

# DECENTRALISATION AND BEYOND: THE IMPACT OF BLOCKCHAIN ON GLOBAL ECONOMIES, BANKING, AND GOVERNANCE

DOI: 10.5937/JEMC2402148S

UDC: 336.74:004.738.5

Review Paper

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Paper received: 13.09.2024.; Paper accepted: 07.11.2024.

**The Fourth Industrial Revolution has ushered in groundbreaking digital advancements across biology, materials science, and computing. Among these, blockchain technology emerges as a key innovation with the power to reshape economic systems and business operations. While blockchain offers solutions for critical digital needs such as user verification, data security, and intellectual property management, its widespread adoption remains constrained by a limited understanding of its benefits. This research explores two primary areas: the sustainability of crypto exchange systems and blockchain's governance implications in our digital economy. Moving beyond Bitcoin, the study examines blockchain from both broad economic perspectives and organisational levels, viewing blockchain-based entities as global institutions. It analyzes blockchain's potential as a decentralized governance tool, assessing how it creates value and enables effective governance while potentially preventing financial fraud. The study also compares different countries' approaches to cryptocurrency regulation. The research methodology combines two methods: a comprehensive review of academic blockchain literature and an analyses of blockchain community discussions. It also includes ethnographic research, examining the governance structures and challenges within DAOs ( decentralised autonomous organisations).**

**Keywords:** Blockchain; Cryptocurrency; Bitcoin; Governance; Banking; Cyberpunks.

## INTRODUCTION

The fourth industrial stage, sometimes known as Industry 4.0, is characterised by a move towards sophisticated technology, smart automation, and digitisation. A prominent example of how nations and industries worldwide are developing plans and strategies to capitalise on these developments is Germany's "Industry 4.0 programme." The shift to smart systems that prioritise software-based, digital transformations over hardware-heavy, physical ones is a major theme in these endeavours. Given the increased susceptibility of networked systems to breaches, the security and privacy of digital systems become crucial, as sectors grow more digitally integrated (Aste et al., 2017). To ensure data integrity and verify participant identities, enhanced cybersecurity measures, including blockchain technology are crucial. Blockchain is a digitally

distributed ledger technology that allows peer-to-peer transactions without intermediaries and securely stores data in an unchangeable manner (Ganne, 2018). Following the 2008 financial crisis, which damaged confidence in centralised banking institutions, it rose to prominence with the launch of Bitcoin. By maintaining data integrity, facilitating direct transactions, and reducing the need on outside validators, blockchain increases trust in digital systems. By simplifying procedures like identity verification and transaction validation, its capabilities increase digital data and system power, which improves business cash flow and operational efficiency (Li et al., 2019). Blockchain can safeguard machine-to-machine connections in the Internet of Things (IoT) domain, promoting a more secure and self-sufficient digital ecosystem (Chakraborty, 2023).

Due to the widespread usage of smartphones and the affordable card readers offered by businesses like Square and PayPal, the use of digital payments is growing quickly. Digital payments are proliferating as more gadgets, including parking meters, and vending machines are updated to accept tap-to-pay. Blockchain is a viable solution for digital payments since it can conduct transactions on a distributed network without the need for central intermediaries, which lowers transaction costs when compared to conventional techniques (Dobrovnik et al., 2018). To manage stocks on its NASDAQ Private Market platform, for example, the National Association of Securities Dealers Automatic Quotation System (NASDAQ) has introduced a blockchain-based ledger. The U.S. Federal Reserve has investigated blockchain as a means of facilitating interbank payments, and Deloitte has established the Deloitte Cryptocurrency Community to assist clients in comprehending the advantages of blockchain technology. It is anticipated that blockchain technology would become more widely used as it gains traction (Kulhari, 2018).

Depending on the type of system, management in blockchain networks can vary. Permissionless blockchains, like Bitcoin, encourage decentralisation and security through scale since they are run by the user community rather than a centralised authority. Permissioned blockchains, on the other hand, are controlled by a central body that controls access while users manage data transactions. Because these permissioned systems are smaller than bigger, decentralised networks, they may be more vulnerable to security threats (Dobrovnik et al., 2018). Around 2013, five years after the introduction of Bitcoin, blockchain technology started to gain traction as notable advancements in the cryptocurrency community brought attention to its potential. Blockchain technology and Bitcoin began to be acknowledged as strong substitutes for established systems, incorporating into a range of economic domains, such as sharing economies and online marketplaces (Rosic, 2016). Governments looked at blockchain's usage in public services like land and health registries, while large corporations started investigating it for operational efficiencies, such as Walmart's use in food quality monitoring. As a result, blockchain's contribution to the global economy keeps growing, highlighting its potential to revolutionise governance structures and industries everywhere (Crosby et al., 2016).

## LITERATURE REVIEW

Blockchain and cryptocurrency have emerged as transformative technologies, reshaping financial systems, data protection, and even geopolitical landscapes. The intersection of blockchain with crime reveals complex challenges in combating illegal activities like money laundering within digital currencies. Blockchain's decentralised nature offers anonymity that can facilitate criminal transactions, yet its transparency and traceability also present opportunities for regulation. Edelman (2022) builds on this by unpacking the nuances of digital assets, illustrating how, while potentially risky, these assets require thoughtful regulation to balance innovation with security. Krishnan (2020) takes this analysis further, illustrating how Decentralized Autonomous Organizations (DAOs), empowered by blockchain, present unique risks, as they can be leveraged for social resistance and even terrorism, complicating the balance between innovation and societal protection.

Blockchain's influence extends into the workplace, where it reshapes data security and work dynamics. Brown and Whittle (2020) discuss how the integration of blockchain and algorithms could redefine workplace roles, potentially leading to decentralized decision-making processes and automation. Kulhari (2018) emphasises blockchain's significant role in data protection, presenting it as a powerful tool for securing personal information and enhancing privacy. Together, these works reveal a dual narrative, where blockchain technology both protects and challenges the privacy and autonomy of individuals and organisations in professional settings.

The history and development of cryptocurrency offer an ideological journey that has defined digital cash. Brunton (2019) delves into the philosophical roots of cryptocurrency, illustrating how anarchists, technologists, and utopians envisioned a digital economy outside state control. January (2021) continues this story, examining Bitcoin's role in disrupting traditional finance. From this perspective, cryptocurrency emerges as a revolution against centralised financial systems, driven not only by technology but also by a vision of economic freedom.

Geopolitics and national strategy are also deeply entwined with blockchain's adoption. Ekman (2021) highlights China's aggressive stance in pioneering blockchain technology, underscoring

how the country's ambitions reflect a strategic move to control the future of digital currency and establish global economic influence. Similarly, Van den Berg (2018) examines blockchain's dual impact on fragile states, illustrating how it offers stability and transparency in governance while also posing risks. These insights suggest that, for some states, blockchain is not merely a technological innovation but a tool for asserting influence on the global stage.

Finally, blockchain's potential extends into environmental and social sustainability. Stuit et al. (2022) explore blockchain's applications in conservation, where its ability to track and verify transactions introduces new possibilities for sustainable practices. Blockchain technology, as these studies reveal, can act as a force for environmental accountability, facilitating responsible practices in industries that have historically lacked transparency.

## RESEARCH METHODOLOGY

The research methodology combines multiple approaches to examine the impact of blockchain technology on global economies, banking, and governance. The study is structured around four key research questions, each aimed at understanding the broader impact of blockchain technology across economic, financial, and governance domains. First, it explores how blockchain technology affects the global economy, assessing both the opportunities it creates and the challenges it presents for financial systems. This includes examining blockchain's potential for decentralising economic control and reducing transaction costs. Second, the study investigates how blockchain is reshaping traditional banking and financial services, focusing on how decentralised financial systems (DeFi), and smart contracts could transform banking operations and expand financial inclusion. Third, it seeks to understand the governance structures within decentralised systems, particularly decentralised autonomous organizations (DAOs) and examines the challenges these models face regarding transparency, accountability, and decision-making. Finally, the study addresses the regulatory approaches to blockchain technology and cryptocurrency across different countries, comparing supportive and restrictive policies to understand how these frameworks impact innovation, financial stability, and government control. Guided by key research questions, the study employs a comprehensive literature review, a

community discourse analysis, ethnographic research on DAOs, and a comparative analysis of regulatory frameworks.

The literature review synthesises academic research on topics like cryptocurrencies, smart contracts, and decentralised finance (DeFi), while community discourse analysis captures real-time discussions from blockchain forums, offering practical insights on emerging issues. Ethnographic research provides a closer look at DAOs, exploring challenges in decentralised governance, including accountability and transparency. Lastly, the comparative regulatory analysis examines different countries' approaches to blockchain, highlighting the implications of supportive versus restrictive policies.

## DECODING BLOCKCHAIN: A TECHNICAL ROADMAP TO DECENTRALISATION

The genesis of blockchain technology can be traced to 2008 when an anonymous entity using the pseudonym Satoshi Nakamoto published a revolutionary white paper. This innovative concept initially gained traction among cryptography experts before evolving into Bitcoin in 2009 through the collaborative efforts of technology enthusiasts. Bitcoin, serving as the inaugural blockchain application, not only enabled secure digital currency transactions but eventually expanded to accommodate various forms of digital information exchange, including property rights, contractual agreements, and electoral systems. This versatility stemmed from Bitcoin's open-source nature, which permitted adaptation for diverse blockchain implementations (Swan, 2015).

A blockchain functions as a distributed digital database that chronicles transactions through sophisticated encryption and consensus mechanisms. The system organises transactions chronologically into blocks, which are then connected in an unalterable sequence. Advanced cryptographic methods safeguard data confidentiality and authenticity, while consensus protocols ensure transaction validation. This creates an enduring, transparent record accessible to all network participants.

The technology's distinctive feature lies in its decentralised structure, which eliminates the need for central authority by utilising a peer-to-peer network sustained through cryptographic methods and economic motivators (Kharpal, 2021). As a

cornerstone of the emerging Industrial Revolution, blockchain enables innovative applications such as origin verification, digital identity administration, and asset trading platforms. Its ability to eliminate centralised vulnerabilities and reduce intermediary dependence suggests enhanced stability and efficiency in global financial operations while promoting financial accessibility and real-time market supervision.

Blockchain architecture can be categorised as either public (permissionless) or private (permissioned), each designed to address specific requirements. Public systems prioritise transparency and accessibility, while private implementations offer enhanced control and confidentiality. These architectural decisions are influenced by intended applications across various sectors, from financial services to supply chain management (Yli-Huumo et al., 2016).

Several challenges face blockchain implementation. Key concerns include access control management, which requires balancing security with authorised user accessibility. Additionally, the theoretical risk of "51% attacks" persists, where network manipulation becomes possible through majority control (Iansiti & Lakhani, 2017). While such incidents are uncommon and increasingly difficult to execute due to enhanced security measures, they remain a potential threat. Furthermore, the system's reliability depends heavily on input data quality, as inaccurate or fraudulent information compromises the entire network's integrity (Hirsh & Alman, 2020). Blockchain technology represents an evolution of existing internet infrastructure rather than a complete overhaul. While often compared to the internet's revolutionary impact, blockchain's unique value proposition lies in its decentralised, transparent, and secure characteristics, drawing parallels to innovations like VoIP technology. The ongoing development of blockchain suggests its potential to facilitate more democratic and equitable internet frameworks, advancing digital innovation (Kewell et al., 2017).

### **FROM CODE TO CURRENCY: A JOURNEY THROUGH THE CRYPTO MONEY GAME**

For a new currency, such as Bitcoin, to take off, it must overcome obstacles in a two-sided market where both consumers and businesses must embrace it. In line with libertarian and anarchist ideas of stateless money, Bitcoin developers took use of the 2008 monetary crisis to market Bitcoin as

an alternative to state-controlled currencies (Haber, & Stornetta, 1991). During the "Confrontation Phase" (2009–2014), cypherpunk dreams of digital currency in a decentralised system found resonance with Bitcoin. By replacing centralised authorities with a peer-to-peer network, it got around established banks, which anarchists distrusted. Early acceptance was not solely fuelled by technological progress, but also by political and ideological factors. WikiLeaks started taking Bitcoin donations in 2011 after PayPal was forced to cease processing its transactions, and the Electronic Frontier Foundation was among the first significant organisations to do so (Kaminski, 2019). This illustrated how Bitcoin could get around established financial systems. Mt. Gox, SilkRoad, and SatoshiDice were part of the early Bitcoin ecosystem. Their services ran against established banking regulations, which strengthened Bitcoin's adversarial posture.

The monetary concept of Bitcoin was reminiscent of "free banking" in the pre-1914 era when the value of currency was set by the market. It also shared principles with commodity-backed systems such as the gold standard. Furthermore, Bitcoin has always been motivated by financial speculation. Without altering its fundamental computer code, the emergence of institutional support changed the administration of the initial Bitcoin money game. The third-party intermediation that Bitcoin was intended to eradicate was reinstated by several institutions (Tapscott & Tapscott, 2016). Although it weakened Bitcoin's original political objective, this re-intermediate action made it possible for cryptocurrency to interact with other financial systems, mostly through unregulated exchanges. Within the Bitcoin ecosystem, a niche market developed due to overlapping strategic and normative objectives (Kulhari, 2018).

Important businesses like Baidu, eBay, and Overstock.com integrated Bitcoin into their operations during the Horizontal Integration phase (2012–15), which saw a change in focus from confrontational to strategic (Sultan, 2019). OkCupid, Virgin Galactic, and TigerDirect were among the other businesses that joined the Bitcoin ecosystem by taking Bitcoin in exchange for a restricted number of products and services. While blockchain technology acquired wider adoption, the "Vertical Integration Phase" (since 2013) brought regulatory hurdles, with Bitcoin frequently linked to criminal activity and money laundering. Although they mostly avoided outright prohibitions,

governments and financial institutions found it difficult to distinguish their reactions to Bitcoin from the underlying blockchain technology. Instead, they pushed for regulatory normalisation to retain some influence over its developing ecosystem (Potts et al., 2017).

### **CURRENCY AND POWER: THE DYNAMICS OF THE GLOBAL MONETARY SYSTEM**

The emergence of blockchain technology and cryptocurrencies represents a significant change in the global financial scene. Cryptocurrencies like Bitcoin operate mostly online and are not bound by national laws or conventional banking institutions. Their software architecture, ownership structures, governance, and degrees of decentralisation differ, all of which have a substantial impact on how investors determine their worth. Cryptocurrencies' value is derived from continuous technological improvements and the teams behind them, as opposed to traditional currencies or commodities. The blockchain software is maintained by developers, and transactions are verified and recorded by miners, establishing cryptocurrencies as a new type of international organisation (Zou et al., 2019).

Bitcoin started out as a bold challenge to centralised money, advocating for autonomy and decentralisation. Its initial anti-establishment mentality has been diluted over time as it has been incorporated into conventional banking systems and regulatory frameworks. However, some advocates continue to see Bitcoin as a libertarian political experiment (Kent & Bain, 2022). In contrast to Bitcoin's core principles of decentralisation, the rise of a "Bitcoin aristocracy" has concentrated power and wealth. The conflict between Bitcoin's revolutionary beginnings and its developing place in conventional finance is brought about by this dichotomy (Treiblmaier, 2018).

The adoption of Bitcoin for government services in Zug, Switzerland, and larger initiatives in Switzerland's "crypto valley" to normalise cryptocurrency use serve as examples of the cryptocurrency's incorporation into the formal sector. Bitcoin's widespread acceptability remains restricted despite these developments. Ongoing discussions between regulatory agencies and the cryptocurrency sector are highlighted by financial entities such as hedge funds and initiatives to create Bitcoin ETFs (Kokina et al., 2017). The SEC's denial of a Bitcoin ETF in the United States, on the

grounds of insufficient market regulation highlights how important regulatory supervision is to determine the future of Bitcoin and its potential to become a commonly used medium of exchange (January, 2021).

Blockchain technology has important ramifications that go beyond Bitcoin, particularly when it comes to central banking and virtual currencies. Although the European Central Bank has expressed worries about the possible destabilising consequences of virtual currencies, it is impossible to ignore blockchain's contribution to the legitimacy of the idea of a cashless society (Underwood, 2016). To streamline monetary policy, fight financial crimes, and challenge the business models of conventional retail banks, central banks throughout the world are investigating the issuing of digital currencies, which have the potential to completely reshape the financial system (Seebacher & Schüritz, 2017). A route to a more inclusive financial system is provided by blockchain's intrinsic decentralization and transparency, which is in line with G20's goals to improve financial inclusion for the billions of unbanked people worldwide.

Beyond conventional banking institutions, blockchain has the potential to revolutionise international remittances, especially in unstable and war-torn nations. De-risking measures that exclude a large number of money transfer operators in these areas make the current remittance transfer system even more expensive and ineffective (Jung, 2023). A good substitute is blockchain technology, which makes cross-border transactions safe, transparent, and direct without the need for intermediaries like correspondent banks. This is particularly pertinent to micropayments, which are common in developing nations, and positions cryptocurrencies as instruments for improving financial inclusion and giving underprivileged groups access to vital financial services. Additionally, the system works well with micropayments, which are widespread in underdeveloped nations. Thus, cryptocurrencies can improve financial inclusion and remittance systems, particularly in economies with weak financial infrastructures and ineffective payment systems (Chandler, 2022).

### **DAO REVOLUTION: REDEFINING ORGANISATIONS IN A DECENTRALISED WORLD**

The idea of directly integrating governance rules into smart contracts on a public, irreversible,

decentralised blockchain gave rise to the concept of Decentralised Autonomous Organisations (DAOs). Supporters thought that this would encourage new kinds of organisation and social interaction that are transparent, efficient, equitable, and democratic. DAOs were made possible by the introduction of sophisticated blockchain platforms with integrated programming interfaces, such as Ethereum, even though the concept had been explored from the early days of cryptocurrencies. Ethereum expanded blockchain capabilities by enabling more intricate activities through smart contracts, in contrast to Bitcoin, which helps with transaction validation.

In 2016, the potential of DAOs seemed within reach with the development of a framework by Slock.it is a blockchain company leveraging the Ethereum platform. Slock.it began developing this DAO framework in June 2015, and by March 2016, it had garnered significant community interest. Christoph Jentzsch of Slock.it released a white paper on 15 March 2016, which outlined the vision of DAOs. A community called DAOhub, founded by Felix Albert and Aurnyn Macmillan, was formed to support this initiative, with Slock.it backing. In April 2016, DAOhub appointed 12 curators, including Ethereum's creator Vitalik Buterin, to endorse the project, solidifying its position as a standard-bearer for future DAOs (White, 2017).

With just 900 lines of code, the DAO gave cryptocurrency investors the ability to actively finance and oversee new projects on the Ethereum network. Digital tokens were used to make investments, and the voting power of the investors was based on their contributions. From financing to administration, the entire process was supposed to be open and documented on an unchangeable public ledger run by a decentralised network. By relying only on the coded rules, this approach was intended to do away with the need for human intervention or conventional bargaining (Krishnan, 2020).

However, on 17 June 2016, shortly after its launch, The DAO was hacked due to a vulnerability in its code, resulting in the loss of millions of dollars in ETH tokens. In response, Slock.it, Ethereum leaders, cryptocurrency exchanges, and other experts intervened to mitigate the damage by halting transactions and taking countermeasures. This incident exposed the gap between the theoretical promise of decentralised governance and the practical realities, leading to the abandonment of the planned decentralised model in favour of traditional dispute resolution. Ultimately, a "hard fork" was

executed, reversing the immutable ledger to address the exploit.

The DAO was intended to be a crowdfunded, decentralised investment platform that would function through democracy or direct administration. It sought to serve as a template for other DAOs and was among the first well-known attempts to create a DAO on the Ethereum platform. At first, DAOs were perceived by Vitalik Buterin as pseudo-legal organizations run by a mix of algorithmic and human actors. These DAOs were made to respond to inputs like online data, digital sensors, or decisions made in the real world by carrying out irreversible actions that are documented on an unchangeable ledger. Despite initial excitement, DAOs failed to see any tangible progress until The DAO was introduced. Although the DAO aimed to use blockchain technology to develop a decentralised crowdfunding site like Kickstarter, it encountered legal issues and generated ongoing discussions on the regulatory status of such fundraising systems. The demise of the DAO provides a case study on the difficulties associated with decentralised governance, algorithmic authority, and incentive design problems. It draws attention to the difficulties in incorporating these technologies into the current legal and social structures, as well as the wider ramifications for automated finance and autonomous systems.

The DAO was officially dissolved after the exploit, but the event had a long-lasting impact. A minority who remained loyal to the original blockchain opposed the contentious hard split that attempted to undo the attack, leading to the development of Ethereum Classic (ETC). This division highlighted the ongoing discussions over decentralisation and immutability as well as the difficulties of governance within the Bitcoin ecosystem. Notwithstanding its flaws, The DAO remains a noteworthy turning point in the investigation of decentralised governance and the ways in which blockchain technology may lead to new kinds of social structure.

### **BLOCKCHAIN vs. MONEY LAUNDERING: A DIGITAL SHIELD AGAINST FINANCIAL CRIMES**

According to estimates, money laundering costs the globe between \$1 and \$2 trillion a year, or 5% of global GDP. About \$8 billion is spent annually by banks and authorities to comply with know-your-

customer (KYC), anti-money laundering (AML), and combating the financing of terrorism (CFT) laws to fight this. However, banks must deal with disparate standards due to the lack of a single global regulatory framework, which results in redundant KYC and AML procedures. Due to their inability to effectively prevent or identify money laundering activities, prominent banks have been hit with multiple fines because of this inefficiency.

Blockchain technology has a mixed effect on money laundering, despite its apparent benefits. Blockchain can make money laundering more difficult for bigger transactions utilising existing banking systems, but permissionless blockchains might offer protection for smaller illegal transactions. Blockchains improve transparency and make it more difficult for criminals to hide transaction data by using intermediary banks and numerous transactions. The development of a proof-of-concept for a KYC blockchain system by OCBC Bank, HSBC, IMDA, and Mitsubishi UFJ Financial Group (MUFG) in 2017 is noteworthy. Customers can only input their information once with this method, which eliminates duplication and enables real-time verification by all parties. By allowing regulators and auditors to track transactions in real-time through unchangeable audit trails, such a configuration reduces the risk of fraud and promotes more effective AML and CFT procedures. The biggest obstacle, meanwhile, is still getting more support from financial institutions and regulators.

Decentralisation and quasi-anonymity are two important characteristics of blockchain that have an impact on global money laundering initiatives. Decentralisation eliminates the need for conventional intermediaries like banks, which are essential to the present AML regime, and allows for direct peer-to-peer transactions. Blockchain transactions employ sophisticated algorithms and dispersed user networks rather than depending on centralised organisations for supervision, making it more difficult to monitor and control financial transactions. For example, direct value exchanges without the involvement of banks are made possible by cryptocurrencies such as Bitcoin. Furthermore, the quasi-anonymity of blockchain complicates identification efforts by making it difficult to connect transactions to actual people. Although it is challenging, it is not impossible to trace individuals due to the cryptographic nature of blockchain.

Because blockchain transactions circumvent conventional checkpoints like banks and financial

institutions, their decentralised and quasi-anonymous nature presents issues to the global AML regime. The Silk Road, an online bazaar that only used Bitcoin for illicit transactions resulting in the creator's life in jail on money laundering charges, is an illustration of how blockchain technology may help with money laundering. Although studies have indicated a connection between the usage of cryptocurrencies and illegal activity, there is currently little proof linking blockchain applications to major money laundering schemes. For example, the British National Danger Assessment from 2015 concluded that there were not enough case studies to classify digital currencies as a danger of money laundering.

Globally, reactions to the difficulties presented by blockchain technology have been diverse. While some nations, like China and Vietnam, have selectively restricted financial services including cryptocurrency, others, like Bangladesh, Bolivia, and Ecuador, have outright outlawed them. The usage of digital currencies has been discouraged or outright banned by the central banks of Iceland and Indonesia, while European organisations have cautioned and suggested that financial regulators restrict their interaction with cryptocurrencies. A division between blockchain operations that are compliant and those that are not has resulted from these differing approaches. While official prohibitions and regulatory use of blockchain for monitoring have forced some blockchain activities underground, voluntary compliance with AML regulations has helped mainstream some blockchain applications, highlighting the two paths of legal and illegal uses of technology.

### **THE NEW FINANCIAL ORDER: DECENTRALISED GOVERNANCE IN GLOBAL BANKING**

Traditional positions in finance and governance are being drastically altered by blockchain technology and cryptocurrencies, posing a threat to well-established occupations like insurance, accounting, and law. By eliminating the requirement for legal interpretation of contract language, smart contracts, self-executing agreements with provisions explicitly put into code, may marginalise traditional legal knowledge (Laurence, 2023). This change emphasises the increasing significance of software developers and ICT specialists while simultaneously making things more difficult for current professionals. By altering how businesses function and handle procedures, the use of smart

contracts has the potential to upend corporate governance.

Blockchain offers different governance models that diverge from conventional financial institutions. Blockchain questions traditional principal-agent relationships by integrating rules and decisions directly into software. Blockchain software is at the centre of governance in decentralised apps, as miners and validators preserve transaction integrity while developers and the community play important roles. This paradigm transfers authority from centralised executives to stakeholders and digital communities (Ølnes et al., 2017).

Blockchain's wider effects go beyond financial institutions and are indicative of a movement to decentralise the power that has historically been possessed by nation-states and multinational enterprises. Blockchain's capacity to increase the influence of centralised organizations tempers its potential to decentralise political power. For instance, international banks are creating guidelines for blockchain use in finance, and the Big Four accounting firms are establishing themselves as intermediaries in the blockchain implementation process (Hertz-Shargel & Livingston, 2019). Blockchain-based digital currencies are being investigated by central banks to phase out cash and enhance monetary control. This suggests that whereas blockchain encourages creativity, it may also strengthen current hierarchies of power.

Bitcoin was created amid the 2008 fiscal crisis with the goal of limiting political authority through market competition and decentralisation. Bitcoin's governance is still controversial, even though its original goal was to operate as a trustless system that relied on algorithms rather than intermediaries. Countries have taken a variety of regulatory stances, ranging from restricted regulations in China to complete prohibitions in countries like Bangladesh and Bolivia. These rules frequently force blockchain operations into unregulated domains, which could hinder advantageous applications like easing remittances for migrants (Edelman, 2022).

States still play a vital role in governance despite these technical developments. Governments have changed from hierarchical to networked systems of governance in response to the digital era. For instance, the Snowden disclosures revealed vast digital monitoring capabilities in association with IT behemoths (Whitaker, 2019). Therefore, state influence continues to play a crucial role in

determining the development and integration of blockchain and cryptocurrency technologies, even as they create new dynamics.

The intricate relationship between centralisation and decentralisation is demonstrated by the development of blockchain technology and Bitcoin. Peer-to-peer transactions enable these technologies to empower individuals, but they are also subject to strong legal and policy impacts from centralised organisations. Different nations have different strategies: China follows a balanced approach, Russia imposes limitations, and the United States takes a laxer approach. Canada, known for being crypto-friendly, was the first country to authorise a Bitcoin-traded fund and classify cryptocurrencies as taxable goods. The constant balancing act between innovation and regulation is highlighted by this varied regulatory environment. This is especially important in the Global South, where technological adaptation is slower than in the Global North, potentially leading to wider developmental gaps.

#### **LIBERALISED TECH GOVERNANCE: SHAPING THE U.S. INNOVATION ECOSYSTEM**

Because of the U.S. government's comparatively permissive regulation of blockchain technology and Bitcoin, financial institutions can interact with the Bitcoin network. This environment is not without regulation. Bitcoin exchanges must register as money transmitters, put anti-money laundering protocols in place, and keep track of any suspicious activity to comply with U.S. requirements, such as those set forth by the Financial Crimes Enforcement Network (FinCEN) in 2013 (Pazaitis et al., 2017). This regulatory structure is like the government's approach to VoIP, where the Federal Communications Commission (FCC) issued guidelines without enforcing stringent regulations, allowing VoIP to compete in a market that was dominated by more established telephone companies.

Private currencies like Bitcoin are not prohibited by the U.S. Constitution, even though states are not allowed to create their own money. New York's "Bit License" framework, which was adopted in 2016, is one example of how states like California and New York have imposed licensing requirements for Bitcoin firms (Walsh et al., 2016). By lowering entry barriers and enabling capital to flow into technology-driven endeavours, this lax regulatory approach promotes innovation.



There are drawbacks to this relaxed regulatory approach, though. The volatility of Bitcoin's price may discourage investors and hinder the uptake of the technology (Li & Wang, 2017). Risks are also associated with the uncontrolled environment, particularly in financially fragile areas, such as the Global South, where capital flight assisted by Bitcoin can be troublesome. As a result, some nations have taken more stringent steps to reduce the risk of financial instability posed by developing technology, while others, like Hong Kong, have chosen not to regulate Bitcoin enterprises because they are deemed low risk.

### **A NATION UNDER RESTRICTIONS: THE PROHIBITORY APPROACH IN RUSSIA**

The first nations to outlaw Bitcoin domestically were Bolivia and Ecuador. The biggest and most powerful nation to ban Bitcoin, Russia, did the same in February 2014, severely upsetting the global Bitcoin market. These prohibitions were primarily justified by worries that Bitcoin could be used for money laundering, buying illegal goods and services, and sponsoring terrorism. Usually, nations that outright forbid Bitcoin do so because they are concerned that it can threaten their financial institutions and cause capital flight via the worldwide Bitcoin network. Since capital frequently moves to the Global North, escalating differences in financial stability and policy responses, this issue is especially urgent for countries in the Global South. The Global South is concerned that the Global North may use developing technology to erode its economic dominance, and this is exacerbated by the disparity in global financial power.

For instance, because Russian authorities saw Bitcoin as a threat from foreign agents, they outright outlawed it (Stuit et al., 2022). Due to worries about foreign economic meddling, Vietnam also enacted a prohibition. A restrictive approach can protect nations against the dangers of innovative technology like blockchain, but it also restricts their capacity to capitalise on the potential advantages, preventing them from developing further. As a result, it is critical to strike a balance between risk management and making use of the potential that modern technologies bring, and investigating different governance strategies is required.

### **BALANCING INNOVATION AND CONTROL: CHINA'S PRUDENT APPROACH TO TECH GOVERNANCE**

Between some countries' laissez-faire approaches and others' outright bans, China's approach to Bitcoin regulation strikes a compromise. Despite being seen as a sluggish adopter of new technologies, China has taken the initiative to control the rise of Bitcoin. Due in significant part to its innovative use of Application Specific Integrated Circuits (ASICs) for mining, China possessed more than 50% of the processing power of the Bitcoin network at the end of 2016. With about 96% of the global exchange volume, Chinese exchanges also controlled the majority of Bitcoin transactions worldwide. Although officials have remained cautious in maintaining domestic economic stability, China's open position on Bitcoin has allowed for this rapid rise (Ekman, 2021).

China's regulatory policies demonstrate a balanced approach. The vicepresident of the People's Bank of China (PBC) acknowledged the inevitable rise of digital currencies in September 2016 and underlined the importance of closely monitoring cryptocurrencies such as Bitcoin. China sees potential advantages in using Bitcoin and blockchain technology to improve its financial system, in contrast to nations like Russia, which perceive it as a danger. Notwithstanding notable economic expansion, China's financial sector still confronts difficulties, such as a dearth of information on unofficial money transfers and pervasive tax fraud. With the potential to lower the cost of paper money, increase transparency, and fight financial crimes, the PBC sees digital currencies as a vehicle for financial reform. In contrast to other major economies like the US, the EU, and Japan, which have taken a more cautious approach, the PBC revealed plans in 2016 to create its own digital currency utilising blockchain technology.

The "Notice to Prepare for the Risks of Bitcoin," published in December 2013 by the PBC and the China Banking Regulatory Commission, reflects China's cautious enthusiasm. This notification was the first to formally regulate Bitcoin in China, recognising it as a virtual commodity instead of a currency. The notification forbade payment institutions from providing services to Bitcoin businesses and restricted financial institutions from taking part in Bitcoin-related activity (Zhao et al., 2016). Given Bitcoin's volatility and China's

comparatively small capital markets, this rule sought to reduce the dangers of Bitcoin speculation having an adverse effect on financial institutions.

China is positioned in the middle of the world in terms of regulations. China aims to limit speculative activities without outright banning Bitcoin, while more liberal nations concentrate on the cryptocurrency's illicit uses and those that have officially banned it are worried about financial instability. This tactic enables China to investigate the possible advantages of digital currency while also managing the risks related to Bitcoin. The "shadow of regulation" refers to the Chinese government's ability to enforce more stringent restrictions if needed (Ekman, 2021).

To sum up, China's cautious but proactive attitude to Bitcoin regulation exemplifies its policy of striking a balance between economic stability and technological innovation. China seeks to reduce economic risks by allowing Bitcoin's flaws while focusing on illicit uses and safeguarding its financial institutions. China's experience is a useful case study for future policy development around innovative technologies like Bitcoin and blockchain since it contrasts with both the more liberal and more prohibitive regulations of other nations.

### **REGULATORY DILEMMAS: CHALLENGES IN IMPLEMENTING FORMAL GOVERNANCE**

The "incumbent monies" dilemma, where traditional currencies already predominate, poses serious obstacles to Bitcoin's broad acceptance (Zheng et al., 2018). Making the switch to Bitcoin entails significant expenses, such as changing vending machines and ATMs, updating transaction systems, and becoming familiar with a new currency (Marinč& Miškinis, 2018). Bitcoin must provide significant benefits that exceed these expenses to displace fiat currency. Existing currencies also profit from network effects, which make them the default option because of historical precedent and gain in value with broad use. Bitcoin finds it difficult to compete with the majority of today's currencies since they are backed by the government, have legal tender status, and are widely accepted (Brown & Whittle, 2020).

Although blockchain technology has the potential to improve transaction processing, most individuals are unlikely to switch from fiat money to cryptocurrency. As seen by its exclusive use in the

Silk Road marketplace from 2011 to 2013, Bitcoin's pseudonymous character makes it appealing for illegal activity. The three primary categories of Bitcoin's governance issues are volatility, fragility, and illicit use (Vyas et al., 2022).

In contrast to fiat currencies controlled by central banks, Bitcoin is extremely volatile, fueled by speculative investments, and lacks central authority to stabilise its price. Its dependability as a unit of account or store of value is compromised by this volatility, which can further worsen economic instability, particularly in the Global South, where concerns about capital flight and inflation are prevalent. Although the Bitcoin system is safe, programs like wallets and exchanges that are based on it are susceptible to intrusions (Watson, 2020). The dangers of a system lacking central authority to hold people accountable for losses, in contrast to established financial systems, are highlighted by incidents such as the 2014 Mt. Gox scandal, in which 850,000 Bitcoins were lost.

The pseudonymity of Bitcoin also makes it more difficult to track down transactions and encourages illicit activity like money laundering and online illegal markets. The cryptocurrency market's lack of regulation raises investor risks, making them more susceptible to fraud, scams, and security threats (Piscini et al., 2017). It also makes dispute resolution more difficult. Furthermore, investors are hesitant due to the unclear tax landscape and the possibility of future prohibitions or limitations, which adds to the larger difficulties Bitcoin faces in achieving universal acceptance.

### **CONCLUSION**

This study reveals comprehensive findings regarding blockchain's transformative potential across multiple domains. The analysis demonstrates that blockchain technology fundamentally addresses critical digital challenges through secure data storage and transaction verification mechanisms in decentralised networks, although significant barriers exist in terms of scalability, energy requirements, and cross-system interoperability. In the financial sector, the research indicates that cryptocurrencies exemplify blockchain's democratising impact by enabling secure peer-to-peer transactions without centralised oversight, suggesting potential for broader financial inclusion despite vulnerabilities to hacking and market volatility. The study finds that blockchain's influence extends beyond digital currency,

challenging traditional financial structures by providing alternative mechanisms for value transfer and storage, potentially reducing reliance on fiat currencies and central banks. In examining organisational governance, the research highlights how Decentralised Autonomous Organisations (DAOs) demonstrate blockchain's capacity to distribute decision-making power transparently across communities, though these organisations face substantial challenges in regulatory compliance and accountability within their decentralised framework. The comparative analysis of international regulatory approaches reveals diverse strategies: the United States maintains an innovation-friendly stance to foster blockchain advancement, Russia adopts a prohibitive approach to maintain governmental control, and China implements a balanced strategy that promotes industrial applications while maintaining strict oversight of financial implementations. These findings collectively suggest that while blockchain technology holds substantial promise for transforming digital interactions and financial systems, its successful implementation requires careful consideration of technical limitations, regulatory frameworks, and governance structures.

The analysis revealed significant findings regarding blockchain technology's impact on global economic, banking, and governance systems. In the economic and banking sphere, blockchain technology has emerged as a substantial advancement in payment processing, effectively utilising widespread computing power through its integration of cryptography and time-stamping techniques. While transaction costs could be dramatically reduced through blockchain implementation, cryptocurrencies remain largely confined to niche markets, with their mainstream adoption appearing dependent on either government support or economic conditions such as hyperinflation.

The examination of governance implications, particularly through case studies of The DAO and Ethereum Classic, exposed both the potential and limitations of decentralised autonomous organisations (DAOs). These cases highlighted three critical governance challenges: the implementation of algorithmic authority within legal frameworks, the practical establishment of decentralised systems, and the resolution of ethical considerations in distributed decision-making. Despite The DAO's ultimate goal of transforming governance, its primary function as a speculative

investment platform underscored the persistent value of traditional governance structures.

Beyond cryptocurrency applications, blockchain technology has spawned numerous experimental initiatives, including smart contracts, national digital currencies, and blockchain-based insurance systems. Central banks have shown increasing interest in developing their own digital currencies, suggesting a gradual movement toward a cashless economy. Bitcoin's transparent and auditable system has served as a prototype for future digital monetary systems while maintaining significant influence despite its decentralised and anonymous nature. The technology's resilience is further demonstrated by continued strong community support, even in the face of setbacks like The DAO's failure. These findings collectively indicate blockchain's transformative potential while acknowledging current limitations and areas requiring further development in the evolution of economic and governance systems.

Blockchain technology has the potential to transform the global economy, banking, and governance by decentralising control and introducing new standards of transparency, efficiency, and security. In the economy, blockchain can lower transaction costs and streamline supply chains by providing a secure, tamper-proof ledger for recording and verifying transactions, thus boosting productivity across sectors. In banking, blockchain underpins cryptocurrencies and smart contracts, enabling faster cross-border payments, reducing reliance on intermediaries, and expanding access to financial services for unbanked populations. Additionally, it enables tokenisation of assets, broadening investment opportunities. In governance, blockchain offers tools for more transparent record-keeping, which can improve trust in public services by securing voter data, enhancing regulatory oversight, and preventing fraud. However, its disruptive potential also raises regulatory and ethical questions about data privacy, power dynamics, and the implications of decentralised governance, challenging existing legal frameworks worldwide.

## **FUTURE SCOPE AND SOLUTIONS**

The G20 should create and support a Central Banks Blockchain Consortium to study the monetary and fiscal policy implications of cryptocurrencies and blockchain technology to improve economic resilience. Blockchain has already been the subject

of extensive investigation by major central banks, including those in the United States, Australia, South Africa, China, Japan, Germany, and the European Union. By combining these initiatives, duplication will be avoided, and resource utilisation will be maximised. To thoroughly assess blockchain-based international monetary systems, this consortium should comprise professionals in the domains of economics, law, cryptography, computer sciences, and allied disciplines.

There are major synergies when IoT, AI, and blockchain are integrated. AI can analyse the important data provided by IoT equipment to improve intelligence, and blockchain guarantees safe, self-governing operations that minimise human error. Research should investigate regulatory sandboxes in Switzerland, the UK, Australia, and other countries, as well as hybrid governance models like China's "prudent enthusiasm" approach to Bitcoin. These methods balance innovation and risk by permitting regulated experimentation within a regulatory framework.

Regulatory capture, in which regulators too closely align themselves with industry interests, is one risk that hybrid governance may encounter. More research is needed on this topic, particularly considering the technological expertise needed to properly regulate blockchain. Balanced governance requires an understanding of and commitment to resisting regulatory capture. The effects of cryptocurrencies on the environment should also be the subject of future study. For instance, mining Bitcoin uses a lot of energy, about the same as small nations. Sustainable behaviours can be guided by comparing the environmental impacts of different cryptocurrencies and conventional payment methods. Research should examine if blockchain applications might enhance group activities and procedures by fostering common social goals and less individualistic approaches.

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## DECENTRALIZACIJA I DALJE: UTICAJ BLOKČEJN TEHNOLOGIJE NA GLOBALNE EKONOMIJE, BANKARSTVO I UPRAVLJANJE

Četvrta industrijska revolucija donela je revolucionarne digitalne napretke u biologiji, nauci o materijalima i računarstvu. Među njima, blokčejn tehnologija se ističe kao ključna inovacija sa potencijalom da transformiše ekonomske sisteme i poslovne operacije. Iako blokčejn nudi rešenja za ključne digitalne potrebe poput verifikacije korisnika, bezbednosti podataka i upravljanja intelektualnom svojinom, njegova široka primena je i dalje ograničena zbog nedovoljnog razumevanja njegovih prednosti. Ovo istraživanje se fokusira na dve primarne oblasti: održivost sistema za razmenu kriptovaluta i implikacije blokčejna na upravljanje u digitalnoj ekonomiji. Prevazilazeći Bitcoin, studija ispituje blokčejn iz šire ekonomske perspektive i na organizacionom nivou, posmatrajući blokčejn entitete kao globalne institucije. Analizira potencijal blokčejna kao alata za decentralizovano upravljanje, procenjujući kako stvara vrednost i omogućava efikasno upravljanje, dok potencijalno sprečava finansijske prevare. Studija takođe poredi različite pristupe regulaciji kriptovaluta u različitim zemljama. Metodologija istraživanja kombinuje dva pristupa: sveobuhvatan pregled akademske literature o blokčejnu i analizu diskusija u blokčejn zajednicama. Takođe uključuje etnografsko istraživanje koje ispituje strukture upravljanja i izazove unutar DAO (decentralizovanih autonomnih organizacija).

**Ključne reči:** Blokčejn; Kriptovalute; Bitcoin; Upravljanje; Bankarstvo; Sajberpank.

