cloud solutions make it possible for users to save on IT costs, increase their

efficiency, and take advantage of advanced technologies without having to invest in long-term IT solutions. Public cloud service providers own and maintain the physical infrastructure, hardware, and software. Users only need to pay for the computing resources that they require. The public cloud market refers to the companies that provide these cloud computing resources and services to individuals, businesses, and organizations.

[26] On the impact of startups and scaleups on economic performance, see, for example, https://www.richmondfed.org/publications/research/economic_brief/2023/eb_23-06; Bos, J. W., & Stam, E. (2014). Gazelles and industry growth: A study of young high-growth firms in The Netherlands. *Industrial and Corporate Change, 23*(1), 145–169. https://doi.org/10.1093/icc/dtt050; Valliere, D., and R. Peterson. "Entrepreneurship and economic growth: Evidence from emerging and developed countries." Entrepreneurship & Regional Development 21:5–6 (2009): 459–480.; OECD (2010), High-Growth Enterprises: What Governments Can Do to Make a Difference, OECD Studies on SMEs and Entrepreneurship - OECD Publishing, available at: http://dx.doi.org/10.1787/9789264048782-en; https://itif.org/publications/2017/11/28/how-technology-based-start-ups-support-us-economic-growth/

[27] European Commission (2023). *The Future of European Competitiveness: In-depth Analysis and Recommendations*.

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[30] The future of European competitiveness_ In-depth analysis and recommendations_0.pdf

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[32] https://hai.stanford.edu/ai-index/2025-ai-index-report

[33] OECD.AI (2025), visualizations powered by JSI using data from LinkedIn, accessed on 8/4/2025, www.oecd.ai

[34] https://www.nber.org/system/files/working_papers/w27425/w27425.pdf

[35] https://www.oecd.org/content/dam/oecd/en/publications/reports/2019/02/digitalisation-and-productivity-in-search-of-the-holy-grail-firm-level-empirical-evidence-from-eu-countries_a3e5982a/5080f4b6-en.pdf. See also Schivardi, F. and Schmitz, T., "The IT Revolution and Southern Europe's Two Lost Decades" Journal of the European Economic Association, Vol. 8, No 5, 2020, pp. 2441-2486; and Hsieh, C.-T., Klenow, P. J. and Shimizu, K., "Romer or Ricardo?", Working Papers, Hoover Institution, 2022.

[36] https://research.rug.nl/files/73877207/jep.22.1.25.pdf

[37] https://www.imf.org/en/Publications/WP/Issues/2025/02/14/Europes-Productivity-Weakness-Firm-Level-Roots-and-Remedies-561771

[38] Demirer, M., Jiménez Hernández, D. J., Li, D., and Peng, S., Data, Privacy Laws and Firm Production: evidence from the GDPR, February 2024. https://www.nber.org/system/files/working_papers/w32146/w32146.pdf

[39] https://digital-strategy.ec.europa.eu/en/library/impact-assessment-regulation-artificial-intelligence

[40] https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-digital-competitiveness-ranking/

[41] https://goingdigital.oecd.org/en/indicator/73

[42] https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en

[43] https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en?filename=The percent20future percent20of percent20European percent20competitiveness_ percent20In-depth percent20analysis percent20and percent20recommendations_0.pdf

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[45] https://ecipe.org/publications/future-of-european-digital-competitiveness/

[46] https://www.digitaleurope.org/news/digital-industry-sounds-the-alarm-on-contradicting-eu-legislation-on-data-and-cloud-that-would-harm-the-economy/. Pelkmans (2024) highlights an irony – that while the single market aims to eliminate regulatory burdens, sector-specific regulations and their often inconsistent implementation across member states can lead to new forms of fragmentation and increased costs for businesses seeking to scale across the EU. See https://www.ceps.eu/ceps-publications/empowering-the-single-market/ Indeed, the IMF estimates that there are many intra-EU barriers with a tariff equivalent of about 44 percent on average for goods trade—three times higher than trade barriers between US states. For services, these estimates barriers are even steeper, equivalent to a 110 percent tariff. See https://www.imf.org/en/News/Articles/2024/12/15/sp121624-europes-choice-policies-for-growth-and-resilience

[47] https://erc.europa.eu/news-events/news/europe-must-prioritize-research-and-innovation-be-competitive

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[52] https://www.mlex.com/mlex/articles/2344845/eu-commission-eyes-pausing-ai-act-s-entry-into-application and https://sifted.eu/articles/eu-ai-act-pause-analysis
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[55] https://www.infosecurity-magazine.com/news/dora-compliance-costs-soar/#:~:text=Compliance%20with%20the%20EU's%20new,over%20%E2%82%AC1m%20on%20compliance.
[56] Se https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Businesses_in_financial_and_insurance_activities_sector#Data_sources_and_availability and https://ec.europa.eu/eurostat/data/database
[57] DORA excludes various entities, such as managers of alternative investment funds; small insurance and reinsurance undertakings; institutions for occupational retirement provision operating pension schemes that have fewer than 15 members; insurance intermediaries, reinsurance intermediaries, and ancillary insurance intermediaries, which are microenterprises or small- or medium-sized enterprises; and post office giro institutions.
[58] See https://www.infosecurity-magazine.com/news/dora-compliance-costs-soar/ Another estimate arrives at similar numbers by finding that ensuring compliance with suppliers affected by DORA increases the workload of the financial services entities by over 200 hours each month, or 2,400 hours year, which comes to 300 full time days – which at a per-employee total cost of €150,000 would come to about €450,000. See https://insio.net/blog/eliminating-the-hidden-costs-of-dora
[59] https://www.mckinsey.com/capabilities/risk-and-resilience/our-insights/europes-new-resilience-regime-the-race-to-get-ready-for-dora
[60] https://digital-strategy.ec.europa.eu/en/library/impact-assessment-regulation-artificial-intelligence
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