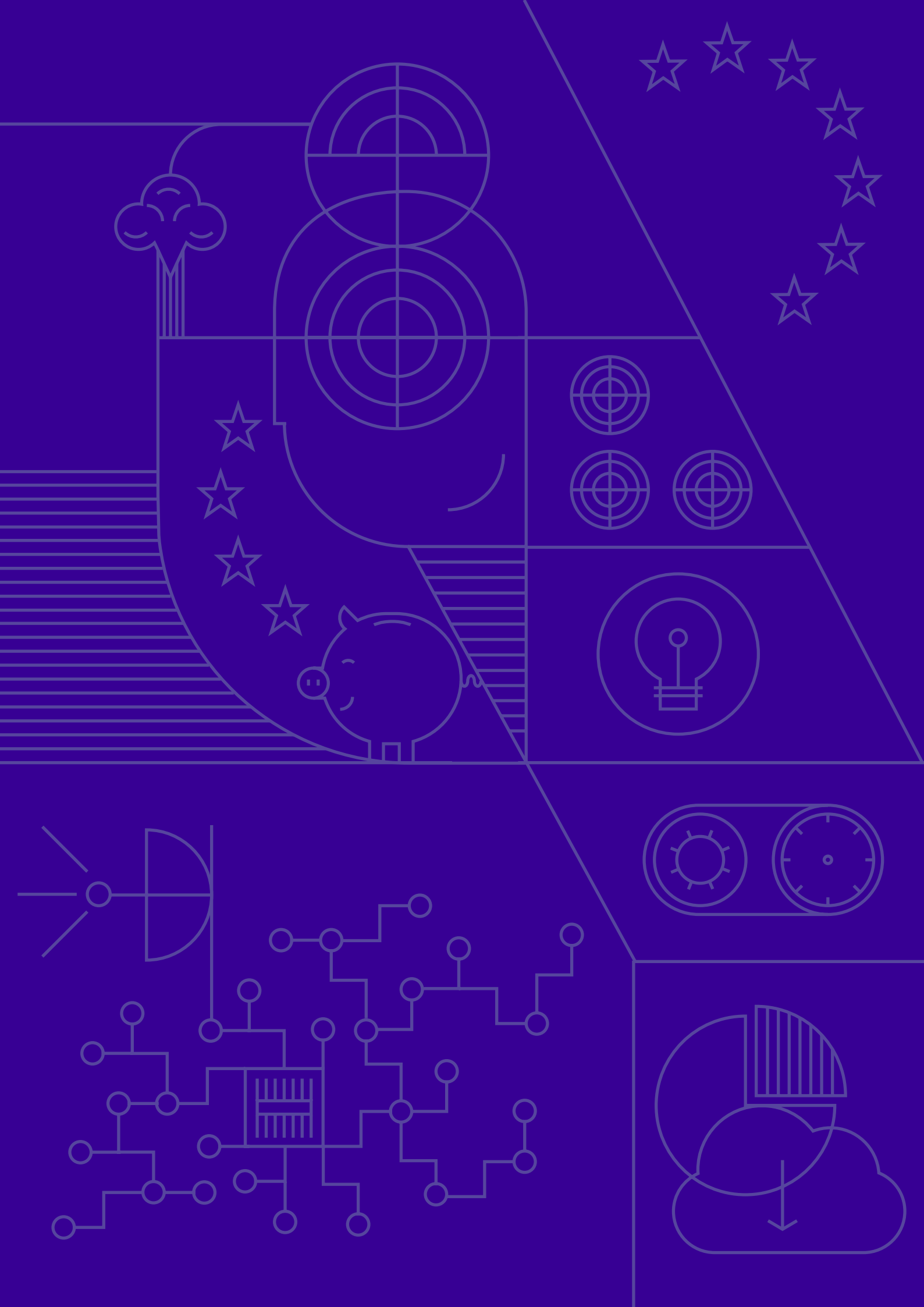
POLITYKA INSIGHT | **RESEARCH**

THE BRAVE DIGITAL WORLD

IS THE EU READY TO COMPETE?



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Warsaw, April 2020

The report was produced in partnership with Allegro. The report is impartial and objective; the partner had no influence over its thesis or content.

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10 key facts about EU Techs

1. EU Techs are technology companies that provide products or services over the internet and are of European origin. They are mainly scale ups, i.e. companies that are already significant and well-known players in their field. EU Techs should therefore be differentiated from start-ups, which are at a different level of business development.

2. There are over 4.5 thousand companies in the EU that can be labelled EU Techs. The largest number are incorporated in the UK and Germany. Among new member states, the largest number of EU Techs are located in Poland.

3. EU Techs are the largest contributors to the EU's data economy, which makes up 2.6 per cent of the common market GDP.

4. Two-thirds of EU Techs provide IT services and consulting. The second-largest group is firms producing software, from mobile applications to CRM and ERP system providers. The smallest group is online service providers – developers of search engines, e-commerce and auction services or internet gaming providers.

5. In the 2018 fiscal year, EU Techs generated a total revenue of EUR 414bn. The highest total revenue in relation to economy size is generated by EU Techs incorporated in Luxembourg (10.6 per cent), Poland (6.0 per cent) and Ireland (5.3 per cent).

6. EU Techs employ 2.2m people in total, comprising 0.9 per cent of total EU employment. The greatest number of employees work in French, German and UK companies which, together with those in Finland, Ireland and Sweden, are the only companies which have an above-average share of EU Tech employment in the country's economy.

7 The average compensation per employee in EU Techs is EUR 58,600 gross annually. This means that a typical worker receives EUR 32,200 annually in net salary. Overall, this gives a total net income for all EU Tech employees of EUR 72bn.

8 EU Techs pay approx. EUR 7bn of corporate income taxes annually to member states' governments. The highest effective CIT rate is paid by online service providers (over 30 per cent).

9 EU Techs share in 7.4 per cent of all investment outlays of non-financial EU corporations and in 1.8 per cent of total gross fixed capital formation in all member states.

10 EU Techs have a higher market share than technology companies from outside the EU in the common market, in business activities including internet security and transaction services, enterprise software development, and e-commerce and auction services.

Key regulatory takeaways

The EU needs to be clear about the necessary trade-offs in its approach to the digital era.

- The dual-use (commercial and military) nature of digital technologies and the strong first mover advantage characterizing the sector pose a threat to EU's economic and political success.
- The traditional strategy of prioritizing further integration within the internal market and focusing on the interests of EU consumers will not be enough to safeguard the EU's strategic autonomy.

The existing legislative landscape does not adequately address these broader strategic concerns.

Regarding consumer protection, decentralized law enforcement fails to ensure a level-playing field between EU-based platforms and companies operating from outside the EU.

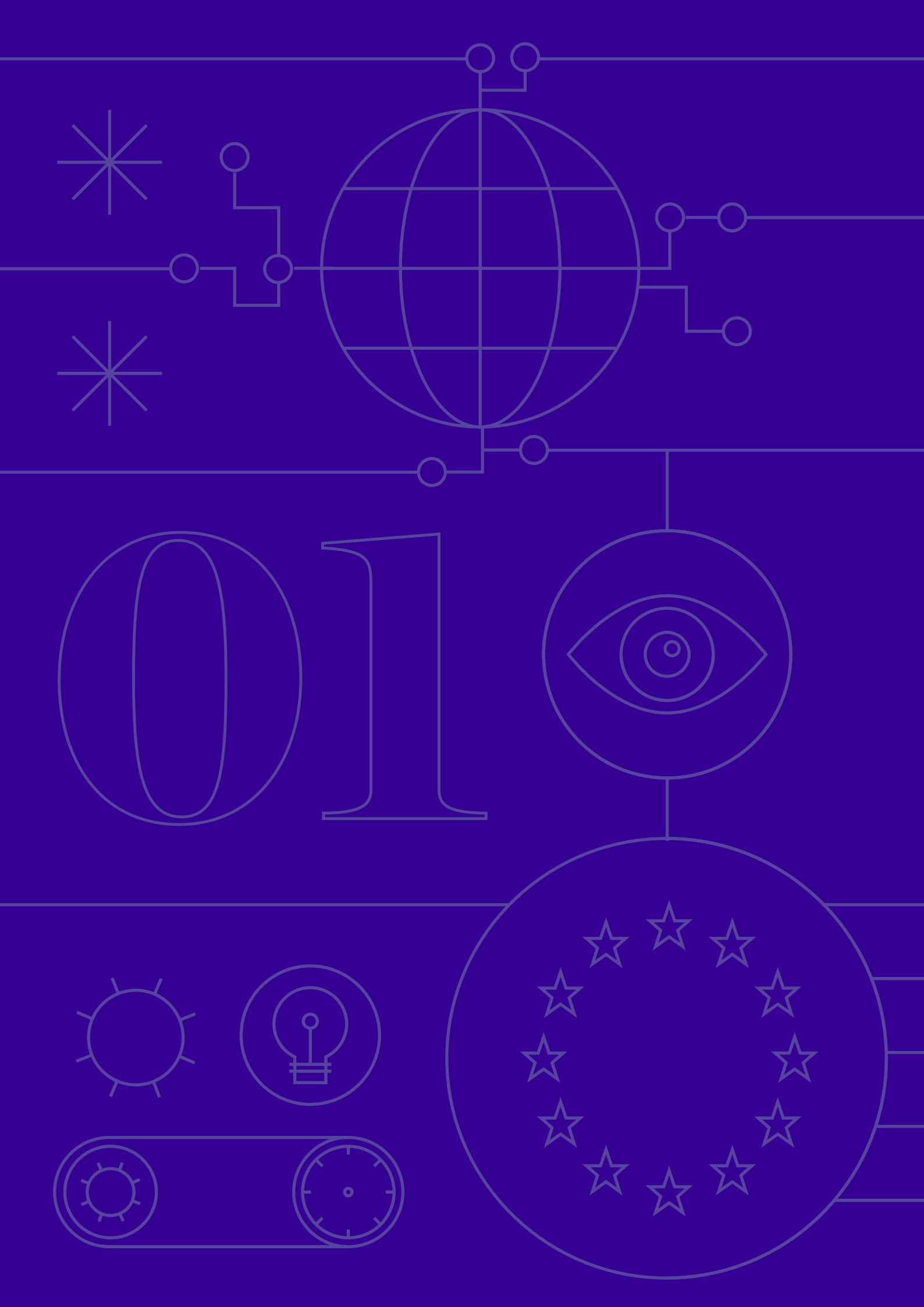
- The inability to effectively enforce EU regulations towards non-EU entities trading within the internal market is a significant threat to European online buyers and sellers alike.

In particular, the EU's policy towards the digital sector and platforms is influenced by concerns about global giants in the marketplace. This one-size-fits-all approach is most damaging to EU-based scale-ups operating in the sector.

- It imposes disproportionate costs on EU-based platforms, diverting resources from the product innovation required for such companies to compete with global giants.

The European Union is faced with two major challenges when it comes to developing artificial intelligence technologies: domestic and foreign.

- The uptake of AI in the EU is slow, made worse by limited raw material—data—and the capacity to analyse it.
- In contrast, the U.S. and Chinese AI sectors are growing rapidly thanks to more available data, more flexible regulatory frameworks, and easy access to capital.
- Instead of aspiring to catch up in the long term, the EU has to focus on reducing its competitive disadvantage in the sector immediately. A failure to act quickly will permanently limit the EU's potential.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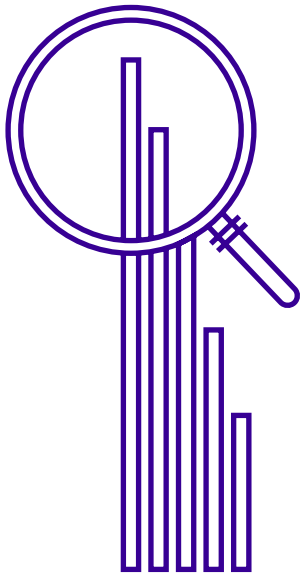


The role of EU Techs in the European economy

The digital market is one of the fastest-growing sectors within the European Union's economy, with double-digit growth rates in almost all member states[1]. Further development of the digital market in the future is also expected, with the introduction of advanced infrastructure, like 5G technology, and the rapid development of new software and applications, as well as increased use of public and private cloud platforms. According to IDC and Lisbon Council estimates,[2] **the share of the data economy in GDP can, in an optimistic scenario, reach 6.3 per cent by 2025, compared to 2.6 per cent in 2018**. Development of the Internet of Things (IoT), Industry 4.0, big-data analysis software and machine-learning tools, aka artificial intelligence (AI), will heavily contribute to that growth – if the EU's regulatory framework allows European technological companies (EU Techs) to reach a competitive position against their competitors from the U.S., Japan or China. In a worst-case scenario, in which various EU regulations—from tax and social security payment schemes, to personal data protection directives and cybersecurity rules—reduce the capacity of EU Tech firms to monetize new intellectual property (IP), the share of the data economy could increase in the next half-dozen years in the EU only to 3.5 per cent of GDP.

1 In our analysis we include Great Britain as an EU country, as they still remain (at least until the end of 2020) a part of the EU's single market.

2 IDC, Lisbon Council (2019), *The European Data Market Monitoring Tool: Key Facts & Figures, First Policy Conclusions, Data Landscape and Quantified Stories. Update of the European Data Market Study SMART 2016/0063*, European Commission.

What are EU Techs?

Before we can analyse the impact of the institutional framework on the EU's digital economy, and their own economic footprint, It is important to clarify what we mean by EU Techs. It is becoming increasingly difficult to pinpoint which companies can be labelled EU Techs. According to a layman's definition, an EU Tech is a company employing a "variety of digital business models that Europe has produced, from music services to next-generation search and information management, online advertising, mobile games, file sync and sharing, and platforms for dating, e-commerce, and mobility"[3]. Therefore, **EU Techs can be seen as service companies which provide products or services over the internet as enabling technology**.

The European Union data economy accounts for 2.6 per cent of its GDP.

EU Techs are mostly of European origin. This refers to companies, which – regardless of the nationality of their current shareholder or owner – run an independent business with European headquarters, and have a European focus in their communication strategy and business decisions i.e. employ workers from European countries, pay taxes to local governments or closely cooperate with European suppliers and have R&D departments located in Europe. Moreover, they should support and engage in building an effective and competitive digital single market.

EU Techs should also be differentiated from European start-ups – though start-ups also contribute to the European economy and share a European identity, they are at a different level of business development. EU Techs are scale ups –

3 European Tech Alliance, *Europe's Tech Vision Five Years from Now*. Available at https://web.tresorit.com/l#aSzN6GUbO2vSaiaFHbUI5w (accessed 10.10.2019).

companies that are already significant and well-known players in their field. These companies already have a large impact on the European economy, through increasing the level of employment, GDP and tax revenues, as well as through delivering new technological solutions that can be used by others within the common market. As a result, they are a cornerstone of the European value chain, enabling the existence of many start-ups through buying and using their cutting-edge solutions, and contributing to lower transaction costs for other non-tech European companies, from FMCG manufacturers, through music, games and film producers to firms providing business support services – consulting agencies, law firms or real estate agencies. There are already plenty of positive examples of EU Techs stretching from e-commerce (Zalando, Allegro), through music streaming (Spotify, Deezer) and ride-hailing apps (Bolt, FreeNow), to business analytics tools' providers (Brand24, Sentiance).

How large is the data economy in the EU?

According to IDC and Lisbon Council estimates[4], in 2018 the EU data economy, as defined above, grew by 12 per cent from 2017 and was worth EUR 378bn, accounting for 2.6 per cent of the EU28 GDP. Estonia developed the largest and fastest-growing data economy, with a share of GDP of 4.3 per cent, followed by the United Kingdom (3.5 per cent), Germany and the Netherlands (3.1 per cent each). At the other end of the scale was Greece (0.9 per cent), Luxembourg (1.1 per cent) and Poland (1.2 per cent), where the large share in other business activities, like financial services, heavy industry, agriculture and fishing, limits the input the data economy can have within their total production.

EU data economy grew by 12 per cent in 2018 and is expected to double till the mid-20s.

4 IDC, Lisbon Council (2019), *The European Data Market Monitoring Tool*.

Out of the 2.6 per cent of GDP generated by the data economy across 28 EU member states, only 0.5 percentage points is created by the data market itself. The rest of the added value is allocated mainly in downstream companies, i.e. firms that benefit from using data-related goods produced by data users (1.2 percentage points), and which is generated by induced effects (0.9 percentage points). This means that EU Techs – located mainly in the upper stream of the EU value chain – contribute to the development of small and medium enterprises (SME) – their usual contractors – within the common market. They use technological and business solutions developed by EU Techs , thanks to which they can lower costs, increase their productivity and reach new clients, eventually becoming more competitive in comparison to their peers from outside of the EU.

715,000 firms from the EU are data users, what accounts to 6.8 per cent of all companies.

These indirect and induced outcomes caused by EU Techs are often omitted in public opinion and by European decision makers, as the general discourse – which also concerns the digital single market – is mainly concentrated on business relations between global technological companies and their EU customers or local tax offices. However, these effects are also crucial for the growth of the common market in the age of a digital revolution. According to IDC and the Lisbon Council there are 715,000 firms which can be classed as downstream contractors, aka data users, registered in 28 EU member states. They constitute 6.8 per cent of all active legal entities in the EU, with a double-digit share in the Netherlands (12.6 per cent of companies), the UK (11.7 per cent) and Ireland (10.2 per cent).

Data users are distributed across all economic sectors, with the largest number providing professional services (26 per cent of all data users), as well as industrial companies (19 per cent), which are mainly manufacturers introducing Industry 4.0 solutions. An equal share (12 per cent) of data users are active in the transportation and storage, retail and wholesale sections of the economy. A fast-growing group of data users are companies in the healthcare sector. Despite a small number (41,000 EU legal entities) of data users from the financial sector, these constitute the largest share of data users in their section of the economy (19.7 per cent). This means that **one in five financial or insurance EU firms already operate within the digital age**, and are able to use data techniques and digital solutions to engage their customers.

Map 1, p.16
Data economy in the EU28

Map 2, p.17
Data users in the EU28

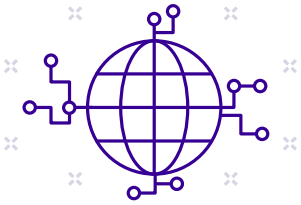
What is the economic footprint of EU Techs?

We have identified 4,629 entities that can be labelled as EU Techs.[5] The largest number of them are incorporated in the UK (945 entities or 20 per cent of all EU Techs) and Germany (915). Other countries with a double-digit share of EU Techs are France (628) and Italy (441). Among new member states, the largest number of EU Techs are located in Poland (184 firms or 4 per cent of the population). A surprisingly small number of European technological scale-ups are registered in Ireland (68) and the Netherlands (57), which are hubs for foreign-owned Techs and many start-ups.

Two-thirds of EU Techs provide IT services and consulting (3,073 firms), out of which 1,500 have computer programming as their main business. The second-largest group (1,325) is firms producing software, from mobile applications to CRM and ERP system providers. The smallest group is online service providers (231)—developers of search engines, e-commerce and auction services or internet gaming providers. However, at the same time this group has the largest average revenue per company, at EUR 173m annually, compared to EUR 86m in the IT services and consulting group and EUR 83m for software developers.

5 A detailed definition of an EU Tech and data sources are presented in the technical annex.

EU Techs generate a total revenue of EUR 414bn annually, equal to 2.6 per cent of the EU28 GDP in 2018. Interestingly, the highest total revenue in relation to the size of economy is generated by EU Techs incorporated in Luxembourg (10.6 per cent), Poland (6.0 per cent) and Ireland (5.3 per cent). Countries where EU Techs have a negligible impact on the economy are Portugal, Slovakia and Croatia (0.2 per cent each).



We have identified 4,629 entities that can be labelled as EU Techs.

The share of EU Techs in overall EU employment is small, as technology companies boast high productivity per worker. They employ 2.2m people in total, comprising 0.9 per cent of total EU employment. The greatest number are employed by French tech companies (741,000), which also have the second-highest share of total employment among EU countries, after Luxembourg. French Techs are followed by German (416,000) and UK (330,000) companies, which together with the Finnish, Irish and Swedish are the only companies which have an above-average share of EU Tech employment in the country's economy.

Graph 1, p.14
EU Techs in
EU28 countries

The high productivity of EU Techs results into high wages for their workers, mostly IT specialists and talented managers. According to our estimates, the average compensation (gross wage plus social security contributions paid by the employer) per employee in EU Techs is EUR 58,600 annually. Taking into account the typical EU tax wedge of around 45 per cent, this means that a typical worker receives EUR 32,200 annually in net salary. Altogether this gives a total net income for all EU Tech employees of EUR 72bn,

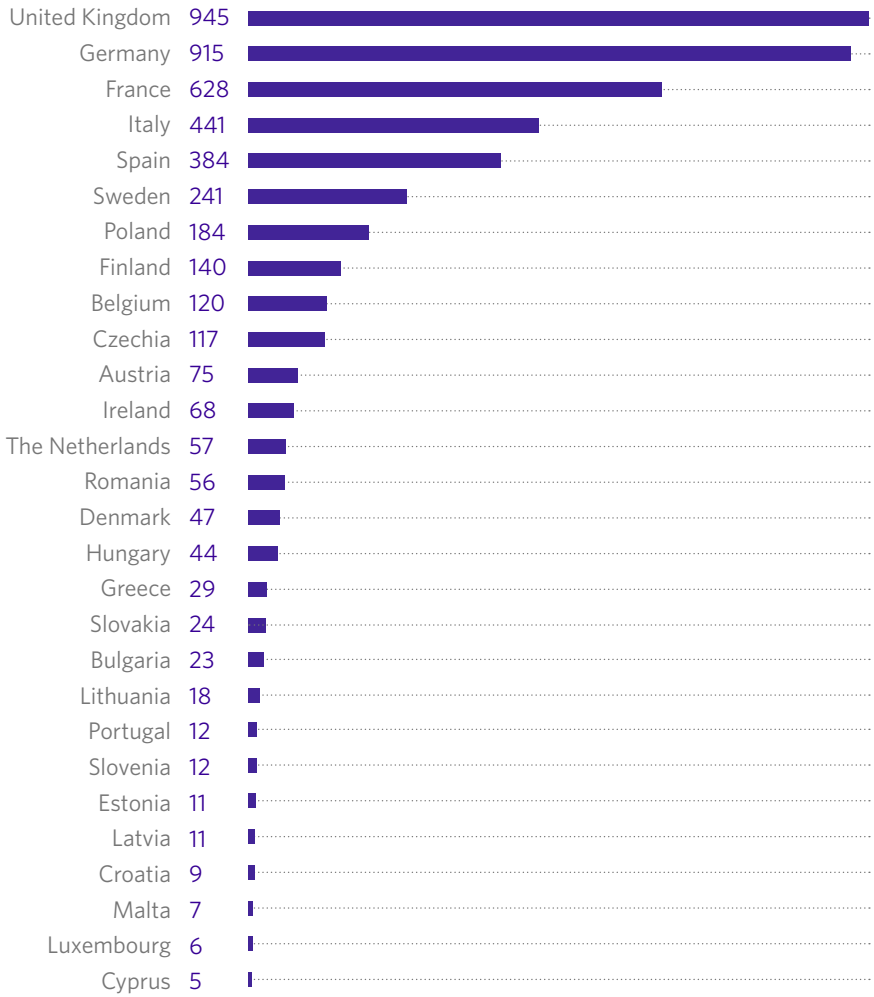
Graph 1. EU Techs in EU28 countries.

Number of EU Techs by Member State in 2018.

Source: Thomson Reuters, own calculations.

Total EU28

4,629



the highest wages are paid in the largest IT hubs, led by Copenhagen (EUR 104,000 in compensation per employee), Munich (EUR 97,000) and London (EUR 87,000).[6]

In contrast to foreign-owned technological companies, **EU Techs provide substantial contributions to EU member states' budgets**. Their average CIT rate in the last five years was 26 per cent of their gross income, which by our calculations generates EUR 7bn in additional EU government revenues per year. And this number does not include income taxes paid by EU Tech employees and the VAT revenues from goods EU Techs offer. Interestingly, the highest effective CIT rate is paid by online service providers (over 30 per cent).

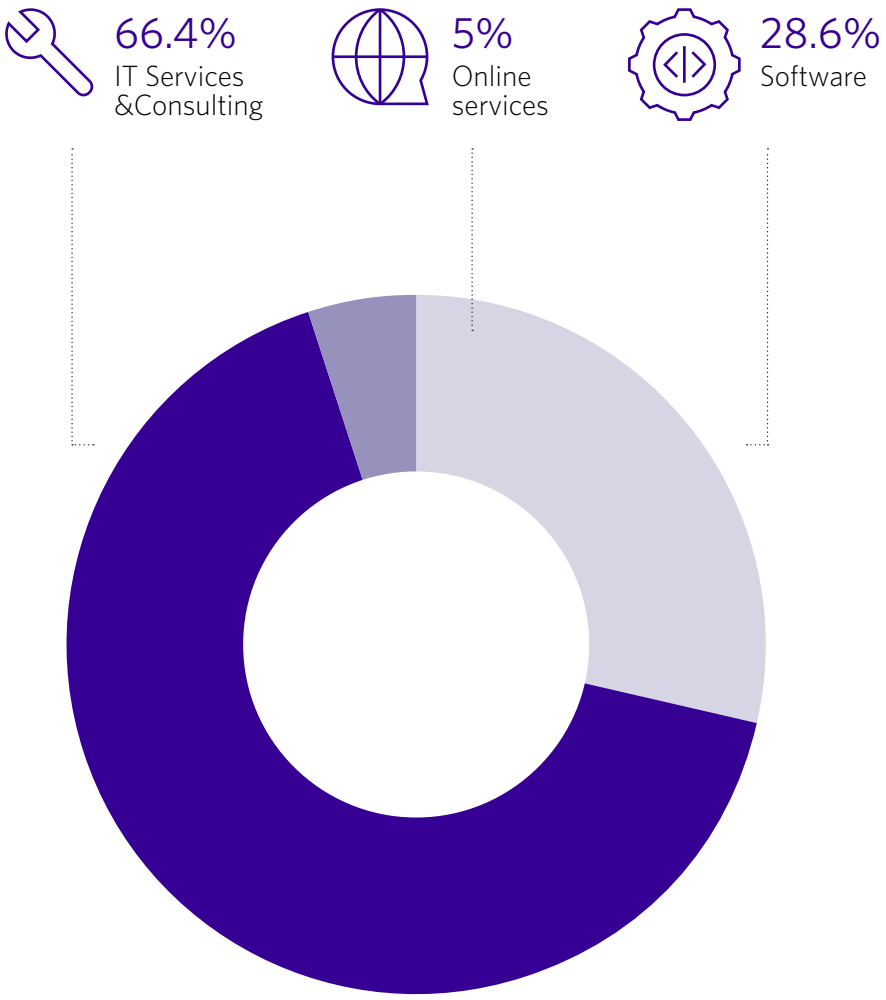
Graph 3, p.18
Total revenue of EU Techs (% of GDP)

6 Own calculations based on AON/CBRE data.

Graph 2. EU Techs by business activity.

Number of EU Techs by TRBC business activity group in 2018.

Source: Thomson Reuters, own calculations.



EU Techs pay annually to member states' governments approx. EUR 7 bn in corporate income taxes.

Last but not least, **EU Techs also make a substantial contribution to gross fixed-capital formation**, as they have large investment needs and are among the leaders in R&D expenditures. Our analysed group of 4,000 technological companies spends annually about EUR 60bn on new investment, which comprises 1.8 per cent of total EU investment outlays, or as much as 7.4 per cent if only expenditures of non-financial corporations are taken into account.

Map 1. Data economy in the EU28.

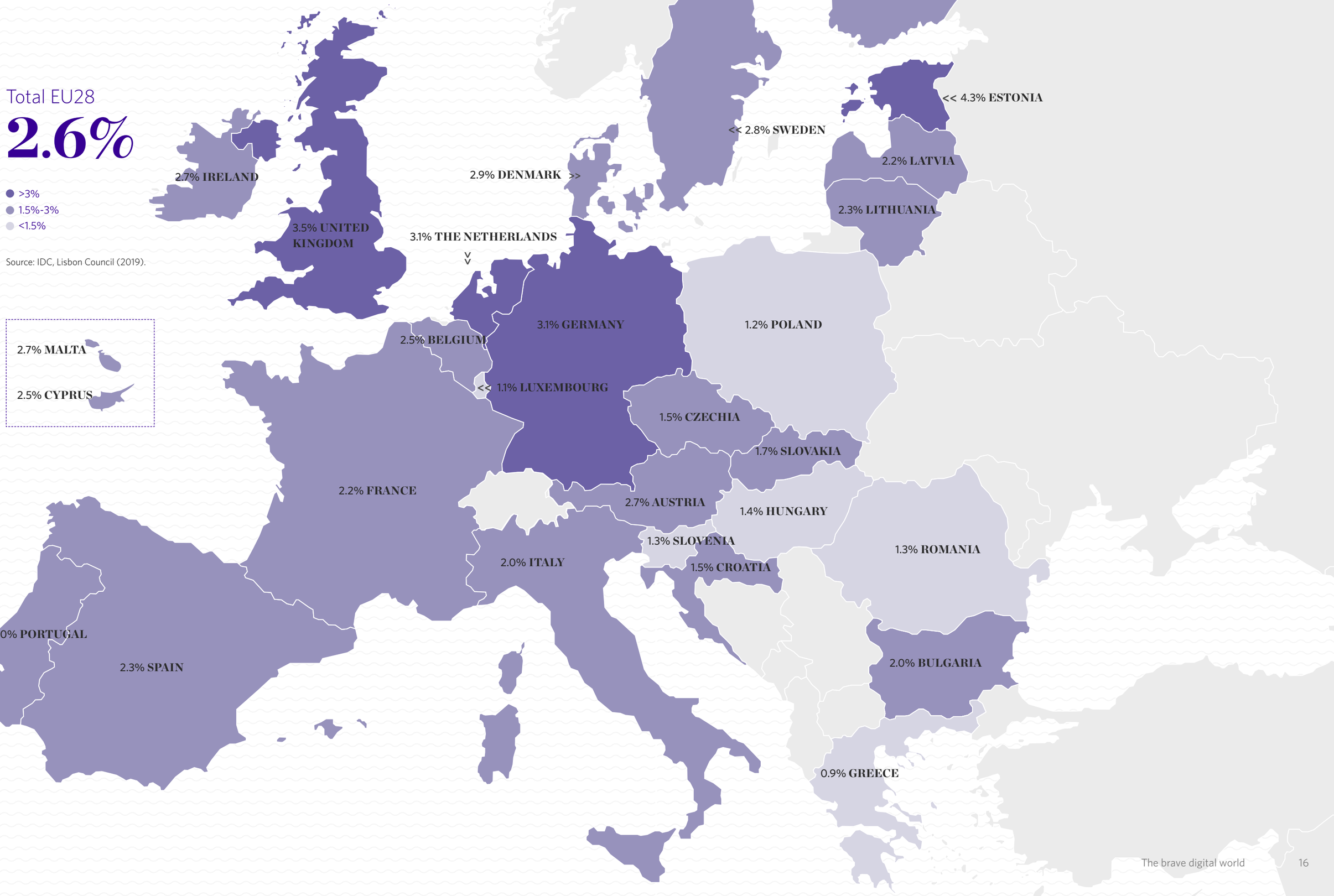
Data Economy Value (Direct, Backward, Forward and Induced Impact) by Member State (% of GDP) in 2018.

Total EU28

2.6%

- >3%
- 1.5%-3%
- <1.5%

Source: IDC, Lisbon Council (2019).



Map 2. Data users in the EU28.

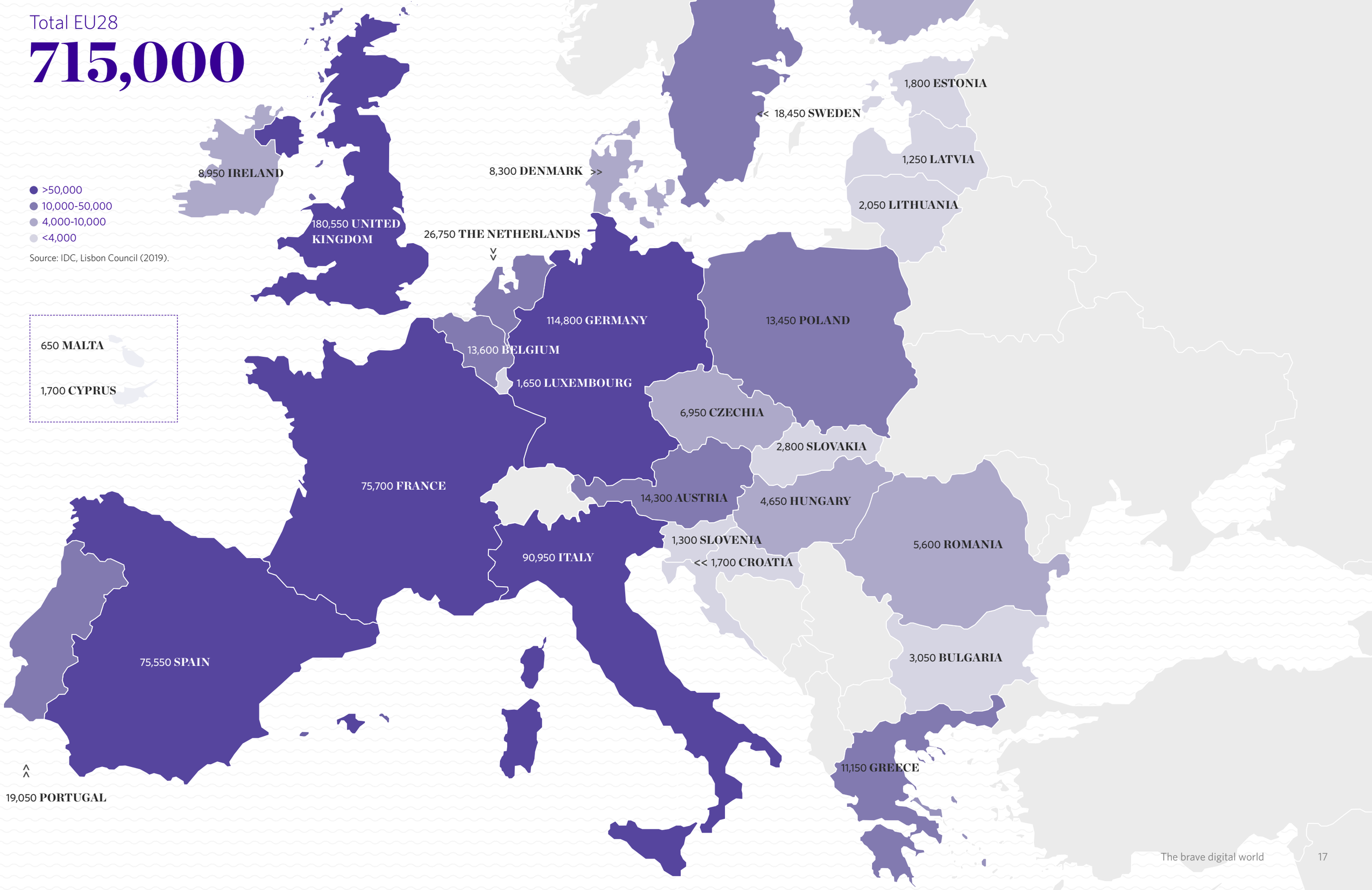
Number of Data Users by Member State in 2018.

Total EU28

715,000

- >50,000
- 10,000-50,000
- 4,000-10,000
- <4,000

Source: IDC, Lisbon Council (2019).



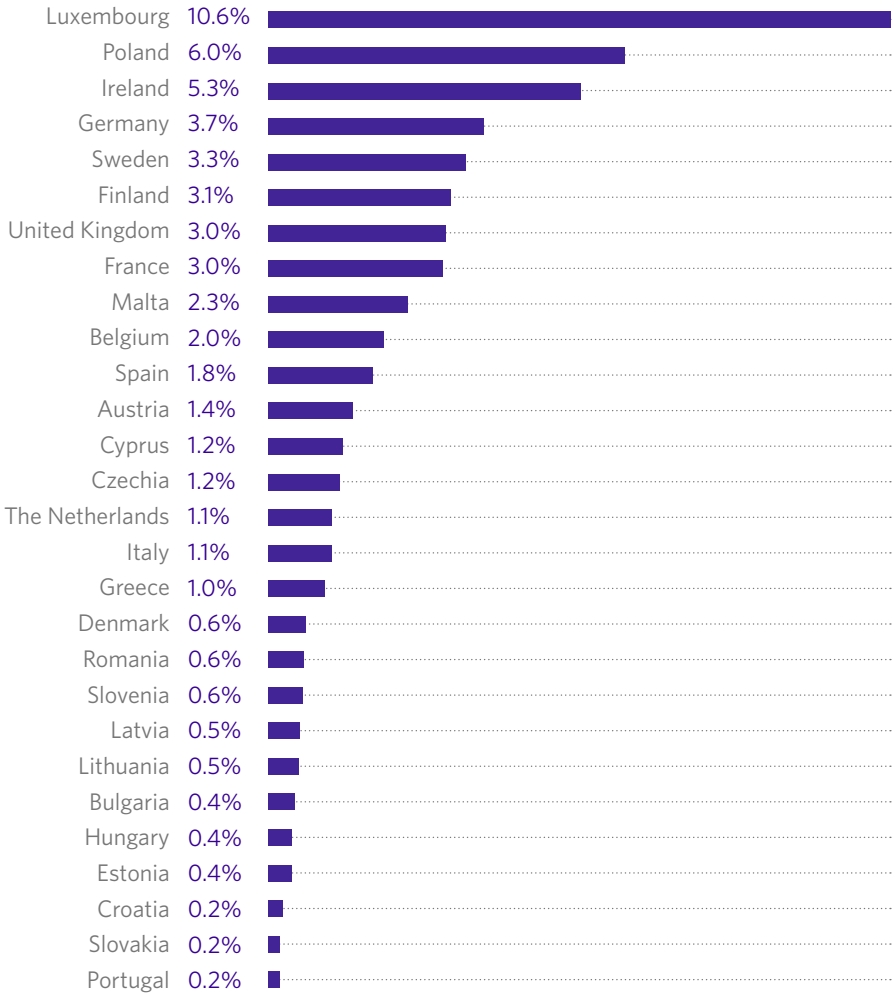
Graph 3. Total revenue of EU Techs (% of GDP).

Total revenue of EU Techs as of FY2018 by Member State (% of GDP).

Source: Thomson Reuters, own calculations.

Total EU28

2.6%



EU Techs vs. Global Techs in the common market

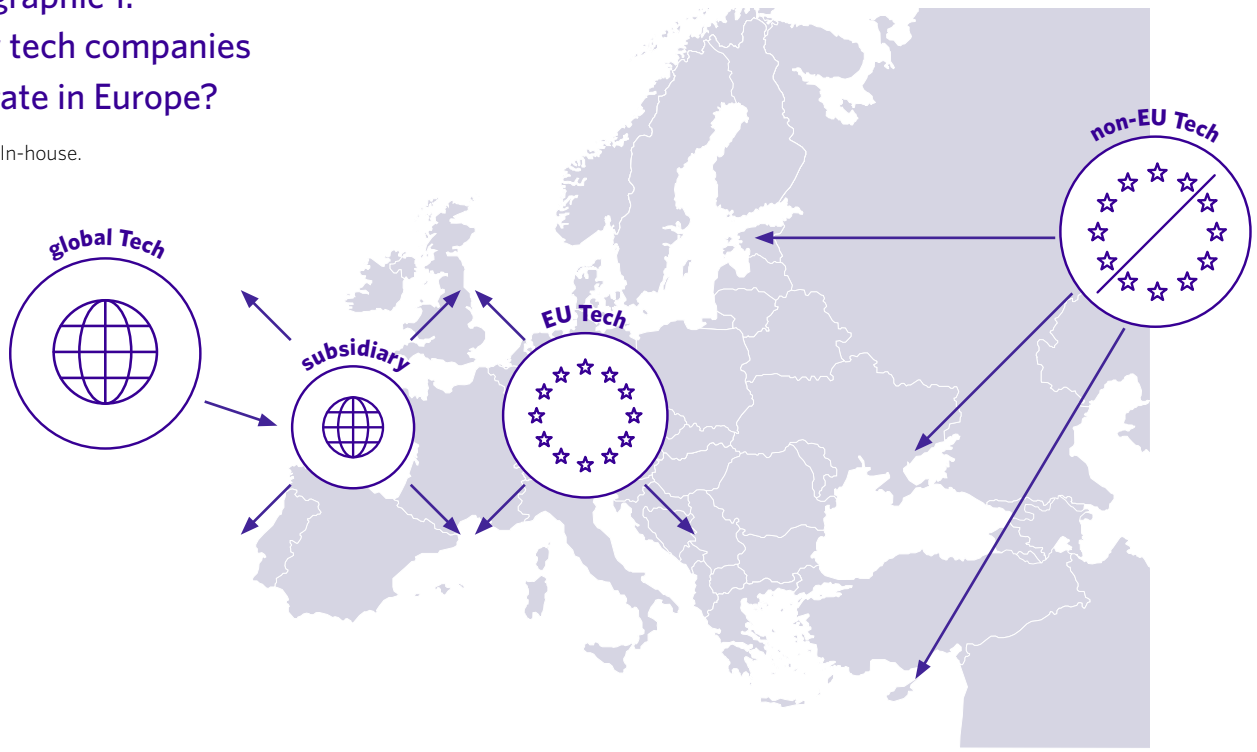
The European market for digital services is divided between three types of technology companies: the EU Techs described above, global corporations (Global Techs) which operate within the common market through EU-based subsidiaries, and non-EU Techs which offer their services from outside the European Union. Below we will discuss how they share the market, the impact on the EU economy, and its consequences for competition within the common market.

There are 808 Global Techs subsidiaries registered in EU countries (including UK). The vast majority are owned by US-based companies (62 per cent of the total population) and the rest mainly by Japanese (8 per cent), Swiss (5 per cent), Canadian (4 per cent) and Indian (3 per cent) firms. The split between US Techs' subsidiaries and subsidiaries from other countries is even larger when we focus on

the total revenues generated within the EU, instead of the quantity of registered entities: technology companies with US headquarters generate 81 per cent of Global Techs' revenues within the common market.

Infographic 1. How tech companies operate in Europe?

Source: In-house.



Map 3, p.22 Employment in EU Techs by country

Infographic 2, p.20 Country of origin of Global Techs' subsidiaries active in the EU market

Global Techs' subsidiaries generate EUR 150bn of revenue within the EU, comprising 27 per cent of the whole common market for Techs services. At the same time they employ only 342,000 people, or 13 per cent of the total employment of EU-registered technology companies. This suggest that despite having a large share in the common market, Global Techs leave a much smaller footprint on the EU economy than their EU competitors. Their subsidiaries often function only as special-purpose vehicles, which helps to increase EU revenues for services designed and delivered outside the common market. This translates directly into lower tax income for the government, as Global Techs' subsidiaries transfer their profits to parent companies. However, the scale of this strategy is largely unknown, as **only three out of 808 subsidiaries publish data on their CIT payments**, and those that do have an effective gross income tax rate of less than 6 per cent, compared to 26 per cent for EU Tech.

Infographic 2.
Country of origin of Global Techs' subsidiaries active in the EU market.

Number of EU-operating subsidiaries by country of ultimate parent headquarters.

Source: Thomson Reuters, own calculations.

The largest Global Techs operate through Ireland, where 40 registered entities generate 51 per cent of Global Techs subsidiaries' revenues. As a result they have a much larger impact on the Irish economy than EU Techs: their revenues equal 24 per cent of Irish GDP, compared to 5.3 per cent for EU Techs. The second most popular location for Global Techs is the UK, which hosts 255 subsidiaries generating EUR 34bn in revenues (1.4 per cent of British GDP). The remaining Global Techs subsidiaries are scattered across other member states proportionally to the size of their economy.

Global Techs' account for 27 per cent of the EU data market revenues, but only for 13 per cent of total Tech companies employment.

Global Techs' subsidiaries have the largest share in revenues among EU-based technology companies, for which the main business is developing mobile system software (96 per cent of all revenue), search engines (91 per cent), computer programming (30 per cent) and internet gaming (28 per cent). EU Techs, on the other hand, dominate in business activities such as internet security and transaction services (98 per cent of all revenue of tech companies in this sector in the EU), enterprise software (93 per cent) and e-commerce and auction services (91 per cent). The latter case can be seen as misleading, however, as EU e-commerce companies face intense foreign competition, especially from non-EU Techs, which offer their services from outside the EU.

The share of online purchases from non-EU sellers made by consumers living in the 28 member states is steadily increasing thanks to the globalization of the digital market. According to Eurostat data, in 2018 26 per cent of individuals who ordered goods or services over the internet decided to buy from non-EU sellers, and another 12 per cent did not know the country of residence of the seller they were buying from.

Map 3. Employment in EU Techs by country.

Total employment of EU Techs in 2018 by Member State (as % of Member State's employment).

Total EU28

0.9%

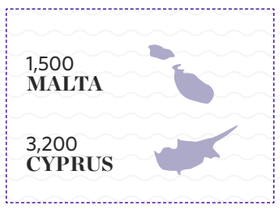
as % of total employment

- >2.0
- 1.1–2
- 0.5–1
- <0.5

Employment

36,700

Source: Thomson Reuters, Eurostat, own calculations.

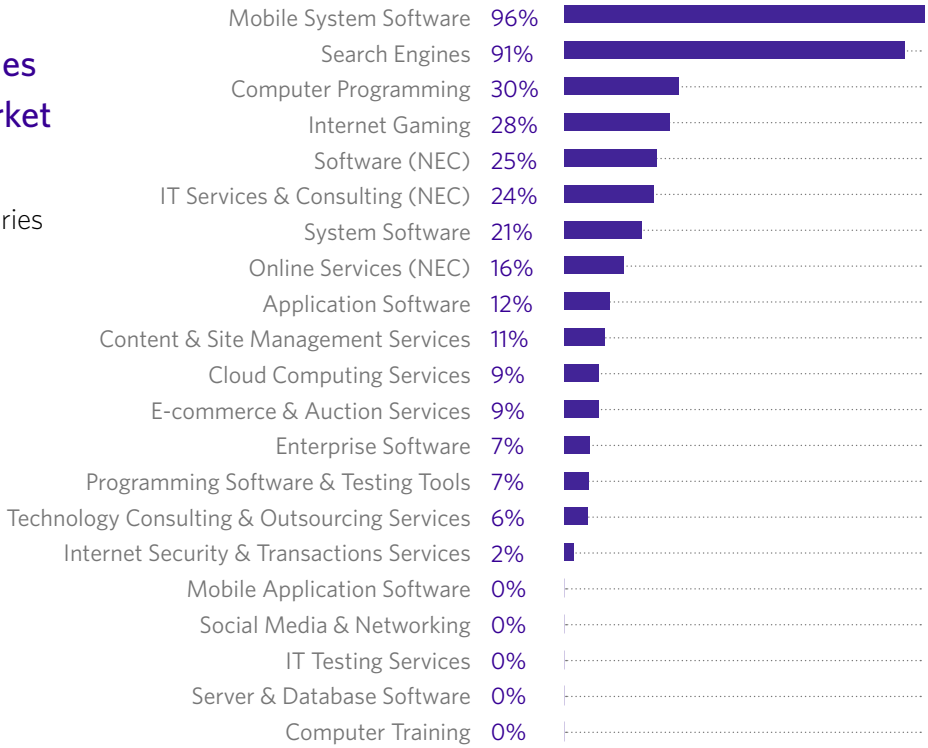


This is a twofold increase during the last decade. In 2008 the sales of non-EU e-commerce firms within the common market was 12 per cent and the sales of sellers of unknown origin was 5 per cent.

Graph 4. Share of Global Techs' subsidiaries within the common market by business activity.

Share of Global Techs' subsidiaries in total revenues (FY 2018) of Global Techs' subsidiaries and EU Techs by TRBC subgroup.

Source: Thomson Reuters, own calculations.



The share of online purchases from non-EU sellers made by EU customers increased from 12 to 26 per cent over the last decade.

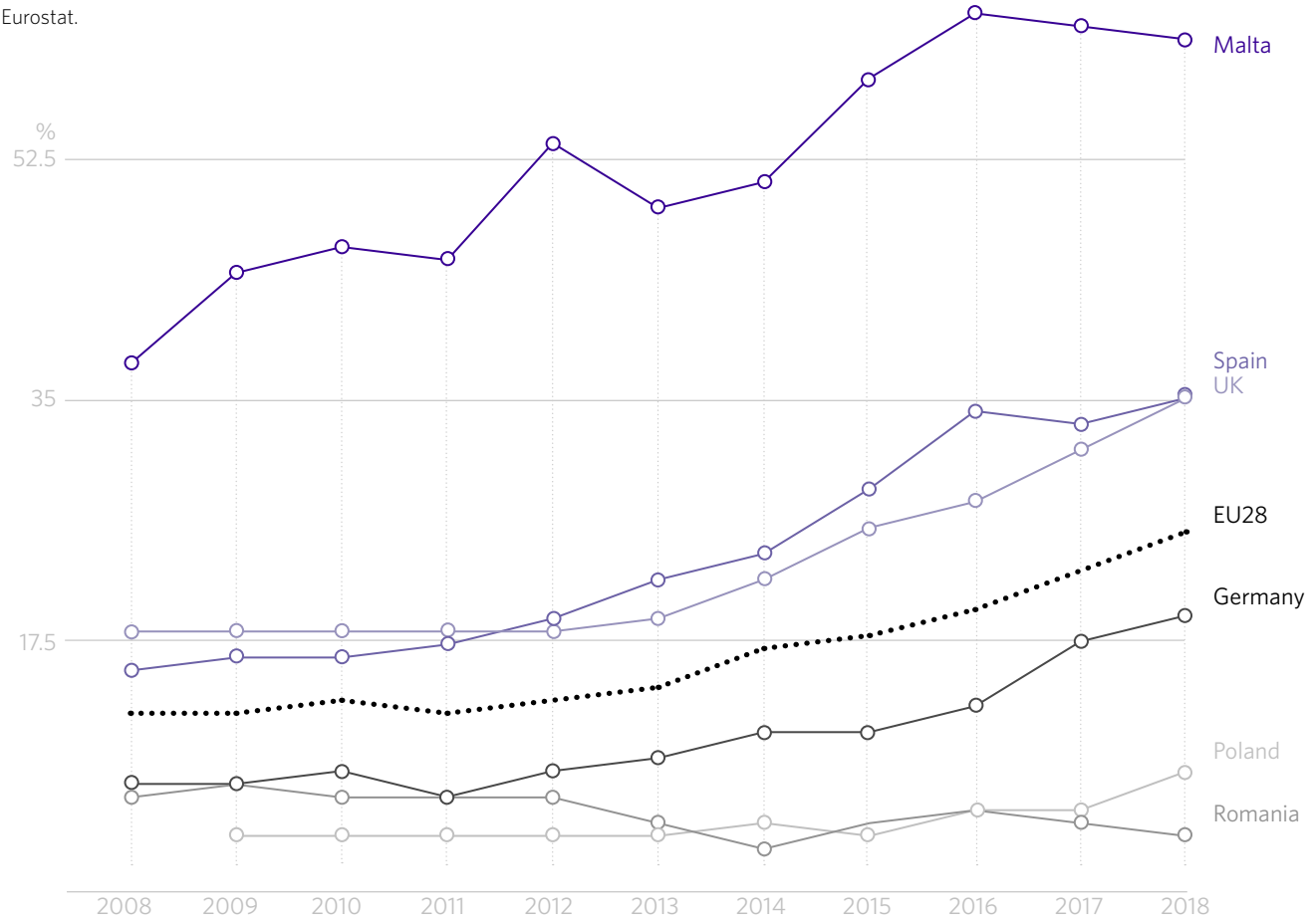
Graph 5, p.24
Share of e-commerce purchase from non-EU companies

Access to financial services, music or video streaming, as well as to search engines or even application services, is sometimes obstructed by EU regulations, geo-blocking and limited use of foreign software within the common market, especially in the case of enterprise applications. As a result, EU Techs, excluding e-commerce companies, are still largely

Graph 5. Share of e-commerce purchase from non-EU companies.

Online purchases from non-EU sellers (% of individuals who ordered goods or services, over the internet, for private use, in the last year).

Source: Eurostat.



EU Techs dominate Global Techs in internet security and transaction services, enterprise software development and e-commerce.

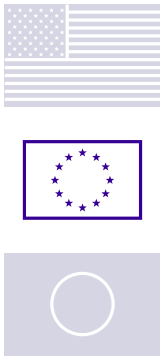
protected from competition from outside the common market. However, foreign competitors are slowly gaining a strong foothold in those markets by selling their products and offering their services via Global Techs' subsidiaries, e.g. mobile applications sold through platforms which are pre-installed in smartphones sold within the common market.

Summing up, **EU Techs are facing growing competition from non-EU Techs**, which do not need to comply with EU standards and regulations (more on this topic will be covered in the second part of the report). This makes it very hard for EU Techs to keep their competitive edge while contending for acknowledgment and endorsement by EU consumers. For EU consumers, the most important characteristics of goods and services are price and quality, which are hard to maintain at the most competitive levels when regulatory requirements also have to be met.

Map 4, p.27
Country of registration of Global Techs' subsidiaries active in the EU market

Outlook for the data economy

Because of the fierce competition from Global Techs and, in some cases, inadequate regulation within the common market, the EU's data[7] economy is smaller than in the U.S. or Japan. According to IDC data, the impact of the data economy on GDP in 2018 was 1.17 per cent in the U.S. and 1.05 per cent in Japan, compared to 0.52 per cent for the 28 EU member states. Also worrying, the number of data users is growing at a much slower pace than the number of data suppliers (3.4 and 4.2 per cent in 2018, respectively). This could be a bottleneck in future development of the EU's digital economy, as data users are at the centre of the IT revolution, developing new business models and employing cutting-edge technology for firms' optimization problems. As more data is supplied to the market, the possibilities to utilize it grow exponentially, requiring a rapid increase in the number of data users, so that the EU market is not overwhelmed by solutions from the U.S., Japan or even China.



Because of the fierce competition from Global Techs and inadequate regulation, the EU's data economy is smaller than that in the U.S. or Japan.

7 IDC, Lisbon Council (2019), *The European Data Market Monitoring Tool*.

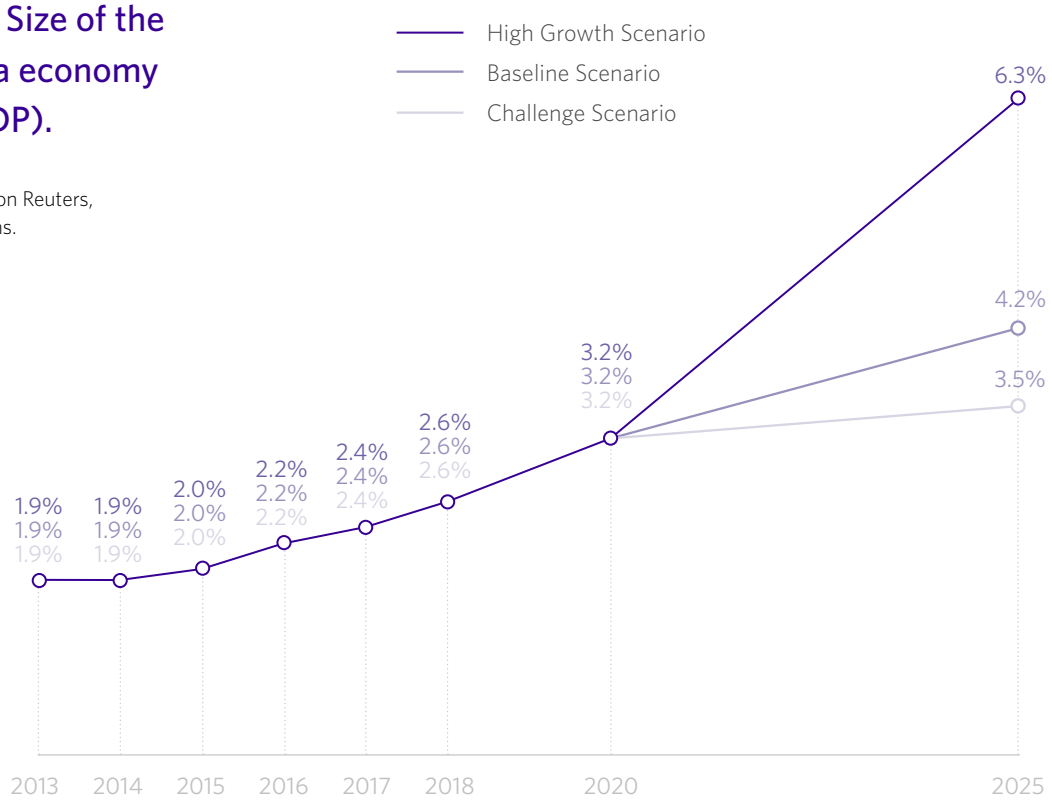
Thus, EU Techs are at a crossroads, from which they can either evolve to become strong contenders against Global Techs, or could be downgraded within the digital value chain to subcontractors and developers of products sold via technology companies from the U.S. or China. According to IDC forecasts[8], **in a challenge scenario, in which EU Techs become less competitive than their foreign counterparts, the contribution of the digital economy to the EU28 GDP could grow by only 3.5 per cent in 2025, from 2.6 per cent in 2018**. By contrast, if the European Commission facilitates the development of EU-originating technology companies and helps them become leading global players in their field, the size of the EU's digital economy could become twice as large, and contribute 6.3 percentage points to the EU's GDP by 2025.

To investigate in detail the reasons why EU Techs are growing slower than their non-EU competitors, in the second part of the report we will take a closer look at various EU regulations that are limiting business activity and undermining the competitiveness of EU-based technological scale-ups, in comparison to their peers from outside the common market. Although the creation of a fully functioning Digital Single

8 Ibid.

Graph 6. Size of the EU's data economy (% of GDP).

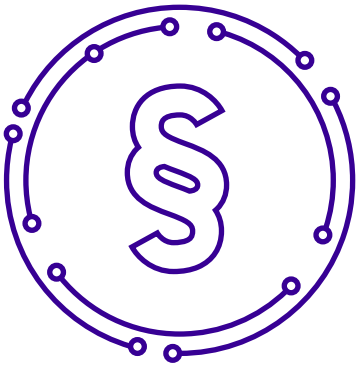
Source: Thomson Reuters, own calculations.



Map 4. Country of registration of Global Techs' subsidiaries active in the EU market.

Number of EU-operating subsidiaries by country of incorporation.


02



How the EU's regulatory approach to the digital era can succeed

Market and an increased competitiveness for the EU's tech companies have been among the top priorities for the European Commission for almost two decades, the sector faces a number of regulatory and political challenges. Despite EU companies' dynamic growth over the last decade, new compliance-related costs are creating challenges in dedicating human and financial resources to adapting to new laws. As a result, the regulatory efforts undertaken by the EU legislators in order to support the digitalization of the European economy risk having unintended consequences which could further exacerbate the EU's economic disadvantage in the digital sector.

This section focuses on several obstacles which are limiting the EU's ability to create a proactive strategy in the emerging digital era. First, it analyses the broader context associated with the changing geopolitical order and the particular importance of the digital sector in ensuring the prosperity and security of Europe. It suggests an incompatibility between the traditional principles of EU policymaking and its conception of itself on one hand, and the demands of the digital era on the other. Second, after defining the challenge faced by the European project, it investigates the regulatory approach undertaken by the EU in the digital sector.

By focusing on the regulatory framework, the aim of this

section is to identify existing problems and define practical priorities for change. It argues that the tendency of the European legislators to design regulatory solutions in response to the behaviour of U.S. tech leaders, and a focus on consumer welfare, may lead to an insufficient understanding of how these regulations impact the competitive outlook of companies at different stages of business growth (in particular scale-ups). As a result, this approach can limit the ability of the EU tech sector to successfully compete on the global stage, which could leave the European Union in danger of becoming a passive rather than active participant in determining the rules of the game brought forward by the digital age.

EU goals in the digital era are diverse, and include among others dismantling barriers to trade and creating a genuine single market, and supporting the EU's 'strategic autonomy', which is threatened by the rising challenges of increasingly hostile geopolitical reality.

1 The EU in the digital world: guiding principles

When trying to understand the European Union's approach to the digital age, it is crucial to begin with an attempt to map out its multiple objectives. Only by defining what the EU should try to achieve can we determine the suitability of policies and agendas proposed by the European Commission, and the legislative initiatives agreed upon by the European Parliament and the Council. These goals range from straightforward and age-old principles at the very core of the European project—dismantling barriers to trade and creating a genuine single market allowing EU citizens and companies to harness the benefits resulting from membership of

the largest economic area in the world—to supporting the EU's 'strategic autonomy', threatened by the rising challenges from the increasingly complex contemporary geopolitical reality.

a The rising role of strategic autonomy

The concept of strategic autonomy has its roots in defence policy and is defined by the European Political Strategy Centre (EPSC) as "the capacity of a political entity to pursue its own course in international relations".[9] The EU's Global Strategy adopted in 2016 points out that "an appropriate level of ambition and strategic autonomy is important for Europe's ability to promote peace and security within and beyond its borders".

Traditionally, strategic autonomy was defined in a narrow sense and focused mostly on the EU's ability to be self-reliant regarding military technology and equipment. **The rise of the digital era forces us, however, to reflect on an extended definition of strategic autonomy with respect to the appropriate sectors, as many digital technologies can be considered dual-use, with commercial applications going hand-in-hand with those used for military and defence**.[10]

The EPSC, the Commission's in-house think tank, specifically underlined the need to expand the criteria concerning digital policy to include the idea of strategic autonomy in its note from July 2019.[11] As the document emphasised, while the notion of dual-use technologies was traditionally considered to encapsulate mostly military inventions which can then be transposed into the civilian, commercial sphere, the digital era is reversing the direction of this interaction, as "seemingly innocuous digital innovations in the civilian sphere are transforming into potential military threats".[12] As a result, while the idea of strategic autonomy in the past

9 European Political Strategy Centre (2019), 'Rethinking Strategic Autonomy in the Digital Age', *EPSC Strategic Notes*, Issue 30, p. 2.
10 High Representative of the Union for Foreign Affairs and Security Policy and Vice-President of the European Commission (2016), 'Shared Vision, Common Action: A Stronger Europe', available at: https://eeas.europa.eu/sites/eeas/files/eugs_review_web_0_0.pdf (consulted on November 30st, 2019).
11 European Political Strategy Centre (2019), 'Rethinking Strategic Autonomy in the Digital Age', *EPSC Strategic Notes*, Issue 30.
12 Ibid., p. 2.

required governments to ensure that defence strategy was considered in terms of the country's ability to obtain defence technologies on its own (or at least with recourse to close allies), the new relationship means that similar considerations are required when it comes to commercial projects in sectors that initially appear to have nothing to do with the military.[13]

b Strategic autonomy and economic sovereignty in the changing geopolitical reality – cooperation or autarky?

At the same time, the global context is rapidly changing, shifting away from mutual cooperation and an economic competition based on freely floating goods in open global markets, towards a context in which geopolitical rivalries are making a comeback. As argued by a joint paper by the European Council on Foreign Relations and Bruegel, throughout its "six-decade history, the EU never took part in competition between great powers, instead considering itself «a soldier of peace»".[14] This approach was based on the idea that the EU's market size and productive potential made it possible for Europeans to interact with other global players on an equal footing, without prejudicing its economic sovereignty.[15]

The rising competition between the U.S. and China and an increasing unwillingness in Washington DC to continue playing the role of the benevolent superpower vis-à-vis the European Union – epitomized by the presidency of Donald Trump – means that the EU can no longer afford to remain insulated from geopolitical concerns.[16] Meanwhile, an increasingly assertive China poses a threat to the global order promoted by the European Union, as recognized recently by the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy.[17]

Amid those concerns, the narrative of cooperation is being slowly supplanted by a narrative based on self-reliance. This is best seen in a growing emphasis on the notion of

13 Ibid.
14 M. Leonard, J. Pisani-Ferry, E. Ribakova, J. Shapiro and G. Wolff (2019), 'Redefining Europe's economic sovereignty', *Bruegel Policy Contribution*, Issue 9, p. 2.
15 Ibid.
16 Ibid., p. 3
17 High Representative of the Union for Foreign Affairs and Security Policy and Vice-President of the European Commission (2019), 'EU-China – A strategic outlook: European Commission and HR/VP contribution to the European Council', JOIN (2019) 5 final.

sovereignty, be it economic[18], digital[19], or AI sovereignty[20]. Recognizing that the European Union is currently unable to reach its objective of strategic autonomy through mutual co-ordination and comprehension of global norms with other key stakeholders, it calls for a decrease in EU's interdependence in the digital sphere through the development of European core infrastructure in sectors such as cloud computing and Artificial Intelligence.

In the digital era, the narrative of cooperation is being slowly supplanted by one based on self-reliance. The notion of sovereignty, be it economic, digital, or AI sovereignty, is making a comeback.

C The new approach and the art of the trade-offs

Both geopolitical and digital challenges have made their way into the rhetoric of the new President of the European Commission, Ursula von der Leyen. In her speech presenting the College of Commissioners to the European Parliament on 27 November 2019, von der Leyen stated that she intends to lead a "geopolitical Commission" that "Europe urgently needs", adding that "[i]n the digital age, we must continue on our European path."[21]

It is crucial to define this European path, and the smart balance referred to by von der Leyen can be achieved. The President of the Commission offered a few clues. She underlined

18 M. Leonard, J. Pisani-Ferry, E. Ribakova, J. Shapiro and G. Wolff (2019), 'Redefining Europe's economic sovereignty',*Bruegel Policy Contribution*.
19 B. Thieulin (2019), 'Towards a European digital sovereignty policy', Opinion of the Economic, Social and Environmental Council, *Official Journal of the French Republic*, NOR: CESL 1100007X.
20 A. Renda (2019), 'Artificial Intelligence. Ethics, governance and policy challenges', *Report of CEPS Task Force*, p. 40.
21 Speech by President-elect von der Leyen in the European Parliament Plenary on the occasion of the presentation of her College of Commissioners and their programme, available at: https://ec.europa.eu/commission/commissioners/2019-2024/president/announcements/speech-president-elect-von-der-leyen-european-parliament-plenary-occasion-presentation-her-college_en (consulted on November 30st, 2019).

the need to master and own key technologies within the continent, including artificial intelligence and quantum computing. She emphasized the importance of Europe's industrial competitiveness in the sector. She spoke of the challenge of providing high-capacity physical infrastructure for the transmission of data, the central role of data as the raw material of digitalization, the imperative to harness non-personal data, and the vital role of cybersecurity.[22]

Despite its more assertive tone, von der Leyen's agenda contained many of the tropes described by the ECFR and Bruegel as characteristic of the EU's approach to the global order. At every turn, it comes back to the notion of the European path, an emphasis which was made even clearer by von der Leyen's decision to give one of the commissioners, Margaritis Schinas, a portfolio called "Protecting the European way of life".

Its core components can be quickly identified by a careful look at the history of European integration and the case law of the EU courts. It includes a core focus on the four fundamental freedoms of movement; a belief in the beneficial role of free-trade agreements and opening up of the global economy; a conviction that the most efficient way of ensuring overall prosperity is focusing on promoting consumer welfare; and an emphasis on fair competition unrestricted by state interference. At the core of this conception is the declaration of faith that when all these elements come together, and as a result the European economy prospers, it puts the European Union in a position to punch above its weight within the global order, including playing a leading role in setting international standards.

While a discussion of the merits of that belief goes beyond the scope of this report, there are clear limits to how applicable this can be within the current context. Despite the remarkable growth of the EU tech industry described in part one, the Union as a whole is lagging behind the two other geopolitical giants, China and the U.S., when it comes to the size of the sector and its ability to produce leading global

22 Ibid.

companies. In turn, this makes it difficult for the EU to be at the forefront of the digital revolution and shape its direction rather than react to external changes. Therefore, there is a need to strike the right balance, with this issue at the centre of the dilemma faced by the Union.

Table 1. EU's digital objectives and the appropriate regulatory approaches to achieve them.

EU's objective	Preferred regulatory approach
Harnessing the digital age to strengthen the four freedoms and the internal market	Maximizing consumer welfare
Promoting the competitiveness of EU's digital industry	Mixed consumer-centric and company-centric approach
Safeguarding EU's strategic autonomy	Maximizing economic self-reliance (autarkic tendencies)

As presented in the table above, **the EU has to bear in mind three parallel objectives**. The first, most closely aligned with the traditional vision of the European way of life, consists of further efforts to maximise the benefits of digitalization, and accelerate this process in order to strengthen the four aforementioned freedoms and the internal market, and achieve improvement for every European's quality of life. The second concerns the need to ensure that EU companies are competitive in the sector, both to promote economic growth and to potentially allow the European Union to play a proactive role in shaping the future during the digital era. The third refers to the ability of the EU to foster not only its economic sovereignty but also its strategic autonomy, thus securing Europe's geopolitical interests amid growing international rivalries.

The first part mainly suggests the EU's preferred consumer-centric approach. The second requires a more mixed

consumer – and company-centric approach. The third questions not only the EU's reliance on consumer welfare, but also its fundamental belief in fostering free trade around the globe. **As other players on the global stage benefit from relaxed regulations (U.S. companies) or far-reaching and generous state support (Chinese companies)[23], the idea of an international level-playing field is unfeasible , forcing a thorough reconsideration of the EU's approach toward protectionism.**

For European well-being to be secured, the devotion to consumer welfare and open markets will have to be revisited.

To put it bluntly, all these coinciding goals cannot be achieved if the "European path" referred to by President von der Leyen is not completely redefined. For European well-being to be properly secured by the policy efforts of European and state institutions, some of the longstanding principles of European integration, including the devotion to consumer welfare and open markets, will have to be revisited. This in no way means giving up on Europe's role in shaping global standards and safeguarding the "European way of life" by simply declining to implement either the Chinese or American model, neither of which could succeed on the continent. However, it will require a more pragmatic and flexible approach, facing inevitable conflicts of values head-on, rather than brushing over them. The next section attempts to bring out some of these tensions by looking at several legislative initiatives constituting the EU's Digital Single Market agenda.

23 A. Renda (2019), 'Artificial Intelligence. Ethics, governance and policy challenges', *Report of CEPS Task Force*, p. 38.

2 Looking back, moving forward: the past and future of the Digital Single Market agenda

One of the key priorities of the Digital Single Market agenda promoted by the previous College of Commissioners was to reduce the barriers to transborder online trade in goods and services within the EU. According to Ecommerce Europe, between 2014 and 2017 the revenues associated with e-commerce grew on average by 14 per cent each year.[24] However, this turnover was mostly generated by trade within member states. While 87 per cent of EU consumers purchased a product or service online in 2017, only 33 per cent did so in cross-border trade.[25] Conversely, while one in five EU-based firms was involved in e-commerce domestically, less than half of them (9 per cent) would sell their products or services abroad within the EU.

While 87 per cent of EU consumers purchased a product or service online in 2017, only 33 per cent did so in cross-border trade.

According to a study commissioned by the European Parliament, **unlocking the cross-border potential of e-commerce can generate some EUR 15 billion in annual benefits to the EU economy**.[26] It is for that reason that the European Commission introduced a package of legislative initiatives aimed at promoting e-commerce between member states. These included the Geoblocking Regulation,[27] the Consumer

24 J. Scott Marcus, Georgios Petropoulos, Timothy Yeung (2019), 'Contribution to Growth. The European Digital Single Market. Delivering economic benefits for citizens and businesses'. Study requested by the IMCO Committee of the European Parliament.
25 Ibid.
26 Ibid., p. 9.
27 Regulation (EU) 2018/302 of the European Parliament and of the Council of 28 February 2018 on addressing unjustified geo-blocking and other forms of discrimination based on customers' nationality, place of residence or place of establishment within the internal market and amending Regulations (EC) No 2006/2004 and (EU) 2017/2394 and Directive 2009/22/EC (Text with EEA relevance), available at: https://eur-lex.europa.eu/content/news/geo-blocking-regulation-enters-into-force.html (consulted on November 30 st, 2019).

Protection Cooperation Regulation,[28] the Regulation on Cross-border Parcel Delivery Services,[29] the Digital Content Directive,[30] the Sale of Goods Directive,[31] and the VAT e-commerce package.[32] This comprehensive set of laws attempts to address obstacles which reduced the willingness to trade cross-border both on the consumers' side, through the abolition of geoblocking and the strengthening of consumer protection, and on the sellers' side, through a streamlining and simplification of VAT and the regulation of cross-border parcel deliveries.

While there is a very strong and well-articulated reasoning behind the Digital Single Market agenda when it comes to growing the EU's digital economy, the purpose of this section is also to analyse how other key issues related to the rise of the digital era, including the ability of EU companies to compete globally and the ability of the European Union to safeguard its economic sovereignty and strategic autonomy, are treated within these legislative approaches. It looks at three initiatives: the already-applicable regulations on consumer protection, with particular emphasis on geoblocking, and on platform-to-business trading practices, as well as the proposals relating to the EU's approach to artificial intelligence.

a EU's approach to consumer protection in the digital age

Introduction

While the European Commission, the European Parliament and the Council have focused on offering significant

28 Regulation (EU) 2017/2394 of the European Parliament and of the Council of 12 December 2017 on cooperation between national authorities responsible for the enforcement of consumer protection laws and repealing Regulation (EC) No 2006/2004 (Text with EEA relevance), available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32017R2394 (consulted on November 30 st, 2019).

29 Regulation (EU) 2018/644 of the European Parliament and of the Council of 18 April 2018 on cross-border parcel delivery services (Text with EEA relevance), available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R0644 (consulted on November 30 st, 2019).

30 Directive (EU) 2019/770 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the supply of digital content and digital services (Text with EEA relevance), available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019L0770 (consulted on November 30 st, 2019).

31 Directive (EU) 2019/771 of the European Parliament and of the Council of 20 May 2019 on certain aspects concerning contracts for the sale of goods, amending Regulation (EU) 2017/2394 and Directive 2009/22/EC, and repealing Directive 1999/44/EC (Text with EEA relevance), available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019L0771 (consulted on November 30 st, 2019).

32 The set of proposals is detailed here: https://ec.europa.eu/taxation_customs/business/vat/digital-single-market-modernising-vat-cross-border-ecommerce_en (consulted on November 30 st, 2019).

incentives for consumers to engage in cross-border trade, a different approach has been chosen when it comes to the actors on the other side of any transaction: sellers and/or intermediating platforms. The Geoblocking Regulation is an illuminating example. Its goal is to stop businesses offering products on their own websites, by blocking access to their services based on the location, country of residence, or nationality of the consumer.

While the EU legislators have focused on incentives for consumers to engage in cross-border trade, a more punitive approach concerns their counterparts: sellers and intermediating platforms.

The regulation is consistent with the foundational values of the European Communities, including the cornerstones of EU law: the freedom of movement of goods and the freedom of movement of services. This requires sellers to accept foreign credit cards if they accept domestic credit cards of the same type, as well as forbidding them from restricting access to their websites based on the consumer's place of residence, either by blocking access entirely or redirecting potential customers to websites created for their countries. Finally, it stipulates that prices and sale conditions should not depend on national.

More stick than carrot: why the regulation's heavy-handed approach could be misguided

When analysed purely from the perspective of basic tenets of EU legal architecture, these new rules are clear and uncontroversial. Discrimination based on place of residence creates barriers between member states which are unacceptable within a single market. But the existence of such discrimination raises a set of questions.

Why would traders, i.e. profit-oriented companies whose objective should be to maximize the size of the market available to them, refuse to provide their goods and services to residents of other EU member states? **According to the European Commission, 63 per cent of companies involved in e-commerce do not let shoppers from other countries buy from their websites,[33] despite the obvious commercial benefits that cross-border trade could bring**.

According to the aforementioned study on the Digital Single Market agenda's contribution to growth in the EU, companies engaged in cross-border online sales experience difficulties due to the high cost of delivering or returning products (27 per cent of businesses), limited knowledge of foreign languages (13 per cent), and issues related to resolving complaints and disputes (12 per cent). The Digital Single Market agenda focused on lessening some of these challenges, including reducing parcel costs and simplifying contracts involved in the online sales of goods and services.[34]

However, one issue which remains unaddressed is that under the Rome I regulation governing the law of contractual obligations,[35] a trader who directs its activities to consumers in other member states will have to abide by the consumer protection laws of the consumer's habitual residence, when they offer a higher level of protection than those which can be derogated from the terms and conditions of the contract between the buyer and the seller. The Geoblocking Regulation can therefore potentially place businesses in a vulnerable position where they cannot refuse to offer their products to consumers from other member states, even though directing their activities towards these consumers means that the sellers will be subject to consumer protection laws of which they might not be familiar. While the regulation explicitly states that the company's own compliance is insufficient to prove

33 European Commission (2018), 'e-Commerce in the EU: How you can make the most out of it as a consumer', factsheet available at: https://ec.europa.eu/digital-single-market/en/news/e-commerce-eu-how-you-can-make-most-out-it-consumer (consulted on November 30 st, 2019).
34 J. Scott Marcus, Georgios Petropoulos, Timothy Yeung (2019), 'Contribution to Growth. The European Digital Single Market. Delivering economic benefits for citizens and businesses'. Study requested by the IMCO Committee of the European Parliament, p. 25.
35 Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I), available at: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32008R0593 (consulted on November 30 st, 2019).

that it "directed its activities to consumers in other Member States", it requires domestic courts to determine whether any particular case fits the description, resulting in legal uncertainty. **Being subject to another member state's jurisdiction is linked to two of the three main difficulties of cross-border online trade identified by EU-based businesses: linguistic barriers and dispute-resolution mechanisms**.

Unlevel playing field and challenges of legal enforcement

Some businesses find themselves less challenged by these requirements. Because of their vast scale, global online marketplace giants find it easier to operate in multiple jurisdictions. The economies of scale associated with their size means they have the resources to ensure they comply with regulations. From a more cynical standpoint, their size also means that they are better suited to cover the costs of non-compliance, especially when enforcement is decentralized and piecemeal.

A recent case study of such approach is the behaviour of AliExpress on the EU market. Six national consumer organizations belonging to the European Consumer Organisation (BEUC) filed a plea with their respective consumer authorities in May 2019 to protest against AliExpress's terms and conditions violating the European Union's *acquis* for consumer protection.[36] Despite having dedicated websites for the Dutch, French, German, Italian, Polish, Portuguese and

Six national consumer organisations belonging to the European Consumer Organisation filed a plea to protest against AliExpress's terms and conditions violating the EU's *acquis* for consumer protection.

36 BEUC (2019), 'Consumer organisations call for action against unfair terms in Alibaba-AliExpress' contracts with consumers', press release available at: https://www.beuc.eu/publications/consumer-organisations-call-action-against-unfair-terms-alibaba-aliexpress%E2%80%99-contracts/html (consulted on November 30st, 2019).

Spanish markets, the platform's terms stipulate that in the case of a conflict between buyer and seller, the dispute will be handled by an arbitration court in Hong Kong. Furthermore, the terms and conditions also do not respect the EU-wide right to return a product purchased online within 14 days without any justification.[37]

While AliExpress's conduct is in clear violation of EU law, it serves as a good example of how eager companies are to enter foreign markets when there is no requirement to adhere to multiple legal frameworks. Of course, in the case of

37 Ibid.

Table 2. Geoblocking Regulation – summary

 What objective is addressed by the EU?	Strengthening of the single market through decreasing barriers to trade.
 Who bears the regulatory burden?	Sellers.
 Is there a need to be familiar with another EU member state's consumer laws?	Potentially yes, since according to Rome I, the applicable laws will under certain conditions be defined by the jurisdiction of the consumer, not the seller.
 Does enforcement take place at the national or the EU level?	Enforcement takes place at the national level.
 Does it have the potential to favour large, non-EU companies?	The lack of any strong, EU-level enforcement mechanism favours large companies operating in multiple national markets in two potential ways. First, these companies are better equipped to bear the additional regulatory burden of operating in foreign markets due to their size, and because their decision to enter EU markets implies operating in a foreign regulatory regime. Second, operating in multiple markets without coordinated enforcement decreases the costs associated with litigation risk.

the Chinese marketplace giant, the burden is removed due to a blatant disregard of EU law, but it confirms the broader point that businesses seek new markets whenever possible, and do not, as the EU regulators fear, attempt to block new customers from purchasing their goods and services.

Is full harmonization of EU consumer protection laws the answer?

Further efforts to harmonize consumer rights across member states and shift their enforcement to the EU level would fulfil the double objective of preventing companies like AliExpress from violating the rights of EU consumers, whilst also fostering EU cross-border trade. It would help fulfil the European Commission's ambition to strengthen the single market. However, the distributional effects of such a move require careful assessment.

In principle, reducing barriers to online trade should help foster a competitiveness between EU businesses, allowing them access to multiple markets and levelling the playing field, which is currently working in favour of large companies that can operate under multiple jurisdictions with ease. It should also allow EU-based online marketplaces such as Allegro, Bolt, Cidscount, eMag and Zalando to grow in size and facilitate their global competition with actors such as the aforementioned AliExpress, or the two American giants, eBay and Amazon.

The case of AliExpress shows that despite the clear and unambiguous rules protecting EU consumers enshrined in the EU legal order, the on-the-ground reality can be very different.

For this to happen, however, the most important element is effective enforcement. The case of AliExpress shows that despite clear and unambiguous rules protecting EU consumers within the EU legal order, the reality can be very different.

As long as the legal enforcement is divided between 28 states and left to their individual courts, a non-EU platform can operate on the EU market virtually immune from legal consequences, able to disregard the EU's consumer acquis and treat the occasional court losses and the resulting fines simply as the costs of doing business. This not only goes against the very principles of the single market and legal certainty that laws like the anti-geoblocking regulation have been attempting to safeguard, but this also puts EU-based companies and marketplaces at a distinct disadvantage. Under the current system, the responsibility of enforcement is comes down to individual member states and is forced onto consumers who may not have a sufficient incentive to engage in legal battle with a foreign, global marketplace giant, as legal costs in terms of time, effort and financial resources can be disproportionally high compared to the price of the purchased product. This approach to consumer protection contrasts with the EU's powers and *modus operandi* in the neighbouring field of competition policy, where the Commission has the initiative to punish companies for their behaviour throughout the entire single market, reducing the power asymmetry and allowing for a stricter enforcement of the rules.

The opportunities created by existing shortfalls in legal enforcement mean non-EU marketplaces can treat EU regulations as optional, and cover legal penalties if and when they arise. This is a threat to EU-based digital companies – which therefore bear the burden of compliance costs. We will continue with an in-depth analysis of factors influencing the competitive outlook for online platforms in the subsequent section on the P2B Regulation.

b Fairness for whom: platform-to-business trading practices

Introduction

While the Geoblocking Regulation places a similar burden on both online marketplaces engaged in retail on their own and on businesses selling their products and services directly to consumers, another pillar of the European Commission's agenda to foster EU digital trade is the P2B Regulation

(Regulation on promoting fairness and transparency for business users of online intermediation services), which reshapes the relationship between sellers and the platforms they use to access consumers.

While only 37 per cent of companies selling their goods online allow customers from other member states to purchase their goods and services, this figure rises to more than 50 per cent among businesses that sell their products through online marketplaces.

Even though the regulation begins by emphasizing that "online intermediation services are key enablers of entrepreneurship and new business models" which offer "access to new markets and commercial opportunities allowing undertakings to exploit the benefits of the internal market", it singles out platforms for raising "challenges that need to be addressed in order to ensure legal certainty".[38]

Twenty-two per cent of the EU e-commerce market is generated due to the intermediation of online platforms. They are particularly important for facilitating online trade, including cross-border trade, for small and medium-sized enterprises. While only 37 per cent of companies selling their goods online allow customers from other member states to purchase their goods and services, this figure rises to more than 50 per cent among businesses which sell their products through online marketplaces.

The purpose of the regulation is to remedy a perceived power inequality between platforms and businesses which use them for trading. Among the elements addressed are

38 Regulation (EU) 2019/1150 of the European Parliament and of the Council of 20 June 2019 on promoting fairness and transparency for business users of online intermediation services (Text with EEA relevance), available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2019.186.01.0057.01.ENG&toc=OJ:L:2019:186:TOC

issues such as unilateral changes to marketplaces' terms and conditions; unclear rules concerning the suspension or termination of companies' accounts on the platforms; the use by platforms of most-favoured-nation (MFN) clauses in their contracts; and a broad set of potentially anticompetitive behaviour related to the management of data, rules around ranking, and favouring of online platforms' own services.[39] It applies to all online intermediaries operating in the single market, with an exemption for small enterprises with fewer than 50 staff and generating less than EUR 10 million in annual turnover.

The relationship between platforms and businesses: The European Commission's view

The P2B Regulation is based on the underlying notion of inherent inequalities between the companies selling their products on platforms and the online intermediaries operating them. The underlying assumptions made by the European Commission appear straightforward in theory: businesses rely on access to the marketplace, without which they would lose the ability to interact with their customer base. Meanwhile, the loss of one company from the list of many selling their products on the platform might only reduce the platform's attractiveness marginally, depriving consumers of only a small percentage of all choices.

The competitive assessment described above is based on a number of assumptions made by the European legislators. First, it claims that online marketplaces have a certain power over the sellers who use them. While in theory the loss of access to a platform with many buyers is more harmful to a seller than the loss of a single seller is to the marketplace, a more dynamic analysis is needed to take into account not only the network effects, but also elements such as switching costs, and a related issue of "multi-homing", i.e. to be present on several different marketplaces concurrently. Another factor is the degree of advantage which is conferred to online marketplaces thanks to their data-gathering capacity.

39 European Commission (2019), 'Online platforms: new rules to increase transparency and fairness', factsheet available at: https://ec.europa.eu/digital-single-market/en/news/online-platforms-new-rules-increase-transparency-and-fairness (consulted on November 30 st, 2019).

One size fits none: how the EU's obsession with GAFA pervades the P2B Regulation

Due to its important role in the theory of competitive harm underpinning the P2B Regulation, the issue of multi-homing is crucial. **Opinions differ regarding the importance of switching costs and the propensity to multi-home when it comes to marketplaces**. A working paper published in 2017 by the Joint Research Centre at the European Commission claims that while multi-homing is relatively prevalent among consumers using marketplaces, it is used less often by the businesses which sell their goods on them.[40] While switching costs appear close to non-existent, an important component of online trading concerns the seller's reputation, which is best built thanks to the review and rating systems present on the marketplaces. A large number of transactions coupled with high ratings obtained from satisfied customers increases the seller's visibility on a platform and contributes to more sales. This makes a seller's reputation close to being platform-specific.[41]

At the same time, data shows that consumers are much more likely to multi-home. A 2015 study by Oxera found that in countries such as France, Germany, Poland and Spain, fewer than one in three consumers limited themselves to using only a single online marketplace over the past month.[42] If consumers actively shop around on multiple platforms,

In countries such as France, Germany, Poland and Spain, fewer than one in three consumers limited themselves to using only a single online marketplace over the past month.

40 N. Duch-Brown (2017), 'The Competitive Landscape of Online Platforms', *Joint Research Council Digital Economy Working Paper*, Issue 4, p. 9.
41 Ibid, p. 10.
42 Oxera (2015), 'Benefits of online platforms', October, p. 28.

this should in principle allow companies to engage in multi-homing, if the benefits of having more places to sell their products outweighs the costs of having a less-streamlined ability to build a positive reputation through reviews.

When assessing the merits of the theory underpinning existing P2B Regulation, which aims closely regulate the relationship between online platforms and the vendors who use them, it is vital to take into account the potential competitive incentives which a marketplace could use to discriminate against the businesses selling through its services. The aforementioned JRC working paper provides a glimpse into the European Commission's concerns. When discussing online marketplaces, the document almost completely focuses on two U.S. giants in the e-commerce sector: eBay and Amazon. Amazon in particular has seen dramatic growth in its role within the e-commerce sector after switching from a model based mostly on retail sales offered by Amazon itself (which accounted for 90 per cent of the company's turnover in 2006) to one driven by a shift towards being a genuine marketplace (amounting to 50 per cent of the company's turnover in 2015).[43]

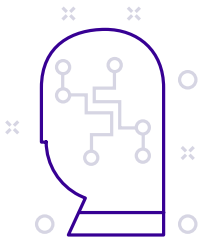
There is no doubt that both giants engage in numerous practices aimed at ensuring their primacy within the e-commerce sector, from offering additional bonuses to their customers to providing training to sellers.[44] Approximately 75 per cent of all sales on online marketplaces in Europe in 2015 in terms of value took place on either eBay or Amazon, with Amazon accounting for almost 50 per cent of the total.[45] This raises potentially justified concerns with respect to the dominant positions of both platforms, in particular Amazon, and merits consideration of whether they constitute an essential facility for SMEs wishing to engage in online trading.

According to its definition, the essential facility doctrine applies in conditions where infrastructure is impossible to replicate and thus the only way market competition is possible

43 N. Duch-Brown (2017), 'The Competitive Landscape of Online Platforms', *Joint Research Council Digital Economy Working Paper,* Issue 4, p. 13.
44 Ibid., p. 12.
45 Ibid.

is through licensing access to the facility.[46] Online platforms could therefore be seen as essential facilities if consumers and businesses are readied for single-homing and if the existence of a large number of consumers provides them with an advantage that cannot be replicated. However, a longer-view analysis of trends in third-party online sales through platforms paints a picture of a dynamic market: whereas in 2010 eBay was the undisputed leader, with more than a 50 per cent share of all European sales on online marketplaces, by 2015 this number was cut in half, as Amazon took over.

Whereas the high concentration index within the sector might be considered an argument for the low level of competition on the market, it also reflects a high intensity of competition for the market, which in turn drives consumer-oriented innovations. Indeed, in many EU countries neither eBay nor Amazon are market leaders, losing out to domestic, EU-based marketplaces (Bol in the Netherlands, Allegro in Poland, eMag in Romania) despite the enormous advantages in economies of scale that the two U.S. giants enjoy.



In many EU countries neither eBay nor Amazon are the largest players, with domestic, EU-based marketplaces (Bol in the Netherlands, Allegro in Poland, eMag in Romania) being the market leaders.

More importantly, however, even legitimate concerns about potentially adverse effects caused by the dominanance of several multinational giants in e-commerce is not in itself sufficient justification for a regulation that applies to the entire sector, with the only exclusion concerning online marketplaces with fewer than 50 staff and generating less than EUR 10 million in annual turnover. First, the bargaining power

46 Frontier Economics (2018), 'Regulating the Tech Titans', available at: https://www.frontier-economics.com/uk/en/news-and-articles/articles/article-i2301-regulating-the-tech-titans/

of smaller platforms vis-à-vis sellers is incomparable to that enjoyed by Amazon and eBay. The compliance costs, on the other hand, are relatively higher, given the generally fixed-cost nature of such costs, which provides larger platforms with a comparative advantage thanks to their ability to cover these charges. **In its current form, the regulation risks imposing additional costs and decreasing the flexibility of EU-based platforms that need to focus their efforts on product innovation in an already unequal competition with globally established giants like Amazon – which the regulation attempts to target.**

Table 3. P2B Regulation – summary

 What objective is addressed by the EU?	To limit the ability of online platforms to act unilaterally towards sellers, thus increasing fairness and levelling the playing field between companies and online intermediaries.
 Who bears the regulatory burden?	Online platforms.
 Is there a need to be familiar with another EU member state's civil, commercial, or consumer laws?	No.
 Does enforcement take place at the national or the EU level?	Enforcement takes place at the national level.
 Does it have the potential to favour non-EU based online platforms?	In principle it should limit the ability of the dominant global platforms to exploit their advantage by promoting their own goods and services at the expense of other sellers. At the same time, it imposes the same compliance costs on all online platforms, placing a disproportionate burden on those operating on a smaller scale.

c The new frontier: a Europe fit for the digital age?

The legislative offensive aimed at preparing the EU for the digital era, which began under the Juncker Commission, appears primed to continue in full gear under the auspices of the von der Leyen Commission. In July 2019, an internal European Commission document discussing a revamped Digital Services Act was leaked, offering a glimpse at the Commission's ambitious plan to alter some of the core legal elements concerning the responsibilities of digital players in the EU, such as the safe-harbour doctrine.[47] Meanwhile, both President von der Leyen and Vice President for a Europe fit for the Digital Age Margrethe Vestager assured that the College of Commissioners will propose legislation to address the human and ethical implications of artificial intelligence within the first 100 days of its mandate.[48] **While the goal of preparing a binding legislation at such short notice has been dismissed as unrealistic, on February 19th the Commission published a package of proposals that summarise the EU's plan to shape its digital future. It comprised of three documents: the White Paper on Artificial Intelligence, the European data strategy, and the roadmap on 'Shaping Europe's digital future'.**

The rising role of AI and its dual-use nature have turned the discussion on AI development into one marked by belligerent rhetoric, with frequent use of the term 'AI arms race'.

The approach to AI is of central importance, as it is both a sector that will play a key role in the ascent of the digital age and a sector in which the European Union currently lags

47 Financial Times, 'EU draws up sweeping rules to curb illegal online content', July 23, 2019, available at: https://www.ft.com/content/e9aa1ed4-ad35-11e9-8030-530adfa879c2; European Political Strategy Centre (2019), 'The Age of Artificial Intelligence', *EPSC Strategic Notes*, Issue 29, p. 11.

48 Atlantic Council, 'Von Der Leyen, new Commission take aim at AI legislation', October 28, 2019, available at: https://www.atlanticcouncil.org/commentary/blog-post/von-der-leyen-new-commission-take-aim-at-ai-legislation/

behind the United States and China, according to most indicators.[49] The rising role of AI and its ability to thoroughly reshape our economies, coupled with its dual-use nature and military applications, have turned the discussion on AI development into one marked by openly competitive and even belligerent rhetoric, with frequent use of the phrase 'the AI arms race'.[50] The importance of AI within the broader picture of the digital transformation was reflected by von der Leyen's "Agenda for Europe"; the digital section beginning with a statement singling out AI: "Digital technologies, especially Artificial Intelligence (AI), are transforming the world at an unprecedented speed."[51]

To rise to the task of catching up with global leaders in AI, the "Agenda for Europe", underlined the need "to find our European way, balancing the flow and wide use of data while preserving high privacy, security, safety and ethical standards."[52] This is a virtuous goal, given the rising concerns over the use of data by global technological giants. However, a principled political aspiration is not the same as a practical and successful policy. The purpose of this section is to look at the challenges the European Union is facing and analyse whether the plans announced by the European Commission are sufficient to address them.

EU and AI: the current state of play

According to the Commission's own European Political Strategy Centre, the European Union is faced with two major challenges when it comes to developing artificial intelligence technologies: one domestic and one foreign.[53] When it comes to the internal aspect, the use of AI and machine-learning technologies by European companies and public administration is slow, made worse by a lack of both

49 D. Castro et al. (2019), "Who Is Winning the AI Race: China, the EU or the United States?", Centre for Data Innovation Report.
50 R. Csernatoni (2019), "An Ambitious Agenda or Big Words? Developing a European Approach to AI", *Security Policy Brief* no. 117, Egmont Royal Institute for International Relations.
51 U. von der Leyen (2019), 'A Union that strives for more. My agenda for Europe", available at: https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf, p. 13.
52 U. von der Leyen (2019), 'A Union that strives for more. My agenda for Europe", available at: https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf, p. 13.
53 European Political Strategy Centre (2019), 'The Age of Artificial Intelligence', EPSC Strategic Notes, Issue 29, p. 4.

raw material—data—and the capacity to analyse it. In 2017, only 4 per cent of the world's data was stored in the EU,[54] even though the EU's economy accounts for 22 per cent of global nominal GDP. Meanwhile, **the use of big data analytics extended to a mere 25 per cent of large companies and 10 per cent of SMEs**.[55]

The external challenge of fast-developing AI technologies in the U.S. and China offers a stark contrast, as more readily available data and a more flexible regulatory framework, coupled with easy access to capital, makes it much easier for tech companies to develop commercial applications for AI and market them to businesses, contributing to the spread of the data-driven economy.[56] The threat posed by external challengers is critical, as there is a widespread understanding that the AI sector offers a strong competitive advantage to early adopters and first movers.[57] This was recognized in the EPSC note on strategic autonomy: the authors claimed that "the costs of lacklustre technological

In 2017, only 4 per cent of the world's data was stored in the EU, even though the EU's economy accounts for 22 per cent of global nominal GDP.

performance are particularly great in the digital age, when technologies tend to build on one another (e.g. Artificial Intelligence relies on big data analytics, which in turn requires access to the necessary data—an area where the EU already lags behind due to its poor digital performance). The risk is thus that failure to master one technology results in knock-on effects with regard to future technologies. The longer this vicious circle ensues, the harder it is to catch up down the line."[58] Therefore, the problem is not only that the EU is

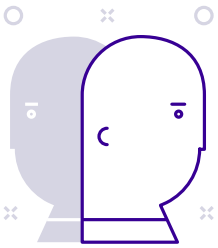
54 Ibid.
55 Ibid.
56 Ibid.
57 R. Csernatoni (2019), "An Ambitious Agenda or Big Words? Developing a European Approach to AI", Security Policy Brief no. 117, Egmont Royal Institute for International Relations. p. 2.
58 European Political Strategy Centre (2019), 'Rethinking Strategic Autonomy in the Digital Age', *EPSC Strategic Notes*, Issue 30, p. 3.

currently lagging behind China and the U.S., but that a growing divide will contribute to reducing the competitiveness of EU companies vis-à-vis their foreign rivals in the long run too, permanently decreasing the EU's productive potential.

The European way and the law and economics of artificial intelligence

The European Commission's objective is for the EU to emerge as the global leader in what it calls "value-based and human-centric" AI. This is predicated on the notion that the EU can build its competitive advantage in the sector by merging the productive potential that AI offers with the high level of privacy protection at the centre of the European project. That is why the White Paper on Artificial Intelligence published in February 2020 emphasizes the human and ethical implications of artificial intelligence, proposing that all "high-risk" AI applications to face mandatory assessment before hitting the market.

There appears to be an inherent contradiction at the centre of the EU's approach. While it broadly recognizes that the first-mover advantage has far-reaching consequences for the digital economy and can lead to EU companies facing a long wait until they can join the frontrunners in the technological revolution, the EPSC claims that while "Europe's practice of data minimisation and high data privacy standards can be seen as a disadvantage", "in the long run digital 'prosperity' will inevitably have to go hand in hand with citizens' well-being", thus creating a competitive edge for the EU.[59]



The growing gap between the EU and its rivals might harm the competitiveness of EU companies in the long run, permanently decreasing the EU's productive potential.

59 European Political Strategy Centre (2019), 'The Age of Artificial Intelligence', *EPSC Strategic Notes*, Issue 29, p. 1.

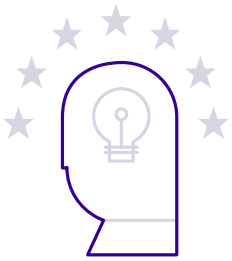
However, if famed British economist John Maynard Keynes taught us anything, it is that in the long run we will all be dead anyway – and this might be the fate of the EU's home-based technological sector too if the continent fails to catch up with the AI global leaders in the near future.

By restricting access to personal data and imposing strict privacy rules on its handling, the European Union is in principle raising the cost for companies of acquiring the single most important raw material of artificial intelligence: data. This has a double effect. First, it means that large, established companies with easier access to capital have a much better chance of participating in the AI revolution, as they are better suited to cover the high entry costs associated with obtaining data and complying with costly regulatory privacy regimes. Second, it forces these companies to seek commercial opportunities with higher revenue potential when it comes to investing in AI-related research and innovation, as a higher cost requires higher potential future profits to recover their investment.

The second part, however, becomes problematic when confronted with the EU's track record in its approach to the competitive advantage conferred by data. As mentioned in the section on P2B Regulation, the European Union sees the use of data by online marketplaces as potentially detrimental to market competition, due to the asymmetrical benefits it provides to platforms vis-à-vis the sellers that use them. This is at the centre of the trade-off that defines the digital economy: companies will only gather and use data if it offers them a competitive edge and increases their potential future profitability. By forcing them to relinquish or share these potential benefits, regulators reduce the incentive to gather data and use it to innovate.

There are elements of the Commission's approach that are important from the point of view of ensuring that European companies become more competitive in the AI sector and that the EU becomes a leading player in the digital era, allowing it to maintain its strategic autonomy. One of them is the

proposal to rethink the basic principles of merger control with respect to digital companies, by allowing a review of transactions which do not meet the notification threshold as currently defined, but could still have far-reaching competitive effects in the future, based on the technologically disruptive nature of the acquired company.[60] As argued by Bruegel and ECFR's contribution on the EU's economic sovereignty, this



The AI revolution will not fully take off in the EU without a rethinking of its approach to data.

should also include a security clause to be invoked by the EU's High Representative as well as mechanisms regarding to foreign investment and export control to take into account a broader definition of security exceptions recognizing the role of digital technologies in the EU's ability to safeguard its strategic autonomy.[61]

However, the AI revolution will not fully take off in the EU without a rethinking of its approach to data. While currently the EU offers a classification based on the legal notions of personal and non-personal data, and the European Data Strategy emphasizes "industrial data" as a competitively central element of the latter. The set of documents detailing EU's plan to shape its digital future presented by President von der Leyen, Deputy President Vestager and the Commissioner for Internal Market and Services Thierry Breton draws a distinction between European and non-European data and underlines the superiority of the former. By relying on an inherent competitive advantage that the use of European data will confer to European companies, the European Commission is adopting an approach to digital sovereignty that comes close to digital autarky.

60 Ibid., p. 11.

61 M. Leonard, J. Pisani-Ferry, E. Ribakova, J. Shapiro and G. Wolff (2019), 'Redefining Europe's economic sovereignty', *Bruegel Policy Contribution*, Issue 9, pp. 12–13.

However, an equally important distinction from the point of view of competitive analysis is to look at the economic characteristics of personal data—its cost of acquisition and rate of depreciation.[62] The cost of data refers to how it is obtained—whether consumers share it freely so it can be obtained directly from them, whether it requires an analysis of their behaviour (browsing history), or whether it is extrapolated from an analysis of large sets of previously obtained data. Its rate of depreciation can be defined as the period over which data remains relevant and holds any value for the company; date of birth and religious beliefs would be an example of slowly deteriorating data, as opposed to someone's location or recent purchasing history.[63]

The inclusion of the cost of personal data and its depreciation rate in the EU's approach to digital technology would allow the EU to adopt a more nuanced, differentiated approach to personal data handling which goes beyond legal concerns over privacy. From the competitive standpoint, a company with access to large sets of fast-depreciating data, especially of a type that is cheap to obtain, poses a much lower threat than if focusing on slow-depreciating, high-cost data. In turn, this would call for differentiated enforcement approaches, while lessening the regulatory grip on companies in possession of data which does not foreclose market access for its competitors in the medium to long term. As the EU has to find ways to ease its approach to restricting the collection and handling of data, or risk losing out in the global AI race and see its strategic autonomy threatened, using criteria based on the economic value of data is worth examining.

62 Oxera (2018), 'Consumer data in online markets', pp. 5–6.
63 Ibid.

Recommendations

The EU's business-as-usual approach doesn't work in the digital era. With that in mind, we recommend three paradigm shifts in the EU's approach to regulating the digital economy, as well as specific policy efforts which would support this transition.

1. On issues where EU's main concern is related to the asymmetric power wielded by the global tech giants the regulatory paradigm should shift from a one-size-fits-all macro-regulation approach to more-targeted micro-regulation efforts.

POLICY PROPOSAL NO.1:
The European Commission should update its guidance on the abuse of dominant position to better fit with the demands of the digital era.

The DG Competition's efforts to enforce the EU's antitrust and state aid laws against the U.S. technological giants such as Google (abuse of dominant position), and Amazon and Apple (unlawful state aid) are a good example of a more effective and better-tailored enforcement tool.

2. In cases where a macro-regulatory approach remains necessary, effective enforcement mechanisms have to apply to all (both EU – and non-EU based) market players.

POLICY PROPOSAL NO. 2:
The EU should establish a centralized consumer protection agency shaped after DG Competition to police breaches of EU regulations concerning the consumer rights acquis.

The current enforcement system relying on the national courts is insufficient. Unlike EU directives, EU regulations are uniformly and directly applicable across the entire single market. An EU-wide, centralized agency endowed with the power to punish companies which violate EU regulations would reduce the power asymmetry and ensure strict enforcement of rules.

POLICY PROPOSAL NO. 3:
The EU should increase pressure on the Chinese government to tackle the issue of industrial subsidies and their impact on trade.

Despite the ongoing EU-China discussions, the uneven level-playing field between EU companies and their state-supported Chinese counterparts remains in place. While the EU's trade agreements now all include provisions on state aid control, the lack of effective framework to tackle the issue of Chinese industrial subsidies is among the largest competitive disadvantages faced by EU businesses.

3 In order to prosper, EU-based scale ups should receive stronger support by the European Union.

POLICY PROPOSAL NO. 4:
The EU has to rethink its approach to data by moving away from singular focus on privacy and towards an economic assessment of data as a necessary input for digital industries.

The current approach taken by the European Commission when it comes to personal data is predicated on the notion of data gathering as an inherent threat. This has far-reaching negative effects on the competitiveness of the EU tech sector. The EU should consider reducing its privacy requirements with respect to data that does not confer long term competitive advantage to companies, by taking into account its cost of acquisition and rate of depreciation.

POLICY PROPOSAL NO. 5:
The EU should radically increase its financial commitment to supporting the EU tech sector through the Digital Europe Programme and the InvestEU initiative.

Both of the EU's flagship initiatives, which were designed to provide a financial spark to the digital sector over the span of the next decade, pale in comparison to even the current investment levels in the U.S. and China. The EU is already lagging in the digital arms race, and the continent's pool of venture capital is relatively shallow. This makes a much larger public investment package a necessity.

Technical Annex

Data on EU Techs

Official business taxonomies like NACE (Statistical Classification of Economic Activities in the European Community) or NAICS (North American Industry Classification System) use a standard twentieth-century approach that classifies companies according to their business purpose, i.e. the type of products or services they offer, and not their mode of operation. As a result, it is easy to find public data on software developers or IT solution providers, but not on e-commerce services or B2C online platforms. In the last decade statistical offices have included some new business activity classes, breaking out some sections of the economy for companies that mainly operate in the digital environment (e.g. NACE 47.91 Retail sale via mail order houses or via Internet), but in many divisions such firms are still categorized as n.e.c. (Not Elsewhere Classified), together with plenty of other atypical business activities. Moreover, each year new companies enter the digital economy by offering new digital solutions in addition to their "analogue" goods, while sticking to their old classification code, which makes the collection of comprehensive data even harder.

A more up-to-date approach is presented by commercial data providers like IDC or Thomson Reuters. The Thomson Reuters Business Classification (TRBC) offers its own classification, including e.g. the division of Online Services, which covers companies providing e-commerce and auction services, content and site management services, internet security and transaction services, as well as development of search engines, internet gaming applications or social media and networking platforms, together with a large group of other online services, n.e.c., which comprise news and media agencies, e-mail platforms, online food delivery marketplaces, and others. A drawback of these data sources is that they cover mainly large and medium-sized enterprises but do not provide comprehensive data on small and micro firms with fewer than 50 employees. To give an example, the Thomson Reuters database includes data on 3,800 EU firms providing retail sales via mail-order houses or internet, which is less than 2 per cent of the 207,000 companies classified as e-commerce (NACE 47.91) by Eurostat at the end of 2016, out of which the vast majority are firms employing up to one person.

The most reliable and extensive source of figures on the data economy is the European Data Market Monitoring Tool (EDMMT), prepared by IDC for the European Commission in 2017 and frequently updated since then based on IDC and Eurostat microdata combined with detailed business surveys. It includes information on "data suppliers", i.e. EU-based firms that have as their main activity the production and delivery of digital data-related products, services and technologies, as well as "data users", i.e. organizations that generate, exploit, collect and analyse digital data intensively and use what they learn to improve their business.

Moreover, the report includes also estimates of the size and value of the data economy itself—revenues and added value generated along the supply chain of data suppliers, from their contractors ("backward indirect effects") to data users and companies that utilize data products and services for optimizing production and delivery processes, as well as improving marketing or existing organization and management practices ("forward indirect effects"). On top of that they include in the data economy the "induced effects" of data suppliers' and users' activity, i.e. multiplier effects of employee compensation and investment outlays. In other words, EDMMT comprises data on all EU companies that use and deliver data-related products, services and technologies, from online platforms to enterprise resource management (ERM) application developers, server hosts, and IT hardware suppliers. This group includes, but is not restricted to, EU Techs.

In order to describe the economic footprint of EU Techs, we need to combine data from various sources to distinguish EU Techs. To provide a statistically valid definition of EU Techs we drew on the internal *modus operandi* of the European Tech Alliance (EUTA).

We put forward four criteria for EU Techs:

(1) EU Techs must be technology companies (excluding technology equipment companies) as defined in the TRBC.
(2) they are independent business units or organizations incorporated in one of the EU countries in 2019.
(3) employ more than 50 people.
(4) provided balance sheet data for any of the fiscal years 2016–2019.

According to the Thomson Reuters database, there are 42,000 entities incorporated in one of the 28 EU member states that operate as technology companies (excluding technology equipment companies), out of which 39,000 have their headquarters within the EU. Based on that data, we identified 4,629 entities

that can be labelled as EU Techs, i.e. which fulfil the above definition. It is worth noting that our EU Tech population is about a third of the large data users and suppliers group as defined in EDMMT (total of 12,440 data companies) and about a third of the 13,000 European tech companies that have raised funding since 2015, as compiled for the Slush 2019 conference. The smaller number of identified companies is the result of more restrictive criteria adopted: we only analyse companies that provide business data, employ at least 50 people (unlike the Slush data) and are technological companies (unlike the IDC data).

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