

Erixon, Fredrik; Guinea, Oscar

Article

From compliance to constraint: How digital regulation impacts productivity and innovation in Europe

EconPol Forum

Provided in Cooperation with:

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Erixon, Fredrik; Guinea, Oscar (2024) : From compliance to constraint: How digital regulation impacts productivity and innovation in Europe, EconPol Forum, ISSN 2752-1184, CESifo GmbH, Munich, Vol. 25, Iss. 6, pp. 18-21

This Version is available at:

<https://hdl.handle.net/10419/308550>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Fredrik Erixon and Oscar Guinea

From Compliance to Constraint: How Digital Regulation Impacts Productivity and Innovation in Europe

KEY MESSAGES

- A big part of the EU-US productivity gap is due to the EU investing less in ICT-related tangible and intangible capital
- These lower investments are partly explained by EU digital regulations limiting companies' access to modern endowments like data
- Limits to these endowments push EU firms towards a market specialization in less ICT-intensive activities
- The EU has overlooked the full impact of digital regulations by focusing on compliance over these behavioral effects
- The EU must reduce digital regulation restrictiveness to increase the contribution of digital technologies to productivity growth

Mario Draghi's report on European competitiveness is a wake-up call for EU policymakers. It presents several reasons that explain the EU's poor economic performance. Chief among them is that Europe is behind the global frontier in the digital and structural transformation of the economy. Draghi says that "the key driver of the rising productivity gap between the EU and the US has been digital technology" (Draghi 2024, 20).

There are many factors behind Europe's underperformance in the creation and diffusion of information and communication technologies (ICT). One of

these factors relates to the design of its regulations, particularly regulations that pertain to digital markets and technologies. The first part of the article explains how Europe's poor record in ICT investments impacts on its productivity performance. The second section sketches a typology to understand the economic consequences of these regulations. The final section presents the key policy conclusions.

EU-US PRODUCTIVITY DIFFERENCES AND THE ROLE OF ICT

In 1990, labor productivity in the EU and the US was very similar, with each worker's annual output averaging close to USD 53 per hour. However, a gap has since emerged – and it continues to grow – with US labor productivity now nearly USD 15 higher than the EU (Erixon et al. 2024b). The growing productivity gap between both economies can be explained by the difference between the two economies in total factor productivity (TFP) growth. While TFP's contribution to labor productivity has declined in both the EU and the US, TFP made a much more significant contribution in the US than in the EU (Erixon et al. 2024a).

TFP measures how efficiently an economy is producing goods and services. A significant factor increasing TFP is investment in intangible capital. Studies estimate that that one-fifth of intangible capital growth translates into gains in TFP. In other words, when a firm raises its investments in intangible capital by 1 percent, the knowledge spillovers that it generates translate into a 0.2 percent increase in TFP (Corrado et al. 2022). Between 1995 and 2020, the share of investments in intangible capital over gross value added (GVA) was, on average, 5 percentage points higher in the US than in the EU (Erixon et al. 2024a). Many of these intangibles relate to ICT such as databases, AI, and software programs. These ICT intangibles make a strong contribution to productivity and economic specialization. First, digital technologies help make business activities more divisible and create new opportunities for the internationalization of production, not least in services that have long been considered non-tradables. Second, digital sectors include a great deal of R&D activities.



Fredrik Erixon

is an economist and writer, and the Founding Director of ECIPE. He is the author of several books on the international economy, technology, and innovation, including *The Innovation Illusion* (Yale University Press).



Oscar Guinea

is a Senior Economist at ECIPE. He is the author of several studies in the field of international trade, digital markets, industrial policy, and healthcare. He contributes regularly to debates on EU trade policy in newspaper articles and seminars.

The EU and the US also diverge in their levels of investment in tangible ICT infrastructure. Physical assets such as computers, cables, and data storage facilities are necessary to support the deployment of ICT intangible investments. During the 1995–1999 period, both the EU12¹ and the US invested between 4 and 5 percent of non-residential capital into ICT equipment. However, by 2015–2020, this number increased by almost 16 percentage points in the US, while it went up by just 3 percentage points in Europe. (Erixon et al. 2024b).

The EU's sluggish investment in ICT intangible capital and digital infrastructure has resulted in an EU ICT sector that makes a much more modest contribution to Europe's value-added growth than the US ICT sector does to the US economy. As identified in the Draghi Report, this is a drag on the EU economy. First, it dampens the productivity gains from the diffusion of ICT technologies. Second, it undermines future productivity growth in the EU that could come from the next generation of intangible-related innovations, such as AI. Figure 1 shows the contribution of ICT services to value-added growth for the EU12 countries and the US. Though both regions follow a similar downward trend, US ICT services contributed, on average, six times more to value-added growth than in the EU12 (omitting years of negative contribution). (Erixon et al. 2024b).

REGULATORY RESTRICTIONS, TYPOLOGIES, AND ECONOMIC EFFECTS OF EU DIGITAL REGULATION

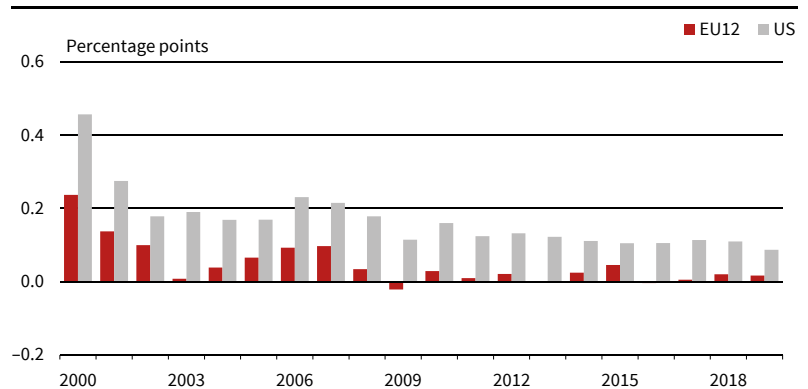
Regulatory restrictions affect the extent to which firms can adopt digital technologies. For instance, restrictive regulation can limit access to digital technologies and services; decrease a firm's ability to use ICT-related intangible capital; and disincentivize firm growth, which hinders efforts to adopt digital technologies. Van der Marel (2020) shows that there is a negative association between digital adoption rates and the restrictiveness of digital regulation across the EU.

Moreover, during recent years, the amount of EU regulation in the digital sector has continued to grow (Sekut and Marcus 2024). As an example, in the case of EU Data and Privacy and E-commerce and Consumer Protection regulation, the number of pages and articles, which can be understood as proxies for regulatory complexity, increased by 833 (pages) and 758 (articles); while the count of the number of times the word “shall” appeared in the regulation, which can be used as a proxy for restrictiveness, grew by 3,673 (Guinea and du Roy 2024).

However, it is not only the volume but also the design of the regulation that matters. EU digital regulations, such as the General Data Protection Regulation (GDPR), the Digital Markets Act (DMA), the Digital

Figure 1

Contribution of ICT Services to Value-Added Growth



Source: EU KLEMS – INTANProd.

© ifo Institute

Services Act (DSA), and the Artificial Intelligence Act (AI Act), cover many different aspects of the digital economy. These comprehensive regulations combine features of product regulation, market access regulation, and regulations governing firms' behavior, concepts traditionally used in competition policy to prevent abuse of market dominance. They are often ambiguous and sources of uncertainty, and they are rarely delineated in ways that conform to traditional concepts of regulation. As such, they are difficult to classify under previous indicators that measure regulatory restrictiveness, such as the OECD Product Market Regulation (PMR) or the OECD Digital Services Trade Restrictiveness Index (DSTRI).

We propose a new way to conceptualize the impact of these new EU digital regulations on the economy. Our starting point is that these regulations profoundly affect economic endowments. Historically, economists studied three key endowments: land, labor, and capital. Countries with abundant land, for example, often specialized in agriculture. By contrast, those with less land but an abundance of labor focused on labor-intensive industries, like manufacturing. As the economy has modernized, some endowments (such as land) have become less significant, while modern endowments, such as data and digital competencies, have emerged.

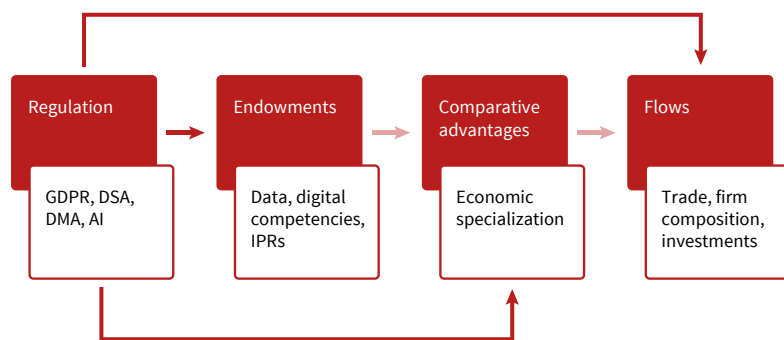
These digital endowments (many of them tangible and intangible ICT-related capital) are exploited by firms to create different comparative advantages within the economy. However, regulations play a crucial role in the ability of firms to transform these endowments into advantages. For instance, if digital regulations restrict access to endowments like data, firms may import goods and services with these endowments embedded – provided it is allowed. In such cases, downstream services can still function, but the regulation limits sectors and firms to specific segments of the supply chain.

Regulations do not influence only advantages but also the flows that result from these advantages. For example, a regulation can affect the portability of data between countries, which impacts their ability

¹ EU12 countries include: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain.

Figure 2

Model for Understanding the Behavioral Effects of Regulation



Source: Authors' own compilation.

© ifo Institute

to export digital services. Digital regulations can also affect the relative balance between firms that are old or young, or big or small. For instance, digital regulations can limit access to endowments, such as data, through restrictions on intermediate services, making it more expensive for firms to access these endowments through the market. Indirectly, these regulatory restrictions benefit big companies, with access to in-house data processing, and penalize younger and smaller ones, which are more dependent on the market to access these endowments, making it harder for them to grow, thereby lowering their productivity and inhibiting their innovations. This has negative knock-on effects on the economy (Barone and Cingano 2011; Ferracane and van der Marel 2021, 2020a, and 2020b).

Figure 2 presents this conceptual framework. It describes how regulations impact modern endowments, advantages, and flows. At the same time, simply by limiting access to endowments, regulations

shape the way firms create different comparative advantages and specializations, which ultimately lead to specific economic flows such as trade, changes in firm demographics, and investments.

These effects have been identified empirically in the case of the GDPR. Article 5 of the GDPR limits firms' ability to combine data for purposes other than those originally intended. These limitations on endowments affect Europe's comparative advantage. For example, EU firms had to destroy substantial amounts of data upon the entry into force of the GDPR. Forward data endowment creation was also damaged: EU firms stored 26 percent less data on average than US firms two years after the GDPR, and reduced computation relative to US firms by 15 percent (Demirer et al. 2024). Ultimately, GDPR also contributed to changes in flows such as innovation, with new app (Janßen et al. 2022) entries falling by half, and firm demographics in favor of older and bigger companies (Chen et al. 2022).

The DSA, DMA, and AI Act have been approved too recently for empirical evidence to emerge. However, since these regulations are also all-encompassing, the conceptual framework in Figure 2 helps us foresee some of the potential impacts on economic endowments, comparative advantages, and flows.

The DMA builds on the assumption that the combination of endowments or assets should be prevented when pursued by gatekeeping platforms. A core aspect of the DMA has the explicit intention of making it more difficult for firms to combine different sets of data. The obvious result is that gatekeeping firms will have to reduce the usefulness and competitiveness of the services they provide or could potentially offer in the future, impacting advantages and flows for EU firms. This is one of the reasons why some US firms have decided to pause the introduction of new data and AI services in the EU.

Endowments and advantages may also be impacted by the DMA with regard to scale. First, the threshold defining the designation of gatekeepers could incentivize digital firms to self-impose limitations on scale to avoid burdensome regulatory obligations. Second, the DMA is likely to reduce the incentives for outsourcing business activities to third parties. Finally, the AI Act defines the degree of regulatory restrictions based on the ethical risks associated with certain types of AI development. This approach tends to discourage offshoring and favors corporate solutions that make business activities indivisible, favoring large and established companies over younger and smaller ones, which are more dependent on intermediate services to buy the endowments they require for their products.

For the economic effects of new types of data regulation to be understood, new conceptual frameworks are necessary. Moreover, it is also required that the regulator, in the first place, is interested in factoring in economic effects when regulations are designed. The past decade of new data regulations in

Table 1

Cost Identified in the EU IAs for the GDPR, DSA, DMA, and IA Act

Regulation	Identified costs
GDPR	Large companies need to designate data protection officers and conduct data protection impact assessments. The IA identifies the risk of slow innovation. However, quantification of this risk is not provided.
DMA	Gatekeepers need to hire compliance officers and additional employees to handle regulatory inquiries. The IA identifies negative impacts on gatekeepers' profits and investments in innovation and recognizes that gatekeepers' innovations can spread to smaller companies. However, these negative impacts on profits and innovation investments are not quantified.
DSA	Large platforms face new obligations for transparency, content moderation, and reporting requirements. Platforms need to invest in new systems for handling users' complaints and complying with due diligence obligations. The IA recognizes that these compliance costs can have negative effects on the growth and innovation of European online platforms. However, innovation slowdowns and reduced investments were not quantified.
IA Act	High-risk AI applications must ensure the transparency, accuracy, and robustness of algorithms. This includes third-party conformity assessments and audits. These requirements result in substantive administrative costs in the form of documentation and reporting requirements. The IA recognizes that some firms may shift their focus from high- to low-risk applications, potentially reducing investments in more advanced AI solutions. However, the cost of investment displacement was not quantified.

Source: Authors' compilation.

the EU is in many ways an example of the opposite: the regulator has rather seemed actively disinterested in learning about the potential economic effects of the new regulations.

There were many weaknesses in the economic analyses conducted by the EU. However, the main weakness was that it completely disregarded the dynamic or behavioral costs of these regulations. Remarkably, as can be seen in Table 1, the only costs identified and quantified in the impact assessments (IAs) were direct compliance and administrative costs – and, as far as the GDPR is concerned, the observed ex-post compliance costs were far higher than those estimated in the IA. However, for these far-reaching regulations, the main costs are not the compliance burden, but the behavioral and downstream economic effects spurred by their implementation.

The conceptual framework in Figure 2 clearly shows that these regulations prompt firms and markets to change their current and future behavior. These changes manifest in the way firms access endowments, find their comparative advantages, and result in specific flows where some digital activities are penalized. As a result, the EU economy continues to be dominated by non-digital activities, dragging its performance down. Unsurprisingly, investments in tangible and intangible ICT-related capital and the contribution of ICT to the economy are much smaller in the EU than in the US, where the level of regulatory restrictions for the digital economy is much lower.

POLICY CONCLUSIONS

In this article we have argued that:

- The EU ICT sector makes a smaller contribution to the EU's value-added than the contribution of the US ICT sector to the US economy. This lower contribution can be explained by the EU's lower levels of investments in tangible and intangible ICT-related capital compared to the US economy.
- These lower levels of investment can be further explained by higher levels of restrictiveness in EU digital regulations. These regulations primarily affect firms operating in industries that are heavily reliant on digital technologies. This is significant because the creation and adoption of ICT are key drivers of higher productivity growth.
- The EU has failed to understand and quantify the full impact of its digital regulations, as it has focused on the administrative and compliance costs rather than the behavioral effects on firms, which account for the largest impacts of these regulations.
- We propose a conceptual framework that emphasizes these behavioral effects. This framework is based on digital endowments, advantages, and flows. Regulations that limit access to digital endowments, such as data, incentivize firms to specialize in less data-intensive activities. This market specialization leads to a flow of production, trade, and investment where non-digital activities play a larger role in the overall economy, to the detriment of digital ones.
- The true extent of the economic effects of the EU's digital regulations is already apparent in the case of the GDPR. Given that other EU digital regulations, such as the DSA, DMA, or the AI Act, are also all-encompassing, similar effects to those identified for the GDPR can be expected from these regulations.

REFERENCES

- Barone, G. and F. Cingano (2011), "Service Regulation and Growth: Evidence from OECD Countries", *Economic Journal* 121, 931–957.
- Chen, C., C. B. Frey and G. Presidente (2022), "Privacy Regulation and Firm Performance: Estimating the GDPR Effect Globally", *The Oxford Martin Working Paper Series* 22(1).
- Corrado, C., J. Haskel, C. Jona-Lasinio and M. Iommi (2022), "Intangible Capital and Modern Economies", *Journal of Economic Perspectives* 36(3), 3–28.
- Demirer, M., D. J. Jiménez-Hernández, D. Li and S. Peng (2024), "Data, Privacy Laws and Firm Production: Evidence from the GDPR", *NBER Working Paper* 32146.
- Draghi, M. (2024), *The Future of European Competitiveness: A Competitive-ness Strategy for Europe*, European Commission, Brussels.
- Erixon, F., O. Guinea and O. du Roy (2024a), "The EU's Productivity Performance: Falling Behind the Curve", *EconPol Forum* 25(3), 23–27.
- Erixon, F., O. Guinea and O. du Roy (2024b), *Keeping Up with the US: Why Europe's Productivity Is Falling Behind*, ECIPE, Brussels.
- Ferracane, M., J. Kren and E. van der Marel (2020a), "Do Data Policy Restrictions Impact the Productivity Performance of Firms and Industries?", *Review of International Economics* 28, 676–722.
- Ferracane, M. and E. van der Marel (2020b), "Patterns of Trade Restrictiveness in Online Platforms: A First Look", *The World Economy* 43, 2932–2959.
- Ferracane, M. and E. van der Marel (2021), "Do Data Flows Restrictions Inhibit Trade in Services?", *Review of World Economics* 157, 727–776.
- Guinea, O. and O. du Roy (2024), *Rules without End: EU's Reluctance to Let Go of Regulation*, ECIPE, Brussels.
- Janßen, R., R. Kesler, M. E. Kummer and J. Waldfogel (2022), "GDPR and the Lost Generation of Innovative Apps", *NBER Working Paper* 30028.
- Sekut, K. and J. S. Marcus (2024), *Simplifying EU Law: A Cumbersome Task with Mixed Results*, Bruegel, Brussels.
- Van der Marel, E., F. Erixon, O. Guinea and P. Lamprecht (2021), *Are Services Sick? How Going Digital Can Cure Services Performance*, Bertelsmann Stiftung, <https://www.bertelsmann-stiftung.de/en/media-center/media/mid/default-d4ed79da3f>.