ASOCIACIÓN ESPAÑOLA PARA LA DEFENSA DE LA COMPETENCIA

AEDC

Contribution to the Call of the European Commission on Competition in Generative AI[1]

11 March 2024

On 9 January 2024, the European Commission published two calls for contributions on competition in virtual worlds and generative artificial intelligence in order to gather specific information and views from stakeholders.

First of all, the AEDC welcomes the initiative launched by the European Commission and the willingness to engage, as competition law enforcer, in a forward-looking analysis and discussion of technology and market trends to identify competition issues that may arise, in particular, in Virtual Worlds.

This document conveys the views of competition practitioners of the **Asociación Española para la Defensa de la Competencia – AEDC** on the topic of **Generative AI**. Following the indications in the Call, the AEDC's views on Virtual Worlds are filed separately. The views and comments below do not necessarily represent the opinion of all the members of the Association.

As the AEDC group that is producing this contribution is composed of lawyers and economists, responses to the questionnaire adopt a legal and economic perspective, setting aside more technical questions which the relevant operators shall certainly be in a better position to address.

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[1] These comments have been drafted by Cristina Vila Gisbert, Diego Garcia Adanez, Patricia Liñan, Fernando Diez Estella, Yolanda Martinez, Borja Chastang, Diego Doménech, Roberto Parra-Segura, Alvaro Angulo y Carolina Fernández Bustillo.

GENERATIVE AI

1) What are the main components (i.e., inputs) necessary to build, train, deploy and distribute generative AI systems? Please explain the importance of these components

Building from some renown definitions of generative AI,[2] the AEDC identifies the following crucial components to build train, deploy and distribute generative AI systems:

- **Large datasets:** are key inputs in order to develop and deploy an AI model, with a particular focus on training. Specifically, a huge amount of data is required in order to build the model. The larger the amount of data that is available to a developer, the better. The diversity and the quality of the data are also relevant to develop a solid foundation model. Both proprietary (which may entail higher acquisition costs) and publicly available data can be used for this purpose, although the use of public data is more common. Since base models are the result of the pre-training stage in the development of generative AI systems, access to base model is an alternative input to the use of large datasets.

- **High computing power and data processing capacity:** due to the large number of mathematical operations that are required in order to produce models and the significant amount of data that is processed, generative AI developers often use supercomputers and distributed computers with a large number of central processing units and graphical processing units, as well as specialised hardware.

    - The main costs associated to computing power related with the development of generative AI are notably the hardware, the select cloud provider and the size of the data. In any event, costs will depend on training, hardware, architecture and timing of the experimentation, and will probably have a more

[2] For the purposes of the present contribution AEDC departs from the following definition of Generative AI, proposed by the FTC:

> *Generative AI is a category of AI that empowers machines to generate new content rather than simply analyse or manipulate existing data. By using models trained on vast amounts of data, generative AI can generate content (such as text, photos, audio, or video) that is sometimes indistinguishable from content crafted directly by humans.*
>
> *Many generative AI models are developed using a multi-step process: a pre-training step, a fine-tuning step, and potential customization steps. These steps may all be performed by the same company, or each step may be performed by a different company. The pre-training step creates a Base Model with broad competency in a specific domain, such as language or images. After pre-training, the model is fine-tuned for a specific application, such as responding to questions or generating images from prompts. Finally, some types of generative AI can be further customized via methods specific to certain types of models, such as prompt engineering. Prompt engineering is used by many chatbot developers to add more constraints (directions to not respond to inappropriate or harmful questions) or to imitate behaviours.*

significant impact on new potential developers. Access to the computer power infrastructure is more relevant during the pre-training phase than in the fine-tuning phase, as the latter should be carried out in fewer elements.

- An alternative to the acquisition of hardware is the use of cloud providers that rent computing capabilities. These providers rent hardware resources including processing hardware, storage, servers and supercomputing technologies over the internet.

- **Expertise:** the development and deployment of AI models requires a skilled workforce working on large-scale systems, with particular machine-learning knowledge and vast experience in computing and data engineering. Additionally, firms need expertise on how deploy their customized AI products.

2) What are the main barriers to entry and expansion for the provision, distribution or integration of generative AI systems and/or components, including AI models? Please indicate to which components they relate.

- **Technological barriers to entry.** Access to the relevant inputs (notably, large datasets or base models, cloud computing and hardware, etc.) seems to be the most relevant barrier to entry.[3] Such access together with large experimentation capacity may largely depend on prior presence in adjacent markets, leading to incumbents' accumulation of market power and network effects.

- **Economic barriers to entry.** Inasmuch as large investment capacity for getting access to the relevant input and devote time to training and experimentation is needed, the relevant players will tend to be first-movers benefiting from large economies of scale and scope, switching costs and lock-in effects.[4]

- **Regulatory barriers to entry.** The risk-oriented approach adopted in the Proposal for an Artificial Intelligence Act[5], notwithstanding its legitimate justifications (fundamental rights and Union values), poses both confidentiality (know how protection) and compliance challenges for AI operators.

- **Technical expertise barriers to entry**. The development and deployment of generative AI requires a high level of expertise in machine learning solutions, and practical knowledge in data engineering and high-performance computing.

[3] "*[T]he cornerstones of competition in Artificial Intelligence are the following: (i) access to data, (ii) access to cloud computing or specialized hardware and (iii) access to foundation models in Generative AI*", Competition and Generative Artificial Intelligence, Autoridade da Concorrência, November 2023, page 4.

[4] Competition and Generative Artificial Intelligence, Autoridade da Concorrência, November 2023, pages 24 and 25.

[5] Proposal for a Regulation of the European Parliament and the Council, laying down harmonized rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts, Brussels, 21.04.2021, COM (2021) 206 final, 2021/0106(COD).

3) What are the main drivers of competition (i.e., the elements that make a company a successful player) for the provision, distribution or integration of generative AI systems and/or components, including AI models?

Competition will take place not only in terms of pricing, but also in terms of quality. In this context, quality refers to the ability of the generative AI system to satisfactorily meet consumers' needs (i.e. accuracy and robustness of texts, images, sound; the timing needed to process the relevant data; or the level of human interaction required, etc.) while ensuring regulatory compliance (data protection, privacy, copyright, etc.).

4) Which competition issues will likely emerge for the provision, distribution or integration of generative AI systems and/or components, including AI models? Please indicate to which components they relate.

Generative AI systems require important access to data or base models, and cloud services or specialized hardware, which are not currently widely available in the market. As a result, the number of current players is small, and the market is concentrated. Therefore, as with any concentrated market, attention should be paid to how the relevant companies operate in this market. However, it may be that several companies may want to jointly cooperate to develop generative AI systems. In this regard, competition law should ensure that effective enforcement does not disincentivize innovation, which is a key element for the development of generative AI systems.

It is also foreseeable that the generative AI sector will attract increasing interest from investors. Thus, merger control rules should be effectively applied, including the referral mechanism to ensure that competition authorities are able to examine mergers that may significantly affect competition in this sector. Effective enforcement should adequately balance the need to protect competition while, at the same time, make sure that it does not disincentivize innovation.

In this context, among the most critical competition issues that may be relevant for the purposes of the present consultation one may consider:

Competition issues that may arise from control over one or more of the critical inputs of generative AI or from control over adjacent markets.

- Leveraging**,** which is common in digital markets, as digital services often interact due to the inputs they share and their overlapping consumer bases.
    - Self-preferencing practices may be defined as "[s]ituations in which an integrated platform discriminates in favour of its services or products to the detriment of those of a third party, for example, by making the latter less prominent, ranking them lower, downgrading or delaying their access to the platform, or worsening their access conditions. As such, they may lead to

partial or total exclusion."[6] In the context of generative AI, a firm with market power may have incentives to, for example, promote its own AI model via its search engine service.

- Tying. A practice in which a firm makes the acquisition of one product or service conditional on the purchase of another. For instance, a firm may condition the use of its dominant software by requiring developers to generate their applications using the firm´s base models (to prevent the growth of competing base models).

- Bundling. Defined as a practice in which a company offers multiple products together as a single package. For instance, access to an IA-powered code editor may be provided together with access to a specific platform for software development.

- Ecosystem lock-in. Refers to a situation in which customers become heavily dependent on the products, services, or technologies of a particular company, making it difficult for them to switch to other alternatives. This creates strong customer retention, that effectively locks in customers within the company's ecosystem. For instance, firms that develop base models and also provide cloud and software services, may have a strong incentive to leverage their overlapping customer bases and complementary services. Due to the specific features of cloud computing (switching costs and lack of interoperability), extended practices (such as committed spend discounts) and the existence of not only high entry barriers, but also exit barriers (egress fees), lock-in effects are particularly strong in this sector.

- **Refusal to grant access.** In the context of generative IA, developers of base models may in principle have incentives to allow access to ensure the widespread adoption of their models. However, they might also want to impose restrictive conditions on rivals that want to use their base models to develop competing functionalities. Similar issues may arise regarding access to proprietary data.

Network effects. An incumbent firm may have a relevant advantage over more recent entrants due to its models being able to generate better content thanks to their interaction with a larger number of users over time. This advantage may in turn result in a more concentrated market with less possibility for entrants to compete effectively.

Algorithmic collusion. Finally, although not directly relevant for generative AI, one may also consider the risks associated to algorithmic collusion, which is as a type of tacit collusion in which pricing algorithms learn through trial and error to achieve a profit-

[6] MOTTA, M. (2023): "Self-preferencing and foreclosure in digital markets: theories of harm for abuse cases", *International Journal of Industrial Organization*, Volume 90 (September), page 1.

maximising outcome by coordinating with other algorithms.[7] Although this issue arises specifically in relation to machine-learning pricing algorithms, there are some scenarios in which generative AI could indirectly help the collusion process. For instance:

- Generative AI models can be used as a tool to expand databases, which are in turn used by pricing algorithms to achieve coordinating outcomes.

- Generative AI models could reuse confidential business information in public conversations, which could potentially lead to tacit collusions.
- Generative AI models may learn to achieve an optimal strategy and generate output through text or computer code, which in turn can lead to an anticompetitive tacit agreement.

However, this is merely a working hypothesis, since these scenarios have not been observed yet in market practice. Accordingly, it is fair to say that competition law is up to date regarding algorithm collusion, and no further reforms in this respect are required[8].

5) How will generative AI systems and/or components, including AI models, likely be monetised, and which components will likely capture most of this monetization?

The monetisation of generative AI systems is linked to the type of system that is finally adopted, either open-source or closed-source.

The economic doctrine[9] accepts that the total value to the industry depends first on the inherent value of the technology. Additionally, this doctrine also points out that it is convenient for firms launching a new technology to choose an open approach, provided that they do not have a real dominant position. The doctrine argues that, to maximise the value of the new technology, it is necessary to get as much feedback as possible in order to correct its existing failures and to improve its performance. At a certain point, open-source AI models must thus decide whether to continue operating in open-source or to turn into a closed-source model.

This decision will be conditioned by the available options to monetize the Generative AI systems and models, which may take different forms:

- Owners of open-source AI models can try to monetise by cross-selling into adjacent high margin products and services.

[7] SCHWALBE, U. (2018): "Algorithms, Machine Learning, and Collusion", *Journal of Competition Law & Economics*, Volume 14, Issue 4, pages 568-607.

[8] BOSTOEN, F. (2023): "Artificial Intelligence and Competition Law" (February 1, 2023), Forthcoming in Nathalie Smuha (ed.), *The Cambridge Handbook on the Law, Ethics and Policy of Artificial Intelligence* (Cambridge University Press 2024).

[9] SHAPIRO, C. and VARIAN, H., "Information Rules: A Strategic Guide to the Network Economy", Harvard Business School Press, 1999.

- Owners of open-source AI models may seek to monetise the best performing models behind a paywall. Offering a basic model for free, but also an upgraded version of the model charging a price.

On the other hand, closed-source models may have different options to monetise depending on the way that the final product or service is launched into the market:[10]

- As explained above, if the owner of the AI model develops a new product or service, it could be monetised through a subscription model. That is, the firm could offer a free version and a paid version of the product or service, with the paid version including certain improvements that are not included in the free one.

- The new product or service could be integrated into other existing products and services, which would enhance the performance of the existing products and services. In this event, the monetisation would be indirect instead of direct.

6) Do open-source generative AI systems and/or components, including AI models compete effectively with proprietary AI generative systems and/or components? Please elaborate on your answer.

If effective competition is defined from a dynamic standpoint, open-source generative AI systems can actually or potentially compete with proprietary AI generative systems in terms of innovation.[11]

Competition between open-source and proprietary AI generative systems and components manifests at various layers of the value-chain:

- Competition **for inputs:** Proprietary AI generative systems compete for inputs (e.g. microchips, talent, computer capabilities including cloud computing services and large specific datasets), with open-source AI generative systems.[12] Some of these markets, such as cloud computing services, may exhibit high levels of concentration where effective competition could be distorted.

- Competition **in the development of AI models**: It remains unclear whether proprietary AI Generative systems can effectively compete with open-source Generative AI systems at this level.
  While some customers may prefer proprietary models to be trained and tailored specifically for their needs using their own hardware capabilities and datasets, others lacking financial resources or access to capabilities may resort to models developed through open-source systems. However, mid-size customers with limited resources could rent computing capabilities from cloud service providers and consider access

[10] AI Foundation Models: Initial Report, CMA 18 September 2023.

[11] Schrepel, T. "The Fight for Open Source in Generative AI" *Network Law Review*, 15 January 2024.

[12] FTC Tech Summit- January 25, 2024 | Federal Trade Commission

to either proprietary or open-source systems for the development of the models they need.

In order to compete effectively with proprietary systems, open-source models depend and may be limited by the available options for monetization. Moreover, open-source systems may be made available for commercial or non-commercial purposes (such as research), and if they are offered solely for non-commercial uses without monetization options, the incentives for investment in innovation and model improvement may be diminished.

- Competition **at the final product/service level:** In terms of models integrated by developers into final products or services, open and closed systems could compete on cost, price and innovation.

7) What is the role of data and what are its relevant characteristics for the provision of generative AI systems and/or components, including AI models?

Both the volume and the quality of training data have a crucial impact on the performance of generative AI services and on their ability to compete in the market. This fact is reflected in the data related advantages of digital incumbents, which arise from having access to existing datasets and having the capabilities to generate new data.

As happens in other data-driven markets, there are various characteristics that determine the value of datasets, including the volume and variety of data. Additionally, the quality of data is also important, as improving data quality over quantity has the advantage of reducing the need for computing power and the cost of training a model. Finally, the use of the most recently available data (the velocity or freshness of data) may have a relevant impact in the performance of the final AI service.

On another note, and as an indirect effect of such use of massive amounts of data, issues of data sensitivity, privacy and data protection certainly arise for both providers generative AI systems and competition and data protection authorities (see reference to regulatory barriers to entry above).

Access to data is a necessary input to develop AI models. Thus, from a competition law perspective, access to data and the provision of generative AI systems would be vertically related and it is within this framework that the competition analysis should take place.

Given the Article 102 implications that (non)compliance with data protection obligations may entail,[13] coordination and compliance with the duty of sincere cooperation between data protection and competition authorities seem particularly challenging. For the sake of legal certainly benefiting both generative AI operators and the competition law community in general, it may be worth considering the issuance of informal guidance (soft law) on how this cooperation / coordination may work in practice (i.e. reciprocal consultations, timings, substantive principles reserved to one another, etc.).

[13] ECJ Judgment of 4 July 2023, case C-252/21*, Meta v Bundeskartellamt*, ECLI:EU:C:2023:537.

Other issues related to massive data processing such as copyright concerns and/or risks of manipulation may already be addressed by other EU legal instruments, such as the Proposal for an Artificial Intelligence Act or the Digital Services Act.[14] The question remains open on whether (non)compliance with such legal instruments may be relevant from a competition standpoint in the context of Article 102 TFEU.

8) What is the role of interoperability in the provision of generative AI systems and/or components, including AI models? Is the lack of interoperability between components a risk to effective competition?

Low levels of interoperability may give rise to barriers to switching and ecosystem lock-in, which limit competition in the market. This problem may be especially relevant in the cloud sector, as customers may have difficulties transferring data (portability) and communication with other cloud providers (interoperability). In this regard, given the quick development of generative AI, competition authorities should remain vigilant and be able to grant timely interim measures if the legal conditions are met.

A related topic is that of open-source ecosystems. As base models become available to the public and new generative AI models with capabilities similar to those of proprietary ones are developed, barriers to entry may be lowered. However, this may provoke interoperability issues between the new open-source base models or their components.

9) Do the vertically integrated companies, which provide several components along the value chain of generative AI systems (including user facing applications and plug-ins), enjoy an advantage compared to other companies?

Any vertically integrated company, including vertically integrated generative AI systems companies may have significant advantages over non-integrated companies. Vertical integration may generate efficiencies for the company (e.g. economies of scope, economies of scale, access to more suitable datasets, access to feedback from final users to refine the model, computing capabilities, etc.) In addition to these efficiencies, the doctrine[15] also recognises additional benefits to vertical integration such as lower transaction costs, secure input supply or correction of market failures. In this case, as in the case of Generative AI companies integrated into ecosystems, the advantages are amplified by the special features of the markets (economies of scales and scope, network externalities, etc.)

These advantages can be realised in terms of costs, capabilities such as larger cloud computing capabilities, interoperability or, if access to the final user´s data and feedback is granted, valuable information to train and refine the model.

In terms of the positive externalities that may arise from vertically integrated companies, the abovementioned incentives to integrate vertically or develop an ecosystem may also lead to entry in adjacent markets, which could in turn increase competition in those markets (e.g.

[14] Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC.
[15] O'DONOGHUE, R. and PADILLA, J. "The law and economics of Article 82 EC", Hart Publishing, 2006.

Microsoft, Meta and Google may want to develop their own chips to topple NVIDIA's position). Moreover, efficiencies may also be achieved through partnership agreements. These partnerships would allow smaller firms to compete when they would otherwise lack sufficient scale or resources to do so.

In conclusion, vertically integrated companies, companies that are part of an ecosystem and companies that are part of partnership agreements at different level of the supply chain or in adjacent markets may enjoy efficiencies and in turn advantages that other companies do not have.

10) What is the rationale of the investments and/or acquisitions of large companies in small providers of generative AI systems and/or components, including AI models? How will they affect competition?

There are incentives for digital companies to grow or develop an ecosystem. Just as in platform markets, large digital companies have incentives to enter adjacent markets, either by organic growth or by strategic acquisitions, in order to leverage its economies of scale, scope, network externalities and to have access to diverse datasets, innovations and talent. Therefore, large companies operating within generative AI systems value chains recognize the potential for market differentiation and enhanced service offerings through strategic acquisitions. Integrating small providers of generative AI systems/components, can augment their existing assets and capabilities, thereby gaining a competitive edge. These acquisitions are aimed at expanding the user base of their ecosystems by offering innovative and comprehensive solutions.

On the other hand, small providers may face high barriers to train and run models. Therefore, by partnering with a larger entity, small providers can leverage their innovations on a broader scale, accelerate growth and gain access to resources such as users, capabilities, financial resources etc.

However, while investments and acquisitions can drive innovation and market expansion, they also pose risks. Large companies may seek to eliminate potential competitors or restrict access to critical inputs/outputs, thereby distorting market dynamics and stifling innovation. Such anti-competitive practices can harm smaller players and limit consumer choice, ultimately undermining the principles of effective competition.

11) Do you expect the emergence of generative AI systems and/or components, including AI models to trigger the need to adapt EU legal antitrust concepts?

There is a concern that Generative AI used in automatic pricing solutions might increase tacit collusion and lead to supra-competitive prices in online and offline markets.

Generative AI could theoretically increase tacit collusion further than non-Generative AI as it might produce autonomous complex pricing decisions (including that of colluding) that are not technically attributable to a natural or legal person but to the Generative AI system itself.

Legal antitrust concepts might not be well fitted to address this concern. The current interpretation of "agreement" or "concerted practice" under article 101 TFEU does not cover tacit collusion.

However, empirical evidence on the effects of the use of Generative IA to automatically generate prices is limited to date. In the absence of strong empirical evidence showing that such use might effectively result in tacit collusion harming competition and consumers, our suggestion would be to refrain from introducing legal changes. Changes not sustained by evidence could lead to undesirable false positives and disincentivize innovation.

This view is further developed below.

Firstly, the theory of harm that pricing algorithms could facilitate collusion that results in supra-competitive prices has been widely addressed by both economic and legal literature[16] and by competition authorities worldwide[17].

In a nutshell, the three situations that could give rise to collusion are: (i) the algorithm facilitates an explicit agreement to collude; (ii) hub and spoke situations in which the algorithm acts as an intermediary between the companies; (iii) the algorithm facilitates tacit collusion (i.e., without an explicit agreement between the companies that use the same algorithm or different algorithms that decide to collude). The latter could be achieved by

[16] From seminal article by STUCKE M.E. y EZRACHI A., "Artificial Intelligence & Collusion: When computers inhibit Competition". Legal Estudies Research Papers Series. University of Tenessee, 2015 to more recent academic works such as Gautier, A., Ittoo, A. & Van Cleynenbreugel, P. AI algorithms, price discrimination and collusion: a technological, economic and legal perspective. *Eur J Law Econ* **50**, 405–435 (2020). https://doi.org/10.1007/s10657-020-09662-6.

[17] Competition and Markets Authority (2021) 'Algorithms: How they can reduce competition and harm consumers; Autorité de la concurrence & Bundeskartellamt (2019), Algorithms and Competition, https://www.autoritedelaconcurrence.fr/sites/default/files/algorithms-and-competition.pdf; Swedish Competition Authority (2021), "Collusion in Algorithmic Pricing", https://www.konkurrensverket.se/globalassets/dokument/informationsmaterial/rapporter-ochbroschyrer/uppdragsforskning/forsk-rapport_2021-3.pdf Norwegian Competition Authority (2021), What effect can algorithms have on competition? The Norwegian Competition Authority's market survey on the use of monitoring and pricing algorithms, https://konkurransetilsynet.no/wp-content/uploads/2021/03/Report-Algorithmsenglish-version-2021.pdf; Danish Competition and Consumer Authority (2021), "Prisalgoritmer - og deres betydning for konkurrencen (Princing algorithms - and their significance for competition)", https://www.kfst.dk/media/yecpmmxu/prisalgoritmer.pdf; Autoridade da Concorrência (2019), "Digital ecosystems, Big Data and Algorithms" disponible en https://www.concorrencia.pt/sites/default/files/processos/epr/Digital%20Ecosystems%2C%20Big%20Data%20and%20Algorithms%20-%20Issues%20Paper.pdf.; Federal Trade Commission (2018) 'FTC Hearing #7: The Competition and Consumer Protection Issues of Algorithms, Artificial Intelligence, and Predictive Analytics' 13 to 14 November.Also, OECD (2023), Algorithmic Competition, OECD Competition Policy Roundtable Background Note, www.oecd.org/daf/competition/algorithmic-competition-2023.pdf.

companies that use the same algorithm or even by companies that use different algorithms that learn to collude autonomously to implement a pricing strategy that maximizes profits.

The emergence of Generative AI might increase competition law concerns in all these three situations in different ways. The need to adapt EU legal antitrust concepts might also differ from one situation to another.

On the one hand, situations in which algorithms facilitate explicit collusive agreements or algorithms in hub and spoke settings (situations i and ii) seem to be adequately covered by EU legal tools, particularly by the prohibition of restrictive agreements under article 101.1 TFEU. Provided that direct or indirect concertation between the companies using the AI pricing tools could be evidenced, article 101.1 TFUE remains fully applicable. Indeed, the decision-making practice by competition authorities shows that article 101 TFEU is flexible enough to cover these scenarios without need for adaptation.

The challenges in these situations are more related with the difficulties in detecting and evidencing the concertation rather than with the applicability of competition rules. Detection and evidencing might become extremely complex as Generative AI expands given that Generative IA might use complex steganographic techniques to hide communication leading to collusion[18]. Such detection and evidencing challenges are dealt with in section 12 below.

By contrast, tacit collusion (situation iii) would not be covered by antitrust existing rules.

Tacit collusion is not prohibited under article 101.1 TFEU because, as consistently interpreted by the EU Courts, this provision requires concertation between undertakings.

The need to extend the prohibition of restrictive agreements to tacit collusion in real world oligopolistic markets has been widely discussed in economic and legal literature. The prohibition of tacit collusion has been ruled out for two main reasons. On the one hand, tacit collusion in real world markets is exceptional. It is difficult to achieve as it requires very specific market conditions (tight oligopoly with features). On the second hand, in the absence of any concerted action, firms should be entitled to adapt intelligently to the market even if this results in supra-competitive prices in oligopolistic markets.

As previously announced, the emergence of Generative AI might increase the risk of tacit collusion as self-learning autonomous algorithms could decide to collude without explicit coordination or information sharing between the parties. Generative AI allows not only the making of predictions on the basis of the information it gathers, but also the making of autonomous decisions (i.e. not pre-programmed but adapted to the environment and its changes). As far as competition law is concerned, in these complex Generative AI systems, the final decision is not technically attributable to humans but to the unilateral decision of Generative Agents themselves on the basis of these complex processes.

[18] Sumeet Ramesh Motwani, Mikhail Baranchuk, C. S. D. Witt (2024) "Secret Collusion Among Generative AI Agents". Published in arXiv.org 12 February 2024.

Therefore, tacit collusion through AI-based automatic pricing might not be as exceptional as in real world markets as it might occur independently of the characteristics of the market (i.e., also in non-oligopolistic markets). Therefore, if the very premise that IA (particularly, Generative IA) significantly increases the risk of tacit collusion irrespective of the features of the market is finally confirmed, the debate on the need to prohibit tacit collusion should be reopened.

To date, there is no sufficient evidence to confirm the very premise that Generative AI makes tacit collusion significantly more likely. Although some recent empirical studies seem to indicate so, particularly when companies use the same software[19], more conclusive studies might be needed to avoid prosecuting false positives and discouraging operators from a healthy use of Generative IA to unilaterally adapt to market conditions and legitimately maximize profits.

However, if the Generative IA tacit collusion theory of harm is finally proven by solid evidence, there would be a need to protect markets from the spread of tacit collusion leading to supra-competitive prices. In that case, current antitrust provisions would have to be adapted.

In this scenario, the debate would be whether the prohibition of tacit collusion could be achieved by way of an interpretation wider interpretation (by the ECJ) of the concepts of agreement or concerted practice under article 101 TFEU or by way of new EU legislation.

The "interpretative solution" could find support in classic literature but will force the ECJ to expressly depart from its previous caselaw[20]. The legislative way poses certain doubts about of available legal basis (in principle, article 103 TFEU complemented by article 352 TFUE) to allow the enactment of legislation that widens the scope of article 101 TFEU (as shown by the Commission's withdrawal of the proposed New Competition Tool).

In addition, it would be convenient to clarify the potential impact of Generative AI from a merger control standpoint and clarify if cases that, in substance, deal with Generative AI are more susceptible to a referral under article 22 EUMR[21].

Finally, it would be convenient to clarify whether Generative AI warrants special attention due to its significant reliance on data. In this regard, the ECJ has already underscored the

[19] Assad, S, Clark, R, Ershov, D, & Xu, L (2020), "Algorithmic Pricing and Competition: Empirical Evidence from the German Retail Gasoline Market", CESifo Working Paper, No. 8521.

[20] Richard Posner argued that Section 1 of the Shearman Act (the equivalent of Article 101(1) TFEU) could be applied to tacit collusion between oligopolists. Posner defended that tacit collusion was not an unconscious act and that the company that choses to increase prices or limit supply, it does so on the understanding that this limitation would be immediately followed by their competitors. In his view, this would be sufficient to understand that there is a conspiracy in restraint of trade as required by Section 1 of the Sherman Act (see MEHRA S.K., "Antitrust and the Robo-Seller: Competition in the times of Algorithms", op. cit., p. 1329).

21 Article 22, Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings

connection between Article 102 TFEU and violations of data protection obligations in *Meta v Bundeskartellmat*[22].

12) Do you expect the emergence of generative AI systems to trigger the need to adapt EU antitrust investigation tools and practices?

Generative AI systems have various applications and potential benefits, such as enhancing creativity, innovation, and diversity of content. However, they also give rise to challenges and risks, including risks specific to competition law.

The emergence of Generative AI systems may have an impact on the competitive dynamics and market structure of the sectors where these systems are implemented. Generative AI systems may reinforce the relevance of access to data, algorithms, computing resources, and talent, as competitive variables among undertakings. In addition, Generative AI systems may also enable new forms of collaboration or coordination, such as data sharing, pooling, or licensing, joint development or standardization. Moreover, they may affect the entry barriers, market power, pricing strategies, or innovation incentives of the providers or users of generative AI systems.

In view of the quick development and expansion of Generative AI systems, competition authorities need to adapt EU antitrust investigation tools and practices, to ensure that the deployment of Generative AI systems is consistent with the objectives and principles of EU competition law and policy. Some possible areas where EU antitrust investigation tools and practices may need to be adapted are:

- **Algorithmic transparency and accountability:** EU antitrust authorities may need to assess the degree and manner of algorithmic transparency and accountability that may be required or expected from the providers or users of Generative AI systems, and the possible anticompetitive practices or effects that may result from the lack or abuse of algorithmic transparency and accountability, such as collusion, manipulation, deception, or discrimination. EU antitrust authorities may also need to evaluate the possible obligations that may be imposed to ensure algorithmic transparency and accountability, such as algorithmic audits, disclosures, explanations, or oversight, and their implications for the protection, security, and innovation of Generative AI systems and their providers and users.

- **Data access and interoperability**: EU antitrust authorities may need to examine the role and importance of data access and interoperability for the development and deployment of Generative AI systems, and the possible anticompetitive practices or effects that may arise from the restriction or denial of data access or interoperability, such as foreclosure, exclusion, discrimination, or leveraging. EU antitrust authorities may also need to consider the possible remedies or obligations that may be imposed or accepted to ensure or facilitate data access or interoperability, such as data portability, data sharing, data pooling, data licensing, or data governance mechanisms, and their implications for the incentives, costs, and benefits of generative AI systems and their providers and users.

22 ECJ Judgment of 4 July 2023, case C-252/21, Meta v Bundeskartellmat, ECLI:EU:C:2023:537, para. 48.

- **Market definition and assessment:** EU antitrust authorities may need to develop new criteria and methods to define and assess the relevant markets and the competitive effects of Generative AI systems, taking into account the specific features and functionalities of Generative AI systems, the degree of substitutability or complementarity between Generative AI systems and other products or services, the potential for cross-market or cross-platform effects, and the dynamic and evolving nature of Generative AI systems. The EU has already adopted a new Notice on Market Definition which upgrades market analysis in view of the emergence and evolution of new technologies.

- **Innovation and diversity:** EU antitrust authorities may need to monitor the impact of Generative AI systems on the innovation and diversity of the sectors where they are deployed or used, and the possible anticompetitive practices or effects that may hamper or harm the innovation and diversity of Generative AI systems. EU antitrust authorities may also need to consider the possible obligations that may be imposed to address the harm on innovation concerns of Generative AI systems, such as divestitures, access conditions, non-discrimination clauses, or innovation commitments.

- **Information processing tools:** EU antitrust authorities must have the ability to decode and understand complex algorithms in the context of antitrust investigations. In this regard, EU antitrust authorities will need to develop tools, systems, or methods designed to analyze, interpret, and understand algorithms, particularly those used in complex Generative AI systems. Additionally, the competition authorities should be prepared to provide explanations about the functioning of these tools. This is essential to ensure that the parties under investigation have an opportunity to challenge the method used to decode the artificial intelligence system in question.

- **Specialized personnel:** EU antitrust authorities should be assisted by specialists and technicians, given the high complexity of Generative AI systems. These specialized personnel would allow EU antitrust authorities to understand how the systems operate and develop more effective investigation tools. Moreover, in the context of dawn raids, such personnel could be effective in various ways, including the seizure and analysis of specific software or the involvement of the specialized personnel in interviews with the staff of the company under investigation.