

Explore the potential use of blockchain technology in financial services beyond cryptocurrencies

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Abstract

Blockchain technology is helpful to financial service providers in improving risk management, security, and authenticity as well as applied in trade and finance systems to create smart contracts between participants, increase efficiency and transparency, and create new revenue streams. In light of blockchain's special recording capabilities, the current clearing and settlement procedure is no longer necessary. Blockchain-enabled IDs are being adopted by banks and other financial institutions to verify individuals. Organisations who are able to anticipate new trends in financial blockchain applications and create blockchain functionality will provide better outcomes. The ownership transfer of assets and the upkeep of an accurate financial record. Accounting specialists should concentrate on three key areas: measurement, communication, and analysis of financial data. Blockchain has the ability to increase efficiency by making asset ownership and accountancy requirements more clear. This study finds and examines pertinent blockchain-related financial publications. The significance of blockchain technology for financial services is the main topic of this essay. adopts additional tools, tactics, and included services related to financial services based on blockchain technology. The study concludes by identifying and assessing the noteworthy uses of Blockchain technology in the financial services industry. Credit reports have a big influence on consumers' financial life. The better security of blockchain-based credit reporting over traditional server-based reporting is demonstrated by recent data breaches. Digital assets can be issued more quickly, more affordably, and with greater customization thanks to blockchain-based platforms. Because digital financial instruments may be tailored to investors' needs, their adoption can minimise counterparty risk, lower costs for issuers, and increase the market for investors. To provide network users with a single common source of truth, it makes use of mutualized standards, protocols, and shared procedures. With the deployment of this technology, corporate network participants may now interact, handle data, and agree more readily.

Keywords: *Blockchain; Cryptocurrencies; Financial services; Applications*

I. Introduction

Users can update the blockchain network through a decentralised approach provided by blockchain. Financial institutions have no influence over blockchain networks. Blockchains allow for the storing of data, and the digital ledger system makes information exchange easier. It can be used to directly transmit information with users of the network. Blockchain offers a safe network for conducting transactions. Many different types of organisations find blockchain technology appealing due to its strong security mechanism. Accounting operations are currently performed individually by each organisation, and data reconciliation takes manpower and time (Trivedi et al., 2021). By enabling the real-time recording of transactional, contractual, and other information in a shared ledger, blockchain technology can solve this problem. It means that compliance with the law will be automatically verified. The organization's activities will operate with far greater efficacy. Customers may have a better experience, and identities and data transactions may be safer. The foundation of blockchain technology is a distributed ledger idea that records each transaction and keeps track of its timeliness and accuracy on a safe, impenetrable global network (Chang et al., 2020).

This technology can support the preservation of the harmony between technology, user data, and privacy as the digital revolution progresses. Confidentiality may be prioritised more, and data management may gain as well. When accounting papers are reliable and up to date amongst counterparties, the audit process is quicker and more transparent. Auditor attention may be diverted from analysing numerous routine transactions to more complex and contentious issues. Therefore, process automation did not result in the elimination of auditors or accountants (Lahkani et al., 2020). Blockchain technology and artificial intelligence are two very different technologies with a remarkably wide range of applications. On the other hand, artificial intelligence is a highly centralised service that depends on secure data that cannot be viewed or reproduced. Their partnership has many benefits, chief among them being financial support. The order-to-cash, record-to-report, and procure-to-pay processes no longer require recordkeeping thanks to blockchain technology, which enables smooth communication between the parties engaged in transactions (Poongodi et al., 2020).

Blockchain-enabled smart contracts can assist all parties in drafting legally enforceable financial contracts, which they will execute with assurance after fulfilling all requirements. Similar to traditional contracts, smart contracts eliminate the middleman and increase accountability for all parties in ways that ordinary contracts cannot by enforcing the conditions on a blockchain in real-time and without ambiguity (Katona, 2021). The distributed ledger system eliminates the need for a trustworthy third party because intermediary tasks are handled by a decentralised network of computers over the internet. Each transaction is recorded in a digital ledger, shared with all participants in the network, and made accessible to the public. Since each network member has a valid copy of the ledger, the network can verify asset ownership and transparent transactions, making it a more secure mechanism than the current central ledger approach (Rijanto, 2021).

Digital technology has opened up new avenues for greater teamwork. Cloud-based applications with analytics tailored for specific use cases, like contract administration, reporting, account payables and receivables, have changed financial accounting methods. Cash, cashier's checks, and wire transfers are the safest ways to pay. Cannot, however, handle cash and wire transfers, which take time. Payments done with blockchain technology eliminate these issues and boost consumer trust. Real-time cash transfers between financial institutions are made feasible by technology, which reduces friction and speeds up settlement. This technology is perfect for tracking transactions and has the ability to be automated. Smart contracts can be used by financial service providers to keep an eye on vendor deliverables and buyer payments (Wang et al., 2021). The necessity, features, tools, and important uses of blockchain technology for financial services are all covered in this article.

What is Blockchain?

Blocks, chains, nodes, and master nodes make up a blockchain. The nodes control the blocks in the network. The process of adding blocks to the Blockchain is difficult and calls for the solution of mathematical puzzles. The hard math problems that need to be solved limit the blockchain network's infinite growth potential. Because hash codes are unique, hacking, cheating, or otherwise tampering with the blockchain network is nearly impossible. Blockchain is a distributed ledger where each linked computer maintains a copy of the ledger. Because the network is made up of linked blocks that serve as transaction records, it is known as the Blockchain. The blockchain network is essential to the concept and operation of cryptocurrencies (Zhang et al., 2018).

A digital transactional ledger is called a blockchain. The name comes from its structure, where different data, called blocks, are joined together in a single list called a chain. Blockchains are used for much more than only recording financial transactions, such as Bitcoin transactions. Data is managed and stored by a blockchain, which makes it difficult or impossible for someone to change, hack, or cheat the network (Anoop and Goldston, 2022). A blockchain is an electronic ledger consisting of several computer systems that replicate and share digital transaction records. The banking sector has long used modern technologies to ensure data and process security. The rise of cryptocurrencies is evidence that blockchains facilitate the reliable, secure, and verifiable conduct of financial transactions (Zhang et al., 2020).

Blockchain is a type of digital database that allows several machines to store certain operation records simultaneously. With this technology, digital information on contracts, transactions, and contact databases is kept in the form of a network of linked blocks. The lack of clear and transparent financial system regulations leaves businesses vulnerable to frequent errors and erroneous interpretations of information (Caldarelli and Ellul, 2021). Most of these issues are resolved by blockchain technology, which also significantly reduces financial risk. Uniting the populace and enabling safe and effective trade and commerce was the primary objective of the establishment of banks. The blockchain platform is a creation that facilitates the completion of diverse tasks on a worldwide scale (Du et al., 2020).

3. Need of blockchain

Every day, the global financial system handles trillions of dollars' worth of transactions while serving billions of people. These lofty goals come with a number of challenges that the finance industry has long had to overcome. These problems include the cost of having several stakeholders, delays, additional paperwork, and data breaches, which cause the company to suffer significant losses every year. Blockchain technology could be the solution to the problems plaguing the global financial system (Gan et al., 2021). Furthermore, the existence of entities such as stock exchanges, brokers, and regulators drives up the cost of the current stock market. Stock exchanges that use a decentralised management style can see an increase in system efficacy. Blockchain allows for the creation of smart contracts, negating the need for outside regulators. As a result, equity markets are preparing to decentralise. Blockchain technology reduces costs by enabling the secure, middle-man-free execution of all forms of investor-company interactions (Schulz and Feist, 2021). The financial industry has long faced a number of challenges. Great technology advancements have solved a lot of problems, but some breakthroughs have created new ones. Choosing the fintech solution that would be appropriate for financial service providers might be difficult because there are so many possibilities accessible nowadays. Blockchain technology is a

promising application in the financial services industry that could solve important business problems (Fisch et al., 2022). Because of centralization, the financial sector has to distribute a large amount of capital across multiple companies. Accounting, database maintenance, central database procurement, value transfer systems, database security, staffing costs, and intermediary commissions are all necessary investments for financial service providers. Because these assets are all recurring, financial service providers likewise need to budget for each one on a regular basis. Because of all the extra costs, a financial service system may become pricey (Jiang et al., 2022).

Numerous financial services that blockchain technology offers

A few of the highlighted services include cross-border financial transactions, trade finance platforms, accurate credit reporting, clearing and settlements, and digital identity verification, in addition to the numerous innovations and advancements made in the field of blockchain practises for the finance sector (Fig. 1). A competent blockchain-based financial sector will be provided by these highlighted services and blockchain industry advancements (Sheth and Dattani, 2019).



Fig. 1: Illustration of specific and typical services of blockchain in financial sectors (DOI: doi.org/10.1016/j.tbench.2022.100073).

Blockchain is lowering risk, improving security, and saving costs. These blockchain-related advantages partially reduce costs for financial organisations. Traditionally, financial institutions have served as a conduit for information between various parties, resulting in labor-intensive, intricate procedures that impede transaction speed (Xu et al., 2022). Financial organisations can increase client confidence, minimise fraud, and expedite the verification process by securing identification information with Blockchain (Bulut, 2022). Blockchain technology creates an efficient and secure, tamper-proof log of critical activity. As a result, it is ideal for international payments and money transfers. On the Blockchain, the entire process can be automated, improving process efficiency and lowering the number of middlemen often required in these transactions. By eliminating the need for banks to settle transactions, blockchain technology can reduce payment costs (Alabbasi, 2020). Blockchain technology allows companies and regulators to obtain real-time record updates, cutting down on delays and simplifying the process of identifying abnormalities. Because it removes duplication, fraudulent entries, and other problems, blockchain's central encryption is especially advantageous for record management (Li et al., 2022). Financial services industry fee-charging intermediaries like custodian banks and clearers may become obsolete due to blockchain technology. Because banks' operational costs have been drastically cut, blockchain enables superior capital optimisation (Kesharwani et al., 2019). With a distributed ledger technology like Blockchain, bank transactions may be traced and settled more effectively than they can with the existing techniques (Vijai et al., 2019).

In some cases, more market-based governance structures can be made possible by smart contracts, which can reduce expenses associated with information collection and processing, contract creation and negotiation, agreement monitoring and enforcement, and relationship management. Potential benefits of smart contracts include increased trade transaction openness, data veracity assurance, reduced risk of fraud or errors, and streamlined payment exchange. They can also boost the confidence of open account trading participants. Beyond Bitcoin and other cryptocurrencies, blockchain applications are possible. Blockchain technology allows for the tracking and recording of any transaction involving ownership information, including that involving intangible assets like intellectual property and tangible assets like real estate. It could also automate contracts, which would make drafting and executing them considerably easier (Osmani et al., 2022).

Blockchain technology applications in finance service

Blockchain technology shows potential applications for financial services.

(1) Maintaining privacy and confidentiality

This improves transparency, trust, and efficiency while preserving privacy and confidentiality. Hundreds of transactions per second and periodic spikes in network activity are handled by its private and hybrid networks. Some payments in the present banking system can take up to seven days to clear. Every transaction must pass through at least two intermediaries due to the present financial system's several levels before it can be settled. These intermediaries could be external companies like currency exchanges or the front and back offices of a bank in the case of cross-border transfers. Many intermediaries can help ensure security and authenticity in a centralised system, but this comes with a number of disadvantages, such as slower settlement times and greater costs. By automating approval workflows and clearing computations with smart contracts, banks can significantly lower the number of employees required for this activity and expedite processing times. Trillions of bank records, ranging from ledgers of stock market transactions listing stock purchases to personal account information, are contained in the global banking industry. The great majority of these transactions might be recorded using blockchain digital ledgers since they are unchangeable and prevent fraud (Haleem et al., 2021).

(2) Fraud prevention

Blockchain technology's peer-to-peer network and anti-tampering properties allow it to bypass traditional fraud protection methods that need multiple parties to confirm transactions. Blockchain technology offers many advantages, including the rapid transfer of verifiable, fraud-free information and transactions. In the financial industry, contracts, financial processes, and transactions are crucial. The efficiency of this massive volume of transferring documents may be significantly increased by utilising blockchain technology. Because blockchain is decentralised, it can reduce fraud, ensure quick and secure transactions, and ultimately help with risk management inside the networked global financial system. However, this also poses certain challenges. Financial institutions are almost universally the target of fraud. Payment processors and banks play a role in the potential for information theft associated with digital payments. To process and store transaction blocks, blockchains employ cryptographic algorithms. This type of cryptography may make transaction processing for financial institutions less dangerous. Because contracts are so important to finance, businesses spend a lot of time on them. According to Kherbouche et al. (2022), self-executing contracts have the potential to significantly boost the efficacy of the operation.

(3) Assurance of security and transparency

Blockchain technology in financial services enables the simultaneous guarantee of transparency and security. Because no one understands what is going on in the system until something goes wrong or data is compromised, security concerns are increased by the lack of transparency. For financial service providers and their clients, having some level of openness in the system is beneficial, even though no one wants their financial information to be made public. A distributed ledger makes it practically difficult to change ownership, making ownership tracking easier. Enhancing confidence, the ledger can verify information like liens and ownership transfers. Transaction costs, complexity, and time are all decreased because to automation made possible by blockchain technology. When a buyer pays and delivers, smart contracts can keep track of it and handle any issues that may arise. Automated systems minimise human error and operate continually. Blockchain's low costs allow startups to compete with incumbent institutions, promoting financial inclusivity. Many customers are searching for alternatives to banks because of constraints such as fees, minimum balance requirements, and access restrictions. By leveraging digital identity and mobile devices, blockchain can provide an alternative to traditional banking (Kurpjuweit et al., 2021).

(4) Calculate credit scores

New banking and financial services and products, shared operational models, cost-effective procedures, and more transparent, inclusive, and safe business networks are all made possible by the blockchain. During audits, the accountants and compliance officials of financial service providers can furnish comprehensive details. It encourages dishonesty, irregular compliance, unethical behaviour, and lengthy auditing periods. Financial services audits can be accelerated with Blockchain. Because blockchain data is unchangeable, auditors can use it to find out what's going on within a given organisation and whether compliance standards are being met. Companies may be able to compute credit scores using non-traditional criteria thanks to blockchain technology. The blockchain might be used to manage credit scores, hence achieving system transparency. Lenders have the ability to utilise immutable blockchain records of financial transactions to evaluate an individual's credit potential. Smart contracts never expose or compromise an applicant's personal information. Financial companies can maintain the privacy of their users' private, personal, and legal information thanks to blockchain technology. The fund investment companies may instantaneously monitor users, as well as the identity and purpose of the data's users, by utilising an immutable smart contract. Thus, the use of blockchain in financial services can improve investment process transparency (Yaksick, 2019).

(5) Helpful in money transaction

In addition to maintaining openness and allowing money transfers and receipts without the need for multiple middlemen, blockchain ensures the morality and honesty of financial service providers. Any dubious transaction activity is easily detected. Due to the availability of all information, auditing processes will go more swiftly. With Blockchain in finance, borrowers can directly negotiate with lenders regarding terms like interest rate, payment schedule, and transaction duration. This is made possible by the use of immutable smart contracts. This allows lenders and borrowers to negotiate using smart contracts. If the borrower doesn't follow the terms, the smart contract will apply late payment penalties that will raise the total amount owing to the lender. A candidate's credit score is necessary for banks and other financial institutions to consider their loan application. One of the shortcomings of the current credit management system is the lack of credit rating mobility. An individual's credit score is no longer valid in another country. Blockchain maintains a ledger to record information, with each block including transaction data and a unique hash pointing to the block that came before it. Every user on the network also receives copies of the transactions. According to Tezel et al. (2020), these characteristics make blockchain technology resistant to hackers, distributed denial-of-service attacks, and other forms of fraud.

(6) Banking operations

Peer-to-peer transactions in banking and finance could be enabled with the use of Blockchain. Hence, financial service providers don't need to worry about how middlemen fit into peer-to-peer transactions. Smart contracts expedite transaction settlement and blockchain technology enhances accuracy and immutability of data. Above all, monitoring each and every network transaction can assist reduce risks associated with credit and money management. For this reason, financial service providers may be able to better control risk if they incorporate Blockchain into the finance function. Blockchain is viewed by market participants as a means of achieving improved execution, facilitating innovation and lowering barriers to entry, improving reporting and compliance through real-time access to immutable asset-level information, and creating new asset classes and structures. Reconciliation and due diligence requirements can be decreased with the use of blockchain. Using Blockchain reduces the risk of data loss, increases end-to-end predictability and transparency, distributes and enforces business rules, executes transactions in real-time, and streamlines infrastructure. Fundamentally, blockchain technology is simple to comprehend. Each entry in the system's shared database must pass through peer-to-peer networks for encryption and verification (Kumar et al., 2022).

(7) Useful for international payments

Blockchain money transfers eliminate the need for consumers to visit a money transfer location, stand in line, and pay transaction fees by enabling them to send and receive money online using their mobile devices. The majority of money transfers take place via banks or companies that accept credit cards. Blockchain technology is undergoing revolutions all over the world. Every industry has blockchain applications, no matter what we look at. Many businesses in the supply chain, healthcare, logistics, banking, and other industries are expanding thanks to the use of blockchain technology. Transparency and efficacy in company processes are the main goals of blockchain applications. Companies are beginning to realise how blockchain technology may help them grow and succeed. As companies create blockchain apps and experiment with different platforms, the need for new blockchain platforms is increasing constantly. Blockchain's decentralisation and transparency have made it a popular technology. A lot of companies are considering creating innovative financial apps for blockchain platforms. Blockchain-based financial applications do not have problems with immutability, security, or decentralisation. Numerous businesses are concentrating their efforts in this field (Ke et al., 2021).

(8) Speedup transaction system

Financial institutions can use blockchain-based distributed, immutable transaction records for record-keeping and regulatory reporting. The quicker transaction settlements provided by blockchain technology can enhance a number of financial services. Lenders will be able to fund loans faster, vendors will receive payments sooner, and stock exchanges will be able to settle stock purchases and sells promptly. Blockchain technology has the potential to eventually solve a long-standing problem for banks. The banks bear the task of authenticating the identity of their clientele. Blockchain technology is already being developed by a number of companies to assist banks and other financial institutions in establishing identities. This cutting-edge technology secures information transmissions in real time. Blockchain seeks to improve transaction efficiency and speed while reducing costs. Because of the technology's many uses that it can incorporate into other enterprises, investors have access to a multitude of opportunities. The possibility of fraud is increased by the possibility of information being intercepted through several financial intermediaries. This oversight gap can be closed by the cryptographic mechanisms employed by the Blockchain, which provide security in the exchange of information between members. As investors move away from financial advisors to avoid paying more substantial fees, blockchain enables users to save money on traditional financial services (Ghosh, 2021).

II. Conclusion

Blockchain technology is said to have the power to completely change the way financial services companies operate. The primary features of blockchain technology are outlined in this chapter, along with a summary of the literature on the possible effects of blockchain adoption on the four primary financial operations of trading and settlement, compliance, credit and lending, payments and remittance, and compliance. Future study directions are identified by discussing the gaps in the literature that already exist.

References

- [1]. Haleem, M. Javaid, R.P. Singh, R. Suman, S. Rab, Blockchain technology applications in healthcare: An overview, *Int. J. Intell. Netw.* 2 (2021) 130–139.
- [2]. Rijanto, Blockchain technology adoption in supply chain finance, *J. Theor. Appl. Electron. Commerce Res.* 16 (7) (2021) 3078–3098.
- [3]. Tezel, E. Papadonikolaki, I. Yitmen, P. Hilletoft, Preparing construction supply chains for blockchain technology: An investigation of its potential and future directions, *Front. Eng. Manag.* 7 (4) (2020) 547–563.
- [4]. Fisch, M. Meoli, S. Vismara, Does blockchain technology democratize entrepreneurial finance? An empirical comparison of ICOs, venture capital, and REITs, *Econ. Innov. New Technol.* 31 (1–2) (2022) 70–89.
- [5]. Vijai, S.M. Suriyalakshmi, D. Joyce, The blockchain technology and modern ledgers through blockchain accounting, *Adalya J.* 8 (12) (2019).
- [6]. Li, D. Han, N. Crespi, R. Minerva, K.C. Li, A blockchain-based secure storage and access control scheme for supply chain finance, *J. Supercomput.* (2022) 1–30.
- [7]. Bulut, Blockchain-based entrepreneurial finance: success determinants of tourism initial coin offerings, *Curr. Issues Tourism* 25 (11) (2022) 1767–1781.
- [8]. Caldarelli, J. Ellul, The blockchain oracle problem in decentralized finance—A multivocal approach, *Appl. Sci.* 11 (16) (2021) 7572.
- [9]. Sheth, and J. Dattani, Overview of blockchain technology, *Asian J. Convergence Technol.* (2019) ISSN-2350-1146.
- [10]. K. Ghosh, Blockchain technology: a catalyst for change in finance. Ghosh, K.(2021). Blockchain technology: a catalyst for change in finance, *Drishtikon: Manag. J.* 12 (1) (2021) 01–22.
- [11]. K. Schulz, M. Feist, Leveraging blockchain technology for innovative climate finance under the Green Climate fund, *Earth Syst. Gov.* 7 (2021) 100084.
- [12]. L. Wang, X.R. Luo, F. Lee, J. Benitez, Value creation in blockchain-driven supply chain finance, *Inf. Manag.* (2021) 103510.
- [13]. L. Zhang, Y. Xie, Y. Zheng, W. Xue, X. Zheng, X. Xu, The challenges and countermeasures of blockchain in finance and economics, *Syst. Res. Behav. Sci.* 37 (4) (2020) 691–698.
- [14]. M. Du, Q. Chen, J. Xiao, H. Yang, X. Ma, Supply chain finance innovation using blockchain, *IEEE Trans. Eng. Manage.* 67 (4) (2020) 1045–1058.
- [15]. M. Kherbouche, G. Pisoni, B. Molnár, Model to program and blockchain approaches for business processes and workflows in finance, *Appl. Syst. Innov.* 5 (1) (2022) 10.
- [16]. M. Osmani, R. El-Haddadeh, N. Hindi, M. Janssen, V. Weerakkody, Blockchain for next generation services in banking and finance: cost, benefit, risk and opportunity analysis, *J. Enterp. Inf. Manag.* (2020).
- [17]. M. Poongodi, A. Sharma, V. Vijayakumar, V. Bhardwaj, A.P. Sharma, R. Iqbal, R. Kumar, Prediction of the price of ethereum blockchain cryptocurrency in an industrial finance system, *Comput. Electr. Eng.* 81 (2020) 106527.
- [18]. M. Xu, S. Ma, G. Wang, Differential game model of information sharing among supply chain finance based on blockchain technology, *Sustainability* 14 (12) (2022) 7139.
- [19]. M.J. Lahkani, S. Wang, M. Urbański, M. Egorova, Sustainable B2B E-commerce and blockchain-based supply chain finance, *Sustainability* 12 (10) (2020) 3968.
- [20]. Q. Gan, R.Y.K. Lau, J. Hong, A critical review of blockchain applications to banking and finance: a qualitative thematic analysis approach, *Technol. Anal. Strateg. Manag.* (2021) 1–17.
- [21]. R. Jiang, Y. Kang, Y. Liu, Z. Liang, Y. Duan, Y. Sun, J. Liu, A trust transitivity model of small and medium-sized manufacturing enterprises under blockchain-based supply chain finance, *Int. J. Prod. Econ.* 247 (2022) 108469.
- [22]. R. Yaksick, Overcoming supply chain finance challenges via blockchain technology, in: *Disruptive Innovation in Business and Finance in the Digital World*, Emerald Publishing Limited, 2019.
- [23]. S. Kesharwani, M.P. Sarkar, S. Oberoi, Impact of blockchain technology and 5G/IoT on supply chain management and trade finance, *Cybernomics* 1 (1) (2019) 18–20.
- [24]. S. Kumar, W.M. Lim, U. Sivarajah, J. Kaur, Artificial intelligence and blockchain integration in business: trends from a bibliometric-content analysis, *Inf. Syst. Front.* (2022) 1–26.
- [25]. S. Kurpjuweit, C.G. Schmidt, M. Klöckner, S.M. Wagner, Blockchain in additive manufacturing and its impact on supply chains, *J. Bus. Logist.* 42 (1) (2021) 46–70.
- [26]. S. Trivedi, K. Mehta, R. Sharma, Systematic literature review on application of blockchain technology in E-finance and financial services, *J. Technol. Manag. Innov.* 16 (3) (2021) 89–102.
- [27]. T. Katona, Decentralized finance: the possibilities of a blockchain money lego system, *Financ. Econ. Rev.* 20 (1) (2021) 74–102.
- [28]. V. Chang, P. Baudier, H. Zhang, Q. Xu, J. Zhang, M. Arami, How Blockchain can impact financial services—The overview, challenges and recommendations from expert interviewees, *Technol. Forecast. Soc. Change* 158 (2020) 120166.
- [29]. V.S. Anoop, J. Goldston, Decentralized finance to hybrid finance through blockchain: a case-study of acala and current, *J. Bank. Financ. Technol.* (2022) 1–7.
- [30]. X. Zhang, M. Aranguiz, D. Xu, X. Zhang, X. Xu, Utilizing blockchain for better enforcement of green finance law and regulations, in: *Transforming Climate Finance and Green Investment with Blockchains*, Academic Press, 2018, pp. 289–301.
- [31]. Y. Alabbasi, Governance and legal framework of blockchain technology as a digital economic finance, *Int. J. Innov. Digit. Econ.* 11 (4) (2020) 52–62.
- [32]. Y. Ke, D. Xianghui, G. Wenxin, T. Wei, Research on the financing mode and path innovation of small and medium-sized private enterprises under the background of blockchain finance, *Acad. J. Bus. Manag.* 3 (2) (2021).