**International Journal of Applied Mathematics**
**Volume 38 No. 8s, 2025**
ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

# BLOCKCHAIN TECHNOLOGY AS STRATEGY FOR IMPROVING THE TRACEABILITY OF RECORDS IN ACCOUNTING MANAGEMENT

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**Abstract**: This paper presents the existing evidence on the effectiveness of blockchain technology, in comparison with traditional methods, for improving the traceability of accounting records in Colombia during the last decade. Through a Systematic Literature Review (SLR), guided by the PRISMA protocol, 17 documents published between 2015 and 2025, in English and Spanish, that addressed the relationship between blockchain, traceability and accounting, were analyzed. The findings show a solid theoretical convergence around the advantages of blockchain; immutability of records, distributed verification, reduction of reconciliation costs, fraud prevention and possibility of continuous audit. Likewise, the projection towards triple-entry accounting is identified, which reinforces transparency and accountability. However, there are important differences related to the lack of empirical evidence in Colombia, the absence of standardized indicators and the adoption challenges related to scalability, regulation and implementation costs. In conclusion, the literature confirms that blockchain is more effective than traditional methods to strengthen accounting traceability, although in the Colombian context this statement should be considered provisional until comparative empirical studies are available that allow its impact to be accurately measured.

**Keywords**: Accounting Management, Traceability of Records, Data Transparency, Financial Information, Reconciliations and Verifications.

## 1. Introduction

Within the framework of digital transformation, organizations seek to integrate emerging technologies that strengthen their internal processes and increase their competitiveness. Among these innovations is Blockchain technology, defined as “a distributed and decentralized ledger that records transactions in an immutable and transparent way" (Gracia-Martínez, Clavijo-Caceres, et al., 2024). These properties make it a promising tool to improve the integrity, traceability and security of accounting records and audit processes. However, there is still a need to identify the empirical evidence that supports its effectiveness compared to traditional accounting methods, particularly in the Colombian context during the last decade.

Received: August 11, 2025

**International Journal of Applied Mathematics**
**Volume 38 No. 8s, 2025**
ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

To understand the potential of Blockchain in this field, it is necessary to first remember the fundamental role of accounting records in professional practice. These constitute the basis of accounting, allowing to document, classify and analyze economic transactions. Beyond their technical function, they reflect the historical, conceptual and technological evolution of the discipline (Translated & Matringe, 2024), the authors also highlight that they currently function as a repository of collective memories that reinforce the sense of belonging in organizations and societies. They also serve as a support for decision-making, facilitating planning and future projection (Birnberg & Shields, 1984; Libby & Trotman, 1993), and constitute an essential mechanism for transaction validation and accountability.

In contrast, the blockchain is presented as a distributed, public and immutable database, structured in cryptographically linked blocks. Its operation relies on a consensus system between nodes, which guarantees availability, persistence and integrity of the data without the need for a central authority (Deloitte, 2019; Monllau Jaques, 2018). These characteristics make it possible to set up a reliable traceability and continuous audit mechanism, in which each transaction is permanently recorded, which makes manipulation difficult and strengthens confidence in accounting and financial processes (Dolader Retamal et al., 2017).

The methodology of this study corresponds to a systematic literature review, developed under the PRISMA protocol, based on the findings published in databases such as Scopus and Google Academic. The research is aimed at answering the following question: What evidence exists on the effectiveness of the use of Blockchain, in comparison with traditional methods, to improve the traceability of accounting records in Colombia during the last decade? For this, studies are considered at three levels: international, Latin American and national, in order to obtain a comprehensive and comparative view.

The historical background shows that the irruption of the Blockchain in 2008, with Nakamoto's article, marked a turning point in registration systems. Although initially designed to support Bitcoin transactions, the technology was consolidated as a distributed and immutable ledger, applicable to the verification and traceability of accounting records. At the international level, different researches highlight benefits such as security, transparency, cost reduction and continuous audits (Rodriguez de Ramirez & Sarro, 2019; Wanden-Berghe, 2023).

In Latin America, studies point to challenges associated with regulatory adaptation and professional training, but also recognize their potential to strengthen accountability and the automation of records (Casanova-Villalba et al., 2024; Rodriguez de Ramirez & Sarro, 2019). In Colombia, although there are advances in areas such as smart contracts and supply chains (Rodríguez Guerrero et al., 2024) accounting research is still at an incipient stage.

The specialized literature agrees that the Blockchain redefines the relationship between accounting and auditing, by moving from a model based on trust in intermediaries to a distributed verification system (Casanova-Villalba et al., 2024; Mataruana Murillo, 2025). However, there are still limitations related to scalability, regulatory gaps and the need for more empirical evidence, especially in national contexts.

In this framework, the present research focuses its analysis on the last decade, with the purpose of comparing the available evidence on the use of Blockchain compared to traditional accounting registration methods, evaluating to what extent this technology contributes to improving the traceability and reliability of financial information. Although the benefits of blockchain have been demonstrated internationally, studies are still emerging in Colombia, which constitutes a knowledge gap that justifies the relevance of this study.

However, in the Colombian context, the comparative empirical evidence on the effectiveness of blockchain compared to traditional methods in the traceability of accounting records remains limited, which raises the need for research that critically analyzes the advances achieved in the last decade and values its applicability at the national level.

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## 2. Literature Review

### 2.1 Blockchain in accounting records.

In the accounting field, blockchain is presented as a disruptive tool that transforms the way financial transactions are recorded and verified. Its distributed, immutable and transparent nature allows to replace the dependence on intermediaries by a decentralized verification system, which strengthens the reliability of the information and reduces the risks of fraud or manipulation. The international literature highlights benefits such as the automation of records, the reduction of reconciliation costs and continuous auditing, in addition to opening the way to triple-entry accounting, where each transaction is recorded in a shared and verifiable ledger, reinforcing transparency and accountability (Casanova-Villalba et al., 2024; Wanden-Berghe, 2023).

### 2.2 Traditional methods of accounting registration.

The traditional methods correspond to conventional accounting registration and control systems, based on double entry and verification processes carried out centrally by trusted intermediaries (accountants, auditors, banks or regulatory entities). These methods are supported by traditional accounting software or even manual records, where the information is validated through reconciliations and periodic audits (De Castro & DAndrea, 2021). Although they have demonstrated effectiveness and historical continuity, their main limitation compared to blockchain is vulnerability to manipulations, duplication of processes and high verification and reconciliation costs, which restricts efficiency and real-time traceability (Mataruana Murillo, 2025; Rodriguez de Ramirez & Sarro, 2019).

### 2.3 Traceability in accounting records.

In the accounting field, traceability is understood as the ability to follow the complete path of a financial transaction from its origin to its final destination, ensuring that each record can be verified, audited and associated with the supporting evidence. Thanks to traceability, users of accounting information can know not only the balances, but also the sequence and justification of each operation (Casanova-Villalba et al., 2024; Gracia-Martínez, Lucrecia Clavijo-Cáceres, et al., 2024).

### 2.4 Advantages of traceability in accounting management.

The implementation of traceability improves processes, minimizes the risks of data manipulation and strengthens trust in management systems (Guerrero Bermúdez, 2024). On the other hand, blockchain has several advantages for accounting records: traceability and transparency, since its immutable records allow real-time audits; reduction of fraud, by reducing the risk through decentralized and tamper-resistant records; and trust and audit, by strengthening the reliability of financial information and improving the quality of audits thanks to verifiable evidence (Alsarayrah & Alrowwad, 2025).

## 3. Methodology

Procedure: for this work, a Systematic Literature Review strategy was developed as the main method to address the research question posed.What evidence exists on the effectiveness of the use of Blockchain, in comparison with traditional methods, to improve the traceability of accounting records in Colombia during the last decade? The Review constitutes a rigorous approach that allows to identify, evaluate and synthesize the evidence available in previous studies, in order to offer a critical and grounded panorama on the analyzed phenomenon (Carrizo & Moller, 2018).

In order to guarantee the quality and transparency of the process, the guidelines of the PRISMA Protocol were taken as a reference (Page et al., 2021), widely recognized in the scientific field for the preparation of systematic reviews. In particular, the eleven proposed methodological steps were followed, which include: the formulation of the research question, the definition of eligibility criteria, the selection of information sources, the design of the search strategy, the identification and

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selection of relevant studies, the extraction and organization of data, the evaluation of the risk of bias, the definition of effect measures, as well as the synthesis and interpretation of the results.
Inclusion Criteria: articles published in Spanish or English were necessarily selected, in order to cover both international, Latin American and national literature, with a publication period between 2015 and 2025, so that the review covers the last decade in which significant advances have been reported in the application of blockchain in accounting. Likewise, systematic or narrative review articles, postgraduate theses and indexed academic documents will be included, provided that they present complete information in their text and that they explicitly address the relationship of blockchain with accounting and the traceability of accounting records.
Exclusion Criteria: Information from documents published before 2015 is excluded, as they do not correspond to the last decade, including those studies written in languages other than Spanish or English, due to access and understanding limitations in the framework of this research. Likewise, those studies that are not available in full text and those that are not directly related to the topic of accounting, blockchain, the traceability of accounting records or with the comparison of traditional methods will be excluded and finally, those documents that after a first reading do not answer the problem question or the specific objectives raised in the research will be eliminated.

## 4. Results and Discussion

### 4.1 Available literature on blockchain and the management of accounting records.

The map of co-occurrences generated in VOSviewer allowed to identify five main clusters in the literature on blockchain and accounting records. The first focuses on accounting data and auditing, highlighting how blockchain strengthens the verification of information. The second one deals with transparency and traceability in management, considered one of its main advantages. A third cluster relates blockchain with security and trust in accounting, by considering it as a proposal compared to traditional methods. The fourth one shows its application in control, smart contracts and distributed accounting, evidencing the automation of processes. Finally, a fifth group links blockchain with the supply chain, highlighting its usefulness beyond the accounting field.
In summary, the results show that the literature is not limited to accounting records, but extends the analysis towards auditing, transparency, control and process management, all strengthened by blockchain.

### 4.2 Characteristics of the information available in consulted databases.

The existing research on blockchain and accounting records, most of them are individual and scattered works, with little collaboration between authors. Only specific co-authorship nuclei are identified, such as that of Llanos and Maldonado, which suggests that this field is still at an initial stage of consolidation and requires strengthening academic networks that promote joint research of greater scope and impact.
The publication of results in publications has been sustained between 2019 and 2024, reaching its highest point in this last year. This reflects the growing interest of the academic community to study the application of blockchain in accounting and record traceability. However, fluctuations are also observed in some years, which shows that, although the topic is advancing, it is still an emerging field in consolidation that requires more comparative and empirical studies, especially in the Colombian context.

### 4.3 Analysis of Convergences.

Recent literature shows a growing consensus around the potential of blockchain technology to transform accounting and overcome the limitations of traditional methods. The authors agree that the main contribution of this innovation lies in the immutability of the records, since, once incorporated into the blockchain, they cannot be modified without leaving a trace, which ensures the integrity of financial information (Mataruana Murillo, 2025; Rodriguez de Ramirez & Sarro, 2019).

Received: August 11, 2025

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Unlike conventional systems, in which data is stored in centralized databases vulnerable to manipulation, blockchain offers a decentralized and verifiable scheme by consensus, reducing dependence on external auditors or trusted intermediaries (Casanova-Villalba et al., 2024). In the same vein, Alsarayrah & Alrowwad (2025) highlight that, faced with the vulnerability of traditional accounting systems to corruption and fraud, distributed blockchain records allow real-time audits, reduce manipulation and strengthen data traceability.

Another point of agreement is the reduction of costs in reconciliations and verifications, since the shared ledger eliminates the duplication of records between the parties, optimizing processes that in traditional methods require more time and resources (Casanova-Villalba et al., 2024). From a global perspective, Liu et al. (2024) confirm through a bibliometric review that blockchain constitutes a disruptive innovation, documenting the evolution of the literature between 2013 and 2023 and highlighting the transition towards triple-entry accounting. This approach increases transparency and reliability compared to the traditional double-entry, while reducing risks of fraud and human errors through smart contracts. Although its comparison with traditional methods is mainly conceptual, its contribution reinforces the vision of blockchain as an accounting paradigm shift. In this same sense, Wanden-Berghe (2023) emphasizes that blockchain facilitates continuous and real-time auditing, unlike conventional periodic reviews, while Vergel Vergel & Torres Arriaza (2019) emphasizes that this transition towards triple entry strengthens accountability and transparency. Even studies applied to other contexts, such as that of wang et al. (2024) within the framework of the Green GDP in China, confirm similar benefits: greater traceability, transparency and credibility of reports, although their field of application differs from business accounting.

### 4.4 Analysis of Divergences.

However, the literature also notes divergences and limitations. Firstly, most of the works are of a conceptual or exploratory nature, with little comparative empirical evidence in the Colombian context, which limits the possibility of accurately measuring the impact of blockchain compared to traditional methods (Rodríguez Guerrero et al., 2024). Likewise, several authors point out technical and organizational challenges, such as the scalability of networks, interoperability with traditional accounting software and high implementation costs, factors that may restrict the theoretical benefits (Casanova-Villalba et al., 2024) (De Castro & DAndrea, 2021). To this is added the need for professional training and clear regulatory frameworks that accompany the adoption, in contrast to the stability and regulatory consolidation of traditional methods. Another aspect highlighted is the tension between transparency and confidentiality, because while the former is presented as a benefit for traceability, some authors warn of risks in sectors where information is highly sensitive, such as health (Rodríguez de Ramirez & Sarro, 2019).

These divergences are also reflected in the approaches of the studies developed by Alsarayrah & Alrowwad, (2025), from an empirical analysis in Ukrainian companies, show concrete results in reducing fraud and investor confidence, although they warn of regulatory and financial barriers that limit practical adoption. On the contrary, Liu et al.(2024), offer a more global and optimistic vision, highlighting the disruptive potential of blockchain in the academic literature without delving into local limitations. In turn, Wang et al. (2024), apply blockchain to macroeconomic and environmental accounting, showing its complementarity in the calculation of GDP rather than a direct replacement of traditional business methods. These methodological and contextual differences show that, although there is a consensus around improving traceability, transparency and trust, the magnitude of these benefits and their applicability depend on regulatory, technological factors and the specific field in which the technology is implemented.

Therefore, the literature converges that blockchain offers a substantial added value to accounting traceability through transparency, immutability and decentralization, positioning itself as a superior alternative to traditional methods. However, it also makes it clear that its effectiveness depends on

Volume 38 No. 8s, 2025
ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

the context, integration with existing systems and the generation of more empirical evidence, especially in Colombia, where this field is still at an early stage of development.

In summary, the discussion allowed to fulfill the specific objectives of the research. On the one hand, the identification of evidence is reflected in the convergences, where the authors agree on highlighting immutability, distributed verification, fraud reduction and continuous auditing as central contributions of the blockchain. In contrast, the analysis of divergences allowed to contrast their effectiveness compared to traditional methods, evidencing limitations in terms of scalability, regulation and implementation costs. Finally, the factors that strengthen traceability, such as transparency, automation of records and triple-entry accounting, are consolidated as key elements that the literature recognizes as substantive advantages of blockchain compared to conventional approaches.

## 5. Conclusion

The analyzed documents provide consistent evidence that blockchain technology has a superior capacity to traditional methods to strengthen the traceability of accounting records. In the contexts where it has been applied effectively, its immutability, distributed verification and shared ledger properties translate into better audit trails, less duplication and reconciliation times, reduced errors and fraud opportunities, and the possibility of continuous auditing (Casanova-Villalba et al., 2024; Rodriguez de Ramirez & Sarro, 2019; Wanden-Berghe, 2023). These improvements are especially noticeable in interorganizational processes and when the solution is integrated with existing accounting systems under clear data governance (Casanova-Villalba et al., 2024; Guerrero Bermúdez, 2024).

However, in the Colombian case, the empirical comparative evidence between blockchain and traditional methods is still scarce and, for the most part, exploratory or extrapolated from other contexts (Rodríguez Guerrero et al., 2024). Measurement gaps persist, such as the lack of standardized indicators of latency, error rate, trail completeness, and verification cost, as well as contextual constraints related to interoperability with legacy software, the absence of clear regulatory frameworks, adoption costs, and the need for professional training (De Castro & DAndrea, 2021; Rodriguez de Ramirez & Sarro, 2019). Therefore, although the direction of the effect favors blockchain and supports its potential effectiveness, it is not possible to accurately quantify the size of the benefit in Colombia or generalize it by sectors with certainty.

Consequently, the answer to the research question is: yes, there is consistent evidence that blockchain is more effective than traditional methods for improving accounting traceability, but in Colombia this statement should be considered provisional until rigorous comparative studies are carried out. It is recommended to promote quasi-experimental pilots with comparable indicators (reconciliation time, error rate, trail completeness, verification cost and registration opportunity), preferably in permissioned networks and with privacy by design, integrated into ERP and aligned with accounting and auditing standards (Alsarayrah & Alrowwad, 2025; Liu et al., 2024). Only in this way will it be possible to confirm and measure the incremental value of blockchain compared to traditional methods in the Colombian context.

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ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

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Received: August 11, 2025 