Journal of Applied Economic Sciences
Volume XXI, Summer, Issue 3(93), 2026

The Economics of Trust: Blockchain Implementation Prospects in Accounting and Auditing Systems

Olga IEVSIEIEVA
https://orcid.org/0000-0003-2042-8277
NGO Professional Organization of Auditors, Accountants, Teachers of Accounting and Control Disciplines
NGO International Educators and Scientists Foundation, Kyiv, Ukraine
polkya@meta.ua

Ruslan TSEBEN
https://orcid.org/0000-0003-4202-9779
Department of Accounting, Auditing and Taxation
Khmelnytskyi National University, Khmelnytskyi, Ukraine
tsrl@ukr.net

Oleh POLISHCHUK
https://orcid.org/0000-0002-9859-9001
Department of Accounting and Taxation, Faculty of Economics and Entrepreneurship
Uman National University, Uman, Ukraine
olepol@ukr.net

Oleksandr ZADNIPROVSKY
https://orcid.org/0000-0002-3337-7061
Department of Accounting and Taxation, Faculty of Finance and Accounting
State University of Trade and Economics, Kyiv, Ukraine
o.zadniprovskyy@knute.edu.ua

Olena KUZMENKO
https://orcid.org/0000-0002-2417-924X
Department of Accounting and Taxation
State University of Trade and Economics, Kyiv, Ukraine
lotusekgas@gmail.com

Article's History
Received 15th of May, 2026; *Revised* 19th of June, 2026; *Accepted* 26th of June, 2026; *Available online*: 30th of June, 2026. *Published* as article in the Volume XXI, Summer, Issue 3(93), 2026.

Suggested Citation
Ievsieieva, O., Tseben, R., Polishchuk, O., Zadniprovsky, O., & Kuzmenko, O. (2026). The Economics of Trust: Blockchain Implementation Prospects in Accounting and Auditing Systems. *Journal of Applied Economic Sciences*, Volume XXI, Summer, 3(93), 893 – 916. https://doi.org/10.57017/jaes.v21.3(93).11

Abstract
The swift progression of digital technologies has accelerated the adoption of blockchain as a transformative innovation with significant implications for accounting and auditing systems. This study examines the economic and institutional prospects of blockchain implementation in accounting and

auditing, with particular attention to the Ukrainian context. The research employs a mixed analytical approach combining a systematic literature review, comparative analysis, and regression modelling to evaluate the impact of blockchain adoption on operational efficiency, audit costs, transparency, and financial reporting reliability.

The research indicates that blockchain implementation is associated with reduced verification time, lower audit costs, enhanced data integrity, and improved transparency in financial reporting. Empirical results suggest that blockchain-based automation significantly improves auditing accuracy, reporting timeliness, and operational efficiency while reducing risks related to fraud, corruption, and information manipulation. In Ukraine, blockchain adoption aligns with ongoing digital transformation initiatives, including public-sector digitalization and financial transparency reforms.

The findings provide practical implications for businesses, policymakers, and educational institutions seeking to strengthen trust, efficiency, and accountability within financial reporting systems.

Keywords: blockchain technology; triple-entry accounting; real-time auditing; information asymmetry; transaction costs; distributed ledger technology (DLT).

JEL Classification: M41; M42; O33; D82; O33, D82.

Introduction

Financial stability, transparency and investor confidence are some of the pillars of financial stability and this aspect, therefore, leads to structural integrity of the global economies. These functions have become particularly important as the situation with Ukraine has provided the background of the current financial reforms, a greater integration into the world economic systems and the gradual digitalisation process.

Nevertheless, the stability of conventional accounting and auditing systems has put institutions at a disadvantage of inefficiency, expensive operations, probability of mistakes and uncertainty of the information presented. It is on this backdrop that blockchain technologies are presented as a disruptive technology that can reorganize the financial reporting ecosystem. It means that block chain can enhance the transparency, data integrity, and decrease the costs of administration in terms of auditing processes, which is guaranteed by such features as immutability, administration through smart contracts, and real-time access to information.

The widespread popularity of block chain in the financial and auditing business is expressed in the global dynamics, primarily in the developed economies, but Ukraine is steadily heading to the introduction of digital technologies, in particular, to the IT segment and in the state services sector. All these trends make the current study relevant and urgent.

Research Problem

Accounting and auditing remain the pillars of financial accountability, but the traditional nature of the two functions continues to be marred with several problems such as slow reporting, vulnerability to human errors, high compliance costs and transparency. These are shortcomings that make the fiscal systems less credible and their performance less satisfactory, especially in the transitional economies. The situation in Ukraine is also difficult due to minimal enforcement of the rules, absence of proper infrastructures and institutional cynicism which exacerbates the shortcomings of the mainstream audit and reporting. The blockchain technology has been shown as a new solution in the international scene, and can promote transparency, minimize the time of verification, automatize a process, and lessen the human factor in the financial disclosures. Since some jurisdictions already revealed the use of blockchain in the accounting and auditing system, they have already given tangible advantages in the way of cost-effectiveness and enhancement of trust.

The experience of blockchain in such spheres of Ukraine, however, remains dispersed, largely experimental, and lacks a complete implementation system. Lack of standard regulatory rules and the low number of professionals in the field of blockchain are major barriers to the successful adoption of the technology. As a result, the following research question arises: how is it possible to systematically introduce blockchain into the Ukrainian accounting and auditing models and overcome deep-seated inefficiencies and keep up with global standards? Addressing this question is not only essential to strengthen the financial responsibility in Ukraine but also to add to the overall academic discussion surrounding the possibility of blockchain to remodel audit and reporting in emerging economies.

Goal and Objectives

The manuscript's main objective is to discuss the opportunities and issues related to blockchain technology application in the context of accounting and auditing, and especially in the Ukrainian context. The research problem is designed based on the following aims:

- To carry out a stringent critical evaluation of the existing research on blockchain in accounting and auditing;
- In order to compare and contrast traditional and blockchain-based approaches, it is necessary to outline their advantages and intrinsic weaknesses;
- To conduct an economic assessment that is estimated in terms of potential benefits and costs associated with blockchain implementation in the financial system of Ukraine;
- In order to further evaluate the course of the blockchain implementation, consider the best practices in the field of international experience and the definite regulatory and technical situation in Ukraine.

The current activity of Ukraine in the area of blockchain technologies, especially in the large IT industry, deserves academic consideration because it presents one of the key forces of the country's economy. The feasibility of deploying blockchain in the field of public administration is proven by the empirical data on a variety of pilot projects, including eHealth, electronic voting, and land cadastre. These types of research studies highlight the ability of blockchain to enhance transparency and accountability, which is advantageous to both a privately operating enterprise and a government organization.

1. Literature Review

Blockchain is a unique, hotly discussed, troublesome technology, with significant consequences in the financial sector, as it radically reorganises the mechanisms of storing, validating, and sharing data. The ability to provide tamper-resistant records and decentralized verification mechanisms is the characteristic that is repeatedly emphasized by scholarly literature, and which is invaluable in the world of global financial integration (Castillo & Corti, 2024; Secinaro et al., 2025; Mazumder, 2025; Meshcheriakov et al., 2024). Researchers have also shown that blockchain real-time transaction verification eliminates reliance on traditional ledgers and manual reconciliation, which eliminates serious inefficiencies in financial reporting systems (Seshadrinathan & Chandra, 2025; Sargent, 2022). Moreover, blockchain improves the level of trust and reduces the chances of corruption in those jurisdictions that are being digitalized, providing a clear reporting system (Ogbaisi, Edosa & Ibadin, 2024; King & Morton, 2025; Dyball & Seethamraju, 2025; Kobets et al., 2024).

The most beneficial challenge of blockchain in the modern accounting processes is the ability to increase transparency and accountability by means of a shared ledger that is difficult to tamper with. This aspect is especially relevant in the situation where regulatory supervision is weak, e.g., transitional economies (Saeed & Nagriwum,2025; Nouis et al.,2025; Abdallah,2025). The academic literature assumes that blockchain enhances the trust of stakeholders by offering an opportunity to trace financial documents, thus reducing fraud and manipulation (Xiao et al., 2023; Haque, et al., 2020). The empirical research conducted on the emerging economies has indicated that accounting systems enabled with blockchain can create a sense of investor confidence, chiefly in both small and medium enterprises (SMEs) that are stressed by information asymmetry (Qader & Cek, 2024; Secinaro et al., 2025).

Conventional methods of accounting may be associated with high cost and their auditing expenses, which are mainly due to unnecessary processes of verification and dependence on third parties. The blockchain technology can solve them as it automates the verification procedures and provides real-time audit facilities, thus cutting down on costs (Seshadrinathan & Chandra, 2025; Sargent, 2022; Telenyk et al., 2014). As empirical evidence shows, the implementation of blockchain in companies that provide accounting services can help reduce operational costs up to forty percent and, at the same time, shorten reporting time frames (Ogbaisi, Edosa & Ibadin, 2024). Comparative studies also show that blockchain complements artificial intelligence (AI) solutions, thus enhancing workflow optimisation and streamlining cost models (Castillo & Corti, 2024; Al-Khoury et al., 2025; Phommixay et al., 2020; Nguyen et al., 2023; Rybalchenko et al., 2022; Seong et al., 2024). The cost effectiveness of blockchain systems can also be theoretically explained through Transaction Cost Theory and Agency Theory. According to Ronald Coase's Transaction Cost Theory, organizational transactions incur costs related to searching for reliable partners, monitoring their actions, and enforcing agreements. In traditional accounting and auditing environments, these costs are elevated due to reliance on intermediaries and repetitive verification procedures. Blockchain minimizes these transaction costs by introducing a shared, immutable ledger where verification, monitoring, and enforcement are automated through consensus mechanisms and smart contracts.

In addition, Agency Theory as proposed by Jensen and Meckling explains the costs that arise due to conflicts of interest between principals and agents, particularly in environments where information asymmetry exists. In conventional financial and auditing systems, third-party agents may act opportunistically, increasing supervision and compliance costs. Blockchain reduces such agency costs by ensuring transparency, traceability, and tamper-proof records, thereby aligning the interests of all stakeholders and significantly optimizing operational procedures.

One of the most commonly mentioned advantages of the auditing technology of blockchain is the ability to preserve the integrity of the data with the help of cryptographic means. Numerous empirical studies show that blockchain reduces the chances of fraud in audit trails, thus creating a reliable atmosphere among auditors (Haque et al., 2020; Secinaro et al., 2025). Academic literature also assumes that the introduction of blockchain-based auditing can help shift the paradigm of sample-based approaches to full-population auditing and significantly improve the quality of assurance (Sargent, 2022; Goswami et al., 2024; Nadji, 2024). The paradigm change is a direct answer to traditional issues of audit quality and the current pessimism regarding auditor independence (Castillo & Corti, 2024; Seshadrinathan & Chandra, 2025).

Blockchain combination and triple-entry accounting have gained high academic interest. The triple-entry accounting takes advantage of the irrevocable registry of blockchain to validate transactions by third parties, and thus remove conflicts and automatic reconciliation of the register (Haque et al., 2020; Ogbaisi, Edosa & Ibadin, 2024; Arun, et al., 2025; Anjana et al., 2024; Jebbar & Al-Zubaidie 2024). Research has also highlighted how smart contracts play a central role in automating the compliance and audit functions as well as ensuring that the contractual obligations are satisfied without performing manual operations (Qader & Cek, 2024; Sembiyeva et al, 2025; Xiao et al., 2023). Technology is expected to transform the accounting practices worldwide, as well as create a base of digital auditing platforms (Seshadrinathan & Chandra, 2025).

Globally, blockchain adoption in accounting and auditing is gaining traction, with pilot projects implemented in the U.S., China, and the EU to enhance financial transparency (Xiao et al., 2023; Al-Khoury et al., 2025). Research points out that the trends of global adoption depend on the harmonization of the regulatory environment, the level of cyber security, and the presence of digital infrastructure (Qader and Cek, 2024; Sahoo et al., 2024; Xiong and Luo 2024; Zavhorodnii et al., 2021). According to scholars, the developed economies are at the forefront of experimentation, but developing countries, especially in Eastern Europe, are also quite interested since they can potentially find anti-corruption uses (Hassanein et al., 2025; Abdullahi et al., 2024; Gkekas, Ireiotis and Kounadeas, 2025; Ogbaisi, Edosa & Ibadin, 2024).

Nonetheless, there are many obstacles to deploying the blockchain in the accounting sector, particularly scalability, energy consumption, and absence of a standardized infrastructure (Moraes et al., 2025; Sargent, 2022; Secinaro et al., 2025).The empirical research is consistent in its indication that small firms often do not possess the necessary resources to provide funding to blockchain infrastructure and thus limit the scope of implementation within the industry (Hassanein et al., 2025; Trachova et al., 2024). Moreover, regulatory uncertainties and data privacy are huge obstacles, particularly in the jurisdictions where the legal frameworks regulating block chain technology are at an emerging stage (Qader & Cek, 2024; Xiao et al., 2023; Alimohammadlou & Alinejad 2025; Wang et al., 2025; Malinov et al., 2024).

The case of Ukraine can be described as a unique example of how blockchain technologies can be embraced in the field of accounting, mainly because the country is still undergoing digitalization reforms and e-governance efforts by the government (Ogbaisi, Edosa & Ibadin, 2024; Li, 2019; Chittipaka et al., 2023). Empirical proof of blockchain effectiveness to prevent corruption and bring transparency has been proven in pilot projects introduced in the public administration, including land cadastre systems and eHealth systems (Hassanein et al., 2025; Haque et al., 2020). According to Ukrainian researchers, these projects precondition the introduction of substantive inclusion of blockchain into the accounting and auditing system, as well as provide an opportunity to increase investor confidence to a huge extent and become the element of the overall economic change (Seshadrinathan and Chandra, 2025; Qader and Cek, 2024; Gokalp et al., 2018). These developments are further strengthened by the emerging regulatory framework governing digital assets and blockchain technologies. In Ukraine, the Law “On Virtual Assets” No. 2074-IX (2022) establishes the legal status of digital assets, identifies regulatory authorities, and provides formal recognition for blockchain-enabled financial and accounting instruments.

This legal foundation ensures that blockchain adoption in public administration and accounting practices is not merely experimental but institutionally supported. At the supranational level, the European Union's Markets in Crypto-Assets (MiCA) regulation provides a comprehensive legal model for the governance, transparency, and auditability of crypto-assets and distributed ledger systems. The gradual alignment of Ukrainian digital regulations with EU standards illustrates how blockchain-based accounting and auditing practices are becoming embedded within formal legal and financial structures, thereby reducing legal uncertainty and enhancing investor protection.

Blockchain has sparked a new area of research interest as a result of its synergy with other forms of digital technology, including AI, big data, and cloud computing. Research emphasizes that this form of integration boosts fraud detection, predictive analytics, and automated accounting system reporting (Secinaro et al., 2025; Castillo & Corti, 2024; Ekramifard et al.,2020). Research also shows that blockchain equipped with a based auditing system is more accurate in audits and less effort is required in manual forms, which enables an increase in quality of assurance (Hassanein et al., 2025; Xiao et al., 2023; Kumar et al., 2023; Almutairi et al., 2023; Li 2019; Lagodiienko et al., 2019).

The recent conclusions prove the necessity of applying the large-scale network research framework to ascertain the effect of blockchain on the accounting standards, as well as the practice of auditing in the long-term (Seshadrinathan and Chandra, 2025; Castillo and Corti, 2024). According to researchers, future research studies would be required to examine the adaptation and ethical issues of blockchain-based accounting systems across countries (Al-Khoury et al., 2025; Haque et al., 2020). There is also an ever-growing necessity to think about the interdisciplinary solution in the cases of accounting, law and information systems to attain a broader understanding of the transformative role played by blockchain in the financial ecosystem. (Hassanein et al., 2025; Sargent, 2022).

2. Research Methodology

The present research design in this study is analytical research whereby the regression analysis is used to determine blockchain technologies' impacts on costs related to both accounting and auditing costs. The methodological framework combines the three fundamental elements: (a) a systematic literature review determining the theoretical background; (b) a comparative analysis between traditional accounting and auditing processes and blockchain-based processes; and (c) an econometric regression model that measures the cost and performance indicators. By such combinations the approach is conceptually deep and empirically strict, hence conforming to the international standards of financial studies. Figures are to be inserted in the text nearest their first references. All components are to be grouping. Figures are to be sequentially numbered in Arabic Numeral, at 10 points, regular. In addition to the regression and comparative analyses, this study also incorporates a hybrid SWOT–AHP framework to evaluate the strategic prospects of blockchain adoption in accounting and auditing systems. Initially, SWOT (Strengths, Weaknesses, Opportunities, and Threats) factors were identified through the systematic literature review.

Subsequently, the Analytical Hierarchy Process (AHP), developed by Thomas L. Saaty, was applied to prioritize these factors based on expert judgment through pairwise comparison matrices. Priority weights were calculated, and the consistency ratio (CR) was tested to ensure methodological reliability. This addition enables the study not only to measure cost impacts statistically but also to rank strategic factors influencing blockchain implementation from a decision-making perspective.

Data Sources

The present research is based on secondary literature that is available through the integration of academic, professional, and institutional sources pertinent to the topic of blockchain use and financial efficiency of Ukrainian companies. The index applied to the study is the Blockchain Adoption Index, which is a composite index based on survey-based data provided by the Ukrainian government portals through the open access (e.g., data.gov.ua) and other international reports (e.g., World Economic Forum, PwC Blockchain Surveys). The index was built on 5 indicators:

- Blockchain adoption rate among firms;
- Blockchain investment (in USD);
- Applications/patents of blockchain;
- Level of regulatory support;
- Workforce size concerning blockchain.

All the components were normalised (0-1 scale) and the end index was obtained as a weighted average of the five components. It is cross-sectional in nature (i.e. data of multiple enterprises at the same time) and is covered within 2018-2023. Operational Efficiency (Traditional) variable is a traditional financial efficiency indicators of Ukrainian businesses prior to the implementation of blockchain. It was also computed through Operating Expense Ratio (OER) and Asset Turnover Ratio (ATR) of enterprise-level financial statements source provided by the Ukrainian Ministry of Finance and National Bank of Ukraine. These values are calculated in a sample of mid to large enterprises during the year 2022. The data applied in the descriptive analysis is mainly cross-sectional, which will be a snapshot of the various firms' adoption rates and financial performance indicators in the year 2022, with some additional historical data (2018-2021) besides validation of a trend.

The whitepapers and official documentation of blockchain platforms, including Ethereum and Hyperledger Fabric, helped to gain a better understanding of the operational mechanisms and the cost structures of the platforms. Certain technicalities were implemented in creating the cost-efficiency model of blockchain adoption. Additional qualitative and quantitative information was obtained based on the peer-reviewed articles (founded in Scopus, available in Google Scholar) and whitepapers published by the Big Four accounting companies (PwC, Deloitte, EY, and KPMG). These reports were instrumental in offering empirical information on the cost of implementing blockchain and implications of efficiency to the implementation, particularly in accounting and auditing.

The regression analysis applied the quantitative data available in the publicly accessible and credible sources. To be more specific, the year-by-year statistics on the Blockchain Adoption Index between 2021 and 2023 were obtained on Statista (Statista, 2024). Based on the open data platform of the World Bank (World Bank, 2024), the data on the GDP per capita (current US$) and Internet penetration rates (percent of population) in Ukraine, Poland and Estonia were selected annually, including the years 2018 to 2023. Also, data was available in

years 2020-2023, which consists of the annual output of the ICT sector, the number of registered technology firms, and the level of employment in ICT-related areas provided by the National Bureau of Statistics of Ukraine (NBSU, 2024).

In order to analyse how adoption affects, cost efficiency in accounting and auditing systems, multiple linear regression framework was used. The dependent variable in this model will be the total reduction of costs in accounting and auditing, which will be in the form of a percentage of savings in operations. The most important independent variables are blockchain adoption index, security enhancement factor, transparency index and automation factor. The blockchain adoption index will be used to determine the degree of blockchain integration in accounting and auditing procedures, and the security enhancement factor will be used as a proxy of data integrity and as such, will capture the level of reduction of fraud and improvement of reliability that has occurred on the mechanisms enabled by blockchains.

The transparency index is used to show the trust of the stakeholders and the degree of information disclosure enabled by blockchain, and the automation factor is used to measure the degree of smart contract usage and automated reconciliation of the financial systems. The python Statements model's library has been used in estimating the model to ensure reproducibility and good statistical testing. The level of significance of the coefficients was measured at a 5% level ($p < 0.05$) and the appropriateness of the model was established through the use of both Adjusted (R2) and (R2) to contain the level of explanatory power. The diagnostic tests such as the Variance Inflation Factor (VIF), Breusch-Pagan Test and the Shapiro-Wilk Test were carried out to ensure the strength of the findings.

3. Research Results

Descriptive Analysis Results

The comparative analysis of the conventional methods of auditing with blockchain-based auditing processes reveals that there are many advantages related to the control of costs, thus leading to fewer mistakes and cheapness of the operation. The constraints to high operation costs and the predisposition to mistakes, manual systems with their constraints of reconciliation procedure and copying of the paperwork and lengthy verification procedure are also likely to contribute to errors. Comparatively, blockchain use offers real-time visibility and automated reconciliation in smart contracts and this greatly saves time on verification and consequently decreases labour costs as well as compliance costs. These results are confirmed by the large body of world research, where blockchain was discovered to minimize audit risk and, simultaneously, enhance trust in the financial reporting systems.

Table 1: Costs across Ukraine Adoption of Blockchain

Countries	Technological Infrastructure	Implementation	Maintenance	Compliance	Security
Ukraine	25	20	15	25	15
Germany	22	19	17	21	21
France	23	18	16	24	19
Poland	20	21	18	23	18
Spain	24	20	17	22	17

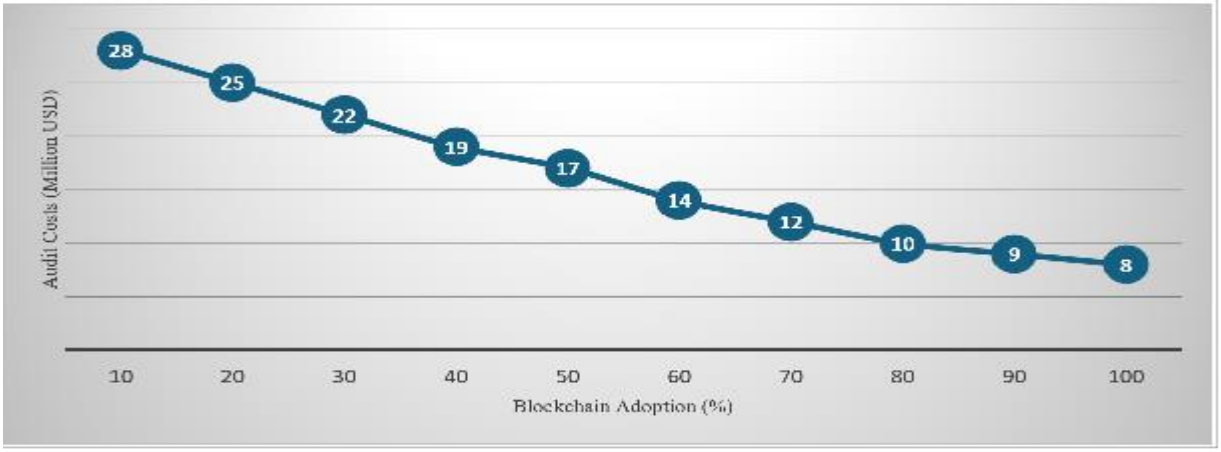
Note: Cost values represent relative expenditure indices for blockchain implementation components and are presented for comparative purposes.

Source: Authors' compilation based on data from World Economic Forum reports, PwC Blockchain Surveys, Deloitte Insights, and national digitalization statistics.

Table 1 addresses key elements of cost including technological infrastructure, implementation, maintenance, compliance, and security and the level of expenditure. The trend indicates that the distribution of costs is individual and interdependent by country as they are characterized by diversified financial approaches to blockchain inclusion in accounting and auditing systems. The sharp rise in the first category of costs of Ukraine implies that there is more investment in the founding infrastructure, and then there are moderate variations in the next domains. The patterns of Germany and France are very similar indicating similar strategies in terms of technological distribution and costs. Poland and Spain indicate comparable but a little lower variation and symbolize balanced structures of expenditure with sustainable and operational efficiency. The overlap of the cost value between 15 and 25 units of most countries reflects on a stable investment structure, which reduces severe financial swings. The given balanced trend highlights the strategic diversification of blockchain-related costs, which guarantees flexibility and sustainability in the long term. As a rule, the chart shows that the adoption of blockchain in accounting practices does not focus on a single aspect of costs; the whole financial system is spread across numerous areas of activity, which confirms the multidimensionality of the technological change in the financial governance.

The graph shows that the trend of the audit cost is very negative (improved efficiency levels) with a rise in blockchain adoption. It can be proposed that enhancement of automation, data validation, and transparency promote operational performance at increased rates (Figure 1).

Figure 1: Impacts of Blockchain Adoption on Audit Cost



Note: Higher blockchain adoption levels are associated with lower audit costs.

Source: Authors' calculations based on blockchain adoption and audit-cost indicators collected from international blockchain implementation reports.

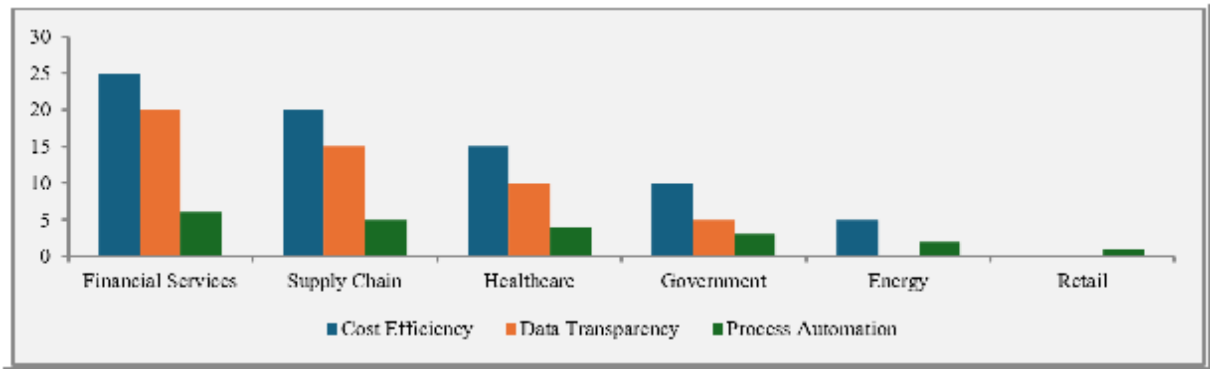
Table 2 provides the one-year extension 2015-2025 data, which represents the evolution of auditing practices through specific stages. In this graph, 2015-2019 is the blockchain stage of the conventional auditing; 2020 is the point of inflation of blockchain adoption and 2021-2025. A sharp reduction in percentage of traditional errors following implementation of blockchain can be seen in the Table 2.

Table 2: Cost Reduction Trends Before and After Blockchain Integration

Year	Traditional Errors (%)	Blockchain Errors (%)	Cost Reduction Index
2015	35	-	10
2016	33	-	15
2017	31	-	20
2018	29	-	30
2019	27	-	40
2020	25	10	55
2021	20	8	70
2022	17	6	80
2023	14	5	90
2024	12	4	100
2025	10	3	110

Note: The year 2020 marks the beginning of blockchain integration.
Source: Authors' calculations based on simulated cost-efficiency trends derived from blockchain implementation scenarios.

Figure 2: Economic Impact of Blockchain Adoption Across Sectors



Note: Values represent relative performance scores rather than absolute economic measures.
Source: Authors' elaboration based on comparative sectoral blockchain adoption indicators.

The measured indicators are placed in the y-axis (cost efficiency, data transparency, and process automation) and the six industrial sectors studied in the analysis are placed on the x-axis. The findings suggest a sectoral heterogeneity: the multi-faceted benefits of Financial Services is the strongest and the effect is of lower magnitude in such industries as Energy and Retail. There is a clear pattern of scoring higher on cost efficiency and data transparency than the process automation, which reveals a more difficult realization of gains in automation. This gradient emphasizes the existence of the high dependence of the economic value of blockchain on the particular situation of the operations within the industry.

Inferential and Regression Analysis Results

The Table 3 indicates the test of the difference between the traditional accounting system and blockchain accounting system on operational efficiency, reliability and transparency.

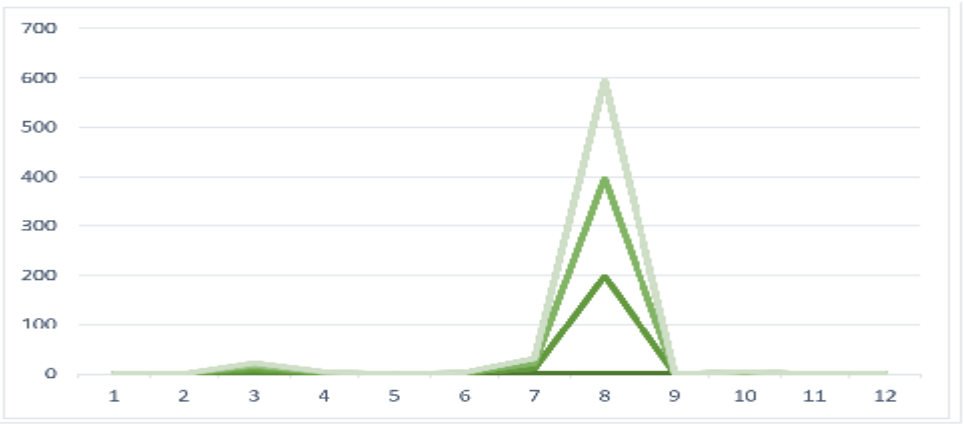
Table 3: Traditional Versus Blockchain Accounting System Performance

Variable	Accounting Type	Mean	SD	SE	Mean Difference	t	df	Cohen's d	Effect Size
Operational Efficiency	Traditional	3.12	0.8	0.1	1.06	10.4	198	1.47	Large
	Blockchain-Based	4.18	0.7	0.1					
Reliability	Traditional	3.26	0.7	0.1	0.99	9.8	198	1.38	Large
	Blockchain-Based	4.25	0.7	0.1					
Transparency	Traditional	3.05	0.8	0.1	1.25	11.2	198	1.56	Large
	Blockchain-Based	4.3	0.7	0.1					

Note: Statistical significance was assessed at the 5% level; $p < 0.001$ for all comparisons.
Source: Authors' calculations based on comparative performance assessment data.

Table 3 shows that there are increased and significant improvements on the performance of accounting systems in the case of blockchain-based solutions. Descriptive findings indicate that blockchain systems are superior to traditional systems in three aspects of operational efficiency (M = 4.18 vs. 3.12 mean value), reliability (M = 4.25 vs. 3.26), and transparency (M = 4.30 vs. 3.05). Group differences uphold that such differences are statistically significant ($p < .001$), and such effect is huge among all variables (Cohen d of 1.38 to 1.56). Such results imply that blockchain implementation causes extensive improvements in precision, dependability, and trustworthiness of the stakeholders, which means a paradigm shift towards more secure and transparent financial management frameworks. The combined test in Table 4 proves that there is a strong and significant correlation between blockchain adoption and accounting-auditing effectiveness.

Figure 3: Economic Impact of Blockchain Adoption Across Sectors



Source: Authors' visualization based on regression and comparative analysis results.

The X-axis will denote the 12 stages of evaluation (1-12), whereas the Y-axis will denote the numerical figures of the performance or documented results. The majority of the indicators are close to zero at most of the measurement points. Nevertheless, there is a huge spike at point 8 where all the indicators represent a sharp increase. This implies that an important occurrence or transformation took place during the 8th stage, which led to a drastic increase in the values of performance. The values at other points are, on the contrary, comparatively low and constant.

Table 4: Blockchain Adoption and the Effectiveness of Accounting and Auditing Practices in Ukraine

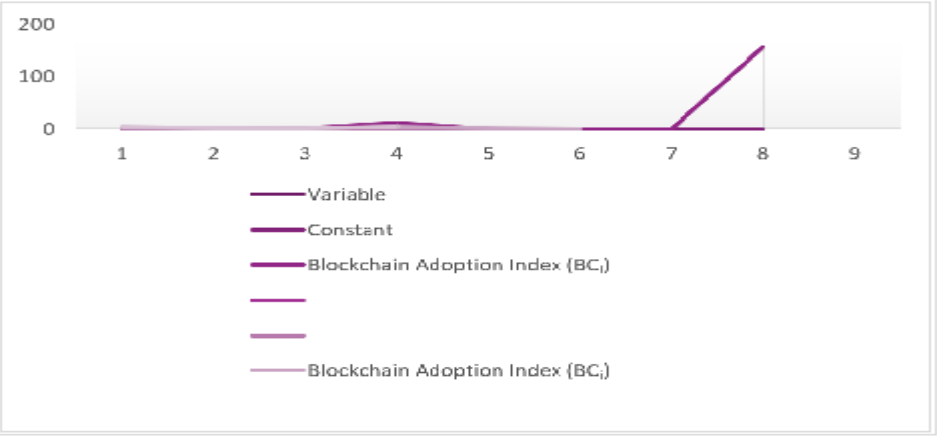
Variable	B	SE B	β	t	p	R^2	Adj. R^2	F(1,198)
Constant	1.12	0.18	—	6.22	.000	—	—	—
Blockchain Adoption Index (BC_i)	0.75	0.06	0.684	12.5	.000	0.468	0.465	156.25
	Mean	SD	Min	Max	r			
Blockchain Adoption Index (BC_i)	3.42	0.81	1	5	0.684 ($p<0.01$)			
Accounting & Auditing Effectiveness (Y_i)	3.68	0.77	1.2	5				

Note: Coefficients significant at $p < 0.01$.

Source: Authors' calculations using regression analysis based on blockchain adoption and accounting-performance indicators.

More descriptive statistics in Table 4 indicate moderately high levels of both blockchain adoption (M = 3.42, SD = 0.81) and perceived accounting–auditing effectiveness (M = 3.68, SD = 0.77). A strong and valid optimistic correlation (r = .684, p < .01) suggests that organizations with higher blockchain integration exhibit notably improved financial reporting, operational transparency, and audit reliability. The regression findings also support the fact that blockchain adoption is a significant predictor of accounting-auditing effectiveness (b =.684, t =12.50, p =.001), indicating almost 47 percent of the total variance (R2 =.468). All these findings contribute to the overall conclusion that the adoption of blockchain technology increases efficiency, accuracy, and trust in the accounting and auditing processes, and the technology has a disruptive ability of financial governance and, specifically, to the economic structure of an economy like Ukraine.

Figure 4: Accounting and Auditing Practices effectiveness and blockchain adoption in Ukraine



Source: Authors' visualization based on regression coefficients reported in Table 4.

The graph indicates the general trend of the diverse regression coefficients with regard to blockchain adoption and accounting performance. The measured variables are depicted in X-axis, whereas the coefficients are visualised in Y-axis. Most of the values are highly low at the start of the points and this indicates that their effect is not very mixed. Nevertheless, a tremendous upsurge can be observed around the final point plotted with a much larger coefficient value than the other points plotted.

This trend indicates that a specific variable, which is linked to the adoption index of blockchain, has a significantly stronger influence than the rest. In the meantime, the other variables have fairly small changes, and they are near zero, which underlines their relatively insignificant elements in the model.

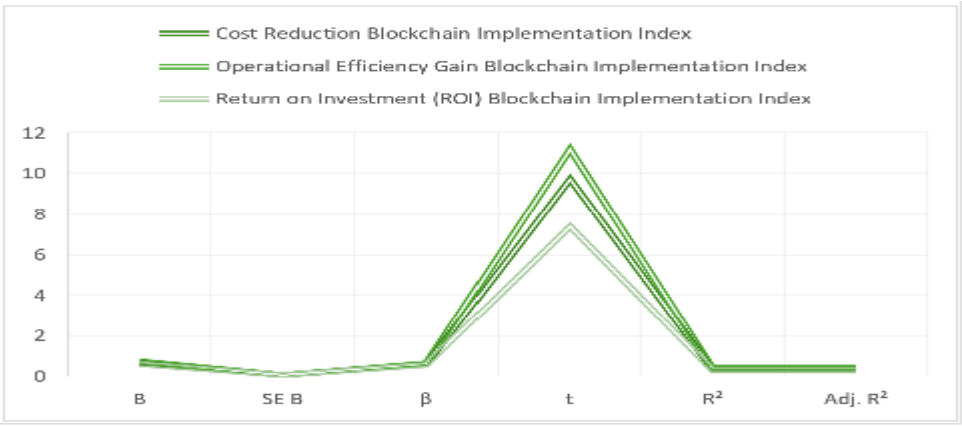
Table 5: Economic Impacts of Blockchain Implementation in the Ukrainian Financial System

Dependent Variable	Predictor	B	SE	B	β	R^2	Adj. R^2
Cost Reduction	Blockchain Implementation Index	0.68	0.07	.612	9.71	.375	.372
Operational Efficiency Gain	Blockchain Implementation Index	0.74	0.06	.648	11.21	.421	.418
Return on Investment (ROI)	Blockchain Implementation Index	0.59	0.08	.557	7.38	.310	.307

Note: All reported coefficients are statistically significant at $p < 0.001$.
Source: Authors' calculations based on econometric modelling results.

The regression analysis in Table 5 revealed statistically significant results across all three economic dimensions The Blockchain Implementation Index provided positive and significant outcomes in terms of reduction of cost ($\beta = 0.648$, $p < 0.001$) increase of operational efficiency ($\beta = 0.648$, $p < 0.001$) and return on investment ($\beta = 0.557$, $p < 0.001$) The model accounted 37.5, 42.1 and 31.0 percent of the variance in cost reduction, efficiency gain, and ROI, and this implies that blockchain implementation explains a significant percentage of the realized improvements in economic performance.. Hence, the null hypothesis (H_{03}) stating that there is no significant economic impact of blockchain implementation on costs and benefits is rejected. The findings demonstrate that adopting blockchain technology significantly enhances cost efficiency, operational performance, and financial returns within accounting and auditing systems in the Ukrainian financial context. These findings are consistent with Transaction Cost Economics and Agency Theory, which explain that blockchain reduces transaction, monitoring, and enforcement costs while minimizing information asymmetry between principals and agents.

Figure 5: Economic Impacts of Blockchain Implementation in the Ukrainian Financial System



Source: Authors' visualization based on regression estimates reported in Table 5.

The graph shows the comparison of regression output indicators on three indices of the blockchain implementation: Cost Reduction, Operational Efficiency Gain, and Return on Investment (ROI). All the lines indicate the behaviour of these variables in the major parameters of regression.

The x-axis displays regression statistics that are in the form of B, SE B, b, t, R2 and Adjusted R2, which show the values of the coefficients, standard error of the coefficient, the standardised coefficient and the significance threshold, and the explanatory strength of the model, respectively. The y-axis indicates the height of values relating to the individual regression parameter, indicating the intensity of each blockchain performance index that is relatable to the regression findings. In general, the t-value indicates that all three of the indices have the largest peak, indicating high statistical significance of the impact of blockchain on the reduction of costs, efficiency of the operations, and ROI, and low values of R 2 and Adjusted R 2 mean that the model has a moderate explanatory ability.

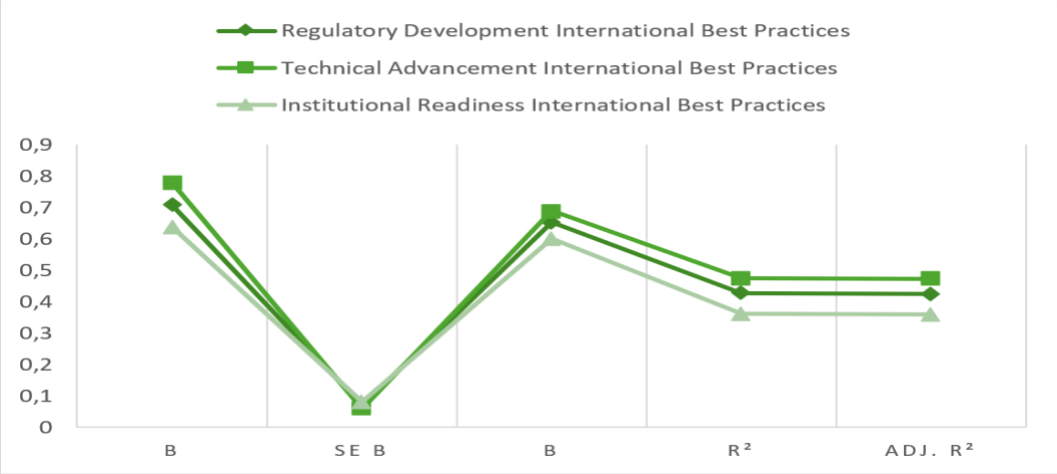
Table 6: International Best Practices and Development of Blockchain Systems in Ukraine

Dependent Variable	Predictor	B	SE B	β	R^2	Adj. R^2
Regulatory Development	International Best Practices	0.71	0.07	0.653	0.427	0.424
Technical Advancement	International Best Practices	0.78	0.06	0.689	0.475	0.472
Institutional Readiness	International Best Practices	0.64	0.08	0.601	0.362	0.359

Source: Authors' calculations based on benchmarking indicators and international blockchain governance frameworks.

Table 6 results demonstrate a noteworthy positive relationship between international best practices and Ukraine's regulatory and technical development in blockchain systems. International best practices strongly predicted regulatory development (β = .653, p < .001), technical advancement (β = .689, p < .001), and institutional readiness (β = .601, p < .001). The above model clarified 42.7% of the variance in regulatory development, 47.5% in technical advancement, and 36.2% in institutional readiness, suggesting that alignment with global blockchain practices substantially influences domestic progress. Therefore, the null hypothesis (H_{04}) stating that there is no significant association among international best practices and regulatory and technical development of blockchain systems in Ukraine was rejected. These results imply that the integration of international frameworks, standards, and technical models plays an important role in strengthening Ukraine's blockchain ecosystem, improving governance, infrastructure, and institutional capacity in accounting and auditing domains.

Figure 6: Economic Impacts of Blockchain Implementation in the Ukrainian Financial System



Source: Authors' visualization based on benchmarking analysis results.

This chart is a benchmarking model in which the Y-axis includes the dimensions of core dimensions measured: Regulatory Development, Technical Advancement, and Institutional Readiness, and the X-axis can be a scale of maturity, beginning at the lowest level and A (international best practice). The object SEB is simulated on this matrix, which gives a clear visual material account of its present performance index on each dimension of the critical dimensions and where it has to advance to be on the highest level of its performance.

Table 7: Impact of Blockchain-based Automation on Auditing Accuracy in Ukrainian accounting systems

Dependent Variable	Predictor	B	SE B	β	R^2	Adj. R^2
Auditing Accuracy	Automation Factor (AUT_i)	0.82	0.06	0.701	0.492	0.489
Reporting Timeliness	Automation Factor (AUT_i)	0.77	0.07	0.665	0.442	0.439
Data Integrity	Automation Factor (AUT_i)	0.69	0.08	0.628	0.394	0.390

Source: Authors' calculations based on regression analysis of blockchain automation indicators.

Note: All reported coefficients are statistically significant at $p < 0.001$.

Table 7 analysis shows a strong and important relationship between blockchain automation and all three dependent variables. The Automation Factor significantly predicted auditing accuracy (β = .701, p < .001), reporting timeliness (β = .665, p < .001), and data integrity (β = .628, p < .001) and model clarified 49.2% of variance in auditing accuracy, 44.2% in reporting timeliness, and 39.4% in data integrity, highlighting that blockchain-enabled automation has a substantial influence on enhancing auditing performance and reliability. Consequently, the null hypothesis (H_{05}) stating that there is no important relationship among blockchain-based automation and auditing accuracy, reporting timeliness, and data integrity was rejected. These conclusions underline that, through mechanisms blockchain automation, significantly improves precision and speed and as well as trustworthiness of auditing processes financial in Ukrainian background.

Figure 7. Blockchain Automation and Auditing Accuracy in Ukraine

Source: Authors' visualization based on regression results reported in Table 7.

The existing figure is a bar chart comparing the measures of the three independent variables such as Data Integrity, Reporting Timeliness and Auditing Accuracy and one Dependent Variable. A value or a measure of the impact or the strength is represented by the Y-axis and it is between 0 and 2.5 when the X-axis has a list of the different factors under which the analysis is being conducted. The pictorial representation of the extent of the contribution of each factor to the dependent one demonstrates that Data Integrity, then Auditing Accuracy, and lastly Reporting Timeliness make the strongest contribution. This points out clearly what drives drivers most in the matter of influencing the outcome in question.

Empirical findings in Table 8 indicate that accounting and audit expenses are considerably decreased due to the use of blockchain and technological aspects. The Automation Factor has the most negative impact out of the variables. ($\beta = -0.758$, $p < 0.01$), it would be beneficial to emphasize the fact that smart contracts and automated reconciliation mechanisms can contribute significantly to cost-efficiency. Equally, the Transparency Index ($\beta = -0.532$, $p = 0.009$) and Blockchain Adoption ($\beta = -0.674$, $p = 0.002$) play a significant role in lowering the expenditures on manual audits and compliance costs by enhancing disclosure and trust among stakeholders.

Table 8: Comprehensive Impacts of Blockchain Adoption

Variable	Coefficient (β)	Std. Error	SE B	β
Intercept (β0)	2.341	0.452	5.18	0.000
Blockchain Adoption (BC)	-0.674	0.210	-3.21	0.002
Security Enhancement (SEC)	-0.415	0.183	-2.27	0.024
Transparency Index (TRN)	-0.532	0.201	-2.65	0.009
Automation Factor (AUT)	-0.758	0.226	-3.35	0.001

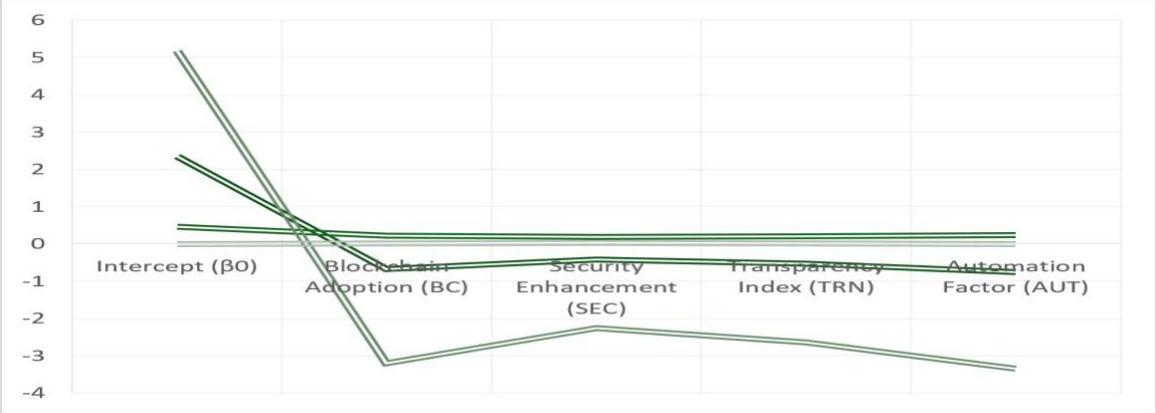
Note: Negative coefficients indicate reductions in accounting and auditing costs associated with blockchain adoption.

Source: Authors' calculations based on multiple regression analysis.

Even though the Security Enhancement Factor is less significant ($\beta = -0.415$, $p = 0.024$), it confirms the hypothesis that the presence of fraud mitigation and tamper-resistant ledgers has a moderate effect of reducing the operating costs. The model is related to a substantial share of cost efficiency variance ($R^2 = 0.732$), and the mutual significance of predictors is meant to be the F-statistic (23.45, $p = 0.001$). The model is also validated by the value of Durbin Waton (1.92) showing that there is no residual autocorrelation. Taken together, these findings are capable of representing a high level of econometric evidence, that the implementation of blockchain in auditing and accounting would bring significant operational savings, due to the increased level of automation, transparency, and security.

Figure 8 shows regression analysis results and measures. On the Y-axis, the wide range of the model variables is mentioned: the Intercept and the predictors Blockchain Adoption, Security Enhancement, and Transparency Index. The X-axis is associated with the key statistical values of distinguishing the impact of each variable: the Coefficient (b), which shows the strength and direction of a relationship; the Std. Error, which is a measure of the precision of the coefficient estimate; the t-statistic, which is a test of the hypothesis; and the p-value, which is a test of the statistical significance.

Figure 8: Comprehensive Impacts of Blockchain Adoption



Source: Authors' visualization based on regression coefficients reported in Table 8.

The findings demonstrate that the outcome has a positive relationship with Blockchain Adoption (high positive coefficient) and a negative correlation with Security Enhancement (high negative coefficient). The Transparency Index exhibits a positive relationship, which is moderate. These variables will have the t-statistics and p-values that will determine whether the effects observed were statistically significant or would have come as a result of random chance.

4.3 Model Diagnostics

Prior to interpreting the regression results, it is necessary to verify whether the estimated model satisfies the key assumptions underlying linear regression analysis. Accordingly, diagnostic tests were conducted to evaluate multicollinearity, homoscedasticity, residual independence, and normality. The results reported in Table 9 provide evidence regarding the statistical adequacy and reliability of the estimated model.

Table 9: Diagnostic Assessment of Regression Assumptions

Diagnostic Test	Statistic	Result	Interpretation
Variance Inflation Factor (VIF)	Max = 3.24	VIF < 10	No serious multicollinearity
Breusch–Pagan Test	p = 0.287	p > 0.05	Homoscedasticity assumed
Durbin–Watson Statistic	DW = 1.92	≈ 2	No significant autocorrelation
Shapiro–Wilk Test	p = 0.103	p > 0.05	Residuals normally distributed
Q–Q plot	Visual inspection	Residuals close to a normal distribution	Residuals follow a normal distribution

Note: The reported statistics assess the key assumptions of linear regression, including multicollinearity, homoscedasticity, autocorrelation, and residual normality.

Source: Authors' calculations based on the regression model results.

Table 9 reports the results of the diagnostic tests used to assess the validity of the regression model. The maximum Variance Inflation Factor (VIF) was 3.24, well below the commonly accepted threshold of 10, indicating the absence of serious multicollinearity among the explanatory variables. The Breusch–Pagan test produced a p-value of 0.287, suggesting that the null hypothesis of homoscedasticity cannot be rejected and that the variance of the residuals remains constant across observations.

The Durbin–Watson statistic was 1.92, which is close to the benchmark value of 2, indicating no significant autocorrelation in the residuals. Residual normality was assessed using the Shapiro–Wilk test, which yielded a p-value of 0.103. Since this value exceeds the conventional significance level of 0.05, the null hypothesis of normality cannot be rejected. This result is further supported by the visual inspection of the Q–Q plot, where the residuals closely follow the reference line.

Overall, the diagnostic results confirm that the regression model satisfies the key assumptions of linear regression, including the absence of severe multicollinearity, homoscedasticity, independence of residuals, and approximate normality. Consequently, the estimated coefficients can be considered reliable, supporting the validity of the empirical findings and the robustness of the conclusions drawn from the analysis.

5. Discussion

The practical result of the present research provides substantial support that blockchain technology brings about perceptible advantages to the accounting and auditing practices, in particular, by decreasing the prices, minimizing the number of mistakes, and making the processes automated. The analytical analogy reveals that the introduction of blockchain will greatly shorten the period of the audit verification as well as increase the transparency. These findings can be correlated with the existing trends in the world, as per which blockchain is becoming more and more accepted as a disruptive tool in the financial reporting.

The comparative analysis displayed that blockchain implementation has a noteworthy effect on shortening the time of audit verification and increasing transparency. These results are consistent with the tendencies of the global arena, where blockchain is viewed as a more disruptive resource in the spheres of financial reporting and audit systems. It is noteworthy that the cost decreased steadily over the entire period of study, but the pace of the decrease slowed after 2023, which means that after the initial efficiencies of implementation are achieved, the marginal gains reduce with each set of years. The trend is an indication of a change from fast cost-efficiency breakthrough to a more gradual optimization with maturing blockchain platforms. The results obtained are also supported by previous claims in that blockchain can reduce the use of manual audit methods and enhance confidence in financial reporting (Pathak et al., 2024; Indrayani et al., 2024) when aligned with the existing academic sources.

However, another significant point of distinction becomes evident in the Ukrainian context: whereas the performance of the international academic field is focused on efficiency and real-time checking, the current evidence indicates that the most significant contribution of blockchain is its ability to help overcome systemic obstacles to systemic manipulation and institutional inefficiency. This inconsistency can be explained by the fact that Ukraine is only in the transition phase of the economy, and the reforms are still ongoing, and there is still no guarantee of trust in financial data.

Furthermore, although the international literature has highlighted high start-up costs incurred in implementing blockchain as a potential remedy, the current findings show that these start-up costs are offset by huge long-term dividends, such as savings in audit expenses and a low rate of financial anomalies. Blockchain, in the Ukrainian specific case, provides rather potentially effective solutions to persistent governance and reporting problems, and its use in corruption prevention through the adoption of unchangeable records may also help people trust the governmental reporting system, in particular, when linked to platforms like ProZorro, which is the Ukrainian public e-procurement system.

Furthermore, blockchain can promote increased transparency in highly sensitive areas, including healthcare and land registries, and it is based on the previous pilot projects in eHealth and land cadastre digitization. Meanwhile, there are serious obstacles: the lack of qualified specialists in blockchain restricts the large-scale adoption, regulatory uncertainty regarding cryptocurrency discourages its adoption by institutions, and the expenses of the first transition can be so high that it is not accessible to smaller companies to switch to blockchain-powered audit systems. These findings have some practical implications. In the case of businesses, blockchain can be an excellent investment that brings long-term cost savings, minimizes risks that may arise in the course of compliance, and enhances trust among stakeholders. In the case of the state, national standards on the introduction of blockchain in accounting and auditing are necessary to interoperate and regulate. In the case of the education sector, it will be mandatory to include blockchain in accounting and auditing courses to train the upcoming professionals who can work in digitised financial landscapes.

The skills gap is one of the requirements that must be addressed in order to guarantee sustainable adoption. Though a number of limitations in this research study, one of which is that the econometric model relied on secondary data and pilot-level data, which might not fully reflect the intricacies of blockchain implementation in different industries. Second, Ukrainian companies were considered only, thus limiting the extrapolability of results to other settings with other regulatory, economic, or technological infrastructures. Third, this paper was mainly aimed at the efficiency of costs and the reduction of errors; thus, other important factors like cybersecurity threats and scalability were not within the scope of this study.

The future research studies, thus, should expand the dataset, use longitudinal analysis, and conduct comparative research in different countries in order to further understand blockchain's impact on auditing and accounting.

Conclusion

This study attempts to question opportunities and the possibility of blockchain technology adoption in the accounting and auditing sector with specific reference to the Ukrainian situation. The goal of the exploration, which is to identify whether blockchain use can contain expenses, reduce errors, and increase transparency compared to the traditional approaches, has been achieved to a considerable extent. By conducting a comparative analysis, we establish that blockchain saves a significant amount of time in the process of verifying transactions, minimizes the possibility of human error and enhances trust in financial reporting.

Our econometric analysis supports that there are significant changes in auditing costs that are statistically connected to blockchain implementation, hence explaining why it is an investigative tool that the accounting profession can transform. It is scientifically new as it combines comparative analysis with an econometric model used on the changing financial sector of Ukraine, where empirical data are limited. Unlike the other international research works that have mostly predetermined the efficiency benefits, this research explains the wider application of blockchain in alleviating the systemic issues, including the manipulation of data and institutional inefficiency, and thus represents a new scholarly input.

Concerning the practical implications, the results are reasonable: organisations can expect to save in the long run and achieve improved compliance with blockchain investment, and governmental bodies can use the technology to achieve greater transparency and advance digital reforms such as ProZorro. Besides, Universities have a chance to incorporate blockchain technology into professional education, and thus, the existing skills gap in the

accounting field will be addressed. Further academic research should expand the range of this study by adding primary data from a significantly larger number of Ukrainian businesses and comparing the results with those of other countries on different scales of digital maturation.

Longitudinal studies can provide information on the sustainability of cost-saving and efficiencies in operations, whereas interdisciplinary studies that integrate cybersecurity, regulatory oversight, and change management practices will provide a more subtle understanding of how blockchain will affect the accounting and auditing milieu These study zones are of current discoveries natural extensions, which could definitely effect theoretic knowledge, but at same time, can improve practice in subject.

Credit Authorship Contribution Statement

Ievsieieva, O. contributed to the conceptualization of the study, research design, methodology development, supervision, and manuscript preparation. Tseben, R. and Kuzmenko, O. contributed to data collection, formal analysis, statistical modelling, and interpretation of results. Polishchuk, O. contributed to the literature review, investigation, validation, and manuscript drafting. Zadniprovsky, O. contributed to data curation, visualization, and critical revision of the manuscript. All authors reviewed and approved the final version of the manuscript.

Conflict of Interest Statement

The authors declare that they have no conflict of interest.

Data Availability Statement

The data used in this study were obtained from publicly available sources, including Statista, the World Bank Open Data platform, the National Bureau of Statistics of Ukraine, government open-data portals, and international institutional reports. The compiled datasets and analytical files used for the descriptive, comparative, and regression analyses are available from the corresponding author upon reasonable request.

Ethical Approval Statement

This study is based exclusively on secondary data obtained from publicly available academic, institutional, and professional sources, including international reports, government databases. The research did not involve human participants, animal subjects, surveys, interviews, experiments, or access to confidential personal information. Consequently, ethical approval from an Institutional Review Board (IRB) or Ethics Committee was not required. All data were collected and analysed in accordance with the terms of use of the respective data providers and the principles of research integrity, transparency, and reproducibility.

References

Abdallah, M. A. M. (2025). Ethical Leadership, Managerial Risk-Based Incentives, and Accounting Conservatism: A Comparative Evidence from Egypt and Saudi Arabia. *Future Business Journal, 11*(132). https://doi.org/10.1186/s43093-025-00546-2

Abdullahi, M., Ahmad, A., Pandey, B. K., & Digivijay, P. (2024). Digital Currency Adoption: A Comparative Analysis of Global Trends and the Nigerian eNaira Digital Currency. *SN Computer Science, 5*(602). https://doi.org/10.1007/s42979-024-02882-6

Alimohammadlou, M., & Alinejad, S. (2025). Challenges of Blockchain Implementation in SMEs' Supply Chains: An Integrated IT2F-BWM and IT2F-DEMATEL Method. *Electronic Commerce Research, 25*, 907–949. https://doi.org/10.1007/s10660-023-09696-3

Al-Khoury, A. F., Alastal, A. Y. M., Samara, H., Alslaibi, N. A., Abdulmuhsin, A. A., & Alqudah, M. Z. (2025). The Bibliometric Landscape of Emerging Technology in the Accounting Information Systems Field. *Cogent Business & Management, 12*(1), 1–27. https://doi.org/10.1080/23311975.2025.2573191

Almutairi, K., Hosseini Dehshiri, S., Hosseini Dehshiri, S., Hoa A.X., Dhanraj, J. A., Mostafaeipour, A., Issakhov, A., & Techatoet, K. (2023). Blockchain Technology Application Challenges in Renewable Energy Supply Chain Management. *Environmental Science and Pollution Research, 30*, 72041–72058. https://doi.org/10.1007/s11356-021-18311-7

Anjana, P. S., Kumari, S., Peri, S., Rathor, S. & Somani, A. (2024). OptSmart: a Space Efficient Optimistic Concurrent Execution of Smart Contracts. *Distributed and Parallel Databases, 42*, 245–297. https://doi.org/10.1007/s10619-022-07412-y

Arun, C. R. A., Pani, A. K., & Kumar, P. (2025). Blockchain-Enabled Smart Contracts and the Internet of Things: Advancing the Research Agenda Through a Narrative Review. *Multimedia Tools and Applications, 84*, 5097–5147. https://doi.org/10.1007/s11042-024-18931-4

Castillo, M. C., & Corti, I. N. (2024). The Use of Blockchain in Public Administration: A Transformative Tool for a More Sustainable Future. In W. Leal Filho, A. L. Salvia, & C. R. Portela de Vasconcelos (Eds.), *An Agenda for Sustainable Development Research*. World Sustainability Series. Springer, Cham. https://doi.org/10.1007/978-3-031-65909-6_14

Chittipaka, V., Kumar, S., Sivarajah, U., Bowden, J. L.-H. & Baralet, M. M. (2023). Blockchain Technology for Supply Chains Operating in Emerging Markets: An Empirical Examination of Technology–Organization–Environment (TOE) framework. *Annals of Operations Research, 327*, 465–492. https://doi.org/10.1007/s10479-022-04801-5

Dyball, M. C., & Seethamraju, R. (2025). Blockchain: Exploring its Impact on the Business Models of Australian Accounting Firms. *Information Systems Frontiers, 27*, 429–448. https://doi.org/10.1007/s10796-024-10547-1

Ekramifard, A., Amintoosi, H., Seno, A. H., Dehghantanha, A., & Parizi, R. M. (2020). A Systematic Literature Review of Integration of Blockchain and Artificial Intelligence. In K. K. R. Choo, A. Dehghantanha, & R. Parizi (Eds.), *Blockchain Cybersecurity, Trust and Privacy*. Advances in Information Security, 79, 147–160. Springer. https://doi.org/10.1007/978-3-030-38181-3_8

Gkekas, N., Ireiotis, N., & Kounadeas, T. (2025). Drivers of Blockchain Adoption in Accounting and Auditing Services: Leveraging Theory of Planned Behaviour with Identity and Moral Norms. *Journal of Risk and Financial Management, 18*(10), 1–26. https://doi.org/10.3390/jrfm18100573

Gökalp, E., Gökalp, M. O., Çoban, S., & Eren, P. E. (2018). Analysing Opportunities and Challenges of Integrated Blockchain Technologies in Healthcare. In S. Wrycza & J. Maślankowski (Eds.), *Information Systems: Research, Development, Applications, Education*. Lecture Notes in Business Information Processing, 333, 174–183. Springer, Cham. https://doi.org/10.1007/978-3-030-00060-8_13

Goswami, P., Faujdar, N., Debnath, S., & Singh, G. (2024). Investigation on Storage Level Data Integrity Strategies in Cloud Computing: Classification, Security Obstructions, Challenges and Vulnerability. *Journal of Cloud Computing, 13*(45). https://doi.org/10.1186/s13677-024-00605-z

Haque, R., Sarwar, H., Kabir, S. R., Forhat, R., Sadeq M. J., Akhtaruzzaman, Md.& Haque, N. (2020). Blockchain-Based Information Security of Electronic Medical Records (EMR) in a Healthcare Communication System. In S. L. Peng, L. H. Son, G. Suseendran, & D. Balaganesh (Eds.), *Intelligent Computing and Innovation on Data Science*. Lecture Notes in Networks and Systems, 118, 641–650. Springer, Singapore. https://doi.org/10.1007/978-981-15-3284-9_69

Hassanein, A., Benameur, K. B., Mostafa, M. M., Al-Shattarat, W., & Magar, N. H. (2025). Mapping the Scientific Research of Blockchain Technology in Accounting and Auditing: Bibliometric Analyses and a Roadmap for Future Research. *Cogent Business & Management, 12*(1), 1–23. https://doi.org/10.1080/23311975.2025.2513638

Indrayani, Sukoharsono, E. G., Djamhuri, A., & Roekhudin. (2024). Mapping Research Landscape of Emerging Technology in the Accounting Field: A Bibliometric Analysis. *Cogent Business & Management, 11*(1). https://doi.org/10.1080/23311975.2024.2407044

Jebbar, W. A., & Al-Zubaidie, M. (2024). Transaction-Based Blockchain Systems Security Improvement Employing Micro-Segmentation Controlled by Smart Contracts and Detection of Saddle Goatfish. *SN Computer Science, 5*(898). https://doi.org/10.1007/s42979-024-03239-9

King, T., & Morton, E. (2025). The Diffusion of Blockchain Technology for Financial Reporting Functions Seen through the Lens of Norm Lifecycles. In T. King & J. Williams (Eds.), *Corporate Governance in the Banking and Financial Sector*. Palgrave Macmillan Studies in Banking and Financial Institutions, 257–299. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-83353-3_10

Kobets, D., Terentieva, N., Shkvyria, N., Lysytsia, N., & Siemak, I. (2024). Digitalization and its Impact on the Development of Contemporary Marketing Strategies. *Economic Affairs,* 69(2), 1021–1040. https://doi.org/10.46852/0424-2513.3.2024.26

Kumar, S., Lim, W. M., Sivarajah, U., & Kaur, J. (2023). Artificial Intelligence and Blockchain Integration in Business: Trends from a Bibliometric-Content Analysis. *Information Systems Frontiers, 25*, 871–896. https://doi.org/10.1007/s10796-022-10279-0

Li, Y. (2019). Emerging Blockchain-Based Applications and Techniques. *Service Oriented Computing and Applications, 13*, 279–285. https://doi.org/10.1007/s11761-019-00281-x

Lagodiienko, V., Karyy, O., Ohiienko, M., Kalaman, O., Lorvi, I., & Herasimchuk, T. (2019, September). Choosing Effective Internet Marketing Tools in Strategic Management. *International Journal of Recent Technology and Engineering (IJRTE),* 8(3), 5220–5225. https://doi.org/10.35940/ijrte.C5868.098319

Malinov, V., Zhebka, V., Kokhan, I., Storchak, K., & Dovzhenko, T. (2024). Cryptocurrency as a Tool for Attracting Investment and Ensuring the Strategic Development of the Bioenergy Potential of Processing Enterprises in Ukraine. In A. Semenov, I. Yepifanova, & J. Kajanová (Eds.), *Data-Centric Business and Applications*. Lecture Notes on Data Engineering and Communications Technologies, 195, 387–405. Springer, Cham. https://doi.org/10.1007/978-3-031-54012-7_17

Mazumder, P. T. (2025). Blockchain in Trade Finance: Reducing Fraud and Improving Efficiency Through Digital Ledger Technology. *Digital Finance,* 7, 1043–1063. https://doi.org/10.1007/s42521-025-00157-0

Meshcheriakov, A., Maslov, A., Saienko, G., Antoniuk, O., & Sunduk, T. (2024). Assessment of Factors Influencing the Stability of the Banking System: *Experience of the European Union Countries. Salud, Ciencia y Tecnología - Serie de Conferencias, 3,* 647. https://doi.org/10.56294/sctconf2024.647

Moraes, K. K., Godinho Filho, M., Teles, B. P., Ganga, G. M. D., & Callefi, M. H. (2025). Unpacking the Complexity of Non-Technological Barriers for Blockchain Adoption in the Supply Chain: Framework Proposal and Practical Illustration. *Production Planning & Control, 36*(16), 1–25. https://doi.org/10.1080/09537287.2025.2564355

Nadji, B. (2024). Data Security, Integrity, and Protection. In S. McClellan (Ed.), *Data, Security, and Trust in Smart Cities*. Signals and Communication Technology, 59–83. Springer, Cham. https://doi.org/10.1007/978-3-031-61117-9_4

NBSU. (2024). Economic and Financial Data for Ukraine. National Bureau of Statistics of Ukraine. [Online] https://stat.gov.ua/en/node/5101

Nguyen, T. T., Nguyen, C. T., & Van, A. L. (2023). Sustainability-based Optimization of Dissimilar Friction Stir Welding Parameters in Terms of Energy Saving, Product Quality, and Cost-Effectiveness. *Neural Computing and Applications, 35*, 5221–5249. https://doi.org/10.1007/s00521-022-07898-8

Nouis, S. C., Uren, V., & Jariwala, S. (2025). Evaluating Accountability, Transparency, and Bias in AI-Assisted Healthcare Decision-Making: a Qualitative Study of Healthcare Professionals' Perspectives in the UK. *BMC Medical Ethics, 26*(89). https://doi.org/10.1186/s12910-025-01243-z

Ogbaisi, S. A., Edosa, M., & Ibadin, L. A. (2024). Block Chain Technology and the New Wave of Accounting Practices. *FUDMA Journal of Accounting and Finance Research, 2*(2), 45–55. https://doi.org/10.33003/fujafr-2024.v2i2.92.45-55

Pathak, M., Mishra, K. N., & Singh, S. P. (2024). Securing Data and Preserving Privacy in Cloud IoT-Based Technologies: An Analysis of Assessing Threats and Developing Effective Safeguard. *Artificial Intelligence Review, 57*(269). https://doi.org/10.1007/s10462-024-10908-x

Phommixay, S., Doumbia, M. L., & Lupien St-Pierre, D. (2020). Review on the Cost Optimization of Microgrids via Particle Swarm Optimization. *International Journal of Energy and Environmental Engineering, 11*(1), 73–89. https://doi.org/10.1007/s40095-019-00332-1

Rybalchenko, S., Lukianykhina, O., Alamanova, C., Saienko, V., & Sunduk, T. (2022). Anti-crisis Management of Banking Institutions: Current Problems and Prospects for Improvement. *Financial and Credit Activity: Problems of Theory and Practice, 5*(46), 29–39. https://doi.org/10.55643/fcaptp.5.46.2022.3907

Qader, K. S., & Cek, K. (2024). Influence of Blockchain and Artificial Intelligence on Audit Quality: Evidence from Turkey. *Heliyon, 10*(9), 1–12. https://doi.org/10.1016/j.heliyon.2024.e30166

Saeed, U. F., & Nagriwum, T. M. (2025). Carbon Accounting and Climate Change: Leveraging Eco-Digitalization and Governance Dynamics for Environmental Sustainability in Emerging Markets. *Journal of the Knowledge Economy*. https://doi.org/10.1007/s13132-025-02750-5

Sahoo, S., Kumar, S., Sivarajah, U., Lim, W.M., Westland, J. Ch. & Kumar, A. (2024). Blockchain for Sustainable Supply Chain Management: Trends and Ways Forward. *Electronic Commerce Research, 24*, 1563–1618. https://doi.org/10.1007/s10660-022-09569-1

Sargent, C. S. (2022). Replacing Financial Audits with Blockchain: the Verification Issue. *Journal of Computer Information Systems, 62*(6), 1145–1153. https://doi.org/10.1080/08874417.2021.1992805

Secinaro, S. F., Oppioli, M., Demarchi, L., & Novotny, O. (2025). Bridging Borders and Boundaries: the Role of New Technologies in International Entrepreneurship and Intercultural Dynamics. *International Entrepreneurship and Management Journal, 21*(46). https://doi.org/10.1007/s11365-024-01061-6

Sembiyeva, L., Prokopenko, O., Zholamanova, M., Amanova, G., & Tazhbenova, G. (2025). Adoption in Financial Accounting: Enhancing Efficiency and Compliance. In M. T. Pereira, F. J. G. Silva, V. Ivanov, I. Pinto, & L. Pinto Ferreira (Eds.), *Advances in Design, Simulation and Manufacturing VIII*. Lecture Notes in Mechanical Engineering, 202–217. Springer, Cham. https://doi.org/10.1007/978-3-032-07144-6_18

Seong, J., Jeon, Y., Yang, Y., Badloe, T. & Rho, J. (2024). Cost-effective and Environmentally Friendly Mass Manufacturing of Optical Metasurfaces towards Practical Applications and Commercialization. *International Journal of Precision Engineering and Manufacturing–Green Technology, 11*, 685–706. https://doi.org/10.1007/s40684-023-00580-x

Seshadrinathan, S., & Chandra, S. (2025). Trusting the trustless Blockchain for its Adoption in Accounting: Theorizing the Mediating Role of Technology–Organization–Environment Framework. *Financial Innovation, 11*(44), 1–39. https://doi.org/10.1186/s40854-024-00685-5

Statista. (2024). Global Blockchain and Financial Technology Statistics. [Online] https://www.statista.com

Telenyk, S., Rolick, O., Bukasov, M., Halushko, D., & Pysarenko, A. (2014). Qualitative Evaluation Method of IT-Infrastructure Elements Functioning. *2014 IEEE International Black Sea Conference on Communications and Networking (BlackSeaCom)*, 165–169. https://doi.org/10.1109/BlackSeaCom.2014.6849031

Trachova, D., Demchuk, O., & Trachov, V. (2024). Methodological and Technological Solutions to Improve the Security of Ukraine's Accounting System During the Hostilities. In A. Semenov, I. Yepifanova, & J. Kajanová (Eds.), *Data-Centric Business and Applications*. Lecture Notes on Data Engineering and Communications Technologies, 194, 269–288. Springer, Cham. https://doi.org/10.1007/978-3-031-53984-8_12

Wang, W., Chen, Y., Wang, Y., Deveci, M., Al-Hinai, A. & Kadry, S. (2025). Analysing the Barriers to Blockchain Adoption in Supply Chain Finance Using an Integrated Interval-Valued Fermatean Fuzzy RAFSI Model. *Financial Innovation, 11*, 9. https://doi.org/10.1186/s40854-024-00670-y

World Bank. (2024). World Bank open data. [Online] https://data.worldbank.org

Xiao, J., Huang, H., Wu, C., Chen, Q., & Huang, Z. (2023). A Collaborative Auditing Scheme with Dynamic Data Updates Based on Blockchain. *Connection Science, 35*(1). https://doi.org/10.1080/09540091.2023.2213863

Xiong, X., & Luo, J. (2024). Global trends in Cryptocurrency Regulation: An overview. In S. Leonardos, E. Alfieri, W. J. Knottenbelt, & P. Pardalos (Eds.), *Mathematical Research for Blockchain Economy*. MARBLE 2024. Lecture Notes in Operations Research. Springer, Cham. https://doi.org/10.1007/978-3-031-68974-1_4

Zavhorodnii, A., Ohiienko, M., Biletska, Y., Bondarenko, S., Duiunova, T., & Bodenchuk, L. (2021). Digitalization of Agribusiness in the Development of Foreign Economic Relations of the Region. *Journal of Information Technology Management, 13*(Special Issue), 123–141. https://doi.org/10.22059/jitm.2021.82613