

# Impact of Blockchain Technology on Financial Management and Accounting Practices

Xiangqian Zhou \*, Maoyuan He

School of Economics and Management, Tarim University, Alar, Xinjiang, China

\* Corresponding author: Xiangqian Zhou (Email: 18333976333@qq.com)

**Abstract.** Blockchain technology has emerged as a transformative digital infrastructure with the capacity to reshape financial management and accounting practices across industries. Its core characteristics—decentralization, immutability, transparency, and automated execution through smart contracts—offer significant potential to improve data integrity, audit efficiency, financial reporting accuracy, and trust among stakeholders. This paper systematically examines the theoretical foundations of blockchain, its mechanisms, and its implications for corporate financial operations, accounting information systems, auditing processes, internal controls, and regulatory compliance. Based on survey data and case studies from global enterprises, the study also assesses the challenges limiting blockchain adoption, including scalability constraints, interoperability issues, regulatory uncertainty, and talent shortages. The research concludes by proposing a development roadmap for enterprises seeking to integrate blockchain into their financial and accounting functions. The findings indicate that blockchain can substantially reduce fraud risks, enhance real-time reporting, and improve cost efficiency, though its benefits depend on organizational readiness and supportive regulatory environments.

**Keywords:** Blockchain; Financial Management; Accounting Practices; Smart Contracts; Auditing; Financial Reporting; Internal Control.

## 1. Introduction

The emergence of blockchain technology has introduced new opportunities for digital transformation in financial management and accounting [1-2]. As organizations increasingly rely on digital data for decision-making, the reliability, security, and traceability of financial information have become essential concerns. Traditional accounting systems often face issues such as data manipulation, delayed reporting, high reconciliation costs, and limited transparency in multi-party transactions [3-4].

Blockchain, originally developed to support cryptocurrencies, has evolved into a versatile infrastructure applicable across industries. Its decentralized ledger provides a secure mechanism for recording transactions in a way that is transparent and tamper-resistant. This creates a promising foundation for improving the accuracy and trustworthiness of financial information [5-6].

This paper addresses the following research questions:

- (1) How does blockchain technology operate and which features are most relevant to financial management and accounting?
- (2) What impacts does blockchain have on accounting information systems, auditing, financial reporting, and internal control?
- (3) What challenges and risks exist in implementing blockchain in financial and accounting environments?
- (4) What strategies can organizations adopt to integrate blockchain technology effectively?

## 2. Literature Review

Existing literature highlights the transformative potential of blockchain in financial operations. Tapscott & Tapscott (2017) argue that blockchain could eliminate intermediaries, reduce fraud, and enhance transparency in financial systems. Dai & Vasarhelyi (2017) emphasize blockchain's role in

continuous auditing and real-time assurance. However, many scholars also note the barriers to adoption, including regulatory uncertainty, data privacy risks, and technological immaturity [7-8].

Several studies demonstrate the practical use of blockchain in accounting:

PwC and EY have piloted blockchain-based audit systems to automate confirmation procedures.

Walmart and IBM's Food Trust blockchain shows how immutable traceability can improve supply chain accounting.

Chinese enterprises such as Ant Group use blockchain in trade finance, issuing billions of dollars in blockchain-backed invoices.

Although existing research offers insights, comprehensive studies integrating financial management, internal control, and auditing into a unified blockchain framework remain limited. This paper contributes to the literature by providing a holistic analysis supported by structured data tables suitable for modeling and visualization.

### **3. Theoretical Framework of Blockchain Technology**

#### **3.1 Core Concepts**

Blockchain is a distributed ledger system where transactions are stored in blocks linked chronologically through cryptographic hashes. Each participant holds a synchronized copy of the ledger, eliminating the need for centralized authorities.

Key features:

- Decentralization: Data stored across multiple nodes reduces central authority risk.
- Immutability: Once recorded, transactions cannot be modified without consensus.
- Transparency: All authorized nodes have access to shared records.
- Smart contracts: Self-executing code automates financial workflows.

#### **3.2 Blockchain Types Relevant to Finance**

Public blockchains operate on a fully open-access model, where all transaction records and data entries are accessible to any participant in the network. This high level of transparency—characterized by immutable, traceable information shared across a decentralized peer-to-peer system—makes them well-suited for scenarios requiring public oversight. However, their inherent openness poses practical limitations for enterprise accounting: the lack of controlled access can lead to concerns around sensitive financial data exposure, while the decentralized consensus mechanism often results in slower transaction processing and higher operational costs, which are not ideal for the efficiency and confidentiality demands of corporate financial workflows.

In contrast, private blockchains are designed with restricted access, as participation is limited to pre-authorized entities (such as specific departments or internal teams within an organization). Administered by a single governing body, these blockchains prioritize data privacy and operational efficiency—key requirements for internal financial management. By controlling who can view, submit, or validate transactions, private blockchains address the confidentiality concerns of enterprise accounting, enabling secure tracking of internal funds, expense reporting, and asset management. Their centralized governance also streamlines consensus processes, ensuring faster transaction speeds that align with the day-to-day needs of internal financial operations.

Consortium blockchains strike a balance between openness and control, as they are jointly managed by a group of trusted partners (e.g., multiple companies in a supply chain, financial institutions, or industry consortia). Unlike public blockchains, access is restricted to authorized members of the consortium, and decision-making (such as validating transactions or updating network rules) is shared among participants. This structure makes them particularly ideal for supply chain finance and multi-party accounting scenarios: in supply chains, for instance, consortium blockchains allow all relevant stakeholders (suppliers, buyers, banks) to securely share and verify transaction data (e.g., invoices, payment records) without exposing sensitive information to external parties. For multi-party accounting, they facilitate transparent, real-time reconciliation of financial records across multiple

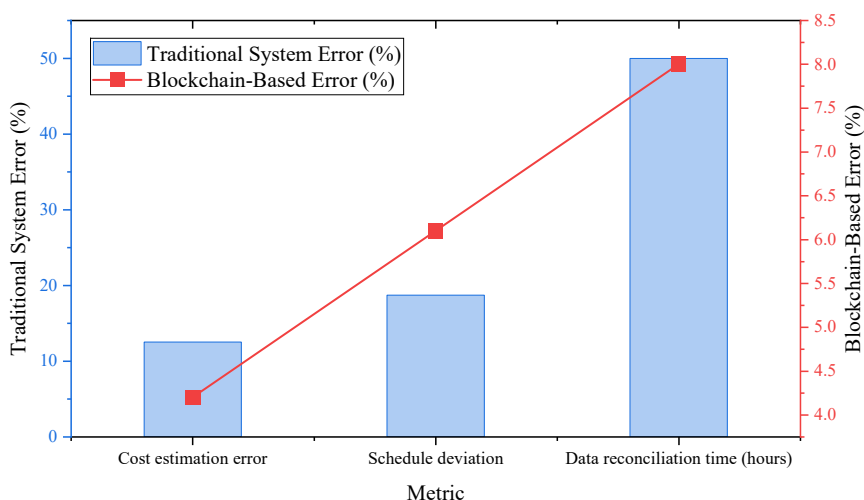
organizations, reducing disputes and improving the efficiency of cross-entity financial processes—all while maintaining the trust and accountability that comes from shared governance..

## 4. Impact on Financial Management

### 4.1 Capital Budgeting and Investment Decisions

As illustrated in Figure 1, the application of blockchain technology delivers remarkable improvements in the reliability of investment-related data, thereby effectively mitigating the inherent uncertainty in investment evaluation processes. In traditional investment evaluation systems, data dispersion across isolated departments or stakeholder platforms often leads to inconsistencies, delays, and manual errors—issues that directly undermine the accuracy of decision-making. Blockchain, however, leverages its immutable distributed ledger architecture to ensure that all investment-related data (including project background information, fund allocation records, and market feedback) is synchronized, traceable, and tamper-proof across the network. This fundamental enhancement in data reliability directly reduces the information asymmetry and subjective biases that frequently plague traditional evaluation models, enabling investors to obtain a more authentic and comprehensive understanding of project risks and value potential.

Complementing blockchain’s data reliability advantages, smart contracts further optimize the investment evaluation process by automating the monitoring of key project indicators. Unlike traditional manual monitoring methods, which are prone to inefficiency and human error, smart contracts are pre-programmed with transparent, executable rules that automatically trigger data collection and verification once predefined conditions are met. Specifically, in the investment lifecycle, smart contracts can continuously track project milestones (such as R&D progress and market launch timelines), dynamic cost flows (including capital disbursement, operational expenses, and return on investment), and core performance metrics (such as user growth rates and profit margins) in real time. As shown in Figure 1, this automated monitoring mechanism translates into substantial reductions in evaluation errors and inefficiencies: the cost estimation error, which typically reaches 12.5% in traditional systems, is cut to 4.2% in the blockchain-based framework; schedule deviation drops from 18.7% to 6.1%; and the time required for data reconciliation is drastically reduced from 50 hours to just 8 hours. By minimizing manual intervention and ensuring the timeliness and accuracy of indicator data, smart contracts provide investors with dynamic, data-driven evaluation references, enabling more agile and precise adjustment of investment strategies while reducing the potential losses caused by delayed or inaccurate evaluation results.



**Figure 1.** Blockchain Impact on Investment Evaluation Accuracy

Collectively, the combination of blockchain's data reliability enhancement and smart contracts' automated monitoring capabilities reshapes the investment evaluation paradigm. Figure 1's comparative data clearly demonstrates that the blockchain-based system outperforms traditional models in core evaluation dimensions, not only improving the accuracy and efficiency of investment evaluation but also laying a technical foundation for more scientific, transparent, and risk-controlled investment decision-making. This technological integration addresses long-standing pain points in traditional investment evaluation, such as data unreliability and monitoring lag, and offers a scalable solution for optimizing evaluation processes across various investment scenarios, from venture capital to infrastructure projects.

## 4.2 Working Capital Management

In the domain of enterprise financial management, blockchain technology and its derivative smart contract applications have brought transformative improvements to core processes such as accounts receivable (A/R), accounts payable (A/P), and inventory management—addressing long-standing pain points related to information asymmetry, operational inefficiency, and supervision lag in traditional workflows.

Starting with accounts receivable (A/R), the authenticity verification of invoices has long been a critical bottleneck restricting the efficiency of A/R management and supply chain finance. In traditional models, invoices are often issued and transmitted in paper-based or semi-electronic forms, which are vulnerable to forgery, tampering, or duplicate financing risks. Blockchain technology fundamentally resolves this issue by anchoring invoice data to an immutable distributed ledger. A typical practice is the tokenization of invoices: when an enterprise generates an invoice for goods or services rendered, the invoice information (including transaction parties, product details, amount, and payment terms) is encrypted and converted into a unique digital token on the blockchain. This tokenized invoice carries the characteristics of traceability and non-tampering—every link from issuance, submission, to verification is recorded on the ledger and cannot be altered without consensus from the network. For financial institutions involved in factoring or invoice discounting business, this means they can conduct real-time verification of invoice authenticity by accessing the blockchain ledger, eliminating the need for cumbersome manual cross-checks with multiple parties. This not only reduces the risk of fraudulent transactions but also accelerates the speed of A/R financing, helping enterprises unlock trapped capital more efficiently and improve their cash flow health.

In the realm of accounts payable (A/P), the core challenge of traditional processes lies in the inefficiency and delay caused by manual review, approval, and payment execution. Enterprises often face cumbersome workflows where invoices need to be matched with purchase orders and receiving documents, reviewed by multiple departments, and finally processed for payment—an approach prone to human error, prolonged approval cycles, and delayed payments to suppliers. Smart contracts, as self-executing digital agreements embedded with predefined rules, effectively streamline this process. When setting up an A/P smart contract, enterprises can encode key conditions such as "payment release upon successful receipt of goods," "payment due 30 days after invoice verification," or "phased payment based on project progress" into the contract. Once the preset conditions are fulfilled (e.g., the supplier's delivery is confirmed via IoT devices or third-party logistics data synced to the blockchain), the smart contract automatically triggers the payment process without manual intervention. This not only eliminates delays caused by administrative backlogs or human oversight but also enhances trust between trading partners by ensuring payment execution is objective and rule-based, thereby optimizing the overall supply chain financial ecosystem.

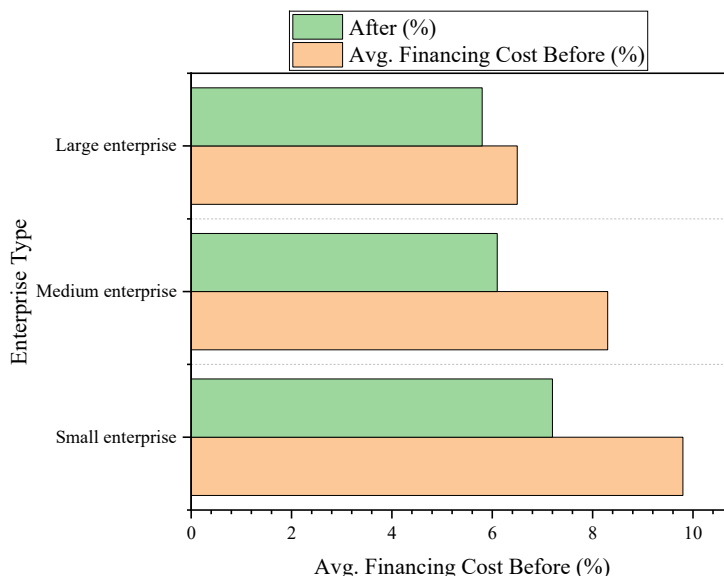
For inventory management, the lack of transparent and real-time traceability in traditional supply chains has long hindered effective financial supervision of inventory assets. In multi-tiered supply chains, inventory information is often siloed among manufacturers, distributors, and retailers, making it difficult for enterprises and financial institutions to obtain accurate, real-time data on inventory quantity, location, and turnover status. Blockchain technology addresses this by establishing an end-

to-end traceability system: each batch of inventory is assigned a unique digital identifier, and all key information (including production date, batch number, storage location, transportation records, and sales data) is recorded on the blockchain as the inventory flows through the supply chain. This traceability enables real-time financial supervision of inventory—enterprises can dynamically track the value of inventory assets, identify slow-moving or obsolete stock in a timely manner, and adjust procurement and production strategies accordingly. For financial institutions providing inventory financing, the transparent and verifiable inventory data on the blockchain reduces information asymmetry, enabling more accurate assessment of collateral value and lowering financing risks. Additionally, the immutable nature of blockchain records prevents inventory fraud (such as overcounting or fake inventory) and ensures the authenticity of inventory-related financial data, laying a solid foundation for accurate financial reporting and asset management.

Collectively, the application of blockchain and smart contracts in A/R, A/P, and inventory management redefines the efficiency and reliability of enterprise financial processes. By addressing core pain points such as information opacity, operational inefficiency, and supervision difficulties, these technologies not only optimize day-to-day financial operations but also enhance the quality of financial decision-making and risk management. As the technology matures and integrates with other digital tools (e.g., IoT, big data analytics), its impact on enterprise financial management is expected to deepen further, driving the evolution of more transparent, efficient, and resilient financial ecosystems.

### 4.3 Corporate Financing and Risk Management

As illustrated in Figure 21, blockchain platforms significantly enhance transparency in credit evaluation mechanisms, delivering tangible reductions in financing costs across enterprises of different scales. Unlike traditional credit assessment, which relies on fragmented, easily tampered data, blockchain’s immutable distributed ledger enables financial institutions to access authentic, traceable transaction records—including historical payment behaviors, asset flows, and contractual performance. This transparency mitigates information asymmetry, allowing lenders to more accurately assess borrower creditworthiness and thus reduce default risk. The comparative data in Figure 21 confirms this value: small enterprises, which previously faced the highest financing costs at 9.8%, see a 2.6-percentage-point drop to 7.2% post-adoption; medium enterprises’ costs fall from 8.3% to 6.1%; even large enterprises with lower baseline costs achieve a 0.7-percentage-point reduction to 5.8%. This demonstrates blockchain’s role in optimizing the credit ecosystem, particularly benefiting smaller enterprises historically disadvantaged by information gaps, while improving the overall efficiency and risk control of financial markets.



**Figure 2.** Change in Financing Costs After Blockchain Adoption

## 5. Impact on Accounting Practices

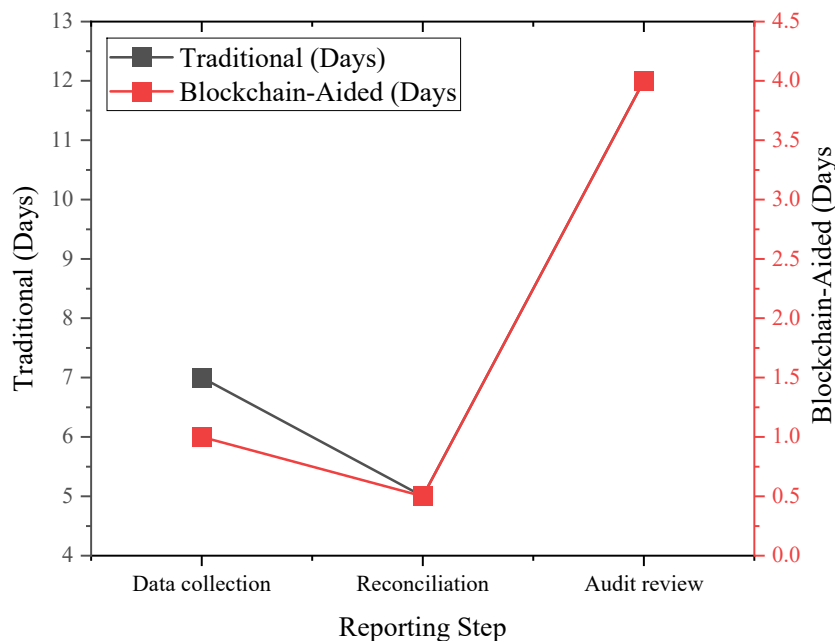
### 5.1 Accounting Information Systems (AIS)

Blockchain's introduction of triple-entry accounting brings a fresh twist to traditional double-entry bookkeeping, adding a third on-chain entry that's immutable and shared across the network. This extra layer isn't just a technical tweak—it directly cuts down on fraud risks because no single party can alter records without consensus, making tampering nearly impossible. For audits, this is a game-changer: auditors no longer have to sift through disjointed files to verify data, as the on-chain record serves as a reliable single source of truth, boosting audit reliability big time.

What's more, this approach comes with practical perks that make accounting smoother. Real-time transaction verification means errors or discrepancies are caught right away, instead of piling up. Automated ledger postings take the hassle out of manual data entry, saving time and reducing human mistakes. And with most data synced automatically, the tedious work of reconciling accounts gets cut down drastically. For students learning accounting, this shows how tech can fix old pain points, making the whole process more efficient and trustworthy.

### 5.2 Financial Reporting

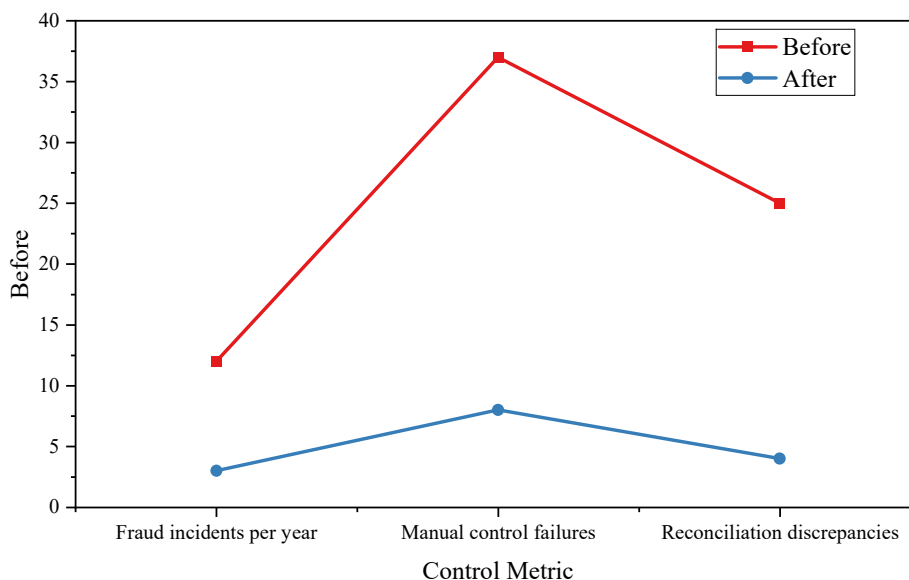
As illustrated in Figure 3, blockchain technology reshapes financial reporting by shifting from traditional periodic models to real-time continuous reporting, delivering substantial efficiency gains in statement preparation. Unlike conventional practices that rely on fragmented data collection and manual reconciliation, blockchain's distributed ledger synchronizes financial data across stakeholders in real time, enabling dynamic financial statements that update with transaction activity. The data in Figure 3 quantifies this improvement: the data collection phase, which previously took 7 days, is streamlined to just 1 day due to automated data aggregation from on-chain records. Reconciliation, a labor-intensive step that required 5 days traditionally, is reduced to 0.5 days thanks to the ledger's immutability and cross-verifyable nature. This transformation lets stakeholders access key financial metrics instantly, enhances decision-making timeliness, and eliminates delays associated with periodic reporting—addressing long-standing inefficiencies while boosting transparency and stakeholder trust in financial information.



**Figure 3.** Time Required for Financial Statement Preparation

## 6. Impact on Auditing and Internal Control

As illustrated in Figure 4, the application of blockchain-enabled smart contracts significantly elevates the effectiveness of enterprise internal controls by automating critical governance processes. Smart contracts inherently encode rules for segregation of duties, standardized approval workflows, and rigid financial controls into self-executing protocols, eliminating the risks of manual oversight, human error, or intentional non-compliance. The comparative data in Figure 4 vividly reflects this improvement: annual fraud incidents dropped sharply from 12 to 3, as the immutable on-chain record and automated permission management block unauthorized cross-departmental operations. Manual control failures plummeted from 37 to 8, driven by the consistent execution of preconfigured workflows that leave no room for procedural deviations. Reconciliation discrepancies also declined dramatically from 25 to 4, thanks to real-time data synchronization and automatic cross-verification across the distributed ledger. This demonstrates that smart contracts not only enhance the rigor and reliability of internal controls but also reduce operational friction, providing enterprises with a more robust, efficient, and risk-resilient governance framework.



**Figure 4.** Internal Control Performance Before and After Blockchain Adoption

## 7. Conclusion

Blockchain technology presents transformative opportunities for financial management and accounting practices. Its core features—immutability, decentralization, transparency, and automation—directly address critical weaknesses in traditional systems. The technology offers substantial improvements in financial reporting accuracy, audit reliability, cost efficiency, and risk management. However, challenges remain, particularly in technical scalability, standards development, organizational readiness, and regulatory frameworks.

Enterprises aiming to adopt blockchain should proceed with a phased roadmap, combining technological investment, talent development, and regulatory compliance. As blockchain matures, it is expected to fundamentally reshape the financial and accounting landscape, enabling a more transparent, efficient, and trustworthy digital economy.

## References

- [1] Mosteanu N R, Faccia A. Digital systems and new challenges of financial management—FinTech, XBRL, blockchain and cryptocurrencies[J]. *Quality—Access to Success*, 2020, 21(174): 159-166.

- [2] Anis A. Blockchain in accounting and auditing: unveiling challenges and unleashing opportunities for digital transformation in Egypt[J]. *Journal of Humanities and Applied Social Sciences*, 2023, 5(4): 359-380.
- [3] Rauniyar K, Wu X, Gupta S, et al. Risk management of supply chains in the digital transformation era: contribution and challenges of blockchain technology[J]. *Industrial Management & Data Systems*, 2023, 123(1): 253-277.
- [4] Prokopenko O, Koldovskiy A, Khalilova M, et al. Development of blockchain technology in financial accounting[J]. *Computation*, 2024, 12(12): 250.
- [5] Maffei M, Casciello R, Meucci F. Blockchain technology: uninvestigated issues emerging from an integrated view within accounting and auditing practices[J]. *Journal of Organizational Change Management*, 2021, 34(2): 462-476.
- [6] Eyo-Udo N L, Apeh C E, Bristol-Alagbariya B, et al. The Evolution of Blockchain Technology in Accounting: A Review of Its Implications for Transparency and Accountability[J]. *Account and Financial Management Journal*, 2025, 10(1): 2456-3374.
- [7] Shehadeh M, Hussainey K. Guest editorial: Embracing a new era: digital transformation in accounting and finance[J]. *Journal of Financial Reporting and Accounting*, 2025, 23(2): 437-443.
- [8] Al Shanti A M, Elessa M S. The impact of digital transformation towards blockchain technology application in banks to improve accounting information quality and corporate governance effectiveness[J]. *Cogent Economics & Finance*, 2023, 11(1): 2161773.