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Collusion in the Blockchain context Comparative study in competition law in the European Union and Iran

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Article Info	Abstract
Article Type: Research Article	1. Introduction and Statement of the Problem Blockchain technology, by eliminating traditional intermediaries and creating distributed ledgers, has transformed the structure of financial markets and provided equal access to digital markets. This transformation, while reducing the concentration of power, intensifies competition and innovation. Nevertheless, the deployment of blockchain carries dual implications for competitive markets: on the one hand, transparency and reduced transaction costs lead to enhanced competition and the entry of new actors, while on the other hand, its decentralized nature can lead to the aggregation of data and potential cooperation among actors, such that collusion may be facilitated through the realization of a meeting of minds or deliberate alignment in market strategies. Competition law takes a firm stance against any collusion that restricts or distorts competition; however, the fundamental questions are as follows: can collusion, in the form of an agreement or concerted practices, actually occur within the blockchain environment, or does it instead arise from the inherent operational logic of this technology? Furthermore, given that decentralized organizations such as blockchain lack independent legal personality, the question arises as to whether the responsible actors within such an environment can be identified, and whether the intervention of competition law in this regard is necessary. Ultimately, do the traditional standards of Iranian competition law possess the requisite capacity to address collusion within the blockchain space, or is there a need for amendment or the formulation of specific competition regulations?
Received: 2026/02/05 Received in revised form: 2026/07/29 Accepted: 2026/08/04 Published online: 2026/12/22	It should be noted that the scope of this study is confined to examining the realization of collusion with a focus on the formation of agreements, the establishment of cartels, and the adoption of concerted practices within the blockchain environment, and does not extend to situations in which the mechanism and forms of collusion are established outside this environment, with blockchain technology being employed merely for the execution or monitoring thereof.
Keywords: <i>Anti-Competitive Agreements, Blockchain, Collusion, Competition Law, Concerted Practices.</i>	

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Abstract

2. Literature Review and Research Gap

To date, no independent case concerning collusion in the blockchain environment has been brought before the competent authorities of the European Union. Accordingly, the present analysis proceeds by relying on analogous cases and by extending the foundational principles of European Union competition law to this environment.

Iranian competition law lacks an adequate legal foundation in this regard, and judicial practice has likewise not yet had the opportunity to clarify the ambiguous dimensions of collusion within the blockchain environment. The analysis of collusion in this environment, as a neglected area of Iranian competition law, constitutes a significant research gap that this article seeks to address. By identifying the strengths and weaknesses of the two legal systems under discussion, the present study attains a deeper understanding of the challenges posed by blockchain to competition law and seeks to propose an effective framework for striking a balance between the protection of market actors and the promotion of innovation.

3. Methodology

This research employs a descriptive-analytical method with a comparative approach. The study examines the competition law frameworks of the European Union and Iran regarding the status of collusion within the blockchain environment, thereby revealing the necessity of revisiting the traditional paradigms of Iranian competition law.

The study's scope includes legal sources related to the Treaty on the Functioning of the European Union (TFEU); the Digital Markets Act, Regulation (EU) 2022/1925; Commission Regulation (EU) 2022/720 on the application of Article 101(3) of the Treaty on the Functioning of the European Union to categories of vertical agreements and concerted practices, together with the accompanying Guidelines on Vertical Restraints (2022, Brussels); the Guidelines on the Applicability of Article 101 of the Treaty on the Functioning of the European Union to Horizontal Co-operation Agreements; and the General Data Protection Regulation (GDPR), Regulation (EU) 2016/679^{*,**} alongside the relevant sources of Iranian law, notably Article 44 of the Law on the Implementation of the General Policies of Principle (44) of the Constitution and certain articles of the Supreme Council of Cyberspace's documents.

Data collection is library-based, drawing on primary sources (treaty provisions, regulations, and guidelines) and secondary sources (legal articles and expert reports).

4. Main Findings

The present study demonstrates that collusion within the blockchain environment is possible, owing to the specific functions and structure of this technology. Consensus mechanisms, information transparency, and the self-regulating nature of transaction recording and verification processes create fertile ground for the formation of agreements, the

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	establishment of cartels, and the emergence of concerted practices to such an extent that the boundary between the legitimate function of the technology and anti-competitive alignment among actors becomes blurred. Accordingly, collusion in blockchain is not the result of a conflict with the technology, but rather the outcome of a deliberate exploitation of its mechanisms to consolidate shared interests and restrict competition. The findings of the research further indicate that the theory of granularity, by adopting an approach that moves beyond traditional frameworks and draws on the technical features of blockchain, including consensus mechanisms, user participation, and the distributed control system, can provide an effective basis for identifying the actors with a vested interest and determining their liability. 5. Conclusion and Recommendations This research indicates that blockchain technology is merely a tool that can operate either in the service of, or in opposition to, competition, and its effects are contingent upon its design, network structure, and the manner of its deployment. It is proposed that a preventive (ex-ante) legal framework be formulated in the field of blockchain technology, one that, by taking into account the technical and structural characteristics of this technology, enables the effective application of competition rules. The proposed legislation should encompass, inter alia, the following headings: a redefinition of the concepts of "agreement" and "concerted practice"; criteria for the identification and attribution of liability among market actors; indicators for assessing market power; and assessment rules tailored to the various types of blockchains. In doing so, the legislation should, while distinguishing between public, private, and consortium blockchains, clarify the distinction between the "market for blockchain technology" and the "market for blockchain-based services," as well as between on-chain collusion and off-chain collusion, and should provide criteria for identifying the relevant undertaking within this decentralized environment, including developers, miners, and users. Furthermore, it is necessary to devise novel criteria for market definition and the relevant market, adopting a multi-tiered approach based on the type of blockchain and the applications built upon it, one that also takes into account the substitutability between different blockchains and other competing technologies.
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