

Letter to Editor

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Criminal Activity and Environmental Impact as Cryptocurrency Concerns

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Abstract

The surge of cryptocurrencies, such as Bitcoin, has raised concerns regarding their widespread adoption without adhering to standard. Unlike traditional currencies, they operate on a decentralized system called blockchain, allowing trustless transactions. Trustless transaction could facilitate their use in social and economic crimes. This letter examines methods to regulate and control the use of cryptocurrencies in social and economic crimes. Additionally, it investigates the environmental impact resulting from the mining process associated with these digital assets. Some strategies are proposed to substitute the current mining process with more environmentally sustainable alternatives.

Keywords Cryptocurrency Concerns, Criminal Activity, Environmental Impact

Introduction

As the use of Cryptocurrencies increases, concerns increase due to their association with their negative implications. Cryptocurrency is a type of digital currency that use blockchain technology to work on a peer-to-peer basis. The nature of the blockchain means that two persons can have a transaction without exitance of a third party even if they do not trust each other, [1]. Unlike traditional currencies, Cryptocurrencies are not controlled by a central authority such as a government or central bank. This leads to social and economic implications. Negative social implications of cryptocurrencies include their use in criminal activities, heightened cybercrime, potential exacerbation of wealth inequality, insufficient consumer protections, and the exclusion of individuals without access to technology or knowledge of using technology. These factors together could deepen the social disparities. Negative Economic Implications of Cryptocurrency include environmental impact, volatility, market manipulation and tax evasion, [2].

This letter tries to analyse two of the most important social

and economic implications of cryptocurrencies: first, the role of cryptocurrency in social and economic criminal activity, and second, addressing their environmental impacts. After that strategies will be explored to address these two economic, social implications associated with cryptocurrency usage. The first approach targets the involvement of cryptocurrencies in social and economic crimes, while the second addresses the environmental impact of mining process.

Association of cryptocurrencies in social and economic crimes

As documented by Kethineni et al, digital currency has gained interest as a means of exchange among certain groups involved in social criminal activities, such as drug dealers and extortion. In addition, the vagueness surrounding this situation presents difficulties for governments in terms of enforcing economic regulations, taxation, and preventing illicit financial activities, such as money laundering and fraud, [3,5].

Addressing the use of digital currency in social criminal



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activities and the associated challenges for governments requires a multi-pronged approach aimed at enhancing transparency, regulation, and enforcement. This comprehensive solution, proposed by Leuprecht encompasses several key strategies, [4]. First and foremost, it advocates for the development and implementation of an enhanced regulatory framework tailored specifically for digital currencies. These regulations should address issues related to Anti-Money Laundering (AML), Know Your Customer (KYC) requirements, and taxation, thus establishing a solid legal foundation for the digital currency market. Furthermore, this solution emphasizes the importance of international collaboration among governments and regulatory bodies. Know Your Customer (KYC) standards are designed to protect financial institutions against fraud, corruption, money laundering and terrorist financing. Strengthening cooperation at a global level can lead to consistent and harmonized regulations, prevent regulatory arbitrage, and ensure that illicit actors cannot exploit regulatory gaps in different jurisdictions. Lastly, the proposal calls for investments in cutting-edge technologies and resources to monitor and analyse cryptocurrency transactions. This proactive approach will assist in identifying and tracking illicit activities, ultimately making the digital currency ecosystem more secure and transparent. One limitation in controlling the role of cryptocurrencies in social and economic criminal activities is the ever-evolving nature of technology, creating a continuous challenge in staying ahead of illicit activities. To enhance the clarity and understanding of the comprehensive approaches taken for preventing criminal activities associated with cryptocurrencies, it is imperative to delve deeper into the specifics of each strategy. Categorizing these approaches can provide a structured framework for readers. For instance, under the umbrella of regulatory frameworks, one can categorize strategies related to Anti-Money Laundering (AML), Know Your Customer (KYC) requirements, and taxation as distinct subcategories, [4,5]. Additionally, within international collaboration, highlighting specific collaborative initiatives and their impact on preventing cross-border illicit activities would offer a more nuanced perspective. In the technological realm, further explanations about the cutting-edge technologies and resources proposed for monitoring and analysing cryptocurrency transactions can be provided. This categorization not only aids in organizing the information logically but also facilitates a more detailed comprehension of the multifaceted strategies employed to curb criminal activities. As governments and regulatory bodies adapt their strategies, criminals may also develop innovative methods to exploit digital currencies, creating a continuous challenge in staying ahead of illicit activities.

Environmental Aspect of Cryptocurrency Usage

It is necessary to recognize the environmental aspects, especially in the context of some cryptocurrency mining methods, such as proof-of-work, which have attracted considerable attention due to their environmental footprint. Therefore, effective solutions must be identified and implemented to prevent the negative social and economic effects of digital currencies. To mitigate the environmental impact of energy-intensive Proof-of-Work (POW), it is recommended to adopt Proof-of-Stake (POS) as an alternative consensus mechanism in blockchain networks, [6,7]. POS selects validators to create new blocks based on their economic investment in the network, eliminating the need for the resource-heavy mining process. Unlike POW, which often necessitates costly and specialized mining equipment, POS allows a broader range of participants to engage as validators, as it primarily relies on token ownership. POS represents a progressive alternative that significantly reduces the carbon footprint. For example, the transition from ETH to Ethereum 2.0 (ETH2) reduces energy consumption and environmental impact significantly by replacing energy-intensive POW with the more sustainable POS consensus mechanism, [6,8]. One major limitation in transitioning to eco-friendly consensus mechanisms like POS is the resistance from established mining communities. Miners heavily invested in traditional POW systems might resist the shift due to financial interests, creating challenges in the widespread adoption of POS and delaying the reduction in environmental impact, [6,7].

Conclusion:

In conclusion, in parallel with the increase in popularity and acceptability of digital currencies, their use in financial and social criminal activities will increase and have higher destructive environmental effects. The criminal exploitation of cryptocurrencies poses a threat to economic stability and social trust. To address these issues, comprehensive solutions must be implemented. Regulatory frameworks tailored to digital currencies, such as KYC and taxation, could improve transparency. Furthermore, transitioning to environmentally friendly consensus mechanisms, such as POS, should reduce the environmental impact of mining processes. Despite the sustainability benefits of POS, challenges such as centralization and technical complexity remain. If these measures are not implemented, criminal activity, trust, and environmental degradation are likely to increase. Effective decisions and policies must be adopted to ensure the responsible and sustainable future of digital currencies, protecting both economies and the environment.

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Consent for publication

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Competing interests

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