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Algorithmic competition – Note by BIAC

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More documents related to this discussion can be found at https://www.oecd.org/competition/algorithmic-competition.htm

Antonio CAPOBIANCO
Antonio.Capobianco@oecd.org, +(33-1) 45 24 98 08

JT03520610

BIAC

1. Introduction

1. The past few years have witnessed an increased use of pricing algorithms and artificial intelligence by firms offering services and products online and offline. Some commentators have raised concerns that, coupled with the availability of large data sets, this practice might change the competitive landscape and have an effect on the intensity of price competition.

2. In June 2017, the OECD held a roundtable on algorithms and collusion to discuss a number of the challenges raised by algorithms.[1] In particular, the roundtable addressed the question whether competition enforcement agencies should reconsider the traditional antitrust concepts of "agreement" and "tacit collusion," and whether antitrust liability can be imposed on algorithms' creators and users. With regard to regulatory intervention, the Competition Committee advocated a need to evaluate the practice further and carefully weigh the benefits of tackling collusion against the risks of over-enforcement. Furthermore, the participants to the roundtable identified the risk that a regulatory intervention may hinder investment and innovation in digital markets.

3. BIAC notes that, since the 2017 OECD roundtable, the number of actual cases involving algorithmic (explicit or tacit) collusion has not grown significantly. This raises the question whether competition agencies are indeed "missing" anything, or whether the initial potential concerns have taken longer to manifest themselves due to the evolution of the economy. However, as the Secretariat's Background Paper for this roundtable[2] observes, recently, two new questions have come up.

4. First, the debate surrounding tacit collusion has gained momentum with the rise of a new generation of algorithms, i.e., algorithms with the logic to collude and self-learning algorithms. The question is whether these phenomena should prompt changes in the way enforcement against algorithms has been perceived so far.

5. Second, certain recent literature proposes moving beyond collusion and exploring how the increasingly precise practice of individualized targeting by algorithms can facilitate the practice of a range of abuses of dominance, including predatory pricing, rebates, and tying and bundling.[3]

6. While BIAC acknowledges the technological advances, as well as the most recent thinking on algorithmic pricing, it warns against overzealous enforcement action based on these observations. Indeed, proper competition law enforcement requires proper insight into the necessary conditions for competitive harm to occur, as well as adequate knowledge of these phenomena in practice. The assessment of the exploitative nature of personalized pricing also needs to take place within a proper framework to distinguish market expanding

[1] *Algorithms and Collusion*, OECD, https://www.oecd.org/competition/algorithms-and-collusion.htm.

[2] OECD, Algorithmic Competition – OECD Competition Policy Roundtable Background Note (2023), https://www.oecd.org/daf/competition/algorithmic-competition-2023.pdf.

[3] *See, e.g.*, Thomas K. Cheng & Julian Nowag, *Algorithmic Predation and Exclusion*, 25 UNIV. PENN. J. BUS. L. 41 (2023), https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=1677&context=jbl. Recent literature also concentrates on algorithmic pricing in merger review. *See, e.g.*, Ai Deng &Cristián Hernández, *Algorithmic Pricing in Horizontal Merger Review: An Initial Assessment*, ANTITRUST (36) 2 (Spring 2022), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3971920.

price discrimination from exploitation. It also requires criteria to determine acceptable and unacceptable factors of price personalization. The latter is more likely to fall within the remit of consumer protection law, rather than competition law, as such rules should extend beyond dominant firms.

2. Algorithmic Price Differentiation and Collusion in General

7. On the one hand, detailed knowledge about their customers may enable firms to use algorithms to price differentiate based on the (perceived) reservation price of individual customers, to promote items that are complementary to items previously purchased, or that are otherwise tailored to specific users. As BIAC has stated previously, the associated effects on allocative efficiency of such practices are generally viewed to be positive.[4] In addition, information on competitors' pricing may be used as an input into a pricing algorithm to optimize companies' own pricing in an attempt to offer more competitive prices to customers and, as a consequence, increase interbrand price competition. From a consumer perspective, algorithms can also produce significant benefits, by optimizing decision-making and enabling consumers to make informed purchase choices, while also increasing buyer power.

8. On the other hand, data about competitors may in some specific settings facilitate tacit collusion, i.e., conscious parallelism and, as a consequence, soften price competition. There is however consensus among economists that for tacit collusion to occur a number of conditions must necessarily be met. In particular, the market must be sufficiently transparent for the firms which coordinate their conduct to be able to monitor sufficiently whether the rules of coordination are being observed. Second, there must be a form of deterrent mechanism in the event of deviant conduct. Third, the reactions of firms which do not participate in the coordination, such as current or future competitors, or the reactions of customers, should not be able to jeopardize the results expected from the coordination.[5] In addition, firms should be able to punish possible deviations, for instance by going back to the competitive equilibrium, or below, for at least a period of time. In practice, such conditions are rarely met in cases of tacit collusion. Indeed, explicit collusion is itself vulnerable to deviation from the collusive equilibrium, and tacit collusion is even more complex to maintain. Only specific market circumstances (related to the information structure and to the oligopolistic structure of the market) are able to give rise to tacit collusion. Moreover, tacit collusion is not caught by Article 101 TFEU (although it may sometimes constitute an abuse of a collective dominant position under Article 102 TFEU).[6]

9. The European Commission's draft revised Horizontal Guidelines explicitly refer to such a risk of algorithmic collusion, resulting from the use of algorithms under certain circumstances. They clarify, however, that algorithmic collusion must be distinguished from the so-called "collusion by code," that refers to the deliberate application by

[4] *See* OECD, Algorithms and Collusion – Note from BIAC, DAF/COMP/WD(2017)53 (June 9, 2017), https://one.oecd.org/document/DAF/COMP/WD(2017)53/en/pdf.

[5] *See* Case T-342/99, Airtours v. Comm'n, ¶ 62, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:61999TJ0342; Case T-464/04, Impala v. Comm'n, ¶ 247, https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:62004TJ0464; and Case C-41306 Bertelsmann & Sony v. Impala, ¶ 123, https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:62006CJ0413. *See also* Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings (2004) O.J. (C 31) 5, n.29.

[6] *See, e.g.*, Joined Cases C-395 and 396/96, Compagnie Maritime Belge Transports v. Comm'n, https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:61996CJ0395.

competitors of common behavioural coordination algorithms. Collusion by code is typically a cartel and therefore a restriction of competition by object, irrespective of the market conditions and of the information exchanged.[7]

10. In addition, algorithms may present a novel situation whereby they may be programmed to consider competitors' actions but may be unable to assign intentions to competitors so that even if algorithmic prices start correlating, one cannot strictly speak of "tacit collusion." Indeed, collusion implies a certain degree of acknowledgement of a common plan or scheme. An algorithm programmed for firm-specific profit maximization, particularly one that is attuned to individual customer price differentiation, is unlikely to be programmed in a way that evaluates and maximizes the profit of its competitor. This scenario should be contrasted with cases where firms jointly feed their data into a shared algorithm that recommends a common strategy to all its members as a function of central decision making based on a jointly defined strategy. One must then separate instances where there are elements of joint decision making (such as when there is alignment on how to program the algorithm or when a common algorithm is used) from instances where individually managed algorithms learn to profit maximize. When correlation arises in the latter case, it is little more than an empirical rebuttal of the premise that perfect competition with full information in a repeated games leads to prices close to marginal cost. Regulators may want to lower the market prices, but this will require regulatory interventions based on premises of price regulation, not competition policy. This has important implications for the design of remedies.

11. In short, a regulatory approach that attacked algorithms that are programmed to maximize individual firm profits through the assessment of market information, individual customer preferences and competitor reactions would render illegal the exact conduct that the competition laws have held to be legal – not only legal but fully anticipated – for generations. The fact that an algorithm can execute on such a strategy better and faster than non-mechanized approaches should not be the basis for enforcement action. Only where there is evidence that the competitors have acted, through a common understanding, with the express intent to jointly develop pricing conduct should enforcement activity be justified.

12. While BIAC appreciates that algorithms may in some specific circumstances increase the scope for price increases, it submits that algorithms do not intrinsically lead to this effect. It is only when these above conditions are met that improper collusion may occur. BIAC emphasizes that a greater use of pricing algorithms does not necessarily increase the likelihood of explicit or tacit collusion. In some cases, the market structure and market conditions themselves may already give rise to a certain level of tacit collusion, while the use of pricing algorithms does not make collusion more or less likely. In other cases, pricing algorithms may also be used to disrupt tacit collusion among other market participants.

13. BIAC advocates a more studied approach and submits that antitrust enforcement is only warranted in cases where there is persuasive evidence of collusion reflecting a common commitment by competitors to a joint pricing scheme. The sine qua non of a competition violation has always vested in the agreement between or among parties – not merely the agreement of prices, which can equally be a sign of competition, but the conscious agreement of the parties themselves to a common plan or scheme. The mere use

[7] *See* Approval of the content of a draft for a Communication from the Commission – Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements (2022/C 164/01), https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52022XC0419(03).

of algorithmic tools does not satisfy this essential criterion, even where algorithms may help to increase individual firm profits.

14. By the same token, BIAC believes that there are insufficient indicia to suggest that ex-ante regulation or industry self-regulation, for instance through the voluntary publication of algorithms that companies use, is warranted. On the contrary, there is a significant risk that ex-ante regulation, or the mandatory disclosure of proprietary algorithm know-how, reduces efficiency, undermines incentives to innovate, and may even lead in anticompetitive effects sanctioned by competition enforcement agencies or governments.

3. Increased Potential for Tacit Collusion or Exclusion?

15. As mentioned above, the necessary conditions for tacit collusion have been well documented in economic literature. Tacit collusion requires sufficient transparency, detection of deviating conduct, and the absence of countervailing measures that disrupt the collusive arrangement.[8] Above all, tacit collusion requires the awareness of a joint strategy and conscious alignment.

16. As a corollary, it is accepted that a number of market conditions may prevent tacit alignment. For instance, the greater the product heterogeneity of products and the more different cost structures are, the more difficult coordination is; the larger the number of sellers is, the more difficult it is to collude; and the larger the time lag is between deviant conduct deviating from the collusive scheme and retaliation, the more difficult it is for the coordination to persist. Algorithmic pricing with independent players may have several added elements of instability depending on the nature of the algorithmic decision-making process.

17. BIAC acknowledges the theoretical possibility that the use of pricing algorithms or artificial intelligence may affect some of the market conditions that tend to prevent coordination and that, as a consequence, the use of algorithms may in theory facilitate coordination. In theory, pricing algorithms may facilitate coordination among sellers. Monitoring algorithms may more quickly detect (genuine) price deviations and may respond more quickly to cheating.

18. However, the possibility that pricing algorithms may have the potential to weaken some of the market conditions that normally prevent coordination does not imply that those algorithms do, in fact, in a given market setting, facilitate or enable tacit collusion. In fact, even if pricing algorithms are used, the necessary conditions for tacit collusion may not be met, for instance because tacit collusion is simply not feasible in light of different cost structures or product heterogeneity to start with. Increased customization of products and prices associated with the use of Big Data are likely to make tacit or explicit collusion more difficult. Accordingly, in those situations, the use of algorithms does not imply an increase in the potential for tacit collusion.

19. In addition, while it is sometimes assumed that pricing algorithms are used to collude with competitors, the very opposite may be true: even if competitors' pricing could be accurately observed, the firm using the algorithm may have an incentive, and may find it more profitable, to pursue a disruptive pricing strategy, thereby bringing more competition to the market. Algorithms may indeed be designed to undercut rivals, or even to price opportunistically in an attempt to grow sales or exclude competitors. In fact, there

[8] *See, e.g.*, JEFFREY CHURCH & ROGER WARE, INDUSTRIAL ORGANIZATION 314 *et seq* (2000).

are few documented cases of algorithmic price alignment when algorithms are independently built and managed.

20. Finally, it can be expected that buyers who may believe that they are suffering as a result of tacit price collusion will try to resort to countervailing measures, for instance by not disclosing information essential to the colluding sellers, bundling purchases with those of other products, or by sponsoring the new entry of more competitive sellers into the market.

21. As a result, it is impossible to conclude that the use of algorithms by definition, or even generally, increases the likelihood of tacit collusion. Instead, what is needed in each specific case, is a thorough and detailed investigation based on the specific conditions in the market, the actual functioning of the algorithms involved and the specific market conduct and conditions at hand, before one may conclude that tacit collusion occurs.

22. But even if an enforcement agency would suspect or find that tacit collusion indeed occurs, it remains to be seen whether this can be explained in whole or in part by the algorithms used by the market participants. Indeed, without a detailed analysis into the actual effects of the use of the algorithms by the various market participants, it cannot be excluded that tacit collusion would have occurred even without the use of those algorithms, largely as a result of market conditions.

23. Similar observations apply to algorithmic exclusion and predation. The Background Note extensively discusses the use of algorithms in the context of different forms of unilateral conduct.[9] The discussion can be summarized by referring to the argument that algorithms may make it easier for a monopolist or dominant company to implement anticompetitive conduct, such as predatory pricing, tying and bundling, or unlawful rebates. The core issue appears to be related to the possibility of more precise customer segmentation enabled by the use of algorithms and the associated ability for a company to target a more specific category of customers.

24. Algorithmic pricing has not yet produced new theories of harm. It just presents new and more efficient ways to adopt well known exclusionary behavior. Exclusionary theories based on algorithmic pricing will have to meet existing standards of proof: identification of the foreclosure strategy, determining potential for foreclosure possibly by establishing sufficient coverage of the strategy, and when applicable, some version of the "as efficient competitor" test. The lack of a reference price for the market may complicate this work, and it remains to be seen whether some rules can be found that would present good approximations.

25. Nevertheless, as already noted above with regard to tacit collusion, it remains to be seen whether the necessary conditions for competitive harm to occur are met in a specific case. For example, customers might not disclose critical essential information in order to reduce their exposure against the dominant company. Furthermore, customer segmentation facilitated by algorithms can also lead to efficiencies, insofar as it allows a company to tailor its pricing policy to customers' needs.

26. Finally. price discrimination can be efficient when in grows the overall market and provides access to new consumers so the personalization of prices could be assessed against this benchmark. Legitimate concerns may be raised over the criteria for such personalization although the banning of criteria for personalization is better addressed with consumer policy and cover all firms. In cases of excessive pricing, the question also arises of the price benchmark to use for the "but for" world. Biases in ranking, allocation, or

[9] OECD, Algorithmic Competition, *supra* note 2, § 3.2.

search may be perceived as exploitative towards consumers when not exclusionary to actual or potential competitors. Ranking or allocation can be a differentiating factor.

4. Competition Law Enforcement Challenges

27. BIAC acknowledges that it may be difficult for competition enforcement agencies to distinguish between situations where algorithms help generate consumer benefits in the form of personalized pricing and product customization on the one hand and situations where algorithms may be instrumental in achieving tacit or explicit collusion. In some respects, these challenges are analogous to the analytical difficulties involved in distinguishing between pro-competitive and potentially anti-competitive exchange of information between market participants. For example, the Luxembourg Competition Council investigated the Webtaxi taxi booking system in Luxembourg, which connects Webtaxi taxis as well as independent undertakings. When a customer makes a reservation for a trip through Webtaxi, the reservation center assigns the closest taxi and determines a non-negotiable price for the trip using an algorithm. The regulator confirmed the existence of a price-fixing agreement between competing taxi undertakings that are members of the Webtaxi taxi booking service; however, the agreement was exempted on the basis of the efficiency gains of the agreement and benefits for consumers stemming from the system.[10]

28. BIAC acknowledges that as a matter of principle the potential for (tacit) collusion through the (simultaneous) use of (similar or identical) pricing algorithms cannot be excluded. Indeed, it cannot be excluded that in exceptional circumstances algorithms may indeed be used to strengthen an existing cartel arrangement or to facilitate tacit collusion, e.g., by instantly identifying deviations and applying responsive measures. This holds true not only in the context of horizontal collusion, but also with regard to vertical arrangements, where algorithms might be used in order, for example, to detect and punish deviations from a fixed or minimum resale price. However, in such scenarios, a prior anticompetitive agreement or concerted practice would be necessary, even without further consideration of the algorithm involved.[11]

29. However, BIAC believes that, while it may perhaps be difficult in practice to adduce the necessary evidence for an antitrust violation, the scope of competition law is sufficiently broad to capture most of the anti-competitive scenarios which may involve the use of pricing algorithms. In addition, competition law enforcement agencies generally have the necessary investigative powers to uncover the information they would need to establish an antitrust violation.

30. In particular, competition law enforcement agencies are well equipped to establish violations in instances where algorithms are used to implement and monitor express cartel agreements and where the same or parallel algorithms are intentionally used by multiple

[10] *See* 2018-FO-01 – Webtaxi, https://concurrence.public.lu/fr/decisions/ententes/2018/decision-2018-fo-01.html.

[11] In relation to dynamic pricing algorithms, the European Commission's draft revised Horizontal Guidelines provide that introducing a pricing rule in a shared algorithmic tool (for instance, the lowest price on the relevant online platform(s) or shop(s) +5%, or the price of one competitor -5%), is also likely to be caught by Article 101(1) TFEU, even in the absence of an explicit agreement to align future pricing. *See supra*, note 7, ¶ 432. In the same vein, the European Commission's draft revised Horizontal Guidelines also note that, whilst using publicly available data to feed algorithmic software is legal, the aggregation of sensitive information into a pricing tool offered by a single IT company to which various competitors have access could amount to horizontal collusion. *See id.*, ¶ 436.

firms to implement a collusive scheme. It appears that these scenarios involve explicit agreements.

31. In light of the above, BIAC believes that there is currently no need to consider expanding the scope of competition law, in particular the notion of "restrictive agreement."

5. Competition Law Enforcement Challenges: Access to Companies' Algorithms?

32. A related question is how competition authorities can or should investigate potential competitive harm stemming from the use of algorithmic tools.

33. Competition authorities can and, effectively, do already investigate companies' algorithms. As shown for instance by the investigation of the UK Competition and Markets Authority and the recent European Commission decision regarding Amazon's Buy Box, competition authorities may obtain access to algorithms and study their practical functioning.[12] The Korean Fair Trade Commission (KFTC) investigated the algorithms used by Kakao, an online platform business that provides, amongst others, a local ride-hailing platform called Kakao Mobility. The KFTC found that Kakao used an algorithm on its mobile application to give preference to its own affiliated drivers over non-franchised drivers, and fined Kakao for abuse of dominance through this practice in February 2023.[13]

34. This suggests that the existing investigative powers that agencies have, such as inspections and issuing requests for information and interviews, are sufficient to gain access to the evidence that is required for a finding of violations.[14]

35. Nevertheless, BIAC is concerned about the risks posed by allowing competition agencies to liberally access companies' algorithms in a wide set of circumstances. Indeed, codes and data on which algorithms are highly confidential and may comprise some of the most competitively sensitive information possessed by a company. Algorithms may be essential to a company's success and often constitute highly valuable know-how. Access to such know-how should be subject to strict tests of necessity and proportionality and should be restricted to exceptional cases where serious evidence already suggests that the algorithm is at the core of a competition violation (e.g., market conditions otherwise would not permit tacit collusion) and less intrusive investigation tools are not available with the view to reduce the risks of leaks. Indeed, a competition authority may not be able to reverse the financial harm to a firm that would stem from the inadvertent disclosure of a key algorithm.

36. In addition, as acknowledged by the Secretariat Background Note, there is no consensus among competition authorities or academics about the most suitable investigative tools.[15] Looking at the enforcement record of prominent competition

[12] Case AT.40462—Amazon Marketplace, https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_40462; Case AT.40703—Amazon Buy Box, https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_40703. Note that the EC investigation culminated in an article 9 commitment decision.

[13] Press Release, Korea Fair Trade Comm'n, KFTC Sanctions KaKao Mobility for Giving More Calls to Its Affiliated Taxis (Feb. 14, 2023), https://www.ftc.go.kr/solution/skin/doc.html?fn=c5345c36473713d9875ccde12ebaf5596bf8cfb554bc639ef11d01700a955991&rs=/fileupload/data/result/BBSMSTR_000000002402/.

[14] *See, e.g.*, Auth. for Cons. & Mkts., Position Paper: Oversight of Algorithms (2020), https://www.acm.nl/sites/default/files/documents/position-paper-oversight-of-algorithms.pdf.

[15] OECD, Algorithmic Competition, *supra* note 2.

agencies, however, it has been shown that the effects on the competition can often also be assessed without access to the algorithm and data.

37. Some algorithms can rightly be considered as black boxes, because they are trained on a large amount of data, the way they behave can only be observed empirically and they are not easily understood by humans. Nonetheless, *all* algorithms, whether they are off-the-shelf or are specifically developed (and regardless of whether they are black boxes or not), respond to specifications. For example, pricing algorithms are often developed and implemented with a precise goal and a set of specified input (e.g., competitor prices) and output (e.g., own prices) values.

38. The algorithm specifications themselves are written by humans and intended for use by humans, often following guidelines or best practices developed by standard bodies (e.g., ISO) or professional associations (e.g., IEEE) and clearly state their developers' intentions so that algorithms can be developed and implemented or modified. Specifications are therefore the first and, in many instances, the most important item that authorities should audit. A proper review of specifications – assuming such a review was warranted – would often avoid authorities having to delve into the details of algorithms: the specifications themselves would reveal whether there could be an intent of 'collusion' or, rather, a quest for optimization under constraints (e.g., costs) given a certain information set (e.g., competitor prices). In the latter case, specifications would also show whether such specifications should be considered abusive given, for example, the inputs it relies on. Specifications may also reveal the extent to which there is room for price "correlation" and how it could or could not emerge if diverse algorithms, with different goals (e.g., some maximizing sales, others maximizing margins and with different costs), are used.

39. In addition, and combined with the review of specifications if warranted, it is possible to observe how the algorithm behaves in the real world, for example when setting product prices. As in the offline world, understanding the intention of the algorithm users, as spelled out in specifications, and pricing decisions, combined with those of competitors should generally be sufficient to determine if an equilibrium that is possibly anticompetitive may exist. Nonetheless, as highlighted above, such assessment requires establishing what an adverse equilibrium is, and whether such equilibrium is not the natural equilibrium emerging from the nature of competition in a given market, in addition to other factors required to establish anticompetitive behaviour.

40. Competition authorities are already well equipped to investigate algorithms. As in the offline world, they can review documents (i.e., algorithm specifications) and ascertain the intentions of the parties to determine whether those actors are involved in unlawful conduct. Competition authorities can also examine whether these intentions, to the extent competition authorities consider they could be improper, give rise to effects that can objectively be considered unlawful, rather than a normal equilibrium emerging from the nature of competition in the market.

41. With respect to the availability and use of less invasive tools than direct access to companies' algorithms, BIAC encourages competition agencies to develop know-how and tools to understand how a company's algorithm works in the marketplace without unnecessarily putting companies' business secrets at risk. The UK CMA appears to subscribe to this position: "there is significant value in investigating automated systems without direct access to the underlying code."[16]

[16] Competition & Mkts Auth., Algorithms: How They Can Reduce Competition And Harm Consumers § 3 (Jan. 19, 2021), https://www.gov.uk/government/publications/algorithms-how-they-can-reduce-

42. If a closer review of the functioning of a company's algorithms is indispensable, it is desirable that authorities have first explored less intrusive tools and, only when it is deemed absolutely necessary for the investigation, as *extrema ratio*, to gain access to algorithm. However, even in this scenario, considering the different available investigative tools, it is nevertheless advisable that the authority carefully select the most appropriate technique in compliance with the principle of proportionality. For instance, depending on the circumstance, a black-box testing should be preferred to a white-box testing where an authority is allowed to access and analyses the code itself.[17]

43. It is important to note that the review of an algorithmic structure can be complex, difficult, and, due to the limits of the existing algorithm technique, may not provide sufficient proof of harm. Therefore, as correctly pointed out by the OECD, it is crucial that "investigations need to be proportionate to the harm being investigated."[18]

44. In view of the above, BIAC holds the position that competition authorities are in most cases already equipped with the necessary powers to gain access to and review the functioning of companies' algorithms. As a consequence, BIAC believes that a priori no new investigative powers are needed. However, while acknowledging the potential competition risks associated with the use of algorithms, BIAC specifically recommends the further study and refinement of the existing investigative tools to review the competitive effects of the use of algorithms without direct access to those algorithms.

6. Regulating the Use of Pricing Algorithms?

45. BIAC supports continued efforts to critically monitor and review the market developments with a view to establishing whether the application of competition law fails to capture instances of tacit collusion brought about by the (simultaneous) use of pricing algorithms. However, BIAC is opposed to mandating the publication of proprietary algorithms developed by companies, or to otherwise regulate the use of those algorithms, for the following reasons.

46. First, an obligation to make algorithms available to others does not correspond to a clear and well-articulated need; there is insufficient evidence to suggest that the use of algorithms significantly contributes to collusive outcomes. Second, such a general obligation is also likely to be overbroad as it would potentially capture a large number of algorithms that are pro-competitive. Those pricing tools may be indispensable for companies to offer innovative and tailored product offerings. Mandating the publication of those tools may jeopardize the firms that have developed them and the incentives for future investment in them. Third, and perhaps most importantly, the mandatory disclosure of pricing algorithms, which may also involve proprietary (customer) data sets, would imply a compulsory license to the intellectual property and know-how that is not justified under current doctrines of refusals to deal; compulsory access to those data would thus go significantly beyond what competition law mandates. Fourth, disclosure of algorithms could facilitate the adoption by other competitors of algorithms that anticipate and

competition-and-harm-consumers/algorithms-how-they-can-reduce-competition-and-harm-consumers#techniques-to-investigate-these-harms.

[17] OECD, It's a Feature, not a Bug: On Learning Algorithms and what they teach us – Note by Avigdor Gal, DAF/COMP/WD(2017)50, at 5-6 (June 7, 2017), https://one.oecd.org/document/DAF/COMP/WD(2017)50/en/pdf.

[18] OECD, Algorithmic Competition, *supra* note 2, at 31.

coordinate with the disclosed algorithm, potentially facilitating the very type of collusion that they competition authorities are seeking to deter.