

**DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
COMPETITION COMMITTEE**

Algorithmic competition – Note by the United Kingdom

14 June 2023

This document reproduces a written contribution from the United Kingdom submitted for Item 5 of the 140th OECD Competition Committee meeting on 14-16 June 2023.

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

JT03520861

United Kingdom

1. Introduction

1. In January 2021, the CMA published a paper entitled *Algorithms: How they can reduce competition and harm consumers* (the ‘CMA 2021 Algorithms paper’).¹ The CMA 2021 Algorithms paper clearly sets out the potential harms caused by the use of algorithms and has been drawn on extensively in the background paper produced for the OECD roundtable discussion. For this reason, this paper does not seek to cover the same areas of discussion again, including the ability of algorithms to reduce competition by facilitating collusion.² How the use of algorithms by actual or potential competitors may increase the risk of collusive outcomes in a market is also considered further in the information exchange chapter of the CMA’s draft guidance on the application of the Chapter I prohibition in the Competition Act 1998 to horizontal agreements.³

2. Instead, this paper sets out the research undertaken by the CMA since the CMA 2021 Algorithms paper, predominantly under the umbrella of the Digital Regulation Cooperation Forum (DRCF).⁴ It then goes on to present a summary of the cases undertaken by the CMA that have involved the investigation of algorithmic systems and the lessons that can be learnt for competition authorities undertaking such work.

2. Research into algorithms systems and investigations

3. Over the course of the last two years, the CMA has continued to conduct research in collaboration with our fellow regulators under the DRCF. The DRCF brings together the CMA, Ofcom (telecommunications), the Information Commissioner’s Office (data protection) and the Financial Conduct Authority (financial services).

4. The DRCF recognises that, as regulators of digital services, it is important to understand how and where algorithmic processing is being used, and the benefits and harms they bring to people and society. It also recognises that our regulatory objectives can, in certain circumstances, be in tension with one another. The aim is therefore to strengthen our shared understanding of, and expertise in, algorithmic systems.

¹ <https://www.gov.uk/government/publications/algorithms-how-they-can-reduce-competition-and-harm-consumers/algorithms-how-they-can-reduce-competition-and-harm-consumers>

² The CMA considers that algorithms can reduce competition by facilitating collusion in three ways: (i) they can be used to automatically detect and respond to price deviations by competitors, which could make explicit collusion between firms more stable, as there is less incentive for those involved to cheat or defect from the cartel; (ii) firms can also use the same algorithmic system to set prices, for example by using the same third-party software, through which they could exchange information; (iii) there are also concerns that algorithms can learn to collude tacitly, without firms explicitly communicating with each other. See [Algorithms: where's the harm? - Competition and Markets Authority](#)

³ See [Draft guidance on Horizontal Agreements - GOV.UK \(www.gov.uk\)](#)

⁴ <https://www.gov.uk/government/collections/the-digital-regulation-cooperation-forum>

5. In 2021-22, the DRCF held more than 20 events with academics, industry, and the UK Government to hear a variety of perspectives on algorithmic processing. Following this engagement, the DRCF published our findings in two papers.

6. The first paper set out the benefits and harms of algorithmic processing and considers the DRCF regulators' shared objectives and challenges, areas of common interest and where a common approach to using regulatory principles and tools may be beneficial.⁵ From a competition perspective, the paper covers many of the potential harms of algorithms set out in the CMA 2021 Algorithms paper however the paper views these through the lenses of all four regulators' objectives.

7. For example, the paper sets price personalisation in the context of the concept of fairness. Fairness is a key legal requirement of data protection regulation. It is also central to the competition and consumer protection regulatory objectives of the CMA in terms of ensuring equity of access and outcomes in markets. In theory, price personalisation could be described as fair, since it may lead to lower income customers paying less and higher income customers paying more, possibly resulting in more people being able to access those goods and services. From a data protection perspective, price personalisation may be viewed as inherently unfair regardless of the outcome, as it would mean sellers are scrutinising the behaviour and characteristics of buyers without their knowledge. Another reason personalisation might be considered unfair is because it could result in people being penalised for circumstances outside of their control. People living in less affluent areas, for example, may be more likely to be the victim of a burglary, and therefore could face higher premiums for their home insurance - a pricing practice that one of our stakeholders described as a "poverty premium". This example also highlights the difficulty of defining fairness, as it could also be argued that the practice is fair with regards to the insurer in terms of increased premium for increased risk.

8. The second paper focuses on algorithmic audit and explains how these audits function in practice, the state of the market, and the potential roles for regulators in this space.⁶ Over a 12-month period, our researchers engaged with stakeholders from industry, academia, civil society and the UK Government about how to audit algorithmic systems effectively. The paper concludes that there is no one-size-fits-all approach to audit. The nature of an appropriate audit varies on a case-by-case basis. It depends on factors such the nature of the potential harm; the business model of the organisation deploying the algorithm; who is impacted by the algorithm; the context of how organisations develop and deploy the algorithm; and the relevant regulatory environment.

9. Our engagement revealed several issues in the current audit landscape. Other than in highly regulated sectors such as health and aviation, the algorithm audit landscape lacks specific rules and standards, and auditors can enter the market without any assurance of their quality. It is unclear which standards audits should follow, and an audit without commonly agreed standards cannot provide assurance, only advice.

10. Further, in some sectors, there is inconsistency in what audits focus on. Often auditors are limited by a lack of access to systems, particularly academics and not-for-profit organisations. Our findings suggested this was due to organisations with algorithmic

⁵ <https://www.gov.uk/government/publications/findings-from-the-drcf-algorithmic-processing-workstream-spring-2022/the-benefits-and-harms-of-algorithms-a-shared-perspective-from-the-four-digital-regulators>

⁶ <https://www.gov.uk/government/publications/findings-from-the-drcf-algorithmic-processing-workstream-spring-2022/auditing-algorithms-the-existing-landscape-role-of-regulators-and-future-outlook>

systems being reluctant to co-operate with audits, the risk of auditors being legally sanctioned for scraping information, or clients providing inconsistent documentation. It was also highlighted to us that, following audits, there is sometimes insufficient action, particularly because the people affected have no means of receiving redress.

11. The paper proposed a framework for thinking about different forms of audit. The framework also discusses the capacity and capability of organisations to conduct such audits and explores when different types of audit may be most appropriate. The types of audit are:

- Governance audit: Assessing whether the organisation followed the correct governance policies, for example through reviewing impact assessments, oversight processes or conformity assessments.
- Empirical audit: Measuring the effect of an algorithm using inputs, outputs, or both. For example, by scraping, ‘mystery shopping’ or other black-box techniques.
- Technical audit: Looking ‘under the bonnet’ of an algorithm at data, source code or methodology. For example, reviewing code, robust performance testing or formal verification.

12. Following this research, the four regulators of the DRCF have continued to collaborate through a series of internal workshops in which each regulator has shared their experience of working on cases involving algorithms. Further to this the DRCF has undertaken research on third-party providers of algorithmic assurance and auditing services to understand how this market is developing and to learn how algorithmic standards and principles can be put into practice and audited.

3. Developments in AI regulation and standards

13. As noted above, there has historically been a lack of specific rules and standards in relation to the regulation, investigation, and audit of algorithmic systems. This is changing rapidly. The UK Government has now published the UK’s draft approach to regulating AI and AI regulation white paper.^{7,8} The CMA has been actively supporting the policy debate surrounding these proposals and has published a response to these.^{9,10}

14. The CMA is also tracking developments globally. The European Union’s AI Act, the United States’ Blueprint for an AI Bill of Rights and National Institute of Standards and Technology (NIST) Risk Management Framework for AI show how governments are responding to the challenge of how to regulate to ensure consumers get the benefits from algorithmic systems, without suffering the harms. The CMA also welcomes the development of principles to support the development and deployment of responsible AI, such as the OECD’s AI principles and UNESCO’S Recommendation on the ethics of

⁷ <https://www.gov.uk/government/publications/establishing-a-pro-innovation-approach-to-regulating-ai/establishing-a-pro-innovation-approach-to-regulating-ai-policy-statement>

⁸ <https://www.gov.uk/government/publications/ai-regulation-a-pro-innovation-approach/white-paper>

⁹ <https://www.gov.uk/government/publications/cma-response-to-dcms-pro-innovation-approach-for-regulating-ai>

¹⁰ <https://www.gov.uk/government/publications/response-to-governments-ai-white-paper>

Artificial Intelligence, as well as industry led standards such as the IEEE's Standards on Autonomous and Intelligent Systems.

15. In terms of powers to investigate algorithmic systems, the CMA can use its statutory information gathering powers under competition law and consumer protection legislation to request information, including data and code, from businesses. For example, the CMA can use its information gathering powers when it launches an antitrust investigation, a market study or market investigation, or a merger inquiry. In addition, the CMA can compel individuals to answer questions and give evidence under the Competition Act 1998 and the Enterprise Act 2002.

4. Practical experience of algorithms on cases

16. The CMA has continued to take on an increasing number of cases that require a substantial knowledge of algorithms and how to analyse and audit them. The Data Technology and Analytics (DaTA) Unit within the CMA has been deploying specialists including data scientists, engineers, behavioural scientists and technologists to assess how firms are using algorithms and the impact on each case.

17. The CMA 2021 Algorithms paper provided a high-level overview of the types of methods that can be used to investigate a system, grouped by intelligence gathering, formal investigations and remedies, and ongoing algorithmic monitoring. In practice, the CMA has deployed the following techniques:

- Reviewing technical documentation on models' development, implementation and monitoring. This can include High Level Design documents, API documentation, model cards, transparency notes, factsheets and so on.
- Meetings with technical staff – in these the CMA's technologists ask questions to the firms' engineers to gain a deeper understanding of how their systems work.
- Large data requests - enabling empirical analysis to evaluate how the models are operating in practice including input-output analysis.
- Reviewing of the source code – this can be implemented as a document request, or an active demonstration by the firm.

18. The CMA 2021 Algorithms paper defines ineffective platform oversight harms as the stated use of algorithms to address harms that may be partially or wholly ineffective in practice that, if accompanied by a lack of transparency, cannot be externally evaluated. These harms can relate to both consumer protection and competition issues. These issues are central to the CMA's current investigation into fake online reviews. While this case is primarily concerned with consumer harms, it also encompasses competition issues in terms of businesses' ability to compete fairly within online marketplaces and review platforms.

19. Algorithmic systems form the core of platforms' approaches to identifying and removing fake customer reviews. The CMA investigation has included the scraping of significant volumes of data from the websites to understand the nature of the problems, submitting detailed information requests, including requests for considerable data and details of the algorithmic systems used by Google and Amazon, and meeting with technical teams that build and run them.

20. Through the digital advertising market study¹¹, the CMA became aware of Google’s proposed phasing out of third-party cookies on Chrome, its web browser, and introduction of new technologies that would support targeted advertising while preventing cross-site tracking: Google’s Privacy Sandbox. The CMA had a concern that the proposed changes could undermine the ability of publishers to generate revenue through advertising, undermine competition in digital advertising and allow Google to entrench its market power as both a publisher providing advertising inventory and a provider of adtech services. In January 2021, the CMA launched an antitrust case in advance of the changes, working closely with the UK Information Commissioner’s Office.¹²

21. Understanding the technologies and algorithms is central to the CMA’s investigation and monitoring of Google’s Privacy Sandbox proposals. The DaTA Unit has attended key meetings with the parties and drafted detailed information requests. The Privacy Sandbox includes a testing and trialling programme to understand the outputs of these complex algorithmic systems. The CMA’s technologists are working closely with economists to make sure that the programme will adequately inform the CMA of the impact of the Privacy Sandbox.

22. The CMA’s other cases which have investigated algorithms include Meta’s use of advertising data¹³, social media endorsements on Instagram,¹⁴ hotel booking site investigations¹⁵ and the mobile ecosystems of Apple and Google.¹⁶

5. Lessons learnt from auditing algorithmic systems

23. Based on its experience of investigating algorithms on cases, the CMA has started to develop a set of key lessons learnt that may be applicable to other jurisdictions.

24. Building working relationships with the technical teams in firms where this is possible can expedite investigations. This has required continued investment in the CMA’s knowledge and understanding of the development and deployment of algorithmic systems. This hiring more staff with relevant technical backgrounds across DaTA Unit and the DMU. The CMA’s technologists engage with firms’ engineers which can reduce the volume of formal requests for information on small or extremely technical aspects of systems.

25. In certain circumstances, where it is practical and appropriate to do so, sending draft questions in advance to firms including an explanation of the intentions behind each question where practical and appropriate to do so can reduce delays in the long run. Some firms and their technical teams are not used to the style of questioning found in formal information requests.

26. Some systems are so complex that it is difficult for a firm to provide information about its inner workings easily or at all. In fact, investigations since 2021 have emphasized how rare it is to encounter a perfectly siloed, discrete system. As such, when considering

¹¹ [Online platforms and digital advertising market study - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/97421/online-platforms-and-digital-advertising-market-study.pdf)

¹² [Investigation into Google’s ‘Privacy Sandbox’ browser changes - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/97421/google-privacy-sandbox-browser-changes.pdf)

¹³ [Investigation into Meta’s \(formerly Facebook\) use of data - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/97421/meta-use-of-data.pdf)

¹⁴ [Social Media Endorsements - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/97421/social-media-endorsements.pdf)

¹⁵ [Online hotel booking - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/97421/hotel-booking-site-investigations.pdf)

¹⁶ [Mobile ecosystems market study - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/97421/mobile-ecosystems-market-study.pdf)

the operation of an algorithmic system, some of the most helpful aspects of the CMA's investigations have focused on algorithms' wider interactions with other systems, including human and technology, and with its consumers.

27. Linked to the complexity of the algorithmic systems, it is important that any audit or investigation remains firmly anchored to the theories of harm and objectives of the overall case. This minimises the risk that the investigation of the algorithm diverges in terms of scope and complexity. To achieve this, it is preferable for technologists to be working closely with the lawyers and economists on a given case.