
RESEARCH ARTICLE

Addressing Algorithmic Tacit Collusion: Insights from Market Investigations¹

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ABSTRACT

This article explores the concept of algorithmic tacit collusion and the potential role of market investigation tools in addressing this issue. The use of algorithms in online sales markets has raised concerns about anti-competitive effects and the adequacy of current competition law provisions. The European Commission has been considering the implementation of a 'New Competition Tool' (NCT) to address structural competition issues beyond the scope of existing regulations. The UK's market investigation tool, regulated under the UK Enterprise Act of 2002, serves as a reference point for examining the potential insights and lessons that could inform the development of the NCT at the EU level. The article highlights the impact of algorithmic pricing on market transparency, the challenges of classifying algorithmic tacit collusion, and the potential for market investigations to address competition-related concerns. It also discusses the procedural safeguards embedded in the UK's market investigation system and the benefits of proactive competition promotion through market investigations. Finally, the article considers the implications of adopting similar tools at the EU level and the potential for enhancing the European Commission's competition enforcement framework.

KEYWORDS

Enforcement, market investigation, procedural safeguards, CMA, New Competition Tool

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1. Introduction

The emergence of algorithmic pricing has gained significant attention since the publication of "Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy" by Ariel Ezrachi and Maurice Stucke in 2016. The authors argued that certain uses of algorithms in online sales markets could result in anti-competitive effects and that current competition law provisions may prove inadequate in holding businesses accountable for such practices.

More recently, the European Commission has been contemplating the proposal of a 'New Competition Tool' to tackle structural competition issues that fall outside the coverage or effectiveness of Articles 101 and 102 TFEU². This tool could also address potential scenarios of tacit algorithmic collusion, as its focus is on the anti-competitive effects rather than human interactions. The 'New Competition Tool' belongs to a category of competition enforcement tools commonly referred to as market investigation tools. The UK's Competition and Markets Authority (CMA) possesses a similar market investigation tool regulated under the UK

¹ The following paper presents the results of research conducted within the framework of the project funded by the grant no. UMO-2018/31/N/HS5/02255, 'Algorithmic pricing under the prohibition of anti-competitive agreements', financed by the National Science Centre of Poland; see more at: https://projekty.ncn.gov.pl/en/index.php?projekt_id=431148; marcinmleczko@gmail.com.

² European Commission, Single Market – new complementary tool to strengthen competition enforcement, <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12416-New-competition-tool>.

Enterprise Act of 2002³. This empowers the CMA to investigate markets and assess whether any market features hinder, restrict, or distort competition. Upon discovering an adverse effect on competition, the CMA can impose a broad range of remedies.

Algorithms are already widely used in online commerce. According to the European Commission's report on the study of the e-commerce sector in 2017, 53% of surveyed businesses monitor their competitors' prices, with 67% of them using specialised software programs for this purpose⁴. Furthermore, as many as 78% of users of these programs employ them to automatically adjust their prices based on competitors' prices.

2. Algorithms that may lead to or facilitate tacit collusion

Although this practice has the potential to negatively affect the market, it cannot be easily classified under the traditional concept of explicit agreement or concerted practice. It involves various algorithm configurations that automatically respond to changes in competitors' prices. This can include slightly larger price reductions, following price increases, or adjusting to competitors' prices.

The increasing use of software programs by businesses to monitor various websites and collect pricing data contributes to greater transparency in the online sales market. This enables easier monitoring of prices, detection of deviations from "desired prices" (both in vertical and horizontal relationships), and real-time response to these deviations.

The online sales market is transparent, and competitors with pricing algorithms can quickly adjust their prices in real-time. Price reductions aimed at attracting customers are generally ineffective when a competitor can offer the same reduction within milliseconds. On the other hand, raising prices may prove profitable if it prompts other sellers to also increase their prices⁵. Under such conditions, prices naturally tend to move towards a higher-than-competitive level.

Competition law recognizes situations in oligopolistic markets where similar behaviour is generally allowed⁶. For example, consider a market with two adjacent gas stations where prices are visible from the outside. If one station lowers its prices to attract more customers, the other station may also lower its prices in response, resulting in customers returning to the starting point. Such a market structure makes price reductions unprofitable, prompting competitors to "intelligently adapt" their prices. These parallel behaviours of businesses, known as conscious parallelism or tacit collusion, may lead to simultaneous and identical price increases, but they cannot be classified as price-fixing under competition law⁷.

While transparency can have positive effects on consumers⁸, it can also reduce uncertainty regarding the strategies of other market participants. A market study conducted by the Bundeskartellamt (German competition authority) in the fuel sector provides an example of this⁹. The study, presented in 2011, revealed that five companies - BP (Aral), ConocoPhillips (Jet), ExxonMobil (Esso), Shell, and Total - dominated the market of petrol stations along highways. To monitor prices, station owners would drive by their competitors' stations several times a day and enter their prices into their own systems. The study observed that when one station increased its prices, competitors responded with their own price increases within 3 to 6 hours.

To address this issue, the German government required real-time disclosure of all fuel prices, which were then made available to consumers. With this solution in place, consumers were expected to have the ability to find the cheapest fuel in their vicinity. However, increased transparency paradoxically led to further price increases. Retail gasoline prices rose by approximately 1.2 to 3.3 euro cents, while diesel prices increased by around 2 euro cents.

Literature suggests that increased market transparency in online sales, along with the widespread use of algorithms, can result in the transfer of oligopoly issues to additional markets (Ezrachi & Stucke, 2016). Markets with high levels of concentration,

³ Enterprise Act 2002, https://www.legislation.gov.uk/ukpga/2002/40/pdfs/ukpga_20020040_en.pdf.

⁴ European Commission, *Commission Staff Working Document accompanying the document Report from the Commission to the Council and the European Parliament Final report on the E-commerce Sector Inquiry*, 2017, p. 51.

⁵ In extreme situations, companies can try to raise prices virtually without the risk of losing customers because algorithms used by their competitors react to these changes in real-time. If the price increase proves to be unprofitable (does not cause a price increase on the competitors' side), then the company can quickly revert to the original price.

⁶ See, for example, the judgment of the European Court of Justice dated September 27, 1988, in the joined cases C-89/85, C-104/85, C-114/85, C-116/85, C-117/85, and C-125/85 to C-129/85, *Ahlström and others v. Commission (Woodpulp)* (ECR I-1307).

⁷ Judgment of the European Court of Justice dated December 16, 1975, in the joined cases 40/73 to 48/73, 50/73, 54/73 to 56/73, 111/73, 113/73, and 114/73, *Suiker Unie and others v. Commission*, point 174.

⁸ It increases, among others, the possibilities of choosing different products and services, as well as the awareness of choosing a particular offer.

⁹ Bundeskartellamt, *Fuel Sector Inquiry, Final Report in accordance with §32e GWB*, 2011. Retrieved from: http://www.bundeskartellamt.de/SharedDocs/Publikation/EN/Sector%20Inquiries/Fuel%20Sector%20Inquiry%20-%20Final%20Report.pdf?__blob=publicationFile&v=14.

particularly those involving homogeneous products, seem to be particularly vulnerable since algorithms can effectively monitor prices (Ezrachi & Stucke, 2017, p. 4).

3. The New Competition Tool

In 2019, the European Commission embarked on a consultation process to gather stakeholders' perspectives on the potential implementation of a 'New Competition Tool' (referred to as the 'NCT') to address structural competition issues on markets falling outside the scope of Articles 101 and 102 TFEU¹⁰. This initiative formed part of a broader endeavour, which, alongside the proposed Digital Services Act¹¹, sought to establish an ex-ante regulatory framework for digital platforms, encompassing additional obligations for entities assuming gatekeeper roles.

Following feedback from various entities, including market participants, consultancies, non-governmental organisations, and governmental bodies, the Commission opted not to introduce a horizontal ex-ante market intervention tool, instead concentrating its efforts on digital markets as a current enforcement priority¹².

The Digital Markets Act, forming part of a comprehensive legislative reform package in the digital sector, alongside the Digital Services Act and the P2B regulation, aims to address these concerns. Nonetheless, the Commission remains cognizant of the lingering issues identified in the Initial Impact Assessment, and it is likely that these matters will resurface, prompting a reassessment of the Commission's decision and potentially leading to the introduction of a horizontal NCT.

The New Competition Tool (NCT) falls within the category of competition enforcement instruments commonly known as "market investigation tools." Its implementation would grant the Directorate-General for Competition (DG COMP) of the European Commission the authority to impose structural or behavioural remedies to address any competition-related structural concerns identified during the market investigation. Notably, the NCT's potency lies in its ability to address such concerns without necessitating a finding of infringement of Article 101 and/or 102 TFEU by the investigated undertakings, rendering it a formidable tool.

While considering the potential use of the NCT, it is crucial to address concerns regarding procedural safeguards, striking a delicate balance between the substantial powers conferred upon the tool. Various jurisdictions, such as the United Kingdom, Italy, Iceland, Greece, Mexico, and Romania, have already empowered their competition authorities with similar market investigation tools¹³. In this article, the focus is on examining the UK's system of market investigations, which incorporates comprehensive procedural safeguards. The goal is to explore potential insights and lessons from this system that could inform the development of the NCT or a comparable market investigation tool at the EU level.

4. Market Investigations in the UK

A plethora of publicly available sources offers in-depth analyses of the market investigation procedure, providing a comprehensive understanding of its intricacies¹⁴. In this article, I will present a concise overview of the key procedural aspects, with a particular emphasis on the safeguards and measures employed to balance the significant powers vested in this tool.

The market investigation is conducted by a panel comprising three to five members of the Competition and Markets Authority (CMA). The CMA, along with sectoral regulators, may initiate an "ordinary reference" when there are reasonable grounds to suspect that certain "features" of a market impede, restrict, or distort competition in the supply or acquisition of goods or services within the UK. These features encompass:

¹⁰ European Commission, Single Market – new complementary tool to strengthen competition enforcement, <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12416-New-competition-tool>.

¹¹ European Commission, Proposal for a Regulation of the European Parliament and of the Council on contestable and fair markets in the digital sector (Digital Markets Act), COM/2020/842 final.

¹² European Commission, Inception Impact Assessment, New Competition Tool, p. 3.

¹³ European Commission, New Competition Tool: Legal Comparative study of existing competition tools aimed at addressing structural competition problems with a particular focus on the UK's market investigation tool – Expert study (accessed at: https://ec.europa.eu/competition/consultations/2020_new_comp_tool/kd0420573enn.pdf), pp. 37-48.

¹⁴ See for example: Whish, R. (2022). Market Investigations in the UK and Beyond. In M. Motta, M. Peitz, & H. Schweitzer (Eds.), *Market Investigations: A New Competition Tool for Europe?*, pp. 216-290, or *Market Studies and Market Investigations: Supplemental guidance on the CMA's approach*, January 2014 (revised July 2017) CMA3, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/624706/cma3-markets-supplemental-guidance-updated-june-2017.pdf.

- (a) The structure of the market or any aspect thereof;
- (b) Conduct of one or more persons supplying or acquiring goods or services in the market;
- (c) Conduct related to the market by customers of such persons¹⁵.

Such conduct may be intentional or not¹⁶. Subsequently, when the CMA panel determines that certain market features have an adverse effect on competition, it must assess how these adverse effects and any harm to customers can be remedied. It is then tasked with implementing appropriate remedies that are effective and proportionate. The CMA possesses broad powers to rectify any market feature that negatively impacts competition or gives rise to harm, including the authority to order the divestment of assets.

It is important to note that a finding in a market investigation that certain market features have an adverse effect on competition does not imply any wrongdoing on the part of the investigated undertakings. Administrative fines are not imposed on the implicated undertakings, nor are damages awarded to those affected by the conduct. As aptly stated by the Competition Commission in paragraph 21 of the Market Research Guidelines, the market research system operates on an investigative and inquisitorial basis rather than an accusatorial one¹⁷.

5. Safeguards of Market Investigations in the UK

The UK's market investigation tool incorporates a comprehensive set of procedural safeguards to ensure transparency and fairness throughout the process. Stakeholder engagement is a fundamental aspect, and the process adheres to clear milestones and statutory time limits. The initiation procedure begins with a vote by the board of the Competition and Markets Authority (CMA), which consists of the Chair and at least five Board Members, including a member of the CMA Panel¹⁸.

The Enterprise Act's Section 169 mandates the CMA or sectoral regulator to conduct consultations before making a market investigation reference. Section 172 requires the provision of reasons for proposing the reference. The consultation process, which can be public or non-public, lacks strict regulation regarding its form and extent.

A market reference group, comprising a minimum of three CMA Panel members, conducts the investigation¹⁹. These Panel members are independent experts with diverse backgrounds and perspectives, distinct from CMA staff. This composition helps mitigate confirmation bias, as Panel members are less likely to perceive the entities under investigation as adversaries (Fletcher, 2020, p. 47). The market reference group determines whether there is an adverse effect on competition (AEC) in the referred market(s) and, if so, determines appropriate remedial actions. To make a valid finding of an AEC subject to remedial action, a decision must be reached by at least a two-thirds majority of the market reference group²⁰.

As highlighted by Fletcher (2020, p. 50), the overall procedure is highly transparent. The CMA publishes various documents throughout the process, including an initial issues statement, working papers, an annotated issues statement, provisional findings, a possible remedies notice (if applicable), a provisional decision on remedies (if applicable), and a final report. The intermediate documents are open to public comments. Additionally, hearings are conducted at significant stages, where all decision-making Group members are present.

The Enterprise Act's Section 169 also requires the CMA to consult with any affected parties before making decisions that may substantially impact their interests in a market investigation case.

The market investigations in the UK also adhere to clear timelines. At the beginning of the investigation, the CMA prepares a proposed timeline and shares it with the main parties involved, inviting their comments. This timeline is updated as the investigation progresses, with the final report required to be released within 18 months from the initiation of the investigation.

¹⁵ Enterprise Act 2002, s 131(2) and s 131(3).

¹⁶ Enterprise Act 2002, s 131(3).

¹⁷ Competition Commission, Guidelines for market investigations: Their role, procedures, assessment and remedies (2013), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284390/cc3_revised.pdf.

¹⁸ See more at the CMA's "Our governance" webpage: <https://www.gov.uk/government/organisations/competition-and-markets-authority/about/our-governance>.

¹⁹ Market Studies and Market Investigations: Supplemental guidance on the CMA's approach, January 2014 (revised July 2017) CMA3, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/624706/cma3-markets-supplemental-guidance-updated-june-2017.pdf.

²⁰ Market Studies and Market Investigations: Supplemental guidance on the CMA's approach, January 2014 (revised July 2017) CMA3, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/624706/cma3-markets-supplemental-guidance-updated-june-2017.pdf, p. 8.

Following the release of the final report, parties have the opportunity to appeal to the Competition Appeal Tribunal (CAT). While cases under the Competition Act 1998 undergo a Full Merits review, appeals related to market investigations are limited to a Judicial Review (JR) basis. The appeal process can proceed to higher courts, including the Court of Appeals and the Supreme Court.

The review of decisions under Part 4 of the Enterprise Act is regulated by Section 179. According to Section 179(1), any person who is "aggrieved by a decision" of the CMA can apply to the CAT for a review of that decision within two months. A Judicial Review basis means that the decision can be challenged on the grounds of illegality, irrationality, and procedural impropriety. The CAT's judgement in *BAA Ltd v Competition Commission* provides further guidance on this matter:

"It is well-established that, despite the specialist composition of the Tribunal, it must act in accordance with the ordinary principles of judicial review: see *IBA Health v Office of Fair Trading* [2004] EWCA Civ. 142 per Carnwarth LJ at [88]–[101]; *British Sky Broadcasting Group plc v Competition Commission* [2008] CAT 25, [56]; *Barclays Bank plc v Competition Commission* [2009] CAT 27, [27]. Accordingly, the Tribunal, like any court exercising judicial review functions, should show particular restraint in 'second-guessing' the educated predictions for the future that have been made by an expert and experienced decision-maker such as the CC..."

6. Advantages of Market Investigations

Market investigations offer several benefits as a tool in the UK's competition arsenal, thanks to their transparent procedures, participative nature, and independent decision-making structure. These characteristics ensure effective procedural safeguards. Unlike other competition law instruments, market investigations proactively promote competition. A notable example is the Open Banking measures resulting from the UK Retail Banking Market Investigation. These measures aim to facilitate disruptive and innovative competition through new technologies and business models (Fletcher, 2020, p. 48).

While standard competition law focuses on the conduct of undertakings, market investigations have a broader scope. They aim to address any identified "functions" in markets that negatively impact competition. As highlighted by Fletcher (2020, p. 49), these functions may involve complex strategic interdependencies among firms, including the potential for tacit coordination²¹. Market investigations also consider scenarios of potential tacit algorithmic collusion since they focus on anticompetitive effects rather than solely human interactions.

The European Commission might be interested in implementing a similar tool for several reasons. Firstly, market investigations offer a proactive approach to promoting competition, which aligns with the Commission's objective of fostering fair and open markets within the European Union. Additionally, the transparent and participatory nature of market investigations ensures public trust and confidence in the decision-making process. Furthermore, the independent split of decision making between referring a market for investigation and the final market investigation decision provides an additional layer of credibility and impartiality. By adopting market investigations, the European Commission can enhance its competition enforcement framework and effectively address market dysfunctions that hinder competition across member states.

7. Conclusion

Although the Commission has currently abandoned its original plan to introduce an ex-ante enforcement instrument, there remains the possibility of revisiting this plan in the future. It is important to clarify that EU law already includes a similar market study tool under Article 17 of Regulation 1/2003²². This provision empowers the Commission to conduct inquiries into specific sectors of the economy or types of agreements across economic sectors when trade trends between Member States, price rigidity, or other circumstances indicate potential restrictions or distortions of competition within the common market. While the Commission can request information from undertakings during these inquiries, it lacks the authority to impose remedies. Following the completion of an inquiry, the Commission can initiate investigations into specific undertakings, limited to potential infringements of Articles 101 or 102 of the Treaty on the Functioning of the European Union (TFEU), rather than addressing broader structural concerns.

It is clear that the current market study tool does not possess the same powers as the envisioned NCT (New Competition Tool). However, it is evident that the implementation of the NCT or a similar instrument would necessitate a carefully designed governance structure to ensure appropriate checks and balances. This would involve determining who has the authority to initiate

²¹ See for example 2014 Aggregates, Cement and Ready-mix Concrete Market Investigation, in which the Competition Commission found a combination of structural and conduct features that were leading to higher prices. It required a divestiture by Lafarge Tarmac to facilitate the entry of a new producer; it also accepted an undertaking by Hanson to divest itself of a blast furnace slag facility; <https://www.gov.uk/cma-cases/aggregates-cement-and-ready-mix-concrete-market-investigation>.

²² Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty (OJ 2003 L 1/1).

a case and who decides whether to proceed with it. As the Directorate-General for Competition (DG COMP) lacks experience in using an internal separation of decision-making, it could consider emulating the UK's system as a model for internal checks. One possibility could be creating a second tier within the existing market inquiry system outlined in Regulation 1/2003. Regarding the judicial review, UK market investigations can only be appealed on the basis of the Judicial Review (JR). However, it remains uncertain if the same level of review would suffice at the EU level. Given that the power to impose structural remedies, which can have irreversible consequences in certain cases, must be balanced, access to legal review of NCT decisions, including the factual basis of the case, would be crucial.

Overall, market investigation tools can offer numerous benefits to the competition law system by addressing its existing gaps. Considering the new forms of anticompetitive behaviour that may elude current competition laws, focusing on market structure appears to be a viable solution. However, in order to balance such substantial power, it is essential to establish an adequate procedural due process and a clear legal foundation. This might even necessitate the creation of new independent decision-making bodies or specialised courts within the EU framework.

It must be highlighted that the limitations of this study include its narrow focus on market investigation tools and their benefits within the competition law system. Other factors, such as technological advancements, global economic trends, and socio-political dynamics, were not considered in this analysis.

Suggestions for future research: understanding the perspectives and experiences of various stakeholders, including businesses, consumers, and regulatory authorities, could provide valuable insights into the practical implications of implementing market investigation tools to tackle algorithmic collusion. Future research could involve conducting surveys, interviews, or case studies to capture these perspectives and incorporate them into the analysis. Future research could also focus on conducting rigorous impact assessments of market investigation tools. This would involve evaluating the actual impact of these tools on competition and consumer welfare, identifying any unintended consequences, and assessing the overall effectiveness of these tools in addressing algorithmic collusion.

8. Statements and Declarations

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