Balanced and Transparent Antitrust in the AI Space

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I. Introduction

1. The appearance of ChatGPT made the extent of recent advancements in machine learning and the potential of AI suddenly obvious to the public at large.[1] Yet, legislators, regulators, and competition authorities around the world—which, a decade or more ago, were caught off guard by the emergence of powerful tech platforms—seem to have been well prepared for the onset of the AI spring. The European Commission (EC) had been working on AI regulation that culminated in the reach of a political agreement on the AI Act between the European Parliament and the Council in December 2023.[2] In the US, President Biden issued an Executive Order in October 2023 to ensure that the United States addresses the risks of AI.[3] The UK Competition and Markets Authority (CMA) launched a review of AI foundation models, published an initial report in September 2023 and an Update Paper in April 2024.[4] Furthermore, in the EU, the EC launched a call for contributions on competition in virtual worlds and generative AI in January 2024.[5] To support enforcement in the digital space, competition authorities have also dedicated part of their staff to this task, and some have hired experts in the field.[6]

2. Given AI's potential to significantly affect people's lives and the ways firms do business, the attention with which the legislators and regulators are scrutinizing AI is not surprising. It is also not surprising that competition agencies have been paying heed to AI. Certain AI applications require access to large and varied datasets and ample computing power in development or deployment. Accordingly, industry commentators and regulators have identified data and computing power as potential bottlenecks in the advancement of AI. Another concern that competition agencies have frequently raised in the digital space relates to supply- and demand-side complementarities that may emerge in the provision of multiple adjacent services. Such complementarities may lead to the emergence of digital "ecosystems," which competition agencies sometimes view as a factor facilitating market position entrenchment. Similar considerations will emerge in relation to AI to the extent the development and deployment of AI take place in ecosystems.

3. AI applications have already been successfully operationalized in certain domains, such as chatbots, finance, medicine, autonomous car driving, and robot process automation. Nevertheless, there is still much that we do not yet know about how AI and AI-related

* The views expressed herein are those of the authors, who are responsible for the content, and do not necessarily represent the views of Cornerstone Research.

1 Over the past two years, generative AI has seen explosive growth among end users and businesses. The trend began with the release of image generation services, such as Midjourney and DALL-E 2, and became undeniable in 2023 following the release of ChatGPT in November 2022.

2 *See* Proposal for a Regulation of the European Parliament and of the Council Laying down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts, COM(2021) 206 final, 21 April 2021.

3 *See* White House, FACT SHEET: President Biden Issues Executive Order on Safe, Secure, and Trustworthy Artificial Intelligence, 30 October 2023, https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/30/fact-sheet-president-biden-issues-executive-order-on-safe-secure-and-trustworthy-artificial-intelligence/#:~:text=With%20this%20Executive%20Order%2C%20the,information%20with%20the%20U.S.%20government.

4 *See* CMA, AI Foundation Models: Initial Report, 18 September 2023, https://assets.publishing.service.gov.uk/media/65081d3aa41cc300145612c0/Full_report_.pdf. An Update Paper, together with a Technical update report was published in April 2024, *see* https://www.gov.uk/government/publications/ai-foundation-models-update-paper.

5 *See* European Commission, press release IP/24/85 of 9 January 2024: Commission launches calls for contributions on competition in virtual worlds and generative AI, *see* https://ec.europa.eu/commission/presscorner/detail/en/IP_24_85.

6 For example, the CMA set up a Chief Data and Technology Insights Officer position and a Data, Technology and Analytics (DaTA) unit. The Directorate General for Competition of the EC followed suit by creating a Chief Technology Officer position and a Data Analysis and Technology unit.

markets will develop: What will the next big advances be? Who will drive them? How will they be commercialized, and how will that affect people's lives? We can, however, say a few things that bear on competition policy and regulation in the space with a fair degree of confidence. First, large tech platforms are well positioned for the advancement and deployment of AI in certain domains and will likely play an important role in the AI space. Second, competition authorities and regulators are much better equipped to deal with AI-specific competition risks today than they were to deal with issues related to tech platforms as they started emerging a decade ago. Third, regulation affects the competitive process and will have an impact on the AI development path.

4. Against this background, we examine the role of EU competition policy and adjacent EU regulations such as the EU Digital Markets Act (DMA) in the emerging AI space.[7] We argue that, to tackle AI-specific challenges, competition authorities will be able to rely on past enforcement experience in relation to tech platforms over the past ten years. The *ex ante* tech platform regulation that the EU put in place will further mitigate the risks to effective competition in the AI space.

5. On the flip side, the high level of uncertainty about the path of advancement and deployment of AI militates for a careful approach to regulation and competition policy. Overzealous regulation, or such competition law enforcement, could well hamper the innovation incentive of, and stifle competition among, large tech platforms in the AI space, and it is not clear that small firms would be able to step up and fill the gap in innovating, commercializing and effectively competing in this space.[8]

6. We start by describing the role of data and computing power (cloud services) in AI development and deployment, and the concerns and opportunities in relation to tech platform ecosystems and AI. We then analyse how the existing instruments of competition policy and regulation in the digital world can address potential competition concerns arising with respect to these elements of the AI space. We argue that these instruments can be employed effectively to deal with the challenges presented by AI. Finally, we call for a gradual and measured approach to competition policy and regulation in the AI space.[9]

II. AI development and deployment

7. AI development and deployment happens across an «AI stack» comprising of several parts. Understanding these parts allows for a more informed analysis of policy questions. At the core of every AI application there is an AI model. This is the mathematical and logical machinery that transforms data (inputs) into (actionable) information. An AI model may (i) take a text query and produce a response that a human understands (as with ChatGPT); (ii) receive information on the state of a chessboard and suggest the next move; (iii) analyse a medical image and respond with potential diagnoses; or (iv) respond to an input from a camera with a set of instructions controlling an actuator (as with modern AI autofocus cameras or self-driving cars).

8. AI models use mathematical formulae and algorithms to "recognize" patterns in the inputs they receive and are often used to solve problems that were until recently thought to be in the domain of human intelligence. To work, an AI model must be "trained" on textual, audiovisual, or other type of data. In the training process, also referred to as "learning," the model's parameters are set and then progressively updated until the model reaches an optimal state where it creates sufficiently accurate outputs to be applied in the real world. AI models differ widely in terms of complexity, the field of application, the scale and scope of data they take as inputs, and the speed with which they work. As such, AI models differ widely in terms of the resources required to build, train, and successfully deploy them.

9. Industry commentators have identified the quantity and scope of data, access to computing power, and access to technical expertise as potential bottlenecks in the development of AI models.[10] Of these, access to data and cloud services seem to attract the most interest from competition agencies.[11] Besides these potential AI bottlenecks, competition agencies and regulators have been paying attention to the interaction among participants in digital "ecosystems" and how AI may change that.

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7 *See* Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act), OJ L 265, 12.10.2022, p. 1.

8 This does not mean we will not see smaller firms successfully innovating and overtaking their larger competitors as OpenAI has done with its AI chatbot ChatGPT.

9 While regulatory objectives such as privacy, transparency and data protection rules are important in the AI space, they are outside the scope of this paper.

10 *See*, for example, C. Carugati, Competition in Generative Artificial Intelligence Foundation Models, *Bruegel Working Paper* 14/2023, 18 June 2023, https://www.bruegel.org/sites/default/files/2023-09/WP%2014.pdf.

11 Besides data and cloud services, a third key input into AI development is expertise. However, regulators have not identified expertise as a bottleneck in the digital space; therefore, we are not discussing it in this article. Furthermore, specialized computer chips are also mentioned as a key component of the AI computing system. However, those chips have not been identified as bottlenecks either in the digital space for AI development.

1. Data and cloud

10. Data are a key input for many digital services and have long been viewed by competition authorities as a potential competitive bottleneck in the digital space.[12] Data are also an important input in AI development.

11. Different applications of AI (AI domains) require different types of data. Within an AI domain, more data in terms of both scale and scope generally translates into better-performing AI models.[13] Beyond this general statement, how valuable an additional batch of data would be in training a specific AI model will depend on the type of AI model and its application.[14]

12. Indeed, it is often not clear in advance, even to experts in the field, just how valuable an additional batch of data may be in AI model training. Moreover, it is often difficult to assess whether a batch—or a stream—of data of one type is a good substitute for a data batch of another type. In fact, data of very different types may turn out to be good substitutes in certain domains.[15]

13. Cloud infrastructure allows users and developers to access scalable computational resources through the Internet and is a key element for a large share of AI development. Competition authorities in Europe have raised concerns in relation to the cost of switching providers and hurdles to multihoming on clouds of independent providers.[16]

14. Cloud services require large infrastructure investments in server farms, cloud-compute software stack and storage in multiple locations, as well as fast broadband connections. Large providers enjoy considerable economies of scale and scope in the provision of cloud services.[17] The three big cloud services providers—Amazon, Microsoft, and Google—today take up around 66% of the worldwide cloud infrastructure market.[18,19]

15. In some domains, such as the sale and commercialization of generative AI and large language models, AI can be considered a cloud-native technology. Training and inference in such applications are highly compute-intensive, which encourages developers to take advantage of the scalable computation and storage of the cloud. Accordingly, all major public cloud computing service providers now offer managed AI cloud services (AI as a service) and cognitive cloud computing, which developers can use to build, train, and deploy AI models. AI is also integrated into other cloud services, such as Salesforce's CRM offerings.[20] Other common AI applications in the cloud include the Internet of Things (IoT) and chatbots such as ChatGPT.

16. Given the strong convergence trend of cloud and AI computing, the large cloud providers that own and operate powerful computing infrastructure seem well positioned to continue pushing the envelope of the computing-power-hungry AI development and deployment.[21]

2. AI ecosystems

17. The term "ecosystem" in relation to tech platforms refers to a network of interdependent firms that interact and coordinate towards a value-creating outcome.[22] One or more large tech platforms typically represent key nodes in an ecosystem.[23] These platforms provide the foundational technologies and services and coordinate other ecosystem participants, while actively nurturing economies of scale and scope and exploring new ones.

18. On the supply side, tech platforms and other ecosystem participants benefit from cost savings on common components of the services' infrastructure and from a combination of user data from different services. On the demand side, ecosystem participants benefit from network effects and from being able to offer users

12 Data have been at the centre of several high-profile EU competition cases and recent EU regulations. *See*, for example, the *Microsoft/LinkedIn*, *Apple/Shazam* and *Google/Fitbit* mergers, the *Amazon Marketplace* abuse of dominance case, the DMA and the Data Act (Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828, OJ L, 2023/2854, 22.12.2023).

13 Scale means providing a larger amount of the same type of data, e.g. adding more text to an existing text stack. Scope means adding different types of data to the data currently used to feed an AI model, for example, by adding pictures and videos to the text stack.

14 This is true both in terms of adding observations of the same sort to existing data and in terms of adding observations of a different sort. For a broader discussion, *see* A. Goldfarb and D. Trefler, Artificial Intelligence and International Trade, in *The Economics of Artificial Intelligence: An Agenda*, A. Agrawal, J. Gans and A. Goldfarb (eds.), University of Chicago Press, 2019, pp. 463–492.

15 For example, credit scoring for individuals had been traditionally assessed from banks' retail transaction data, but it turned out that social media data can be used for that purpose too and can be even more informative for individuals with short credit history. *See* P. Yildirim, The Surprising Ways that Social Media Can Be Used for Credit Scoring, *Knowledge at Wharton*, 5 November 2014, https://knowledge.wharton.upenn.edu/article/using-social-media-for-credit-scoring/.

16 *See* the Dutch Authority for Consumers and Markets, Market Study Cloud services, 2023, https://www.acm.nl/system/files/documents/public-market-study-cloud-services.pdf; the French Autorité de la concurrence, Opinion 23-A-08 of 29 June 2023 on competition in the cloud sector, https://www.autoritedelaconcurrence.fr/en/press-release/cloud-computing-autorite-de-la-concurrence-issues-its-market-study-competition-cloud; and UK Ofcom Cloud services market study, Final report, 5 October 2023, https://www.ofcom.org.uk/__data/assets/pdf_file/0027/269127/Cloud-services-market-study-final-report.pdf.

17 *See* R. Harms and M. Yamartino, The Economics of the cloud, , https://download.microsoft.com/download/6/e/4/6e4cb3d1-5004-4024-8d90-6c66c83c17aa/the_economics_of_the_cloud_white_paper.pdf.

18 Other key players in the market include IBM, Salesforce, and Oracle.

19 Synergy Research Group, Cloud Spending Growth Rate Slows But Q4 Still Up By $10 Billion from 2021; Microsoft Gains Market Share, 6 February 2023, https://www.srgresearch.com/articles/cloud-spending-growth-rate-slows-but-q4-still-up-by-10-billion-from-2021-microsoft-gains-market-share.

20 Salesforce has incorporated conversational, predictive and generative AI capabilities in its cloud CRM offerings. *See* Salesforce, Salesforce Announces Einstein GPT, the World's First Generative AI for CRM, press release, 7 March 2023, https://www.salesforce.com/uk/news/press-releases/2023/03/07/einstein-generative-ai/.

21 For example, Google developed its own processing unit. Microsoft, Amazon and Google all invested heavily in cloud infrastructure. Open AI is using Microsoft's Azure cloud infrastructure. IBM built an AI-optimized, cloud-native supercomputer (Vela, *see* T. Gershon, S. Seelam, J. Jubran, E. Gampel and D. Thorstensen, Why we built an AI supercomputer in the cloud, IBM Blog, 7 February 2023, https://research.ibm.com/blog/AI-supercomputer-Vela-GPU-cluster).

22 A distinction can be made between multi-actor and multi-product ecosystems, depending on whether the products belonging to the ecosystem are provided by the same company. *See* OECD, Summary of Discussion of the Hearing on Competition Economics of Digital Ecosystems, DAF/COMP/M(2020)2/ANN5/FINAL, 29 October 2021, https://one.oecd.org/document/DAF/COMP/M(2020)2/ANN5/FINAL/en/pdf.

23 Some of them cover so many services that they may qualify as an ecosystem on their own. *See* footnote 22 above.

a one-stop shop for a bundle of services. Smaller firms often co-exist with large tech platforms in an ecosystem, sometimes in synergy and other times in competition, by providing complementary or competing, technologies and services.

19. Three types of competition policy concerns have been raised in relation to ecosystems. First, technologies and services in one ecosystem are not always compatible with those in another ecosystem, which can make switching between ecosystems for complementors and users costly. Second, players that control foundational technologies in an ecosystem may have an incentive to introduce hurdles for smaller firms wishing to introduce competing services.[24] Third, ecosystems may be difficult to replicate, which may lead to barriers to entry and expansion and further entrenchment of key ecosystem players.[25]

III. A balanced approach to competition policy in the AI space

20. The digital space has been scrutinized closely by regulators and competition agencies in Europe and beyond. The EC and several national competition agencies have thus been testing novel theories of harm in investigations into allegations of dominance abuse (e.g. self-preferencing), and in mergers involving tech platforms (e.g. in relation to the effects mediated by data and ecosystem considerations).

21. In parallel, the EU introduced regulation of large digital platforms (DMA) and a suite of adjacent regulations to complement traditional competition law enforcement.[26] The DMA prescribes behavioural restrictions (e.g. prohibiting self-preferencing and tying, obligation to provide access to user data, etc.) and limits the use of personal data across adjacent services for designated large tech platforms referred to as "gatekeepers".[27] For now, the DMA directly affects Alphabet (Google), Amazon, Apple, ByteDance (TikTok), Meta and Microsoft who were designated as gatekeepers across several markets.[28]

24 Such concerns are currently being investigated by the EC in relation to whether Microsoft has breached competition rules by tying or bundling Teams to its Office 365 and Microsoft 365 business suite. *See* European Commission, press release IP/23/3991 of 27 July 2023, Antitrust: Commission opens investigation into possible anticompetitive practices by Microsoft regarding Teams, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3991.

25 *See* the DMA and the ecosystem-related theories of harm proposed recently by the EC, e.g. in the *Booking/eTraveli* merger.

26 Examples of adjacent regulations include the Data Act, the Data Governance Act (Regulation (EU) 2022/868), and the P2B Regulation (EU) 2019/1150.

27 *See* recital 2 and Articles 5 and 6 of the DMA.

28 *See* European Commission, press release IP/23/4328 of 6 September 2023, Digital Markets Act: Commission designates six gatekeepers, https://ec.europa.eu/commission/presscorner/detail/en/ip_23_4328.

22. These regulations and the arsenal of novel theories of harm will also apply in the AI space. Given their far-reaching nature, the competition policy challenge in relation to AI does not seem to be the lack of instruments for enforcement. Instead, it is how to enforce the existing rules in a way that effectively deals with competitive concerns without unduly undermining the efficient AI innovation incentives of large players in the digital space.

1. Data

23. The DMA limits the extent to which designated platforms can use personal data across various services, including those powered by AI. The DMA thus prohibits designated platforms (i) from combining personal data produced in use of their core services with personal data produced in other (core and non-core) services and (ii) from using such data in their other services.[29] This is complemented by obligations for gatekeeper platforms to grant access to various types of data generated on them.[30]

24. While the DMA addresses several potentially legitimate data-related competition concerns linked to gatekeeper platforms, it does not seem to put much weight on the efficiencies in the scenarios it covers. This is a concern from the perspective of promoting efficient advancement of AI for which large platforms may be well positioned. Furthermore, the scope for efficiencies from combining data produced by different services may be considerable.

25. Competition law enforcement complements the DMA and adjacent regulations in the digital space. Competition agencies now routinely examine data-mediated effects in mergers and dominance abuse cases in the digital space.[31] A recent example is the EC's *Google/Fitbit* merger assessment. There, the EC assessed the balance between (i) the efficiencies brought by combining Google's own data with Fitbit's data for Google's advertising service and (ii) the potential competitive harm in the form of increased data-based barriers to entry and expansion in the online advertising services market.[32]

26. To assess the trade-offs in *Google/Fitbit*, the EC relied on responses from market participants to its market investigation questionnaire. The EC has not attempted to quantify or balance the opposing effects in a comprehensive economic framework that takes account of all relevant effects, positive and negative.[33] While this

29 Core platform services are digital services that have some features that can be exploited by their operators. *See* recital 2 and Article 2(2) of the DMA.

30 The Data Act takes a similar view in relation to data generated by users when they use a product and service.

31 The EC also investigated data in abuse of dominance cases, e.g. in the *Amazon Marketplace* case. The details of the economic assessment are not known in that case as it ended with an Article 9 commitment decision.

32 The EC concluded that the potential harm from the combination of the two types of data will likely exceed the efficiency benefits. *See* European Commission, decision C(2020) 9105 final of 17 December 2020, *Google/Fitbit*, case M.9660, para. 467, https://ec.europa.eu/competition/mergers/cases1/202120/m9660_3314_3.pdf.

33 The insights provided from responses to market investigation questionnaires may be biased if the fraction of non-responses is high. That may signal lack of concerns by a large share of stakeholders, without that lack of concern being articulated.

is a difficult exercise, it is necessary for transparent and predictable competition law enforcement that protects innovation incentives and promotes effective competition.

27. When assessing data-based theories of harm, proper attention must also be given to the fact that collecting, storing, and processing data are costly activities. Valuable data on user preferences, for example, are not lying around in wait to be harvested; instead, they are produced as users avail themselves of various services. In exchange for such data, which are sometimes monetized through advertising, platforms must provide costly services, sometimes for free (like in the case of ad-funded platforms).

28. Finally, competition agencies should acknowledge that data-driven theories of harm will often be highly uncertain and tackle the uncertainty in a transparent way. Indeed, it is difficult to quantify the various, potentially opposing, effects mediated by data with any reasonable precision. This may give rise to temptation for the agencies to avoid dealing with the uncertainty by employing a partial framework for the analysis, or to ignore an important effect, either pro- or anticompetitive, by choosing a narrow market definition.[34] Such an approach would lead to inferior competitive outcomes and may even undermine the trust of businesses and the public in the agency.

2. Cloud services

29. Whereas the DMA identifies cloud computing as a core platform service, no platform has yet been designated as a gatekeeper in cloud services. In parallel with the incorporation of cloud services into the DMA, several European competition agencies have undertaken market investigations into these services. These agencies have identified switching between cloud service providers and hurdles to multihoming in the cloud as potential competitive concerns. The DMA and adjacent regulations can, in combination with competition law enforcement, effectively address these concerns, as the Dutch and French competition agencies have found in their market investigations in the space.[35]

30. Hurdles to switching among cloud providers are likely candidates for regulation and competition policy intervention, as such hurdles often harm effective competition. At the same time, regulation should not be stretched to force cloud providers to incur undue costs to actively facilitate such switching. This could inefficiently hamper their incentives to introduce new services and compete intensely to acquire new users, and ultimately result in higher quality-adjusted subscription or usage fees.

31. Competition agencies are also on the lookout for potential anticompetitive effects of practices such as bundling or tying in the provision of cloud services.[36] Bundling and tying AI with other cloud services will naturally arise, and, in principle, could make it harder for standalone AI service providers to effectively compete with a multi-service provider. At the same time, it should be kept in mind, when shaping competition policy in the AI space, that the scope for efficiencies from bundling and tying in this space is considerable.[37] Indeed, it is likely that these efficiencies are an important factor behind the convergence of AI and cloud computing discussed above.

32. To achieve desirable competitive outcomes in AI space, efficiencies should therefore be considered in assessments of mergers and alleged dominance abuse cases in the space. These types of efficiencies are often produced by the same economic forces that are alleged to generate anticompetitive effects; consequentially, the pro- and anticompetitive effects cannot effectively be separated and need to be assessed in a comprehensive framework. For the same reason, the burden of proof for efficiencies should not be mechanically shifted on the firm whose conduct is being scrutinized.

3. Ecosystems

33. The EC has recently started formulating novel theories of harm in relation to digital ecosystems. For example, in the proposed *Booking/eTraveli* merger, the EC investigated whether the acquisition of a neighbouring linked service by a firm operating an ecosystem may raise competition concerns that the acquisition entrenches the acquirer's already strong market position in specific markets.

34. The problem with theories of harm in relation to ecosystems (and data) is that their limiting principles have not yet been clearly established, which may deter firms from launching new services or considering potentially pro-competitive mergers.[38] This may be an issue for developments in the AI space where a significant share of the advancement and deployment of AI will efficiently take place in ecosystems, as outlined in Section II.[39]

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34 For a discussion of the importance of a comprehensive analytical framework in the analysis of innovation effects, *see* K. Gupta, G. Langus and V. Lipatov, Innovation in Merger Control, *CPI Antitrust Chronicle*, November 2023.

35 *See* footnote 16 above for reference.

36 The DMA can also be applied in the case of gatekeepers.

37 Such efficiency-enhancing pro-competitive effects include scope economies in consumption, scope economies in production and distribution, incentivizing product innovation, helping solve reputation problems as well as welfare-enhancing price discrimination. For a more detailed discussion, *see* section 4.2 on Efficiency and Price Discrimination Rationales (for Tying, Bundling and Bundled Rebates) in C. Fumagalli, M. Motta and C. Calgano, *Exclusionary Practices: The Economics of Monopolisation and Abuse of Dominance*, Cambridge University Press, 2018. For a discussion of conditions when bundling may lead to more intense competition, *see*, for example, C. Matutes and P. Régibeau, Compatibility and Bundling of Complementary Goods in a Duopoly, *The Journal of Industrial Economics*, Vol. 40, No. 1, 1992, pp. 37–54.

38 For example, the theory of harm in *Booking/eTraveli* cannot be derived from the Non-Horizontal Merger Guidelines of the EC.

39 Indeed, many of the larger firms in the AI space have found it valuable to laterally integrate several inputs into AI development or to vertically integrate inputs for AI development with the AI development itself. For example, Microsoft (i) operates cloud services offering computing power for AI, (ii) disposes over large amounts of data that can train AI models for a wide range of applications, (iii) is active in AI development (especially after strengthening its ties with OpenAI), and (iv) also runs services (e.g. Bing search engine) using complex AI. Similarly, Google, Amazon and other large tech platforms also operate in more than just one segment of the AI space.

35. Like in other industries, many business practices that competition agencies identify as capable of generating anticompetitive effects in the context of AI will also have important pro-competitive potential. This could be particularly relevant in terms of the ecosystem-related efficiencies that large tech platforms enjoy in developing AI. The relevant trade-offs will typically be difficult to analyse, which may give rise to the temptation to take shortcuts in the analysis. These shortcuts should be avoided.

IV. Conclusion

36. Given the broad suite of regulations and novel expansive theories of harm in competition policy in the digital space, the challenge for the regulators in the upcoming AI era is not finding new AI-specific regulations or theories of harm. Instead, it is how to apply the regulations and competition rules in a way that supports the efficient advancement of AI. To avoid creating a thicket of competition policy rules that would be difficult and costly to navigate for large and small players, competition agencies and regulators should enforce laws and regulations cautiously, by recognizing efficiencies, accounting for uncertainty and clearly delineating the boundaries of theories of harm that they are testing. ■