Balancing Innovation and Regulation: Evaluation of the CMA's Report on AI Foundation Models and their impact on competition and consumer protection

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Abstract

This paper examines the transformative potential and challenges of foundation models (FMs) in artificial intelligence (AI) and their implications for competition and consumer protection. It focuses on the pivotal role of the UK's Competition and Markets Authority (CMA) in overseeing AI market development. This paper explores the balance between fostering innovation and ensuring robust competition by analyzing the CMA's reports on AI Foundation Models from September 2023 and April 2024. It highlights the need for a comprehensive regulatory approach to maximize societal and economic benefits while mitigating risks associated with AI development.

I. Introduction

The development of artificial intelligence (AI) and the growing use of machine learning in recent years has attracted considerable attention. Extremely large models trained on vast Internet-scale datasets have achieved top-tier performance across diverse tasks, leading to a significant shift in modern machine-learning training methods.[2] Instead of building task-specific models from scratch, pre-trained foundation models (so-called "foundation models (FMs)") are adapted through fine-tuning or few-shot/zero-shot learning strategies, enabling them to be used across various domains, transferring knowledge and reducing the need for task-specific training data.[3] The transformative potential of FMs is vast, extending across industries and promising substantial benefits. These include enhanced products and services, improved access to information, assistance with creative and administrative tasks, and potential scientific and health breakthroughs, often at lower costs. However, the rapid evolution and deployment of FMs present both opportunities and challenges. If effectively harnessed, FMs could democratize access to advanced technologies, fostering effective competition and driving economic productivity and growth. Robust competition is crucial to ensuring that consumers

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[2] Rishi Bommasani and others, 'On the Opportunities and Risks of Foundation Models' (2021) arXiv:2108.07258 https://arxiv.org/abs/2108.07258 > accessed 07 June 2024.
[3] Gengchen Mai and others, 'On the Opportunities and Challenges of Foundation Models for Geospatial Artificial Intelligence' (2023) < https://arxiv.org/abs/2304.06798 > accessed 07 June 2024.

gain the full advantages of FMs, from superior products and services to innovative solutions at competitive prices. This potential underscores the importance of understanding and considering any concern related to competition and consumer protection to ensure that FMs and their benefits are maximized and risks are mitigated.

This paper focuses on the pivotal role of the UK competition regulator, the Competition and Markets Authority (CMA), in overseeing the development of this emerging market to identify risks related to negative market outcomes. By analyzing the CMA's insights and recommendations from the initial report on FMs published in September 2023 and the updated one published in April 2024, this paper will explore the current state and future directions of AI market development, offering perspectives on how to balance innovation with regulation to maximize societal and economic benefits.[4] The aim is to highlight the need for a holistic approach that integrates competition policy with broader regulatory considerations. This paper aims to provide a comprehensive commentary on the CMA's initial review of AI markets, focusing on the potential evolution of these markets, the opportunities and risks they present, and the guiding principles necessary to foster vibrant innovation while safeguarding competition and consumer protection.

II. The CMA's initial Report on FMs

The CMA launched the review of AI development in FMs, considering their rapid growth and adoption across many markets and user applications, in order to create an understanding of how this market could evolve, the scenarios that might emerge, and the opportunities and risks these scenarios could bring for competition and consumers. The CMA started its evaluation by analysing the development and use of FMs. It was found that since the release of OpenAI's GPT (Generative Pretrained Transformers) in 2018, approximately 160 FMs have been developed by various firms, including major tech companies and new AI enterprises. Building an FM requires key inputs such as significant computing power, vast amounts of data, technical expertise, and substantial capital to develop and maintain. These models are used in applications such as chatbots, code-writing assistants, and image generators and are incorporated into software like Microsoft 365 to assist users. It means that users can incorporate FM technology using a developer's FM without the need to build and maintain their own FM. In the market for FMs, release approaches vary in openness. Open-source models are freely

[4] CMA, AL Foundation Models Initial Report, 18 September 2023 < Full report (publishing.service.gov.uk) > accessed 14 May 2024; CMA, AL Foundation Models Updated Paper, 11 April 2024 < Update Paper (publishing.service.gov.uk) > accessed 15 May 2024.

shared, allowing other developers to build upon them with minimal restrictions. Conversely, closed source or proprietary models are not publicly shared; they have limited information on their characteristics and capabilities and are tightly controlled for use. Developers of closed-source models may use them exclusively for their own business or license them to others via APIs. A mix of open and closed source FMs exists, enabling diverse firms to invest in and develop these models. Understanding the functioning of the market was an important step in the CMA's analysis of the potential scenarios of market evolution impacted by AI. The CMA identified significant vertical integration as several FM creators, like Google, Amazon, and Microsoft, own servers, data centers, and other essential infrastructure for creating and delivering FMs. They are also linked throughout multiple stages of the value chain since they are active in various user-facing markets where FM technology can be integrated, such as online shopping, search, and software provision.

The next step of the assessment was to elaborate on the opportunities and risks these scenarios may bring for competition and consumer protection. The CMA considered that to maximize FMs' potential, it is crucial to maintain effective competition among developers. This positive outcome would involve multiple independent developers competing to produce high-quality models, enabling firms to access necessary inputs, experiment with diverse business models, and offer both open-source and closed-source FMs. This competitive environment would foster innovation and economic growth. Conversely, a negative outcome could occur if access to inputs is restricted, allowing only a few firms to dominate. These dominant firms might exclusively offer closed-source models, impose unfair prices and terms, and stifle innovation, negatively impacting economic growth and productivity. Further, the CMA considered that the market development in FMs will be influenced by access to data, computing power requirements, the advantage of large technology companies, and the existence of competitive open-source models. In addition, it noted that access to proprietary data, larger models, and the presence of open-source models will determine market outcomes. The importance of FMs in the economy raises concerns about access to key inputs, particularly data and computing power. A market trend towards positive outcomes is likely if a range of developers can access these inputs on fair commercial terms, initial successful developers face ongoing competition, there are various models available, and firms cannot restrict access to competitors or other FM developers.

The CMA considered that weak competition in the AI market could have severe consequences for consumers and businesses. Immediate risks include exposure to false information, AI-

enabled fraud, and fake reviews. Over the longer term, the entrenchment of market power by a few firms could stifle innovation, leading to suboptimal products and services and higher prices. These scenarios underscore the urgency of maintaining a competitive market environment to avoid such negative outcomes and ensure the full benefits of AI Foundation Models are realized.

Recognizing that effective competition alone is insufficient to ensure optimal market outcomes, it is imperative to consider additional measures. The interplay between competition and other regulatory frameworks is vital to navigate the complexities of the evolving AI landscape.

Summary and Elaboration of the Guiding Principles

In its report, the CMA emphasizes the necessity for businesses to comply with existing consumer and competition laws to ensure that the benefits of AI innovation are realized by people, businesses, and the broader economy. Recognizing the evolving nature of foundation models (FMs) and their potential impact on markets, the CMA proposes several guiding principles to maintain effective competition and consumer protection. These principles are access, diversity, choice, fair dealing, transparency, and accountability.

1. **Access:** Ensuring broad access to AI technologies and markets.

The principle of access emphasizes the need for the widespread availability of AI technologies. This ensures that businesses and consumers can leverage AI innovations without undue barriers. Broad access to AI tools and platforms can democratize innovation, enabling small and medium-sized enterprises (SMEs) to compete alongside larger firms. It also ensures that consumers can benefit from AI advancements without being excluded due to technological or financial constraints. Policies should aim to reduce barriers to entry for AI developers and promote open standards and interoperability to facilitate access.

2. **Diversity:** Promoting a diverse range of AI developers and applications.

Diversity involves encouraging a varied ecosystem of AI developers, applications, and use cases. This prevents market dominance by a few entities and fosters innovation from multiple sources. A diverse AI market mitigates the risk of monopolistic practices and ensures innovation is driven by various perspectives and needs. This diversity can lead to more robust and creative solutions. Support for diverse AI development can be promoted through funding opportunities, incubation programs, and policies discouraging monopolistic behaviors.

3. **Choice:** Safeguarding consumer choice in the AI market.

The principle of choice ensures that consumers have multiple options when selecting AI products and services, preventing dependency on a single provider. Consumer choice is one of the parameters of competition. This principle compels AI developers to improve their offerings continuously to attract and retain customers. The CMA considers that regulatory measures should prevent anti-competitive practices such as exclusive agreements or bundling that limit consumer choice.

4. **Fair Dealing:** Enforcing fair business practices in AI-related activities.

Fair dealing requires that businesses engage in honest and ethical practices in their AI-related activities, including transparent pricing, clear terms of service, and respecting consumer rights. Ensuring fair practices protects consumers from exploitation and builds trust in AI technologies, which is essential for widespread adoption. Strict enforcement of consumer protection laws and the establishment of industry standards for fair dealing in AI are necessary.

5. **Transparency:** Enhancing transparency in AI operations and outcomes.

Transparency involves providing clear, accessible information about AI systems, including how they work, the data they use, and their decision-making processes. The CMA highlights that transparency is vital for accountability and helps consumers understand the implications of using AI technologies, fostering informed decision-making. Therefore, disclosures on AI models, training data, and performance metrics can increase transparency.

6. **Accountability:** Establishing accountability mechanisms for AI developers and users.

Accountability ensures that AI developers and users are responsible for their systems' outcomes, including addressing any harms or biases that arise. The CMA considers that establishing accountability mechanisms builds public trust and ensures that AI technologies are used ethically and responsibly. Therefore, transparent legal and regulatory frameworks that define AI developers' and users' responsibilities and liabilities are essential for accountability.

By developing these guiding principles, the CMA aims to foster a competitive and innovative AI market that benefits all stakeholders while protecting consumers and ensuring fair practices. These principles provide a foundation for developing policies and regulations that can adapt to the rapid evolution in AI technology.

III. The CMA's Updated Report on Foundation Models: An Academic Perspective

In April 2024, the CMA released an updated report expanding upon its initial review of FMs, highlighting how the sector's rapid development might lead to negative market outcomes. This updated report delves deeper into the evolving dynamics of the FM sector and identifies key risks that may negatively impact market outcomes. The CMA's analysis highlights three primary risks that could affect competition within the FM sector. The first one is related to companies that have control over critical inputs.[5] The CMA is concerned that companies that control essential inputs necessary for developing FMs might restrict access to these resources to protect themselves from competitive pressures. This behavior could hinder innovation and create barriers for new entrants. The second risk is related to the exploitation of market power.[6] The CMA is concerned that the dominant incumbents could leverage their existing market power to manipulate choice and competition in FM services. This could reduce market entry opportunities for new firms and limit consumer options. The last risk identified by the CMA is related to reinforcing market power through partnerships.[7] According to the CMA analysis, the strategic partnerships among key players might serve to extend their market dominance across the FM value chain. Such alliances could consolidate control and suppress competitive dynamics, further enhancing the positions of these firms.

In response to these risks, the CMA has articulated an updated set of Principles, urging firms to align their business practices accordingly. These principles are designed to foster a competitive and transparent AI ecosystem. The updated principles reflect a more nuanced and detailed approach to promoting a competitive, fair, and innovative FMs market. For example, the updated principle of access adds specificity by emphasizing the role of open-source models, which are crucial for sustaining a competitive market to lower entry barriers.[8] The updated principle for diversity broadens the focus to include diversity in business models and types of FMs models, ensuring a more comprehensive approach to preventing market dominance and fostering innovation. The updated principle of choice highlights the importance of freedom to switch and choose among different AI services, enhancing the emphasis on avoiding lock-in and ensuring market flexibility. The fair dealing principle was expanded to prevent anti-competitive conduct, including anti-competitive self-preferencing, tying or bundling, and protecting market dynamics. The updated principle of transparency adds a specific focus on the risks and limitations of FMs, making transparency more comprehensive and directly tied

[5] CMA's AL Foundation Models Updated Paper, paragraphs 31-35.
[6] CMA's AL Foundation Models Updated Paper, paragraphs 36-41.
[7] CMA's AL Foundation Models Updated Paper, paragraphs 42-47.
[8] CMA's AL Foundation Models Updated Paper, paragraph 24.

to trust and informed use. Lastly, the updated principle of accountability refines the focus on accountability by clearly defining the responsibility of both developers and deployers to address any negative consequences, ensuring the public interest is safeguarded. These refinements ensure that the principles are more robust and better aligned with AI technologies and the markets' complex and dynamic nature.

In addition, the CMA outlines several ongoing and future workstreams to address the competitive landscape of AI and FMs. The CMA intends to publish a detailed technical update report soon, which will include developments in the market since its initial review and stakeholder feedback. In addition, the CMA is investigating potential critical inputs to FM-related markets through its Cloud Market Investigation and a planned examination of the competitive landscape in AI accelerator chips. The CMA is also planning to closely monitor current and emerging partnerships and increase its use of merger control to scrutinize these arrangements to understand how they could affect competition in various parts of the ecosystem. An example is its investigation into Microsoft's partnership with OpenAI.[9]

When the CMA assesses the potential impact of partnerships, it might consider several critical factors.[10] These include the capabilities of the partners and the FMs involved, as well as their prospects for future development. The CMA also examines the upstream power that either partner may hold over essential inputs for FM development and the downstream power where FMs are or could be deployed. Additionally, the nature of the partnership is scrutinized, focusing on the extent of influence and the alignment of incentives between the parties. This analysis aligns with the current merger control framework in the UK, which aims to prevent anti-competitive practices that could harm consumer welfare and market efficiency. By evaluating the power dynamics and strategic alignment within partnerships, the CMA ensures that collaborations do not stifle competition or innovation.

Next, the CMA is actively enhancing its understanding of consumer protection concerns related to AI-driven products and services. To achieve this, the CMA is collaborating with the Digital Regulation Cooperation Forum on research to better understand how consumers perceive and utilize these AI-powered services.[11] This research aims to identify these technologies' potential risks and benefits and develop strategies to mitigate any negative impacts on consumers.

[9] CMA (08/12/2023) CMA seeks views on Microsoft's partnership with OpenAI.
[10] CMA's AL Foundation Models Updated Paper, paragraph 48.
[11] CMA's AL Foundation Models Updated Paper, paragraph 51.

The CMA considers preventive steps to address consumer risk and emphasizes its commitment to the principles of ‘transparency’ and ‘accountability. ' It aims to ensure that consumers and businesses are well-informed about the potential risks and advantages of AI products. To address any ambiguities or emerging issues in AI-related markets, the CMA is considering providing proactive guidance to firms on adhering to consumer protection laws.

The CMA is considering how it might utilize anticipated new powers from the Digital Markets, Competition, and Consumers Bill to enforce consumer protection laws in AI-powered markets. Lastly, the CMA is working on a joint statement with the Information Commissioner's Office (ICO) to address the interplay between competition, consumer protection, and data protection in the context of FMs.

Moreover, the CMA acknowledges that the Digital Markets Competition and Consumer Bill (DMCC) will enhance the CMA's powers to enforce consumer protection laws and impose significant financial penalties for non-compliance. This legislative framework will support the CMA's efforts to address unfair practices in AI-powered markets and protect consumers from harm. The bill will grant the CMA new powers to enforce consumer protection laws directly.

IV. CMA’s forward-looking agenda on AI

The CMA’s ongoing programme of work represents a proactive and comprehensive approach to addressing the complexities and risks associated with the rise of FMs. It seems that the CMA’s agenda to continue with its research on the effect of AI on competition and consumers is evident by its current analysis on the impact of AI on choice architecture in digital marketing, which is part of the ongoing work included in the discussion paper from April 2022 and a collaborative paper with the Information Commissioner's Office released on 9 August 2023.[12] In addition, on 29 April 2024, the CMA published an AI Strategic Update, released in response to the UK Government’s White Paper outlining its approach to regulating AI.[13] In this document, the CMA expressed its intention to continue with its research on the impact of AI on competition and consumers. By focusing on key areas such as the role of AI accelerator chips, consumer understanding, and the interplay between competition and data protection, the CMA aims to create a regulatory framework that balances innovation with consumer and market protection. Overall, the CMA’s work demonstrates a balanced and forward-thinking

[12] Online Choice Architecture - How digital design can harm competition and consumers - discussion paper (publishing.service.gov.uk); https://www.drcf.org.uk/__data/assets/pdf_file/0024/266226/Harmful-Design-in-Digital-Markets-ICO-CMA-joint-position-paper.pdf.

[13] The White Paper was presented to the Parliament on 29 March 2023, CMA AI strategic update - GOV.UK (www.gov.uk).

strategy, crucial for navigating the rapidly evolving AI landscape while safeguarding public interest and promoting fair market practices. CMA is committed to identifying firms using AI to engage in anti-competitive behavior and unfair consumer practices, mainly through its merger control and digital market regimes. The CMA also sends clear guidance to companies using AI, outlining the importance of ensuring their practices align with regulatory development and the CMA's AI principles, designed to guide the sector in achieving positive outcomes. An update on CMA's FMs report is expected in Autumn 2024.