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RESEARCH ARTICLE | MARCH 01 2024

Impact of Blockchain on Improving Taxpayers' Compliance: Empirical Evidence from Panel Data Model and Agent-Based Simulation

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Journal of Emerging Technologies in Accounting (2024) 21 (1): 89–109.

https://doi.org/10.2308/JETA-2022-046

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ABSTRACT

The purpose of this study is to examine the impact of blockchain technology on taxpayer compliance among U.S. taxpayers, using it as a case study. It aims to explore the critical factors affecting blockchain technology applications in tax compliance systems. We first utilized a panel data model to establish empirical parameters linking audit intensity and qualification rates of Internal Revenue Service (IRS) tax returns. We then applied these parameters to an agent-based simulation model powered by artificial intelligence. We showed that integrating blockchain technology can effectively address noncooperative behavior and reduce the tax gap. Moreover, we identified two key factors—the improvement of the IRS's efficiency and increased punishment—that can accelerate the development of blockchain technology in the tax compliance system. Our research adds to the existing literature on applications of agent-based simulation models in tax compliance systems and provides policy implications for promoting the use of blockchain technology.

Data Availability: Data are available from the public sources cited in the text.

Keywords: blockchain technology, IRS audit rate, tax compliance, noncooperative behavior, artificial intelligence, agent-based simulation

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American Accounting Association
Strategic and Emerging Technologies

Print ISSN: 1554-1908 **Online ISSN:** 1558-7940