Organisation for Economic Co-operation and Development

DAF/COMP/WD(2024)41

Unclassified

English - Or. English

29 May 2024

DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
COMPETITION COMMITTEE

Artificial Intelligence, Data and Competition – Note by Singapore

12 June 2024

This document reproduces a written contribution from Singapore submitted for Item 4 of the 143rd OECD Competition Committee meeting on 12-14 June 2024.

More documents related to this discussion can be found at www.oecd.org/competition/artificial-intelligence-data-and-competition.htm

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1. Introduction

1. In recent years, Singapore has taken ambitious steps towards harnessing the transformative potential of artificial intelligence ("**AI**"). Through the implementation of the Singapore National AI Strategy, Singapore intends to uplift industries in accelerating their AI adoption efforts, attract AI talent and develop a conducive ecosystem for the trusted adoption of AI.[1]

2. To achieve this vision, Singapore recognizes that AI must be developed in a safe and responsible manner, in order to manage the risks of AI systems being abused or mismanaged. The careless application of AI can potentially amplify negative outcomes to society (such as discrimination, anti-competitive behaviours, or intellectual property infringement), or even supercharge existing threats (such as scams and misinformation).[2]

3. For this reason, the Competition and Consumer Commission of Singapore ("**CCCS**") has taken a keen interest in the rapid development of AI in the fast-moving digital market, and how AI may impact competition across markets.

4. Based on market studies conducted by CCCS, we observed that an increased use of AI systems and algorithms to make pricing decisions could increase the risk of collusion between competitors on digital platform.[3] For instance, price-monitoring systems may allow competitors to automatically collect and analyse real time information concerning their competitors' prices, business decisions and other market data. Such market transparency could facilitate the monitoring of competitors' actions, as well as the detection of deviations from a collusive agreement. Additionally, the use of AI systems or algorithms may facilitate a "hub-and-spoke" collusion, if there is an industry-wide use of a single AI system or algorithm to determine prices, and competitors rely on that same third party-owned "hub" (i.e. a pricing AI system or algorithm) to coordinate pricing strategies.[4]

5. With the emergence of new AI models (such as generative AI) and evolving theories of harm on AI and competition, it is important for CCCS to ensure that our competition framework and toolkits remain robust and future-ready to manage competition risks arising from AI. At the same time, CCCS considers that AI has the potential to enhance competition enforcement. By leveraging on AI, CCCS can more effectively identify and address anti-competitive behaviour, which ultimately leads to a more competitive marketplace and better outcomes for consumers.

[1] Singapore's National AI Strategy was first published on 2019, outlining plans to deepen the use of AI to transform Singapore's economy. In 2023, Singapore launched the Singapore National AI Strategy 2.0 to outline its commitment towards building a trusted and responsible AI ecosystem, driving innovation and growth through AI and empowering Singaporeans and businesses to understand and engage AI.

[2] Singapore's National AI Strategy 2.0 (2023), page 55.

[3] CCCS Market Study on E-Commerce Platforms (2020), paragraph 212.

[4] CCCS's Market Study on Online Travel Booking Systems (2019), paragraphs 156 and 157.

6. The following sections outlines CCCS's response to AI developments, in relation to: (a) engaging industries, (b) scaling up capabilities, and (c) integrating AI into CCCS's enforcement work.

2. Engaging industries

7. Regulators across the world have adopted different regulatory approaches towards managing developments in the AI market. For instance, the European Union enacted the Artificial Intelligence Act, which imposes obligations on providers and users of AI systems based on risks posed by the AI system.

8. For Singapore, a key tenet of our National AI Strategy is to retain agility in our regulatory approach on AI. A careful balancing exercise is necessary to maintain a regulatory environment that supports AI experimentation and innovation, while ensuring that AI is developed in line with the rule of law and safeguards in place.[5]

9. This calibrated approach is reflected in Singapore's "Model AI Governance Framework" published by the Singapore's Personal Data Protection Commission ("**PDPC**"), which provides baseline guidance to AI developers and users on how to be responsible in the design and use of AI. The Model AI Governance Framework is guided by two core principles: Decisions made by AI should be explainable, transparent and fair, and that AI systems should be human-centric.[6] Local government agencies have since leveraged on the Model AI Governance Framework to develop specific guidance on emerging AI topics. For example, in January 2024, Singapore's Infocomm Media Development Authority ("**IMDA**") issued a draft "Model AI Governance Framework for Generative AI", which prescribes suggested practices for safety evaluation of Generative AI models. Core principles of the Model AI Governance Framework have also been endorsed regionally, as Singapore led the development of the "ASEAN Guide on AI Governance and Ethics", which was recently endorsed by the ASEAN Digital Ministers' meeting in February 2024.

10. CCCS considers that the core principles of the Model AI Governance Framework are equally applicable for undertakings in managing competition law risks arising from the use of AI systems. Hence, CCCS has advocated for undertakings to take reference, and comply with, existing frameworks that address key ethical and governance issues when developing and deploying AI systems, including the Model AI Governance Framework.[7]

11. Further, to facilitate the use of AI systems, organizations should be empowered to self-assess and manage risks arising from their use. In Singapore, the IMDA launched the "AI Verify" toolkit in May 2022,[8] which is an AI governance testing framework and software toolkit for organizations to validate the performance of their AI systems against internationally recognized AI ethic principles. The "AI Verify" toolkit is an open-source integrated software toolkit that operates within the user's enterprise environment, enabling users to conduct technical tests on their AI systems, record process checks and generate testing reports for their AI systems.

[5] Singapore's National AI Strategy 2.0 (2023), page 54.

[6] PDPC's Model Artificial Intelligence Governance Framework (2nd Ed), paragraph 2.7.

[7] CCCS's Market Study on E-Commerce Platforms (2020), paragraph 215.

[8] Please refer to Singapore's AI Verify Foundation Website (https://www.aiverifyfoundation.sg/what-is-ai-verify/) for more information.

12. Leveraging on this infrastructure, CCCS is working closely with IMDA to develop an extension of the "AI Verify" toolkit, for companies to audit their AI systems before or after deployment, to determine whether their AI systems may potentially give rise to competition concerns, such as recommending prices that might lead to collusive outcomes or preferencing certain products over others.

13. Given that issues relating to AI span several domains, it is important for CCCS to engage with other public agencies on developing and implementing a "Whole-of-Government" digital strategy for Singapore for AI. In this regard, CCCS has been an active participant in an ongoing cross-agency dialogue known as "AI Governance Roundtable", which is led by IMDA and brings together representatives from different public agencies, to discuss emerging topics such as the allocation of responsibility for AI systems.

14. Beyond advocacy, CCCS has taken steps to incorporate the core principles from the Model AI Governance Framework into relevant industry standards. For instance, CCCS has been engaging industry stakeholders in the digital markets to update Singapore's national standards for electronic commerce transactions,[9] which sets out best practices for digital platforms and online business in relation to their activities relating to electronic commerce transactions. These standards, when updated, are intended to serve as a set of voluntary industry benchmark for digital platforms and online business to assist them, among other things, in managing their competition and consumer protection risks, including risks arising from the use of AI systems and algorithms in the creation, delivery and governance of pricing and non-pricing content on digital platforms.

15. In developing a trusted national AI ecosystem, CCCS will also need to keep abreast of emerging theories of harm in relation to AI. Competition concerns may arise not only in relation to the *use* of AI (in facilitating collusive outcomes), but also in relation to the *provision* of AI. In this regard, CCCS notes that cloud computing has become an important "input" for generative AI, which may have implications on the competitive landscape in the generative AI sector. A multi-faceted approach is necessary to ensure that the market for AI and AI users remain competitive and vibrant.

16. CCCS will continue to review and adjust its assessment and enforcement framework and toolkits to reflect emerging principles, concerns and technological developments.

3. Scaling up capabilities

17. To ensure that CCCS remains well-equipped to navigate and respond to the regulatory demands of digital markets effectively, it is essential for CCCS to develop expertise in various areas, including data science, data engineering, technology insight and behavioural insight.[10]

18. In this regard, CCCS has established the Data and Digital ("**D2**") Division, which leads CCCS's work on digital markets and data science by: (i) designing internal technology infrastructure and systems, (ii) performing data analytics to generate market intelligence that supports decision-making, and (iii) undertaking digital market investigations and studies.

[9] This is known as the "Technical Reference 76: Guidelines for E-Commerce Transactions".

[10] Singapore Digital Government Blueprint (2020), paragraph 20.

19. The D2 Division also monitors overseas regulatory developments in the areas of competition and consumer protection in digital markets and recommends necessary follow-up action. This would enable close coordination and alignment amongst case teams working on various digital-related projects and cases, and facilitate technical sharing and brainstorming. The D2 Division will also represent CCCS in international engagements on technological developments in competition enforcement.

20. The D2 Division will also focus on strengthening human capital competencies in data science and engineering. In this regard, CCCS officers in the D2 Division have undergone external training to develop basic skillsets and know-how on web scraping, data analytics, machine learning and AI application.

4. Harnessing AI to strengthen enforcement

21. Finally, CCCS is developing tools that rely on Machine Learning (ML)/AI to improve our internal enforcement capabilities. One such tool is our "Complaint Analytics" tool. Complaints are an important source of information for CCCS to identify potential anti-competitive conduct in the market or problematic industries, so that CCCS can take enforcement action where appropriate. However, given the large number of complaints received on a day-to-day basis, it is often a laborious task for CCCS officers to analyse and assess all complaints within a short timeframe. To automate the analysis of complaints, CCCS has developed a topic modelling tool which uses natural language processing and machine learning techniques to cluster complaints into common themes for further analysis and sense making. The complaint analytics tool has greatly increased the efficiency of CCCS officers, through the reduction in manpower resources that were needed to carry out the manual processing previously.

22. CCCS intends to collaborate with other public agencies to bolster our complaint management capabilities using AI. For example, GovTech Singapore has developed an AI writing tool known as "SmartCompose", which uses language models to generate accurate responses to email enquiries and basic logic checks to verify submitted documents. CCCS intends to explore how such tools can be leveraged into our day-to-day operations, which would enable CCCS officers to dedicate more resources towards high-value work.

23. Given the transformative potential of AI, CCCS will also explore how AI can be used in investigations to identify potential infringements of competition law. For example, CCCS utilizes an in-house "Bid Rigging Detection Tool" to identify suspicious indicators in tender documents using data from Singapore's procurement portal. Through this process, CCCS officers can streamline their review process, saving manhours while expanding our investigative coverage. While the "Bid Rigging Detection Tool" currently applies a rule-based methodology, CCCS notes the potential for unsupervised AI to buttress our bid-rigging detection tool in future, so as to expedite and streamline our investigative processes further.