# Comments on CMA Report on How Algorithms May Reduce Competition and Harm Customers

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**Abstract:** The Competition and Markets Authority (UK) has published their Research and analysis on 'Algorithms: How they can reduce competition and harm consumers'. They have done so in parallel with a call for information on this critical area of research and potential regulation/standards. This article does two things: i. It provides a condensed summary of the report, and, ii. It notes our main findings and comments, which we offer as part of our feedback to the call for information. The principal takeaway is the need for disambiguation regarding whether or not novel and enforceable legislation/regulation/standards is in the pipeline and that empirical work in this area is greatly needed.

**Keywords:** Competition Law, AI Audit, AI Assurance, Compliance, Bias, Robustness, Explainability

**Introduction**

The UK's Competition and Markets Authority (CMA) has published their research and analysis on 'Algorithms: How they can reduce competition and harm consumers'.[1] They have done so in parallel with a call for information on this critical area of research, and indeed in the context of potential regulation/standards in this space. This article does two things:

    I. It provides a condensed summary of the report, and,

    Ii.  It notes our main findings and comments, which we offer as part of our feedback to the call for information

Our main findings are:

- **Disambiguation of Regulatory signalling** - clarity is needed regarding whether existing competition, privacy, equality etc. law suffice or should there be AI regulation
- **Standardisation** is required for:
  - Technical Auditing of Systems
  - Documentation and Reporting
- **Empirical work** on specific areas of  consumer and competition harms, as well as AI assurance more broadly, is greatly needed.

Below we provide our summaries of each section and comment on each section in term.

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[1] CMA. (2021). CMA. (2021). Algorithms: How they can reduce competition and harm consumers. https://www.gov.uk/government/publications/algorithms-how-they-can-reduce-competition-and-harm-consumers

1

1.  **Summary of Report**

CMA are reviewing potential harms to competition and consumers from the use of  algorithms. The review/call for consultation addresses two broad kinds of harm, namely that which comes about through algorithmic personalisation (or individual targeting) and the use of algorithms to reduce competition (ex through preferening, ranking, pricing etc.). In addition to surveying harm, the review outlines developments in the mitigation of such harms, this is through discussion of assessing and evaluating the performance of an algorithmic system through various techniques and frameworks (ex assessing input data, auditing of outputs etc.) referred to in the text as 'appropriate methods to audit the system'. The review closes with notes on the role regulators.

2.  **Introduction**

The call for comment highlights a desire by the CMA to 'proactively prevent harms' (1.8), with three threads:

(a) Whether these areas and potential harms are the right ones to focus on, their likelihood and impact, and whether there are others that deserve attention;

(b) Methods and techniques to i) monitor and assess the potential for harms and ii) investigate and audit the algorithms and systems of any given firm; and

(c) Feasible, effective and proportionate measures to prevent or **remedy algorithmic harms**.

3.  **Harms**

This section surveys notions of harm in the context of anti-competitive effects or consumer detriment. The main focus is economic (2.1) - ex manipulation of customer behaviour, access to information, pricing etc. Anti-competitiveness can be in regards to customer spend but also by excluding or introducing 'barriers' to competitors (ex ranking preference in search functions etc.). (2.4). The discussion of potential harms covers issues such as:

- direct harms to consumers, including: systems that manipulate customer choices, personalise according to protected characteristics, and presenting unfair ranking. This can lead to insufficient competition (i.e.  monopolist price discrimination), loss of trust in online markets, and, can increase search and transaction costs (consumers needing to shop around or take significant or costly steps to avoid being charged a premium).
- exclusionary practices (ex self-preferencing, geographic targeting and discriminatory ad targeting).
- issue of potential collusion by pricing algorithms - this can be explicit coordination, more indirect collusion (ex firms use the same algorithmic system to set prices,  including by using the same software or services supplied by a third-party,   or by delegating their pricing decisions to a common intermediary, this  can create a 'hub-and-spoke' structure and facilitate information  exchange), and 'autonomous tacit collusion', whereby  pricing algorithms learn to collude without requiring other information   sharing or existing coordination.
- ineffective platform oversight/lack of  transparency - retarding the ability to be externally (as well as internally) evaluated.

*Techniques to investigate Harms:* In this section the review cites work from both governance and engineering papers - techniques such as fairness audits to output analysis (3.7), the use of

APIs (3.8), and data auditing, are discussed. It is noteworthy that the extent to which a system can be accessed, without compromising intellectual property, is discussed (ex inspection of documentation, code, a randomised control trial (RCT) to conduct an end to-end audit).

*Comment:*
- In 2020 there was significant activity in the space of calling for AI Auditing, with publications by numerous standards and governmental bodies. However, in our readings, these publications were difficult to operationalise. Indeed the problem with techniques to investigate harms can be summaries with
  - There is currently no empirical evidence behind suggestions for auditing
  - There is little standardisation - including lack of benchmarks and best practice
  - Auditing, thus far, has largely concerned outputs rather than processes.
- We believe that there should be a call to develop mechanisms to knowledge-share, so that the community of practitioners can learn from 'unknown harms' and share best practice (c.f. Red teaming).
- In general we feel that the Competition Act 1998 and Article 101(1) of the Treaty on the Functioning of the European Union (TFEU), with the power to impose fines of up to 10% for any business found to have infringed these prohibitions provides a suitable framework to deal with harms that may arise from the inappropriate use of algorithms.

### 4. Role of regulators

The report asserts that there is a strong case for intervention (4.2), based on the opacity of systems and lack of operational transparency, and **that such systems can 'occupy important strategic positions in the UK economy (and internationally)'**. Mention is made of the following:
- regarding AI impact assessment that draws on analogy with **Data Protection Impact Assessment (DPIA)**. (C.f. ICO)
- Drawing upon explainable AI (XAI) literature (c.f. ICO/ATI document)
- The European Commission High Level Expert Group on AI suggests that co-regulatory approaches beyond standards can be developed, such as **accreditation schemes and professional codes of ethics**. (4.11)
- Drawing on **stringent legal requirements to address risks already exist for investment firms engaged in algorithmic trading** (4.13)*.
- Mechanism by regulator itself to identify and remedy existing harms (4.2) - the suggestion is made that this can be via intelligence gathering by dedicated units or researchers/investigative journalists, and other civil society organisations.
- **Auditing Tools (4.17)** and **Ongoing algorithmic monitoring** (4.3), via the intelligence gathering mentioned above or Regulatory sandboxes (4.25). Following this, the CMA notes, in relation to itself, that there is a need to Build and use digital capabilities, and enhance collaboration (4.4)
- **Formal investigations** and remedies (4.2.2), mentioned are:
  - ordering firms to disclose information to consumers, to approved researchers, auditors and regulators. these audits may be ad hoc or more regular.

3

- ○ impose ongoing monitoring requirements and require firms to  submit compliance reports, provide ongoing and continuous reporting  data or API access to key systems to auditors and regulators
- ○ to conduct and publish algorithmic risk  assessments of prospective algorithmic systems and changes, and/or  impact evaluations of their existing systems.
- ○ order firms to make certain changes to the design and operation of key algorithmic systems and require firms to appoint a monitoring  trustee to ensure compliance and that the necessary changes are made.

*Comment:*

As a general point, we agree with 4.10 that auditors and regulators will require significantly detailed explanations for the outcomes of algorithmic systems, but feel that there should be moves towards every algorithmic system requiring a statement of objectives that can be used as a benchmark to test compliance against.

- Regulators lack the expertise in this space - notwithstanding the CMA's note on hiring experts and data scientists (4.28) and upskilling, the techniques are bleeding edge in terms of assessing the system itself.  Better that the regulators look to accountability.
- Point 4.7 notes that 'many of the guidelines and principles are not legally binding and regulators and policymakers may need to go further. We believe that **this is the principal reason why audit and assurance of AI has not matured.** With such a regulatory drive, it is likely that companies will focus only on reputational risk. There is therefore a need for a discussion around sanctions that should be imposed on those who breach regulations or good practice.
- We welcome the note on the economic and geopolitical of getting the framework of AI assurance right.
- Elsewhere we have published our position on the interrelation between AI and Data ethics in the context of DPIA - we believe this will be one of the bottlenecks for AI risk mitigation.
- Explainable AI literature is mentioned as tool in the aid of transparency. Where we agree is that this is in terms of technical assessment of a system: we read transparency in broader terms to include documentation (which itself can be automated) and ascription of accountability to those who make decisions on how the system is developed and deployed.
- A cursory note is discussed on 'Auditing Tool' - we believe that this a crucial area of research activity. Unlike DPIA, we anticipate that AI impact will require providing metrics rather than solely discursive answers. It will require proper understanding and prioritization of risk metrics that are inherent to AI systems, such as robustness, fairness and explainability. The trade-offs between will need to be understood and mitigated.
- Reporting is discussed - we call for standardisation of reporting itself.

## 5. Conclusions

The report concludes with a call for transparency and seemingly notes the problem of opacity in systems is the primary risk (5.5). In addition to this the report notes that '*Whilst there has been a lot of attention and discussion of algorithmic harms in  general, there is relatively little empirical*

4

*work on some of the specific areas of  consumer and competition harms, and almost none that we are aware of in  the UK'* (5.2, emphasis ours).

*Comment:*
- While endorsing the concern noted regarding the risk of opacity, we believe it is important to understand the state of research which presents systems as a spectrum - from 'transparent white box' to  opaque black box' - and with this recognise that the level of transparency a system will exhibit changes the function of the system and may come at the cost of performance, or privacy etc…  Indeed, it is often noted in the literature that what is required is a tradeoff analysis: in our analysis there are four verticals - namely, privacy, robustness, explainability and fairness - that form the matrix within which the tradeoff is sought. Furthermore, we argue that optimisation of these features and tradeoffs depends on a multiplicity of factors, such who and for what purpose is being used (use case), the regulatory jurisdiction and sector standards, and finally the risk appetite of the organization implementing the algorithm.


**Further reading:**

- Kazim, Emre and Koshiyama, Adriano, A High-Level Overview of AI Ethics (May 24, 2020). Available at SSRN: https://ssrn.com/abstract=3609292 or http://dx.doi.org/10.2139/ssrn.3609292
- Koshiyama, Adriano, et al. Towards Algorithm Auditing: A Survey on Managing Legal, Ethical and Technological Risks of AI, ML and Associated Algorithms (February 4, 2021). Available at SSRN https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3778998
- Kazim, E., Denny, D.M.T. & Koshiyama, A. AI auditing and impact assessment: according to the UK information commissioner's office. AI Ethics (2021). https://doi.org/10.1007/s43681-021-00039-2
- Kazim, E, Koshiyama, A. The interrelation between data and AI ethics in the context of impact assessments. AI Ethics (2020). https://doi.org/10.1007/s43681-020-00029-w
- Automation and Fairness: Assessing the Automation of Fairness in Cases of Reasonable Pluralism and Considering the Blackbox of Human Judgment

5