

**Proceedings of the Weizenbaum Conference 2022:
Practicing Sovereignty. Interventions for Open Digital Futures**

EUROPE'S DIGITAL SOVEREIGNTY

**AN INTERNATIONAL POLITICAL ECONOMY CONCEPTUAL
APPROACH**

Kreutzer, Stephan
Technopolis Group
Berlin, Germany

stephan.kreutzer@technopolis-group.com

Vogelsang, Manuel Molina
Fraunhofer IMW
Leipzig, Germany

manuel.molina.vogelsang@imw.fraunhofer.de

KEYWORDS

digital sovereignty; economic policy; international political economy, market competition;
technology companies; data economy

ABSTRACT

This paper looks at conceptual approaches to digital sovereignty from an international political economy perspective, focusing on the state level. We consider the implications of the rise of the data economy and analyze different economic policy approaches to restoring and preserving Europe's digital sovereignty from market liberal and industrial policy perspectives. We conclude that networked sovereignty can optimally be attained by supporting the emergence and success of homegrown technology companies in a globalized data economy. Digital sovereignty can best be achieved by policy makers using a mix of market liberal and more proactive industrial policy instruments. The liberal focus on framework conditions is useful in refocusing policy makers' efforts on deepening the EU single market, while the industrial policy approach can be a suitable way of funding pilot projects in early-stage technology areas in partnership with industry and setting rules for newly emerging markets. State action is also necessary to avoid monopolies.

1 INTRODUCTION

One of the most salient phenomena of today is the digital transformation of society. The impact these developments are having on the competitiveness of businesses, market structures, and global value networks are of geopolitical relevance (Brynjolfsson and Saunders 2010; Rumana Bukht and Richard Heeks 2017; van de Velde et al. 2015). From a European Union (EU) perspective, the rise of data-driven business models introduced by digital platform companies³ in the United States and, to a lesser extent, in China, may conflict with the political goals of protecting citizens' privacy and enhancing the competitiveness of homegrown companies. Due to the importance of digital technologies—such as semiconductors, cloud computing, and artificial intelligence—for various industries, such conflicts have implications for the technological sovereignty of the EU (Braud et al. 2021; Bauer and Erixon 2020; Bendiek and Neyer 2020; Edler et al. 2020).

The aim of this paper is to compare different approaches rooted in economic theory to identify a practical approach to answering the following question: How can Europe restore and preserve its digital sovereignty? Conceptually, the paper contributes to the academic debate on the geopolitical and international political economy perspective on digital sovereignty: How can digital sovereignty be defined at the level of states and supranational entities (such as the EU)? What challenges and potential opportunities does the rise of digital platform companies present for political actors? What (combination of) economic policy instruments supporting digital sovereignty show most promise? In tackling these questions, the paper touches upon regulatory and technological aspects and questions of autonomy, control, and authority in a globalized data economy.

In Section 2, we summarize the academic debate on “digital sovereignty” and define the term at the state level. In Section 3, we outline the characteristics of the data economy and the European position vis-à-vis major competitors. We analyze economic policy approaches to restoring and preserving digital sovereignty at the EU level in Section 4. Finally, we conclude by summarizing the results and outlining further research questions.

2 CONCEPTUAL CONSIDERATIONS

The concept of “sovereignty” has varying definitions and has been used in different contexts throughout history. Today, the term digital sovereignty is widely used in the political debate (Krasner 2012; Korff 1923; Biersteker 2002, 1999; Couture and Toupin 2019; Hummel et al. 2021; Pohle and Thiel 2020). To analyze the interlinkages between the geopolitical and economic dimensions of

³ In the following, we understand technology and digital platform companies as encompassing those enterprises whose business model is highly dependent on R&D and the use of digital technologies.

digital sovereignty at the state level, we suggest adopting an international political economy viewpoint in the following discussion. Therefore, we conducted a semantic search for “digital sovereignty” in the titles, abstracts, and keywords recorded in the bibliographic databases Scopus, Web of Science, and Dimensions.ai.

Figure 1 shows that the debate on “digital sovereignty” is a relatively new one. The first documented publications date back to 2013; since 2018, the volume of publications has increased substantially. The analysis shows that fewer publications were listed in the academic databases Scopus and Web of Science than in Dimensions.ai, which also covers reports, working papers, and policy documents. Nevertheless, all three bibliographic databases show the same dynamics.

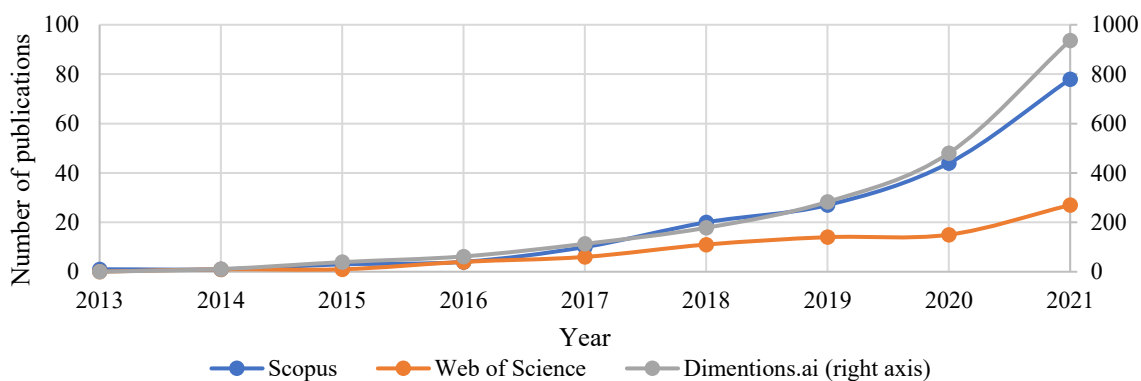


Figure 1. Development of publications for the keyword “digital sovereignty” in different bibliographic databases; own depiction based on Scopus, Web of Science, and Dimensions.ai

Furthermore, most of the publications are in computer sciences and social sciences (see Table 1). Most publications are from European (Germany, France, Finland, UK) and to a lesser extent US authors.

Top subject area	Scopus	Web of Science	Dimensions.ai
1st	Computer Science (39)	Computer Science Information Systems (6)	Studies in Human Society (307)
2nd	Social Sciences (38)	Computer Science Theory Methods (6)	Information and Computing Sciences (185)
3rd	Engineering (14)	Communication (5)	Law and Legal Studies (144)
4th	Arts and Humanities (11)	Engineering Electrical Electronic (4)	Economics (62)
5th	Business, Management and Accounting (8)	Telecommunications (3)	Commerce, Management, Tourism and Services (52)

Figure 2. Most relevant subject areas of publication on “digital sovereignty”; number of publications between 2013 and 2021 in parentheses; own elaboration based on Scopus, Web of Science, and Dimensions.ai

Regardless of the scientific or geographical background, the concept of “digital sovereignty” refers to an individual’s capacity to pursue their own goals in a self-determined way and without being limited by access to key digital technologies and competences (Pohle and Thiel 2020; Lambach 2020; Wittpahl 2017; VDE 2020). It is widely acknowledged that digital sovereignty can be used at the individual, organizational, national, and even supranational levels.

At the **individual level**, the term usually refers to citizens’ right to privacy and data protection but also to their ability and competences to use digital technologies in a self-determined way. This is relevant for the geopolitical dimension of sovereignty insofar as broad acceptance of digital technologies is needed for these to successfully be taken up in society. Societal take-up, in turn, facilitates the creation of a competitive technology base. Moreover, most data-driven business models rely on citizens’ willingness to share their personal data.

At the **organizational level**, digital sovereignty can be assessed from the point of view of companies and other organizations. Here, aspects such as cybersecurity or intellectual property and the control of data are of major concern. Questions of competitiveness and value chains are equally relevant in this context.

At the **state level**, in focus here, the term touches upon regulation. Here, data sovereignty can translate into technological leadership and into economic competitiveness and geopolitical power. As digitalization reaches ever more industries and knowledge areas, the question of who has access to and controls the data impacts on the competitiveness of entire economies. Global leadership in key technology areas and innovation does not only mean locating high-added-value activities and

competitive industries at home but also results in geopolitical power abroad and makes it possible to shape global economic and social governance and rules.

There is also the question of what *constitutes* sovereignty and how it can best be achieved in the globalized data economy. Digital sovereignty is widely considered to solve a set of interlinked problems in various policy areas (Bendiek and Neyer 2020; Pohle and Thiel 2020; VDE 2020). At the state level, it is argued that neither autonomy, nor autarky, nor heteronomy are viable options for achieving and preserving digital sovereignty. Digital sovereignty is best achieved through networking and diversification, and global interconnectedness and interdependence (Syuntyurenko 2015). We conclude that digital sovereignty manifests itself in the interaction between economic, technological, and political actors.

The bibliographic analysis shows that the debate focuses more on the individual and organizational level than the state level. We find little evidence of conceptual or empirical studies on the best choice of economic policy approaches to preserve digital sovereignty at the state level. To help fill this gap, we will first look at the features of the data-driven economy and then summarize the key notions of each of these economic policy approaches. This research focus implies that we regard digital sovereignty as a normative term, that is, as a status that is considered desirable.

3 APPLICATION: THE CASE OF EUROPEAN DIGITAL SOVEREIGNTY

The EU as a supranational entity faces challenges to its digital sovereignty (Floridi 2020). Until recently, Europe was able to shape and influence global rules for the data economy, but it was also able to influence rulemaking in other technological and economic areas. By making access to its market of more than 450 million people contingent on compliance with its own rules, it has often led technology companies to adopt global policies that are in line with EU regulation. This has been termed the “Brussels effect” (Bradford 2020). The most prominent example is the General Data Protection Regulation (GDPR) which has been mirrored in other jurisdictions, most notably in California (Sirota, 2019; Voss and Houser 2019; Baik 2020). However, as Europe’s share of global GDP shrinks, its power to influence global rules will do so as well in the absence of homegrown digital platform companies and in the wake of rising competition from the United States, China, and elsewhere.

This gives rise to the question of why Europe has so far failed to create digital technology companies that could shape the global data economy. The data economy is characterized more than other industries by scale and network effects (Rochet and Tirole 2003; Katz 1994; Alt and Zimmermann 2019). In digital markets, there is a tendency towards oligopolies; indeed, in more narrowly defined sections of the data economy, such as the social media or search engine sectors,

quasi-monopolies are leading to suboptimal outcomes economically (Ducci 2020; Shapiro and Varian 2008). Digital platforms act as intermediaries between two or more user groups with interdependent demands in so-called two-sided markets (Veisdal 2020; Hagiu 2009; Boudreau and Jeppesen 2015). This is so because many platform providers need a critical mass of users to function properly, and in turn, the users draw more benefits from the platforms most in use.

Lock-in effects, such as access to a personal network or algorithmically personalized search results, make platform-switching costlier from the user's perspective. At the same time, the rising importance of digital services for the functioning of society means that some of these platform providers can now be considered part of a country's "critical infrastructure," just like telecommunications or electricity providers; they are no longer viewed as purely economic actors. While Europe clearly failed to ride the first wave of digital platform economies, which are mostly business-to-consumer (B2C) focused, whether European firms will be more successful in the next, more business-to-business (B2B) focused wave remains unclear. The peculiarities of data-driven digital markets give rise to the question of what the state can do to achieve and preserve digital sovereignty. In the following, we compare two distinct approaches.

4 DISCUSSION: TWO INTERNATIONAL POLITICAL ECONOMY APPROACHES

The different explanations for Europe's failure to create digital champions in the first wave of digital platform economies and the proposals for remedying this in the second wave essentially all try to answer the following question: What is the right balance between state intervention and market dynamics that offers the greatest added value for society in a globally networked data economy? In the following, we summarize the key notions of each of these economic policy approaches before proposing a way forward.

The **market liberal approach** proposed by Adam Smith and other (neo)classical economists contends that market dynamics in an open economy generate optimal outcomes. Accordingly, the state cannot enforce the emergence of digital champions. Even if this were possible, it would only prompt the replacement of foreign businesses with homegrown monopoly companies, which might enhance digital sovereignty on the state level but would do nothing to foster it on the individual or organizational level. The result of such political interventions can be observed in China, where politically imposed market entry barriers have created national digital champions pursuing business models comparable to those of US companies, leading to an even stronger market concentration than in the United States or Europe (Arsène 2015). In addition, any attempt to create European champions would risk decoupling the EU from cutting-edge developments in the rest of the world by limiting

the ability of foreign companies to operate in Europe. Indeed, foreign dominance in industries where such companies have a comparative advantage is not problematic from a market liberal perspective, as explained in the international division of labor theory by David Ricardo. This, however, does not say much about Europe's role in newly emerging technology areas. Rather than directly promoting companies, market liberalists focus on framework conditions. In the European context, they recommend completing the single market in digital services and goods to give European companies a bigger market and potential user base from which to scale up their businesses to global success. Restrictive regulations in some jurisdictions also hamper the growth of technology companies (Detrixhe 2018). Liberalists also note that financing for rapidly growing companies in Europe could be improved, for instance, by further integrating cross-border venture capital markets and providing tax incentives. Finally, labor mobility in the EU is much lower than in the US, making it more difficult for clusters of technology innovation and excellence such as Silicon Valley to emerge (Bauer and Erixon 2020).

In contrast, the **industry approach** regards (limited) state intervention and an active industrial policy as necessary to enable the rise of new technology clusters and to ensure a functioning market later on, especially in those areas of critical importance to a competitive and resilient economy and society (building on 19th century economist Friedrich List's infant industry argument). This line of thinking accepts short-term economic efficiency losses for the benefit of societal welfare in the longer term. According to this approach, unrestricted competition will result in market failure if it leads to monopolies or oligopolies dominated by foreign companies commanding vast amounts of data. The existence of higher market entry barriers in such industries compared to many other ones make it necessary for the state to help individual companies grow to a size where they can compete on a global level. Industrial policy advocates are concerned about the next technology wave of B2B digital platforms in the realm of the internet of things, as these technologies may affect many industries where Europe is traditionally strong (e.g., cars and machinery). Advocates of a more interventionist approach also maintain that even in the supposedly market-oriented US economy, many technology companies have benefitted from state intervention and public funding in R&D (Mazzucato 2011).

The industrial policy approach emphasizes the criticality of digital services and platforms for the state's digital sovereignty. According to this, theories of comparative advantage are inadequate to explain the complexity of today's digital economy, where control over data is just as important as economic efficiency gains (Carriere-Swallow and Haksar 2019). This would justify stronger regulation of the data economy, promoting data access and data-sharing (El-Dardiry, Dinkova, and Overvest 2021).

It is evident that, in recent years, the discourse on economic policy in Europe has shifted away from the market liberal approach and gone closer to an active industrial policy approach. This shift has only been augmented by the COVID-19 pandemic and the accelerated digital transformation, even as failed attempts to re-shore production of sensitive equipment have demonstrated the limits of state intervention and adverse effects of trying to upend global supply chains.

We conclude that a combination of elements of a market liberal and a more proactive industrial policy approach will be most conducive to the growth of European companies in the next wave of digital innovation. The liberal focus on framework conditions is useful in refocusing policy makers' efforts on deepening the incomplete EU single market, strengthening venture capital markets, and reminding policy makers of previous failed attempts of the state to pick individual firms and try to grow them into digital champions. On the other hand, according to an industrial policy approach, it may be advisable for the state to fund pilot projects in early-stage technology areas in partnership with industry to define new standards and rules for markets that are not yet fully consolidated. Policy makers can also regulate digital platform providers in such a way that they have to offer their customers different business relationships—for instance, providing free services in return for customer's personal data, or a subscription-model without data sharing, or even business models where users receive compensation for sharing more data. This would make the data economy more transparent and facilitate platform-switching. The draft EU legislation on Digital Markets and Digital Services already goes in that direction (European Commission 2020).

Importantly, when determining the right policy mix and balance between market openness and state intervention, policy makers should adopt a differentiated approach for different technology fields and stages of technology development. They may need to find the right moment to move away from an interventionist industrial policy and to a more market liberal approach. Even after the state has withdrawn from a more developed technology market (with higher technology readiness levels), it should maintain some oversight to prevent excessive market concentration. European policymakers should thus adopt bolder, more proactive industrial policies in early-stage technology areas and allow for more market competition in more advanced fields. A combination of liberal market-enabling measures and industrial policy regulation and standard-setting could shape a European “third way” to safeguarding digital sovereignty.

5 CONCLUSION AND OUTLOOK

This paper contributes to filling a gap in the debate on digital sovereignty by focusing on the level of the state and the geopolitical dimension of digital sovereignty. Using the example of the European debate on how to achieve and preserve digital sovereignty vis-à-vis global competition and

considering the market dynamics of the data economy, we adopt a political economy perspective that compares a market liberal and an industrial policy approach to answering this question.

Irrespective of the specific technology area, it is important for Europe to remain open to technology companies from abroad, so as to avoid creating a technosphere of its own that cannot access and benefit from innovation elsewhere. Instead, Europe should make its own model for the data economy attractive to the rest of the world by emphasizing trusted digital services and goods, data security and privacy. This way, digital sovereignty can be realized through *coopetition* (strategic cooperation and competition) globally.

The questions discussed in this paper can be investigated further. Research could build on the concept of digital sovereignty proposed here and review the political debate in other parts of the world, notably in the United States, China, and other parts of Asia. Furthermore, while this paper alluded to the consequences that different policy approaches on the state level may have on the level of organizations (businesses in particular) and individuals, further research could investigate the links between the state and these other two levels more thoroughly, and thus arrive at a more holistic understanding of digital sovereignty as a concept permeating all levels of society.

6 REFERENCES

1. Alt, R., Zimmermann, H. (2019). Electronic Markets on Platform Competition. *Electronic markets*, 29 (2), 143–149. <https://doi.org/10.1007/s12525-019-00353-y>.
2. Arsène, S. (2015). Internet Domain Names in China. *China perspectives*, 2015 (4): 25–34. <https://doi.org/10.4000/chinaperspectives.6846>.
3. Baik, J. (2020). Data Privacy Against Innovation or Against Discrimination? The Case of the California Consumer Privacy Act (CCPA). *Telematics and Informatics*, 52:101431. <https://doi.org/10.1016/j.tele.2020.101431>.
4. Bauer, M., Erixon, F. (2020). Europe's Quest for Technology Sovereignty: Opportunities and Pitfalls. ECIPE occasional paper 2020, 02. Brussels, Belgium. European Centre for International Political Economy. https://ecipe.org/wp-content/uploads/2020/05/ECI_20_OccPaper_02_2020_Technology_LY02.pdf.
5. Bendiek, A., Neyer, J. (2020). Europas Digitale Souveränität: Bedingungen und Herausforderungen Internationaler Politischer Handlungsfähigkeit. *Demokratietheorie im Zeitalter der Frühdigitalisierung*, edited by Oswald, M., Borucki, I. 103–25. Wiesbaden, Heidelberg: Springer VS.
6. Biersteker, T. (Ed.). (1999). *State Sovereignty as Social Construct*. Reprinting. Cambridge studies in international relations 46. Cambridge: Cambridge Univ. Press.
7. Biersteker, T. (2002). State, Sovereignty and Territory. *Handbook of International Relations*, 157–76. London, United Kingdom: SAGE Publications Ltd.
8. Boudreau, K., Jeppesen, L. B. (2015). Unpaid Crowd Complementors: The Platform Network Effect Mirage. *Strat. Mgmt. J.* 36 (12): 1761–77. <https://doi.org/10.1002/smj.2324>.
9. Bradford, A. (2020). *The Brussels Effect: How the European Union Rules the World*. New York, NY: Oxford University Press.
10. Braud, A., Fromentoux, G., Radier, B. and Grand, O. (2021). The Road to European Digital Sovereignty with Gaia-X and IDSA. *IEEE Network* 35 (2): 4–5. <https://doi.org/10.1109/MNET.2021.9387709>.
11. Brynjolfsson, E. Saunders, A. (2010). *Wired for Innovation: How Information Technology Is Reshaping the Economy*. Cambridge, Mass. MIT Press.
12. Carriere-Swallow, Y. Haksar, V. (2019). *The Economics and Implications of Data: An Integrated Perspective*. Departmental paper no. 19, 16. Washington, DC, USA: International Monetary Fund.
13. Couture, S., Toupin, S. (2019). What Does the Notion of “Sovereignty” Mean When Referring to the Digital? *New Media & Society* 21 (10): 2305–22. <https://doi.org/10.1177/1461444819865984>.
14. Detrixhe, J. (2018). Why Can't Europe Create Tech Giants Like the US and China? <https://qz.com/1320983/why-arent-europes-technology-companies-as-big-as-in-the-us-and-china/>.
15. Ducci, F. 2020. *Natural Monopolies in Digital Platform Markets*. Global competition law and economics policy. Cambridge: Cambridge University Press.
16. Edler, J., Blind, K., Frietsch, R., Kimpeler, S., Kroll, H., Lerch, C., Reiss, T. et al. (2020). *Technologiesouveränität – Von der Forderung zum Konzept*.

17. El-Dardiry, R. Dinkova, M., Overvest, B. (2021). Policy Options for the Data Economy: A Literature Review. CPB background document. The Hague: CPB Netherlands Bureau for Economic Policy Analysis.
<https://www.cpb.nl/sites/default/files/omnidownload/CPB-Background-Document-Policy-Options-Data-Economy-Literature-Review.pdf>.
18. European Commission. 2020. Europe Fit for the Digital Age: Digital Platforms.
https://ec.europa.eu/commission/presscorner/detail/en/ip_20_2347.
19. Floridi, L. (2020). The Fight for Digital Sovereignty: What It Is, and Why It Matters, Especially for the EU. *Philos. Technol.* 33 (3): 369–78. <https://doi.org/10.1007/s13347-020-00423-6>.
20. Hagiu, A. (2009). Two-Sided Platforms: Product Variety and Pricing Structures. *Journal of Economics & Management Strategy* 18 (4): 1011–43. <https://doi.org/10.1111/j.1530-9134.2009.00236.x>.
21. Hummel, P., Braun, M., Tretter, M., Dabrock, P. (2021). Data Sovereignty: A Review. *Big Data & Society* 8 (1): 205395172098201. <https://doi.org/10.1177/2053951720982012>.
22. Katz, M. L. (1994). Systems Competition and Network Effects. *The journal of economic perspectives*.
23. Korff, B. S. A. (1923). The Problem of Sovereignty. *Am Polit Sci Rev* 17 (3): 404–14.
<https://doi.org/10.2307/1944043>.
24. Krasner, S. D. (2012). *Problematic Sovereignty: Contested Rules and Political Possibilities*. New York: Columbia University Press. <http://gbv.ebib.com/patron/FullRecord.aspx?p=909282>.
25. Lambach, D. (2020). The Territorialization of Cyberspace*. *International Studies Review* 22 (3): 482–506.
<https://doi.org/10.1093/isr/viz022>.
26. Mazzucato, M. (2011). *The Entrepreneurial State: Debunking Public Vs. Private Sector Myths*. London: Demos.
27. Pohle, J., Thiel, T. (2020). Digital Sovereignty. *Internet Policy Review* 9 (4). <https://doi.org/10.14763/2020.4.1532>.
28. Rochet, J.-C., Tirole, J. (2003). Platform Competition in Two-Sided Markets. *Journal of the European Economic Association* 1 (4): 990–1029. <https://doi.org/10.1162/154247603322493212>.
29. Rumana B., Heeks, R. (2017). Defining, Conceptualising and Measuring the Digital Economy: Development Informatics Working Paper No.68. Development Informatics Working Paper (68).
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3431732.
30. Shapiro, C., Varian, H. R. (2008). *Information Rules: A Strategic Guide to the Network Economy*. 17. Boston, Mass. Harvard Business School Press.
31. Sirota, D. (2019). California's New Data Privacy Law Brings U.S. Closer to GDPR. TechCrunch, 2019.
https://techcrunch.com/2019/11/14/californias-new-data-privacy-law-brings-u-s-closer-to-gdpr/?guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xiLmNvbS8&guce_referrer_sig=AQAAACMQoZFpS9Ci7d5lj_PJzvHypRA4cvF3nKe6LbZ52Oe2P3Q41SpNww49FMJNLAuGD1a6GZE4p5rflQI4uuxpXf3efNTJSXD5NsXVytFA1EYYephTds-PIUUmof-FAMT9w0WolhiJM4GL7pPIQFggfCZkKnYI9Zkd4r1HTsXrLr&guccounter=2.
32. Syuntyurenko, O. V. (2015). The Digital Environment: The Trends and Risks of Development. *Sci. Tech. Inf. Proc.* 42 (1): 24–29. <https://doi.org/10.3103/S0147688215010062>.
33. van de Velde, E., Debergh, P., Wydra, S., Som, O. (2015). *Key Enabling Technologies (KETs) Observatory: Second Report December 2015*.

34. VDE. (2020). Technologische Souveränität: Vorschlag Einer Methodik Und Handlungsempfehlungen. VDE-Positionspapier.
35. Veisdal, J. (2020). The Dynamics of Entry for Digital Platforms in Two-Sided Markets: A Multi-Case Study. *Electronic markets* 30 (3): 539–56. <https://doi.org/10.1007/s12525-020-00409-4>.
36. Voss, W. G., Houser, K. A. (2019). Personal Data and the GDPR: Providing a Competitive Advantage for U.S. Companies. *Am Bus Law J* 56 (2): 287–344. <https://doi.org/10.1111/ablj.12139>.
37. Wittpahl, V., (Ed.) (2017). iit-Themenband - Digitale Souveränität: Bürger, Unternehmen, Staat. Berlin, Heidelberg: Springer Vieweg Open.