

COMPETITION LAW AND ARTIFICIAL INTELLIGENCE – CHALLENGES AND OPPORTUNITIES

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Abstract. The dynamic development and expansion of artificial intelligence (AI), one of the most important technologies currently being developed in the world, which may herald the fourth technological revolution, brings not only numerous benefits, but also threats in many spheres of socio-economic life, including law. This breakthrough technology also creates a number of challenges and opportunities for the science and practice of competition law (or antitrust law). The aim of this study is to show the pro- and anticompetitive effects of AI implementation, as well as to identify and outline the key challenges and opportunities that these effects have on competition law. This paper is intended to serve as an introduction to the subject matter. It does not claim to examine it exhaustively, but rather to inspire its further, more extensive and in-depth analysis.

Keywords: algorithms, artificial intelligence, competition, competition law

“I think some of these algorithms,
they all have to go to law school before they are let out”
[Vestager 2017]

INTRODUCTION

The dynamic development and expansion of artificial intelligence (AI), one of the most important technologies currently being developed in the world, that may herald the fourth technological revolution, does not only bring numerous benefits, but also threats in many spheres of socio-economic life, including law [Skalfist, Mikelsten, and Teigens 2020; Schwab 2018]. This breakthrough technology also creates a number of challenges and opportunities for the science and practice of competition law (or antitrust law). It is certainly no longer *terra incognita* of this field of law, especially when it comes to research on antitrust threats associated with AI development. Nevertheless, the body of Polish scholarly literature and commentary addressing this subject still seems less than modest [Mleczeko 2018, 63ff; Derdak 2018, 73ff]. Therefore, the author deemed it substantiated to show the pro- and anticompetitive effects

of AI implementation, and to identify and outline the key challenges and opportunities that these effects have on competition law. Due to the framework of the study, it is an introduction to the issues in question. This paper does not claim to examine it exhaustively, but rather to inspire further, more extensive and in-depth analysis.

1. WHAT IS AI FROM THE PERSPECTIVE OF LAW?

The very definition of AI proves quite a challenge in itself. Admittedly, it is a subject of numerous definitions formulated on the ground of various fields of science, yet it has not been given a single, universal and commonly accepted meaning (which is otherwise accepted at times) [Stone et al. 2016]. There is no normative definition of AI in the national and international legal order. Also, legal writings devoted to AI often (if not as a rule) do not define this concept at all, assuming its certain intuitive understanding or reaching for non-legal explanations of AI (usually of a technical or sociological character) [Zalewski 2020, 1ff]. There is no doubt that the AI concept is extremely capacious, heterogeneous and ambiguous and at the same time strongly dependent on the specific context in which it is examined and applied. What is more, because this concept refers to solutions based on dynamically developing technologies, its definition is at risk of being rapidly obsolete. Metaphorically speaking, defining AI can resemble chasing the horizon: when we have familiarised ourselves with a technological process that we do not understand, named AI, it stops being called AI and becomes just another clever computer program [Turner 2019, 8]. In this context, some commentators doubt or even rule out the possibility of creating a correct legal definition of AI [Schuett 2019; Rajpurohit and Seal, 87ff]. However, efforts to formulate it are already being taken due to political and regulatory considerations. As has already been raised, they have not yet enjoyed full success. This is also why for the purpose of this study it will be sufficient to adopt a simplified understanding of AI that appears in documents of the European Commission and of the Polish government.¹ In a nutshell, AI means a collection of technologies that combine data, algorithms and computing power or a specific combination of complex algorithms in a system capable of perceiving the environment and affecting it.²

¹ See *White Paper on Artificial intelligence - A European approach to excellence and trust*, Brussels (19.02.2020), COM(2020) 65 final, p. 2; *Polityka Rozwoju Sztucznej Inteligencji w Polsce na lata 2019–2027*, Warsaw 2019, p. 81.

² It is also worth noting that in 2018 a group of independent high-level experts appointed by the European Commission recommended the following (extensive and complex) (technical) definition of AI: “Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured

2. PROCOMPETITIVE EFFECTS OF IMPLEMENTING AI

It might seem that from the perspective of competition law benefits for market competition that the development of AI may bring do not deserve much attention. It may somewhat be evidenced by the fact that theory and practice of this law addresses, understandably, negative consequences of AI implementation rather than positive ones. However, these benefits cannot be completely ignored, especially in the context of the so-called economization of the competition law that dominates in today's antitrust policy (also in the UE and Poland), which is often manifested by the concept of the so-called more economic approach in the process of creation and application of this law [Piszcz 2009; Nizioł 2019, 127ff; Witt 2016; Drexl, Kerber, and Podszun 2011]. In line with this concept, when evaluating market behaviours one should mainly focus on their effects but not leaving out the so-called social and economic efficiency gains.

It turns out that AI implementation implies (directly or indirectly) an array of such benefits, both on the supply side and the demand side of the market³ [Gürkaynak 2019, 29ff]. The probably most significant (and the most obvious) value of AI is the fact that it allows profound reduction of costs borne by suppliers and buyers (including consumers).

On the supply side, reduction of production and transaction costs that is possible by improving the allocation of resources translates into lower prices for consumers. Thanks to deep learning technologies, companies can optimise their commercial strategies instantaneously. By using advanced algorithms, they can analyse large quantities of data faster and more efficiently, which allows more suitable responses to buyers' needs. Artificial intelligence lowers entry barriers to markets, making them more transparent, which may increase the number of active participants and thus intensify competition. In turn, price algorithms allow responding to changes in supply conditions and demand fluctuations almost instantaneously, which leads to optimisation of prices, which are probably the most important parameter of market competition. Other algorithms offer an array of qualitative benefits, helping in numerous ways to improve market offers (e.g. search engines or price comparison websites may

or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behaviour by analysing how the environment is affected by their previous actions." *A Definition of AI: Main Capabilities and Disciplines*, High-Level Expert Group on Artificial Intelligence, <https://digital-strategy.ec.europa.eu/en/library/definition-artificial-intelligence-main-capabilities-and-scientific-disciplines> [accessed: 08.04.2021].

³ *Algorithms and Collusion: Competition Policy in the Digital Age*, www.oecd.org/competition/algorithms-collusion-competition-policy-in-the-digital-age.htm [accessed: 08.05.2021], p. 14ff.

provide personalized purchase recommendations). Procompetitive implications of implementing AI entail benefits in terms of static and dynamic efficiency alike. Artificial intelligence, making knowledge more available, facilitating market trend predictions and also allowing estimation of risk of research and development projects, clearly accelerates the placing of new products on the market and thus inspires innovations, including breakthroughs [Cockburn, Henderson, and Stern 2018]. Undertakings from the high-tech sector are the most inclined to compete intensively in creating their own IT systems and in offering new and increasingly advanced technologies to their recipients.

Procompetitive benefits on the demand side generated by AI include in particular optimisation of consumer decisions by ensuring more effective (easier, quicker, cheaper and fuller) access to commercial information and by protecting consumers from manipulative marketing techniques and price discrimination. By allowing consumers to compare a greater number of offers, AI algorithms (e.g. in the form of price comparison websites) increase transparency of the market environment, reduce information asymmetry and improve the flow of commercial information, which in consequence may encourage people to change suppliers and thus intensify competitive pressure on the side of the latter. Autonomous operations of algorithms of a new generation may also level consumers' opportunities. Those who are not able to use the potential of tools for on-line shopping may use the so-called digital personal assistants or digital butlers, who can identify users' purchase needs on their own, choose optimal offers and execute transactions [Budzinski, Noskova, and Zhang 2019]. Another procompetitive application of AI involves creation of consumer shopping platforms which enhance purchasing power and solve some problems related to collective actions on the demand side [Rha and Widdows 2002, 107ff].

The benefits of AI implementation presented above point to its significant procompetitive potential. By contributing to greater attractiveness of goods and services offered on the market (in terms of availability, prices, quality or innovativeness), AI increases consumer welfare, which is commonly considered one of the main objectives of the competition law (if not its ultimate goal).⁴

3. ANTICOMPETITIVE EFFECTS OF IMPLEMENTING AI

As has already been mentioned, the AI phenomenon has an ambivalent effect on market competition – both positive and negative. This technology may be used to the detriment of competition practically in all market conduct,

⁴ On consumer welfare as the goal of competition law, see Hovenkamp 2020; Idem 2019; Reyna 2019; Daskalova 2015; Orbach 2011; Miąsik 2008; Cseres 2007.

qualified under competition law as practices limiting competition or as concentrations (mergers and acquisitions). There is no doubt that the majority of concerns here relate to the use of AI as a tool to effect multilateral (collective) competition-restricting practices that take the form of anticompetitive agreements and to AI's contribution to non-agreed market coordination, most often referred to as tacit collusion⁵. To illustrate this, we can point to five different scenarios of such threats, with a reservation that this categorisation is not definitive and that it is simplified (these scenarios are not disjoint and their delimitation in practice may often be difficult and ambiguous)⁶ [Ezrachi and Stucke 2017, 1775ff; Marx, Ritz, and Weller 2019, 3ff].

In the *Messenger* scenario, AI may serve as an ordinary (though technically sophisticated) tool to assist in incorporating (implementing, monitoring, policing or concealing) a “classic” anticompetitive agreement, which had been executed (before) in a “traditional” way as a result of human interaction (e.g. cartel or vertical agreement) [Ezrachi and Stucke 2017, 1784ff].

Hub and Spoke, the second scenario, is one in which several competitors enter into vertical agreements with an AI software developer who acts as the hub which helps orchestrate anticompetitive horizontal agreements between counter parties (spokes) [ibid.]. This agreement is not an effect of direct contact between competitors but a consequence of actions of the algorithm supplied and its developer.

In the third scenario, *Predictable Agent*, no agreement is made at all between business operators, but each of them independently applies their own AI algorithm so that it leads to non-agreed coordination of their market behaviours (tacit collusion) [Ezrachi and Stucke 2017, 1789ff; Mehra 2016, 1323ff]. The source of the problem lies in AI algorithms' ability to respond in real time to the changing market situation (e.g. prices of competitive products) and to monitor the market in a much broader scope than possible with conventional tools of market analysis. In effect, the market environment may become so transparent that competitors find it much easier to reach a price balance at a supracompetitive level (higher than the market level). We would then be

⁵ According to a frequently quoted definition of tacit collusion formulated by the US Supreme Court in *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 227 (1993), p. 227, this term describes the process allowing firms operating in a concentrated market to share monopoly power. By recognizing their shared economic interests and their interdependence with respect to price and output decisions, such undertakings may set their prices at a profit-maximizing, supracompetitive level. Under tacit collusion (contrary to its name which is an oxymoron), its participants do not contact one another in any way to coordinate their market behaviour, thereby it cannot be classified as an agreement in the meaning of competition law (this is why alternative names for this phenomenon are more adequate, though less popular, such as coordinated effects or conscious parallelism). More in Wieczorek 2011, 25ff; Rees 1993, 27ff.

⁶ *Algorithms and Competition*, <https://www.autoritedelaconurrence.fr/sites/default/files/algorithms-and-competition.pdf> [accessed: 08.05.2021], p. 26ff.

dealing with something that has been suggestively described in the literature as “tacit collusion on steroids” [Ezrachi and Stucke 2016, 56n.].

The next scenario, *Invisible Hand*, assumes that the AI software developer is able to independently manipulate in an anticompetitive fashion the market on which the users of its product operate (without them knowing about it) [Marx, Ritz, and Weller 2019, 4ff]. By using the information of its customers and by controlling their pricing, such developer can (like an invisible hand) in his own particular interest (hoping for benefits of increased sales) raise the prices of all competitors using its algorithm, while they may not be (fully) aware that they apply artificially high rates.

The last scenario, *Digital Eye*, also points to a threat in the form of tacit collusion where it is no longer a creation of a specific human project, but where it is rather created autonomously (without human interference) by highly advanced self-learning AI [Ezrachi and Stucke 2017, 1795ff].

Apart from the last scenario, which has the most speculative nature and which seems to still remain in the sphere of legal science fiction [Schwalbe 2018, 568ff; Schrepel 2017], the antitrust practice already provides (though still relatively few) examples of realisation of the threats pointed to above (naturally, these are usually cases falling under the first two scenarios).⁷

In the context of unilateral anticompetitive conduct (under competition law categorised as abuse of dominant position or monopolisation), AI may be used to effect both exploitative and exclusive practices. In particular, as is commonly believed, smart algorithms create abundant opportunities to apply discriminatory practices [Faella and Romano 2019, 20]. They allow undertakings to obtain and precisely process information about counter parties’ and consumers’ preferences and willingness to pay a specific price to carry out extremely sophisticated forms of price discrimination (in real time). AI-based price discrimination may be coming closer to perfect discrimination in the form of offering (hyper-) personalized prices [Faella and Romano 2019, 20; Botta and Wiedemann 2020, 381ff; Woodcock 2019, 311ff]. Moreover, by helping firms to estimate competitors’ costs structure and to assess the probability that the practice will be successful and profitable, AI might facilitate exclusionary practices such as margin squeeze, predatory pricing or blocking (restricting) access to data necessary for algorithms’ effective operation [Faella and Romano 2019, 20].

Compared to the threats outlined above that the AI poses in the area of practices (especially collective ones) that restrain competition, this technology rises much less doubt in the context of concentrations. However, even here strategic use of AI technologies for anticompetitive purposes is possible.

⁷ A review of these cases is presented in the following studies: Mleczek 2018, 63ff; Derdak 2018, 73ff; Gürkaynak 2019, 29ff; Ezrachi and Stucke 2017, 1775ff; Marx, Ritz, and Weller 2019. See also: *Algorithms and Collusion: Competition Policy in the Digital Age*, p. 14ff.

In particular, extremely effective and rapid market adjustment by AI tools may increase the risk that concentrations lead to the so-called coordinated effects, even in less concentrated markets [Faella and Romano 2019, 20; McSweeney and O’Dea 2017, 75ff].

4. CHALLENGES FOR COMPETITION LAW IN THE FACE OF AI

Radical changes in the functioning of many markets, caused by AI development and proliferation, and especially the related threats pose a number of challenges for competition law. These challenges differ significantly depending on whether AI amplifies only conduct which is already covered under the current legal framework or whether it creates, to some extent, new risks related to behaviours not covered by the current antitrust rules.⁸ In the first case, the problem does not seem exceptionally complicated, because the question of using AI ought to be assessed together with the main infringement that it helps enforce. While detecting the existence of an infringement and proving it might still be complex because of the presence of AI (especially in the case of deep learning algorithms), antitrust authorities can nevertheless rely on existing rules, e.g. referring to explicit collusions, which offer a framework to assess how AI is used on its own or as practices ancillary to the main infringement. As such, the challenges for authorities are left to understanding how the technology works and how AI can facilitate or support the main antitrust infringement.

The problem becomes even more complex in the second case when a given conduct that employs AI is not covered by standard antitrust rules. Such two legal loopholes (at least potential) seem to engage competition law experts in particular.

The first is related to the AI’s expanding (especially by self-learning algorithms) the grey area between practices qualified as unlawful explicit collusions and practices that constitute tacit collusion, which despite being socially undesirable (since they produce anticompetitive effects, such as higher prices, similar to e.g. cartels), are not in fact prohibited under competition law.⁹ Therefore, AI can amplify the so-called oligopoly problem by expanding its reach to cover non-oligopolistic markets (normally resistant to tacit collusion)¹⁰ [Ittoo and Petit 2017].¹¹ To put it short, this problem boils down to the fact that

⁸ *Algorithms and Collusion: Competition Policy in the Digital Age*, p. 133ff.

⁹ *Ibid.*, p. 25.

¹⁰ *Ibid.*

¹¹ The “oligopoly problem” (term attributed to R. Posner), otherwise immensely disputable and bothering lawyers for decades (still unresolved), reflects the concern that specific characteristics of oligopolistic markets (including far-reaching interdependence of oligopolists) may result in tacit collusion [Posner 1969, 1562ff; Petit 2013, 259ff].

AI enables competition restriction by means of lawful coordination instead of unlawful collusion. It does not seem that a remedy for this problem may come in the form of traditional antitrust instruments which are sometimes employed in attempts to address classic oligopoly problem, e.g. *ex ante* control of concentrations (since AI facilitates tacit collusion also in less concentrated markets) or *ex post* enforcement of the prohibition of abuse of collective market dominance (which is exceptionally difficult to prove). A remedy for this problem may be sought in considered, and sometimes even postulated, revision of the approach to the term collusion under competition law (i.e. expanding the scope of its normative definition or its interpretation). Even though this term is commonly understood in a broad angle (to ensure efficiency of prohibition of explicit collusion), it is still not to the degree that allows it to accommodate individual market behaviour (*ergo* tacit collusion). For example, in the Polish and EU competition law, execution of a typical agreement requires the “meeting of minds” or the “concurrence of wills” of two or more parties.¹² In turn, collusion in the form of “concerted practices” is admittedly highly capacious and may accommodate certain applications of AI, yet it still does not allow capturing all situations leading to anticompetitive effects when using it.¹³

The second loophole, which is a particular challenge for competition law in the face of development and expansion of AI, entails the so-called anthropocentric nature of this law, which uses traditionally subjective concepts (e.g. the concept of guilt) to attribute liability for its violation [Blockx 2017; Mleczko 2018, 70]. While in the case of (currently dominant) less advanced AI tools, operating on the basis of human-made instructions, there is usually no doubt about liability of the latter (undertakings) for violations of antitrust rules by means of AI (treated as a mere tool), the answer to the question of who is to be responsible and on what basis for AI’s autonomous decisions and actions that violate antitrust rules may be much more difficult given the development of highly advanced and independent AI systems whose ties with

¹² See judgment of the Court of First Instance of 26 October 2000, Bayer AG v Commission of the European Communities, ECLI:EU:T:2000:242 (“the concept of an agreement [...] centres around the existence of a concurrence of wills between at least two parties, the form in which it is manifested being unimportant so long as it constitutes the faithful expression of the parties’ intention”) [Górska 2012, 289ff].

¹³ See e.g. judgment of the Polish Supreme Court of 9 August 2006, ref. no. III SK 6/06, OSNP 2008/1–2/25 (“They are not a manifestation of explicit collusion, especially one that has the form of concerted behaviour under Article 5(1)(1) of the Consumer and Competition Protection Law, the so-called parallel behaviours of undertakings who intentionally adjust to the market situation emerged. Conscious adjustment to changing market requirements, inter alia in terms of competitors’ price offers, as a regular market response, is not prohibited. The difference between parallel lawful behaviour and unlawful collusion that restricts competition lies in the fact that in the first case we are only dealing with a rationally justified imitation of behaviours of other competitors, and in the second – with an agreement executed between competitors (in any way and form).”

human operators decrease (or even disappear). As it seems, the answer to this question (at least partially) will require the adjustment of existing concepts of antitrust liability of undertakings to AI attributes or the development of new, *sui generis* principles of this liability. In the context of civil law liability for damage caused by violation of the competition law, it is worth noting that there have already been legislative initiatives in the EU which aimed to streamline principles of civil law liability for AI actions in various legal systems of Member States, which postulated i.a. introduction of strict liability for an operator of a high-risk AI system together with the obligation to insure such liability.¹⁴

It is also worth mentioning new challenges for international cooperation in antitrust matters, implicated by anticompetitive AI threats with a global scope. As it is pointed out, guidelines adopted under the auspices of OECD concerning effective action against cartels do not correspond to these challenges.¹⁵ Therefore, it is postulated that these recommendations should be modified by supplementing them with a uniform definition of agreement (as the basis of the concept of a cartel), with provisions that strengthen international cooperation not only in terms of penalising cartel participants, but also their detection, and with provisions that specify entities and practices that outline the personal and material scope of liability for “algorithmic” cartels [Noethlich 2019, 923ff].

5. AI IN THE SERVICE OF ANTITRUST ENFORCEMENT

Relations between competition law and AI have a synergistic character, which is an emanation of not only procompetitive market effects of AI implementation (previously described), but also new possibilities that this technology offers to antitrust authorities in their mission to protect and support the development of competition. In particular, they may use AI as a sophisticated tool to detect violations of competition law and to control compliance with it. Implementation of the so-called ECN+ Directive provides a convenient opportunity for significant strengthening of enforcement powers of antitrust authorities of EU Member States, thanks to the application of AI-based analytic tools.¹⁶

¹⁴ See European Parliament resolution of 20 October 2020 with recommendations to the Commission on a civil liability regime for artificial intelligence (2020/2014(INL)).

¹⁵ Recommendation of the Council concerning Effective Action Against Hard Core Cartels, 25 March 1998, C(98)35/Final.

¹⁶ See e.g. Recital 30 of the Directive (EU) 2019/1 of the European Parliament and of the Council of 11 December 2018 to empower the competition authorities of the Member States to be more effective enforcers and to ensure the proper functioning of the internal market OJ L 11,

As envisaged, application of AI algorithms e.g. in the fight against bid rigging or more generally – against cartel practices (generally perceived as being the most serious infringements of the competition rules¹⁷) will open unprecedented possibilities of engaging technologies in the service of competition law enforcement¹⁸ [Huber and Imhof 2019, 277ff; von Bonin and Malhi 2020, 468ff; Patakyová 2019]. Already now, antitrust authorities in many jurisdictions inform about the application of such tools to detect bid rigging, not without success. For example, many bid rigging situations in South Korea (who is one of the pioneers in digital screening in public tenders) as well as in Brazil and Russia were detected thanks to this type of advanced control of bid documentation.¹⁹ The Polish Office of Competition and Consumer Protection is also carrying out works on the implementation of AI-based system for i.a. more effective detection of bid rigging.²⁰

AI tools may also be used to monitor and assess market trends and developments, with a view to identifying possible anomalies, which might be linked to anticompetitive practices. Finally, the use of AI could also simplify and speed up the review process in merger cases or the conduct of antitrust proceedings, and could enable enforcers to monitor the correct implementation of remedies and commitments by firms more effectively and at lower costs [Faella and Romano 2019, 21].

The use of AI in cases of private enforcement of competition law, especially to obtain and assess evidence, deserves a separate mention. For example, AI tools may be helpful in the finding of a causal nexus between a given market conduct and the damage allegedly suffered, and also could help to quantify damages more precisely [ibid.].

14.1.2019, p. 3–33 (“The investigative powers of national administrative competition authorities should be adequate to meet the enforcement challenges of the digital environment”).

¹⁷ See e.g. judgment of the US Supreme Court in *Verizon Communications v. Law Offices of Curtis V. Trinko*, 540 U.S. 398 (2004), in which judge Antonin Scalia described cartels with a telling phrase “the supreme evil of the antitrust”).

¹⁸ *Algorithms and Collusion: Competition Policy in the Digital Age*, p. 14.

¹⁹ *Ibid.*; *Ex officio cartel investigations and the use of screens to detect cartels*, <https://www.oecd.org/daf/competition/exofficio-cartel-investigation-2013.pdf> [accessed: 08.05.2021]; *Latin American and Caribbean Competition Forum – Session I: Digital Evidence Gathering in Cartel Investigations – Contribution from UNCTAD*, [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/LACF\(2020\)4&docLanguage=En](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/LACF(2020)4&docLanguage=En) [accessed: 08.05.2021].

²⁰ See *Chróstny: UOKiK chce inwestować w AI, by wykrywać m.in. zminy przetargowe*, <https://www.wnp.pl/finanse/chrostny-uokik-chce-inwestowac-w-ai-by-wykrywac-m-in-zmowy-przetargowe,416400.html> [accessed: 25.04.2021]. Incidentally, as early as in 2014, the President of the Office announced the development of their own screening programme directed at detection of bid rigging in public tenders, see *Polityka konkurencji na lata 2014–2018*, UOKiK, Warsaw 2014, p. 31.

CONCLUSIONS

As Melvin Kranzberg's first law says: "Technology is neither good nor bad; nor is it neutral" [Kranzberg 1986, 547]. In the light of the findings made in this paper, there is no doubt that this maxim also applies to AI. On the one hand, this breakthrough technology opens extremely promising perspectives for undertakings and consumers, on the other it gives rise to threats the consequences of which should involve increased responsibility on the side of AI developers and operators.

As it has been demonstrated, benefits and threats implicated by AI do not bypass one of the main pillars of social market economy – market competition, which translates into opportunities and threats for competition law that safeguards it. How to tackle these opportunities and challenges is still an open question. Due to a relatively early stage of research on AI impact on market competition, positions presented in this matter are, naturally, preliminary. However, one can undoubtedly see quite a bit of uncertainty and scepticism in them, or even concerns whether competition law in its current form is able to deal with AI-triggered threats and challenges.

Thus, postulates to undertake specific regulatory remedial actions (calling for a revision of competition law) meet with appeals for caution and with a warning not to follow the siren's call that asks for more regulatory interventionism each time there is a new technological evolution, which may turn out premature and in consequence counterproductive (sparking e.g. the chilling effect on competition, innovation and investment) [Colombo 2018, 22; Gal and Schrepel 2020, 3].

Artificial intelligence's ambivalent impact on competition puts decision-makers responsible for its protection before a truly Shakespearean dilemma: to regulate or not to regulate? So far, the wait-and-see strategy is the preferred option, though recently e.g. the European Commission seems to be more inclined to a position that opts for changes in competition law dictated by AI development [Colangelo 2021, 25].

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