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THE IMPACT OF EMERGING TECHNOLOGIES, SUCH AS ARTIFICIAL INTELLIGENCE AND BLOCKCHAIN, ON COMPETITION LAW IN THE DIGITAL ECONOMY

Abstract. The digital economy is constantly evolving, and emerging technologies such as artificial intelligence (AI) and blockchain are playing an increasingly important role in shaping competition in this space. This article examines the impact of AI and blockchain on competition law in the digital economy, with a particular focus on the European Union (EU).

The use of AI in pricing algorithms has the potential to increase price transparency and reduce costs for consumers, but it can also facilitate collusion between competitors. Similarly, the use of blockchain in supply chain management could increase efficiency and reduce costs, but it could also lead to anti-competitive behavior if one company controls the entire blockchain network.

In order to effectively enforce the law, competition authorities must be alert and possess a thorough understanding of how these technologies operate and can be applied to encourage anti-competitive behavior. The European Commission has taken a proactive stance in the EU to enforce competition law in the digital economy, starting with a thorough review of EU competition policy to make sure it is appropriate for the digital age.

The penalties issued on Google and Qualcomm show that the European Commission is willing to take legal action against businesses that exhibit anti-competitive behavior. However, there are still issues with enforcement, like the difficulty in establishing collusion that was made possible by AI algorithms or the potential for blockchain-based monopolies.

Competition authorities must continue to be flexible and willing to work together and share information with other competition authorities throughout the



world in order to meet these difficulties. By doing this, they can ensure that all enterprises operate on an even playing field and advance the long-term health and vitality of the digital economy.

In conclusion, whilst emerging technologies like AI and blockchain have the potential to revolutionize the digital economy, they also pose significant difficulties for the administration of competition law. In order to foster competition and innovation while safeguarding consumers, competition legislation and enforcement must keep up with the rapid evolution of the digital economy.

Keywords: emerging technologies, AI, blockchain, competition law, digital economy, European Union, enforcement challenges, collusion, monopolies, price transparency, innovation, consumer protection.

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ВПЛИВ НОВИХ ТЕХНОЛОГІЙ, ТАКИХ ЯК ШТУЧНИЙ ІНТЕЛЕКТ ТА БЛОКЧЕЙН, НА КОНКУРЕНТНЕ ПРАВО У СФЕРІ ЦИФРОВОЇ ЕКОНОМІКИ.

Анотація. Цифрова економіка постійно змінюється, а нові технології, такі як штучний інтелект (AI) та блокчейн, відіграють все більш важливу роль у формуванні конкуренції в цьому просторі. У цій статті досліджується вплив AI та блокчейну на конкурентне право в цифровій економіці, зокрема в Європейському Союзі (ЄС). Використання AI в алгоритмах ціноутворення має потенціал підвищити прозорість цін та зменшити витрати для споживачів, але також може сприяти змові між конкурентами. Аналогічно, використання блокчейну в управлінні ланцюгом постачання може підвищити ефективність та зменшити витрати, але може також призвести до антиконкурентної поведінки, якщо одна компанія контролює всю мережу блокчейну.

Конкурентні органи мають бути пильними та володіти знаннями щодо механізмів роботи цих технологій. Європейська Комісія застосувала превентивний підхід до забезпечення дотримання конкурентного права в цифровій економіці, включаючи всебічний аналіз конкурентної політики ЄС, щоб переконатися, що вона відповідає цифровій епохі.

Європейська Комісія також продемонструвала свою готовність діяти проти компаній, які займаються антиконкурентною поведінкою, як свідчать штрафи, застосовані нещодавно до Google та Qualcomm. Проте, все ще



існують проблеми з забезпеченням дотримання законодавства, яким сприяють складність доведення використання алгоритмів штучного інтелекту для антиконкурентних дій, або потенціал блокчейн-монополій.

Для вирішення цих проблем, антимонопольні органи повинні залишатися пристосованими та готовими до співпраці та обміну інформацією з відповідними органами інших держав. Цим вони можуть допомогти забезпечити рівні умови для всіх учасників ринку та сприяти життєздатності цифрової економіки.

Отже, нові технології, такі як штучний інтелект та блокчейн, можуть суттєво вплинути на розвиток цифрової економіки, але вони також ставлять перед конкурентним правом нові виклики. При тому, як цифрова економіка продовжує розвиватися, конкурентне право має застосовувати нові підходи до захисту прав споживачів.

Ключові слова: нові технології, штучний інтелект, блокчейн, конкурентне право, цифрова економіка, Європейський Союз, виклики з підтримки, змови, монополії, прозорість цін, інновації, захист споживачів.

Formulation of the Problem: Blockchain and other emerging technologies are revolutionizing the digital economy and opening up new options for both businesses and consumers. These new technologies, however, also pose fresh difficulties for the administration of competition law. One example of how new technology can encourage anti-competitive behavior is the use of AI in pricing algorithms and the potential for blockchain-based monopolies. Therefore, in order to foster competition and innovation while safeguarding consumers in the digital economy, competition authorities must stay alert and flexible in their enforcement activities. As a result, the challenge is how to address the effects of AI and blockchain on the administration of competition law in the digital economy, notably in the European Union.

Analysis of Recent Research and Publications: The difficulties and effects of developing technologies, such as blockchain and artificial intelligence, on competition law in the digital economy have been recently highlighted in study and publications. The report "Artificial Intelligence and Collusion: New Challenges for Competition Policy" by the Organisation for Economic Co-operation and Development (OECD) highlights how AI could make it easier for businesses to collude, and it urges competition authorities to create new tools to identify and stop collusion in the digital economy. Farrell and Kumbhakar's research (2020) investigates the connection between AI and competition and discusses how AI may be used to promote collusion, track and coordinate market activities, and strengthen market dominance. Kostyuk (2021) discusses the implications of big data and AI for competition law, including concerns around data-driven exclusionary conduct and



the need for competition authorities to develop new tools to analyze and understand big data. Gavil and Kovacic (2019) examine the antitrust issues arising from blockchain and smart contracts, highlighting the potential for collusion and the need for competition authorities to develop new tools to detect and prevent anti-competitive behavior in these contexts. Renda and Siciliani (2022) discuss the digitalization of competition policy, highlighting the need for competition authorities to adapt to the changing digital landscape and develop new tools and approaches to effectively enforce competition law in the digital economy.

Purpose of the Article: This article's goal is to examine how AI and blockchain are affecting the application of competition law in the digital economy. Its objectives are to analyze current research and publications, identify possibilities and obstacles, and offer suggestions to competition authorities. In the paper, the possibility for collusion by AI and the potential for anti-competitive behavior by blockchain users are discussed. Additionally, it looks at current EU cases and how they affect the application of competition law. Overall, it offers information on how competition enforcement agencies might adjust to the evolving digital landscape.

Presentation of the main material. The introduction of new technologies like blockchain and artificial intelligence (AI) has significantly altered the digital economy. While new technologies have many advantages, they also pose particular difficulties for competition law. Blockchain technology and AI could make it easier for businesses to engage in anti-competitive behavior including market manipulation and rival collusion. It is crucial to consider how new technologies may affect competition law in the digital economy in order to guarantee that enterprises operate on an even playing field and to protect consumers. We will examine the regulations and guidelines set by the European Union (EU), cases related to anti-competitive actions, and the enforcement challenges that arise with these technologies. Understanding the impact of AI and blockchain on competition law is crucial for promoting innovation and competition in the digital economy.

A rapidly evolving technology, artificial intelligence (AI) has the potential to completely transform a wide range of markets, including the digital economy. While AI has the potential to significantly increase efficiency and decision-making, it also creates special obstacles for the practice of competition law⁵.

The European Union (EU) has established recommendations on the use of AI in the EU after acknowledging the possible influence of AI on competition legislation. Aiming to safeguard competitiveness in the digital economy, the EU's General Data Protection Regulation (GDPR) and the EU's Directive on Copyright in the Digital Single Market both contain measures relating to AI. In addition, the European Commission has launched a comprehensive review of EU competition policy to ensure that it is fit for the digital age and can effectively address challenges presented by AI and other emerging technologies.



These guidelines aim to ensure that businesses using AI do not engage in anti-competitive practices that harm consumers or other businesses. The guidelines emphasize the importance of transparency and explainability in AI decision-making, as well as the need for human oversight to ensure that AI systems do not operate in an anti-competitive manner.

The European Commission fined automobile makers for employing algorithms to coordinate on price and emissions technology as one famous example of how AI could allow collusion between rivals. It was discovered that the automakers employed AI algorithms to coordinate their price plans and impede the creation and adoption of cleaner emissions technology. Customers were hurt by this collaboration since it restricted their access to cheaper, cleaner autos. This instance emphasizes the necessity for authorities to carefully watch how AI is used in order to guard against competitor collusion and safeguard consumers.

AI has the potential to facilitate other anti-competitive actions, such as price discrimination and the construction of entry hurdles for new competitors, in addition to collusion. As AI continues to be integrated into the digital economy, it will be important for competition authorities to remain vigilant in their enforcement of competition law to prevent such practices.

Overall, the use of AI presents both opportunities and challenges for competition law in the digital economy. While AI can bring significant benefits, it also has the potential to facilitate anti-competitive practices that harm consumers and other businesses. As such, it is crucial for competition authorities to carefully monitor the use of AI and enforce competition law to ensure a level playing field for all businesses and protect consumers⁸.

A decentralized ledger technology called blockchain makes it possible to conduct secure and open transactions without the use of middlemen. By allowing peer-to-peer transactions and lowering transaction costs, it has the potential to completely transform a variety of industries, including the digital economy. Blockchain, however, also poses particular difficulties for competition law, much like AI does.

The potential for collusion amongst competitors is one of the biggest problems that blockchain presents. Competitors can build and take part in decentralized networks that can coordinate pricing and output choices without the need for a central authority thanks to blockchain technology. This raises the possibility of anticompetitive activity that could hurt customers and other businesses, such as price fixing and output restrictions.

To address these challenges, the EU has implemented regulations that specifically target anticompetitive behavior related to blockchain. For example, the EU's General Data Protection Regulation (GDPR) includes provisions related to blockchain that aim to prevent the abuse of market power and protect competition in the digital economy.



Blockchain's ability to lead to the formation of monopolies or other dominating positions presents another difficulty. Blockchain can make it possible to build decentralized networks that are governed by a limited group of people, which could harm consumers and restrict competition¹². Competition authorities might need to step in to make sure that access to blockchain networks is open and non-discriminatory in order to stop this.

In general, the blockchain offers particular difficulties for the digital economy's competition law. While it might have a positive impact, it could also encourage anti-competitive behavior and the formation of monopolies or dominant positions. As such, it is important for competition authorities to carefully monitor the use of blockchain and enforce competition law to ensure a level playing field for all businesses and protect consumers.

Enforcing competition law in the digital economy presents unique challenges for regulators. As emerging technologies such as AI and blockchain continue to develop, it becomes increasingly difficult to identify and regulate anti-competitive behavior¹¹.

One of the main challenges is the difficulty in identifying anti-competitive behavior. Digital markets are often characterized by complex interactions and rapidly changing dynamics, making it difficult for regulators to keep up. In addition, the use of AI and other emerging technologies can make it even more difficult to identify anti-competitive practices, as they can be disguised and automated.

The requirement for international cooperation presents another difficulty. Anti-competitive activity can have an effect on consumers and enterprises across many different jurisdictions because many digital markets are international. In order to ensure that competition legislation is effectively enforced, coordination amongst competition agencies is crucial¹⁶.

Despite these obstacles, anti-competitive behavior in the internet sector has been addressed by the competition authorities. Understanding how new technologies impact competition is one of the main obstacles to applying competition law in the digital economy. New forms of market power are being created by emerging technologies like blockchain and artificial intelligence, which may call for new regulatory strategies.

In response to these challenges, the European Commission has launched a comprehensive review of EU competition policy to ensure that it is fit for the digital age and can effectively address challenges presented by emerging technologies such as AI and blockchain.

The European Commission has also taken action against companies that have engaged in anti-competitive behavior. For example, in 2017, the European Commission fined Google €2.4 billion for abusing its dominant position in the search engine market. The European Commission found that Google had given



preferential treatment to its own comparison-shopping service in its search results, while demoting rival comparison-shopping services. As a remedy, the European Commission required Google to stop its anti-competitive practices and to ensure equal treatment of rival comparison-shopping services in its search results.

In a similar vein, Qualcomm was fined €97 million by the European Commission in 2018 for abusing its dominant position in the mobile chipset industry. The European Commission discovered that Qualcomm had paid Apple significant sums of money so that Apple would only use its chipsets in iPhones and iPads, effectively shutting out competitors. In order to ensure fair competition on the market for mobile chipsets, the European Commission mandated Qualcomm to stop its anti-competitive activities and to adhere to specific duties.

These cases show how committed the European Commission is to upholding competition law in the digital economy and guaranteeing fair competition for all companies. The sanctions imposed on Google and Qualcomm are meant to serve as a message to other businesses that engaging in anti-competitive activities will not be permitted and that doing so will result in serious consequences. However, competition authorities will need to be alert and flexible in their enforcement operations as long as technology continue to advance.

Conclusion. Blockchain and other cutting-edge technologies have the ability to change the digital economy and open up new options for both consumers and enterprises. They do, however, also bring significant difficulties for the administration of competition law.

Depending on how they are applied and develop over time, various technologies will have a different effect on competition law. For instance, the application of AI to pricing algorithms may promote price transparency and cut customer costs, but it may also encourage collusion between rivals. Similar to this, if one corporation controls the entire blockchain network, using blockchain in supply chain management could result in anti-competitive behavior while also increasing efficiency and lowering costs.

To address these challenges, competition authorities must remain vigilant and adaptable in their enforcement efforts. They must have a deep understanding of how these technologies work and how they can be used to facilitate anti-competitive behavior. They must also be willing to collaborate and share information with other competition authorities around the world.

The European Commission has taken a proactive stance in the EU to enforce competition law in the digital economy, starting with a thorough review of EU competition policy to make sure it is appropriate for the digital era. The penalties issued on Google and Qualcomm show that the European Commission is willing to take legal action against businesses that exhibit anti-competitive behavior.



It's critical that competition legislation and enforcement keep up with how the digital economy develops. The competition authorities will continue to face new problems from emerging technologies like AI and blockchain, but there are also opportunities to foster innovation and competition. By remaining vigilant and adaptable, competition authorities can help ensure a level playing field for all businesses and promote the long-term health and vitality of the digital economy.

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