

Editorial

Cryptocurrencies, Blockchain, and Criminology: Emerging Challenges and Opportunities - Foreword to the Special Issue

In the rapidly evolving landscape of digital finance, cryptocurrencies and blockchain technologies constitute transformative forces that have reshaped economic systems and legal frameworks globally. Characterized by their decentralized nature and potential for innovative financial solutions, these technologies offer opportunities for enhanced transparency and operational efficiency. However, they also introduce complex ethical challenges and raise critical questions about regulatory oversight and financial security, particularly in the light of some association with illicit activities (Foley *et al.*, 2019).

The articles in this special issue explore these intricate dynamics, focusing on the intersection between cryptocurrencies, blockchain technology, and criminology. Dondjio and Kazamias provide a thoughtful examination of the ethical considerations surrounding these technologies, highlighting their impact on socio-economic structures in both developed and developing contexts. Their analysis elucidates the dual nature of cryptocurrencies: as tools for liberation from traditional financial constraints and as potential enablers of criminal behavior, emphasizing the need for responsible adoption and comprehensive policy frameworks (Zhao, 2024).

Building on this foundation, Sadok *et al.* delve into the historical and multidisciplinary perspectives that have shaped our understanding of cryptocurrencies. Their synthesis of existing literature reveals fragmented regulatory responses that often fail to address the unique challenges posed by digital currencies. They advocate for a balanced approach that acknowledges both the financial innovations provided by cryptocurrencies and the accompanying risks of illicit transactions and exploitation (Dhali *et al.*, 2023).

The regulatory landscape is further explored by Nastri, who critiques the current EU regulations on crypto-assets for the piecemeal approach and lack of cohesive strategy. By highlighting recent legislative developments, including anti-money laundering (AML) measures, Nastri underscores the necessity of harmonizing national laws with EU directives to strengthen the framework governing cryptocurrencies and effectively address financial crimes (Zhelekhovska, 2024; Ferreira & Pereira, 2023).

Moreover, Passas highlights how cryptocurrencies foster both innovation and significant financial crimes such as money laundering and fraud, similarly to other financial institutions and services. With continuing concerns about illicit transactions, it is evident that existing frameworks have not fully mitigated these risks. Passas's examination of regulatory responses establishes a foundation for constructive dialogue on how legislative measures and practical steps leveraging evolving technologies can facilitate innovation while addressing criminal risks (Schär, 2021; Huang, 2022).

In a complementary fashion, Passas and Coppola explore how blockchain technology and Decentralized Autonomous Organizations (DAOs) can provide innovative solutions to ongoing challenges in corporate compliance. Their analysis is grounded on criminological theory, underscores the complexity of effectively regulating cryptocurrencies and advocates for proactive compliance systems embedded within blockchain infrastructure to address the rapid evolution of digital economies (Zhu *et al.*, 2022; Chohan, 2021).

Blue addresses the vulnerabilities that accompany cryptocurrency ownership. Findings from surveys indicate that demographic factors significantly influence who is most susceptible to financial risks within this space. Low education levels, income disparities, and diverse identities contribute to a broader understanding of vulnerability in the digital economy, calling for greater educational initiatives aimed at empowering potential users and enhancing their resilience against the pitfalls of crypto investments (Grassi *et al.*, 2022; Ante *et al.*, 2021).

Furthermore, the work of Gjorgjev *et al.* illustrates how blockchain forensic techniques have emerged as crucial tools for law enforcement agencies combating cybercrime on the dark web. Their analysis illustrates a shift in the narrative surrounding cryptocurrencies—from instruments of anonymity that facilitate crimes to mechanisms that

enable the tracing of criminal activities, thereby highlighting the role of technology in both perpetrating and preventing illicit actions (Rossi *et al.*, 2022; Kshetri, 2023).

In short, this collection of articles reflects the multifaceted relationship between cryptocurrencies, blockchain technology, and criminology. It captures the ongoing debate surrounding the benefits and challenges presented by these innovations, thus offering invaluable perspectives and practical suggestions for policymakers, researchers, and industry professionals alike. As we continue to navigate this dynamic terrain, fostering a dialogue that balances innovation with accountability will be essential in harnessing the potential of cryptocurrencies while mitigating their risks (Brenig *et al.*, 2023).

REFERENCES

- Ante, L., Fiedler, I., & Strehle, E. (2021). The influence of stablecoin issuances on cryptocurrency markets. *Finance Research Letters*, 41, 101867.
<https://doi.org/10.1016/j.frl.2020.101867>
- Brenig, C., Schwarz, J., & Rückeshäuser, N. (2023). Value discovery in cryptocurrency markets: A bibliometric analysis and systematic review of the literature. *Electronic Markets*, 33, 2091-2125.
<https://doi.org/10.1007/s12525-022-00544-0>
- Chohan, U. W. (2021). Decentralized autonomous organizations: Governance, dispute resolution and regulations. Critical Blockchain Research Initiative, Working Papers.
<https://doi.org/10.2139/ssrn.3776353>
- Dhali, M., Hassan, S., Mehar, S. M., Shahzad, K., & Zaman, F. (2023). Cryptocurrency in the darknet: sustainability of the current national legislation. *International Journal of Law and Management*, 65(3), 261-282.
<https://doi.org/10.1108/ijlma-09-2022-0206>
- Ferreira, A., & Pereira, J. (2023). Regulating cryptocurrencies in the European Union: Opportunities and challenges. *Journal of International Economic Law*, 26(1), 121-141.
<https://doi.org/10.1093/jiel/jgad002>
- Foley, S., Karlsen, J. R., & Putnigš, T. J. (2019). Sex, drugs, and bitcoin: How much illegal activity is financed through cryptocurrencies? *The Review of Financial Studies*, 32(5), 1798-1853.
<https://doi.org/10.1093/rfs/hhz015>
- Grassi, L., Lanfranchi, D., Faes, A., & Renga, F. (2022). Do we still need financial intermediation? The case of decentralized finance – DeFi. *Qualitative Research in Accounting & Management*, 19(3), 323-347.
<https://doi.org/10.1108/qram-03-2021-0051>
- Huang, R. H. (2022). The regulation of crypto assets in China: A retrospective and prospective look. *European Business Organization Law Review*, 23, 569-591.
<https://doi.org/10.1007/s40804-022-00244-4>
- Kshetri, N. (2023). Blockchain and the dark web economy: Implications for cybersecurity. *IEEE Security & Privacy*, 21(3), 69-75.
<https://doi.org/10.1109/MSEC.2023.3256539>
- Rossi, L. M. D., Avital, M., & Gleasure, R. (2022). The proliferation of end users as a success metric for cryptocurrencies. *Proceedings of the Annual Hawaii International Conference on System Sciences*.
<https://doi.org/10.24251/hicss.2022.738>
- Schär, F. (2021). Decentralized finance: On blockchain- and smart contract-based financial markets. *Review*, 103(2).
<https://doi.org/10.20955/r.103.153-74>
- Zhao, Y. (2024). Empowering sustainable finance: The convergence of AI, blockchain, and big data analytics. *Advances in Economics, Management and Political Sciences*, 85(1), 267-273.
<https://doi.org/10.54254/2754-1169/85/20240925>
- Zhelekhovska, T. (2024). Legal regulation of cryptocurrency and cryptocurrency operations in the European Union. *Visegrad Journal on Human Rights*, (6), 201-207.
<https://doi.org/10.61345/1339-7915.2023.6.31>
- Zhu, T., Liao, C., Zhou, Z., Li, X., & Zhang, Q. (2022). Fast popularity value calculation of virtual cryptocurrency trading stage based on machine learning. *Frontiers in Physics*, 9.
<https://doi.org/10.3389/fphy.2021.788508>

Prof. Dr. Nikos Passas
 School of Criminology and Criminal Justice
 Northeastern University
 USA
 E-mail: n.passas@northeastern.edu