FINANSE i PRAWO FINANSOWE

JOURNAL of FINANCE and FINANCIAL LAW

ISSN 2353-5601 Special Issue 2025, vol. 1

NUMER SPECJALNY 2025
SPECIAL ISSUE 2025

FACULTY OF ECONOMICS AND SOCIOLOGY
University of Lodz

UNIVERSITY OF LODZ

Scientific Council

Femi Ayoola (University of Ibadan, Nigeria)
Djula Borozan (University of Osijek, Croatia)
Monika Boguszewicz-Kreft (WSB Merito University Gdansk, Poland)
Raffaela Ciuffreda (University of Sannio, Italy)
Zbysław Dobrowolski (Jagiellonian University, Poland)
Cagri Elmas (Akdeniz University, Turkey)
Teresa Famulska (University of Economics, Katowice, Poland)
Jovana Filipović (University of Kragujevac: Kragujevac, Serbia)
Stanisław Flejterski (University of Szczecin, Poland)
Jerzy Gajdka (University of Lodz, Poland)
Mircea Georgescu (Universitatea „Alexandru Ioan Cuza" din Iași, Romania)
Grzegorz Gołębiowski (School of Finance and Management in Warsaw, Poland)
Simon Grima (University of Malta, Malta)
Iryna Hryhoruk (Vasyl Stefanyk Precarpathian National University, Ivano-Frankivs'k, Ukraine)
Ireneusz Jaźwiński (University of Szczecin, Poland)
Hongjoo Jung (Sungkyunkwan University Seoul, South Korea)
Sami Kajalo (Aalto University, Finland)
Stanisław Kasiewicz (The Warsaw School of Economics: SGH, Poland)
Mustafa Cem Kirankabes (Balıkesir University, Turkey)
Zbigniew Kmieciak (University of Lodz, Polska)
Jan Kreft (Gdańsk Tech, Poland)
Sophia Lobozynska (Ivan Franko L'viv National University, Ukraine)
Maciej Malaczewski (University of Lodz, Poland)
Elena Manas (University of Alcala de Henares, Spain)
Daniel Meyer (College of Business and Economics in Johannesburg, RPA)
Veronika Miťková (Comenius University Bratislava, Slovakia)
María del Carmen Montero Bancalero (Universidad de Sevilla, Spain)
Paulo Reis Mourao (University of Minho, Braga, Portugal)
Yunju Nam (University at Buffalo of New York, USA)
Kazumi Naito (Keio University, Japan)
Abdelhamid Nechad (ENCG Tangier, Morocco)
Dijana Oreski (University of Zagreb, Croatia)
Witold Orłowski (University of Lodz, Vistula University in Warsaw, Poland)
Fazilah Mohd Razali (University Putra Malaysia, Selangor, Malaysia)
Humberto Nuno Rito Ribeiro (University of Aveiro, Portugal)
Humberto Nuno Rito Ribeiro (University of Aveiro, Portugal)
Cristina Teodora Roman (Universitatea „Alexandru Ioan Cuza" din Iași, Romania)
María Dolores Alcaide Ruiz (University of Seville, Spain)
Ramona Rupeika-Apoga (University of Latvia, Ryga, Latvia)
Edyta Rutkowska-Tomaszewska (University of Wroclaw, Poland)
Eleni Sakellariou (University of Crete, Greece)
Carmen Sanchez (Universidade de Santiago de Compostela, Spain)
Wolfgang Scherf (Justus Liebig University, Giessen, Germany)
Francisco Serrano Domínguez (Universidad de Sevilla, Spain)
Biagio Simonetti (University of Sannio, Italy)
Iryna Skomorowycz (Ivan Franko National University of Lviv, Ukraine)
Magdalena Maria Stuss (Jagiellonian University, Poland)
Anna Tarabasz (Curtin University, Dubai, United Arab Emirates)
Mahmut Tekce (Marmara University, Turkey)
Fátima Teresa Sol Murta (University of Coimbra, Portugal)
Jacek Tomkiewicz (Kozminski University, Warsaw, Poland)
Harry W. Trummer (Goethe University, Frankfurt, Germany)
Ulyana Vladychyn (Ivan Franko National University of Lviv, Ukraine)
Leon Wolff (Hitotsubashi University, Tokyo, Japan)
Valentyna Mykhailivna Yakubiv (Vasyl Stefanyk Precarpathian National University, Ukraine)

FINANSE i PRAWO FINANSOWE

JOURNAL of FINANCE and FINANCIAL LAW

ISSN 2353-5601

NUMER SPECJALNY 2025
SPECIAL ISSUE 2025

Editorial Team

CONTENTS

• F I N A N S E I P R A W O F I N A N S O W E •
• JOURNAL OF FINANCE AND FINANCIAL LAW •

Special Issue 2025, vol. 1: 7–8

INTRODUCTION TO SPECIAL ISSUE

We are pleased to present to our readers a special issue devoted to the role of accounting, auditing, and digital technologies in fostering financial transparency and economic resilience amid contemporary crises. The collected articles address highly relevant challenges associated with the transformation of accounting and financial oversight systems under the influence of digitalization, war, corruption, and informational asymmetry. The common thread uniting all contributions is the conviction that modern accounting instruments supported by technology, ethics, and social responsibility can substantially enhance the resilience of institutions and enterprises to economic and social risks.

This issue offers a wide spectrum of research perspectives: from theoretical and conceptual analyses to empirical studies, diagnostic frameworks, and model proposals. The authors represent diverse academic backgrounds and methodological traditions, yet they share a common goal to seek methods that improve transparency, efficiency, and ethical standards in financial management in a rapidly changing technological and socio-political environment.

The first article addresses the fight against the shadow economy and corruption through the enhancement of accounting and auditing methodologies. It emphasizes that well-designed accounting systems, supported by digital technologies and strong ethical foundations, can serve as effective instruments for reducing financial crime and increasing transparency. Combining theoretical inquiry with empirical evidence, the study includes semi-structured interviews with accountants and auditors from both public and private sectors. The results confirm that the integration of digital accounting tools such as blockchain and electronic auditing with professional ethics significantly limits opportunities for misconduct. The key conclusion is that an integrated ethical and technological framework is essential for positioning accounting as a central mechanism in combating corruption and the informal economy.

The second paper explores the influence of cloud technologies and blockchain on the development of control systems in auditing. This theoretically grounded study investigates how the integration of digital innovations reshapes auditing into a continuous and proactive process. The findings indicate that technologies such as cloud computing and blockchain increase transparency, traceability, and data immutability, which are essential for combating fraud and strengthening internal controls. At the same time, the research identifies challenges related to cybersecurity, dependence on network infrastructure, and regulatory uncertainty. Ultimately, the paper provides a balanced view of how technological solutions can transform audit practices and reinforce corporate governance.

The final article focuses on accounting strategies and corporate social responsibility (CSR) under wartime conditions. It explores how strategic accounting can support socially responsible and ethical business practices in contexts of instability and conflict. Combining theoretical analysis with empirical interviews among accounting professionals, the study reveals that wartime CSR initiatives - such as expenditures on shelters, humanitarian aid, and employee support - have become integral to management accounting systems. However, the absence of standardized reporting frameworks limits comparability and transparency. The authors advocate for the creation of internal indicators to measure the social, environmental, and security impacts of corporate activities. The paper concludes that integrating strategic accounting with CSR enhances trust among businesses, governments, and society, transforming social responsibility from a voluntary initiative into a critical factor of organizational survival and societal resilience.

Iwa Kuchciak
Vita Semaniuk

Guest Editors

• F I N A N S E I P R A W O F I N A N S O W E •
• JOURNAL OF FINANCE AND FINANCIAL LAW •

Special Issue 2025, vol. 1: 9–24
https://doi.org/10.18778/2391-6478.S1.2025.01

COPE Member since 2021 JM15102

Vita Semaniuk https://orcid.org/0000-0001-7010-9923
Doctor of Economics Sciences, Professor, West Ukrainian National University,
e-mail: v.semaniuk@wunu.edu.ua

Iwa Kuchciak https://orcid.org/0000-0002-2577-776X
Dr, University of Lodz, The Faculty of Economics and Sociology, Lodz University

THE STRUGGLE AGAINST THE SHADOW ECONOMY AND CORRUPTION: THE POSSIBILITIES OF ACCOUNTING AND DIGITAL TECHNOLOGIES

ABSTRACT

The purpose of the article. The shadow economy and corruption pose significant threats to national economies, as illicit income from financial crimes and tax evasion often funds organized crime and terrorism, while exacerbating inequality and hindering development. This article examines key categories of financial crime, including asset misappropriation, fraud, bribery, cybercrime, and accounting violations. The study aims to enhance accounting methodology as a tool in combating corruption and the shadow economy. The central hypothesis is that improvements in accounting and auditingwhen supported by ethical, organizational, and technological infrastructurecan reduce these phenomena. Accounting information, when integrated with digital systems and ethical standards, becomes a powerful instrument for transparency and accountability.
Methodology. The study's methodological approach integrates theoretical and empirical components to examine the role of accounting in combating corruption and the shadow economy. Theoretically, it draws on general philosophical and scientific methods, including bibliometric analysis, synthesis, and historical-logical approaches, to explore the structural roots of financial crime and the potential of accounting for transparency and control. Empirically, the research involved 15 semi-structured interviews with accounting professionalsboth accountants and auditors from public and private sectors.
Results of the research. The interviews aimed to identify practical challenges in financial transparency, ethical dilemmas, and the impact of digitalization on fraud prevention. This qualitative data enriched the study's conclusions, offering a multidimensional perspective on how accounting practices are shaped by real-world constraints, organizational culture, and technological readiness.

Keywords: shadow economy, corruption, accounting transparency, digital technologies, forensic accounting, fraud prevention, blockchain in accounting

JEL Class: E60, M41, M42, O33

Introduction

The shadow economy, corruption, and financial crime represent serious threats to sustainable economic development, leading to reduced tax revenues, growing social inequality, and the support of illicit activities, including the financing of terrorism. It is estimated that the global shadow economy exceeds $10 trillion, directly affecting the livelihoods of approximately 1.8 billion people (ACCA Global, 2017a).

According to the Association of Chartered Certified Accountants (ACCA), the shadow economy's share in global GDP may decline from 23% (2011) to 21% by 2025; however, this trend is uneven particularly in developing countries, where its share is projected to rise (ACCA Global, 2017b). Key drivers of this phenomenon include excessive tax burdens, complex tax systems, intense market competition, rising unemployment and poverty, limited access to education, escalating corruption, and increasing digitalization, which offers

Received: 2025.01.14. Accepted: 2025.06.28.

Funding Information: None. **Conflicts of interests:** None. **Ethical Considerations:** The Authors assure of no violations of publication ethics and take full responsibility for the content of the publication.

anonymity to users (ACCA Global, 2022). Additionally, the European shadow banking sector has been shown to be highly procyclical and positively related to stricter capital regulations (Hodula et al., 2020).

These dynamics have intensified in the context of recent global crises most notably the COVID-19 pandemic and the Russian invasion of Ukraine both of which have increased the risk of economic stagnation and accelerated criminal activity. In the current digital transformation era, information technologies play a dual role: on one hand, enabling effective tracking of business operations; on the other, creating new avenues for fraud through the exploitation of digital loopholes and user anonymity.

The hypothesis of this study posits that improving accounting and auditing methods when supported by ethical, organizational, and technological infrastructure contributes to a reduction in corruption and the shadow economy. Accounting systems integrated with modern digital technologies such as blockchain, artificial intelligence, and Big Data can significantly enhance information transparency, reduce informational asymmetry, and serve as effective tools for preventing abuse and economic crime.

Despite ongoing regulatory efforts, effective countermeasures against the shadow economy require a preventive approach, the creation of an institutional environment of zero tolerance for misconduct, and the engagement of the accounting profession as guardians of integrity, responsibility, and the ethical dimension of financial information (Everett et al., 2020).

Literature review

The analysis of scientific research in the field of economics, sociology, law, etc., allows to define the shadow economy as a separate sphere of economic relationships that take different forms (informal, hidden, illegal) and are implemented in a parallel space to the legal economy. The shadow economy is interpreted as activities performed with the express intention of avoiding taxes and social contributions or legal requirements concerning minimum wages, working hours, health and safety regulations (Schneider, 2005; Medina and Schneider, 2018). The analysis of scientific publications on the shadow economy shows a multitude definition of the mentioned concept (Schneider&Buehn, 2000; Ergene, 2015, Farzanegan et al., 2020) from "Unobservable economy" to "parallel economy").

From an economic perspective, the shadow economy arises from corruption (political factors), legislative conflicts (legal factors), and excessive regulation and taxation (economic factors). Its informal and non-declarative nature makes it difficult to measure, but various assessment methods exist, including economic-mathematical, statistical, expert-analytical, sociological, socio-psychological, control, futurological, criminological, and legal approaches.

There are quantitative methods of calculating the level of the shadow economy, which are applied to the micro-level of the functioning of the economic system: the questionnaire method (Schneider, 2005; Schneider & Enste, 2000; Medina & Schneider, 2018), expert methods, analysis of testimonies of victims or accomplices; control methods; analytical and accounting methods – analysis of accounting documents, economic analysis, audit (Mogensen et al., 1995).

Scientists have proposed a method of comparing two or more sources of the same data obtained in the accounting system (Postea & Achim, 2022). However, it can reveal only a portion of the shadow economy tied to legal activity. Given the rise of the information economy and major structural shifts, existing assessment methods require revision due to biases stemming from the increasing value of intellectual labor and intangible GDP components. In addition, monetary methods are becoming less reliable amid reduced cash usage and the emergence of cryptocurrencies.

The shadow economy has become the subject of economic research despite the ambiguity of interpretations and the difficulty of measuring this phenomenon, because the subjects of shadow economic relations hide the facts of their implementation. The differences between the formal and informal sectors of the economy were investigated by Hart (Hart, 1973) and initiated research into the methodology for detecting and preventing

the shadow economy (Feige, 1979; Gutmann, 1979; Schneider & Buehn, 2018). The shadow economy, tax evasion and corruption are the cause of economic crises (González-Fernández & González-Velasco, 2014; Farzanegan & Badreldin, 2017) proved the possibility of growing budget deficits, declining infrastructure quality and growing to political instability due to the growth of the shadow economy, and (Davis, 2007; Quintano & Mazzocchi, 2010; Lisi , 2016) show its negative impact on economic growth.

As well as, there are studies on the positive impact of the shadow sector of the economy on the socio-economic development of the country (Gerxhani, 2004; La Porta & Shleifer, 2014; Schneider & Enste, 2000), which claim that informal firms add minimal value to the formal economy due to low labor productivity, and the parallel economy has a positive effect on economic growth (Nabi & Drine, 2009; Ergene, 2015). Such statements are often contradictory and depend on the functioning of economic systems. In less developed countries, the shadow economy brings no positive effects. In contrast, in developed economies forming an information society, it is closely linked to the legal economy and divides into two segments: a symbiotic one where only part of the production cycle occurs in the shadow economy and an autonomous one, which spans the entire value creation process, from resource acquisition to final consumption (Bashlakova & Bashlakov, 2020).

Expert assessment remains a key tool for estimating the shadow economy, as it accounts for both quantitative and psychological factors driving shadow activity, corruption, and economic crime. In the absence of fully reliable measurement methods, the urgency of addressing these issues is especially high in less developed economies. Insufficient data on the shadow sector leads to macroeconomic and managerial inefficiencies, as distorted information undermines decision-making and resource allocation. International accounting standards support greater transparency by aligning practices with global reporting expectations (Cuadrado-Ballesteros et al., 2020; Paterson et al., 2019; Rodrigue & Dey, 2022).

Therefore the basis of the formation of economic information at different levels of management is the accounting system, and the object of accounting research is the economic reality of the business entity at its various levels (global economy, country, business entities (large, small, medium – the micro level of accounting), individual and households (quasi-level of accounting) (Semaniuk, 2018). The analysis of the literature shows that accounting can contribute to anti-corruption efforts in the social, economic and political contexts, as well as become a preventive factor in the implementation of fraudulent actions and shadow operations (Malagueño, 2010; Cooper et al., 2013; Goddard et al., 2016, Rodrigue & Dey, 2022).

The ability of accounting systems to generate relevant information is expanding with the widespread adoption of digital technologies. Digitization transforms accounting methodology and can drive the development of tools to prevent shadow operations, money laundering, fraud, corruption, and other economic crimes. The literature presents two contrasting views on accounting's role in this context: the orthodox approach emphasizes its value-creating potential, while the radical approach sees accounting as both a catalyst and potential constraint for economic responsibility (Everett et al., 2007).

Study by the International Federation of Accountants, for instance, illustrates the vital and unique role that accountants play when it comes to stymieing fraud on the international stage, where tricksters can rely on impressive digital tech and the dizzying nature of international regulations to avoid prying eyes. The study revealed what should be common sense to most, as it told us that the more accountants we have in the workforce, the lower the levels of corruption" (Kirtley, 2016). The positive impact of the adoption of international accounting and auditing standards on the perception of corruption, directly or indirectly, through SARS prove Kurniawati, E.P. and Achjari, D., proposing a strategy to eradicate corruption by adopting international accounting and auditing standards and strengthening auditing and reporting standards (Kurniawati & Achjari, 2022).

There is also an opposite point of view regarding accounting – research on the relationship between corruption and accounting in the field of public procurement. It examines how accoun-ting can combat or facilitate corruption. The MOSE case offers intriguing insights into how accounting can be used to build a "sustainable" network of corruption by collecting dirty money and facilitating the distribution of benefits among individuals (Pilonato, 2022).

Scholars describe the roles of accounting and accountants in organizations and society in the context of the digital era, providing practical insight into the potential relationship between technological (especially digital) developments and labor market dynamics for accounting professionals (Gonçalves et al., 2022). Korhonen et al. (2022) explore remote control and virtual or augmented reality technologies to prove that accountants can remain efficient and competitive compared to machines, and this makes significant adjustments in decision-making processes and creation of information in management accounting.

The digital transformation of accounting methods will facilitate access to information and its transparency (Yüksel, 2020). Cloud accounting technologies have a positive effect on efficiency in the context of "reducing the risk of error (especially human error), low risk of fraud, system automation, big data analysis, huge cost savings (due to increased efficiency and reduced errors), increased reliability in financial reports and reducing the work process" (Mosteanu & Faccia, 2020). Some researchers, including Yau-Yeung et al. (2020) emphasize the existence of certain risks associated with the digitization of accounting. Literature review in the field of accounting shows that attention to the prospects for the use of digital technologies in accounting is significant, and the main publications relate to the use of Bid Data methods, digital platforms, the use of new technologies in accounting, cyber security (Moll & Yigitbasioglu, 2019; Leoni & Parker, 2019).

The use of information technologies reduces the informal economy a trend confirmed in African countries and may apply to all low-income nations when paired with financial development, human capital, and corruption control (Ndoya et al., 2023). Integrating accounting methods with digital tools enhances information creation, data collection, analysis, and decision-making, enabling more effective control and audit practices against shadow activity and corruption. To support this, accounting science must evolve beyond the traditional dual-methodological framework.

Relationship between shadow economy, corruption and accounting

The shadow economy operates outside formal accounting and control systems, leading to unrecorded transactions and violations of established accounting principles. Its core drivers are economic crime and corruption, often enabled by unethical accounting practices. Fraud contributes to corporate collapses and broader economic crises. Despite advances in digital innovation, core mechanisms of bribery, corruption, and illicit operations have remained largely unaffected. The fifth technological revolution has introduced new tools not only for business transformation but also for the advancement of sophisticated financial crimes. This necessitates a strategic approach to identifying and mitigating economic crime risks in the context of a rapidly evolving economic landscape.

The COVID-19 pandemic highlighted systemic limitations in internal controls and accelerated digital transformation, thereby increasing exposure to fraud and enabling long-standing schemes to emerge or evolve (The Economist, 2020). In the global economy, threats can originate both internally and externally, and organizational success depends heavily on risk mitigation and reputational integrity.

Fraud investigations and effective risk management strategies are essential to safeguarding a company's tangible and intangible assets. Mechanisms such as dispute resolution, cybercrime response, and regulatory compliance contribute to organizational resilience (PwC, 2020). Post-industrial economies demand new skillsets, adaptive thinking, and intelligent data processing where accounting shifts from a secondary system into a critical information infrastructure for decision-making.

Corruption, conceptualized by Klitgaard (1988) as $C = M + D - A$ (corruption = monopoly + discretion – accountability), depends on the concealment of financial information. This distorts accounting outputs and undermines its informational value. Cross-country analysis of 57 nations confirms a correlation between accounting transparency and reduced perceived corruption; improvements in accounting and audit quality can lower corruption levels (Malagueño et al., 2010). Corruption and fraud are often facilitated by accountants with access to documentation, methods, and systems that allow fabrication of reports and contracts. The concept

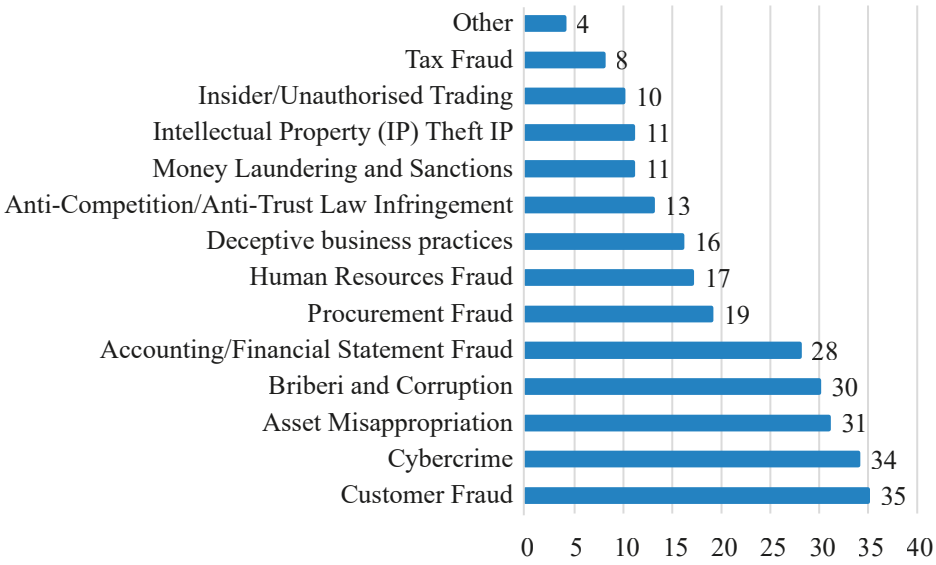
of "creative accounting" involves manipulation of reports to meet management demands (Mathews & Perera, 1991; Shah et al., 2011). Innovation in reporting may be legitimate, crossing ethical boundaries leads to misinformation. Activities such as off-the-book reporting, unregistered transactions, or falsified documentation clearly violate accounting norms.

Creativity in accounting, as understood here, involves applying nontraditional techniques (especially in management accounting) to generate decision-relevant information while remaining within ethical limits (Semaniuk, 2018). However, misuse of such methods can distort financial reality and obscure illegal operations.

Shadow economies are frequently intertwined with corruption and illicit capital flows, such as bribes for policy influence or concealment of criminal activity. Financial crime is estimated to cost over $3.5 trillion annually surpassing the GDP of the UK (Gordon, 2020). These phenomena create systemic risks at both macroeconomic and global levels, generating income that fuels inequality, terrorism, and narcotics trade.

A reciprocal relationship exists between accounting and the shadow economy. On one hand, illicit schemes often require the involvement or negligence of accounting professionals. On the other, those same professionals may be deceived by falsified data or asymmetrical information. Consequently, forensic accounting and audit technologies have emerged to identify and mitigate such fraud risks. Economic crime continues to outpace preventive frameworks, driven by the rapid development of digital and business technologies. According to PwC's (2020), the most prevalent forms of financial crime include customer fraud, cybercrime, asset misappropriation, bribery, and financial statement fraud.

Figure 1. *The structure of economic crimes in 2020*



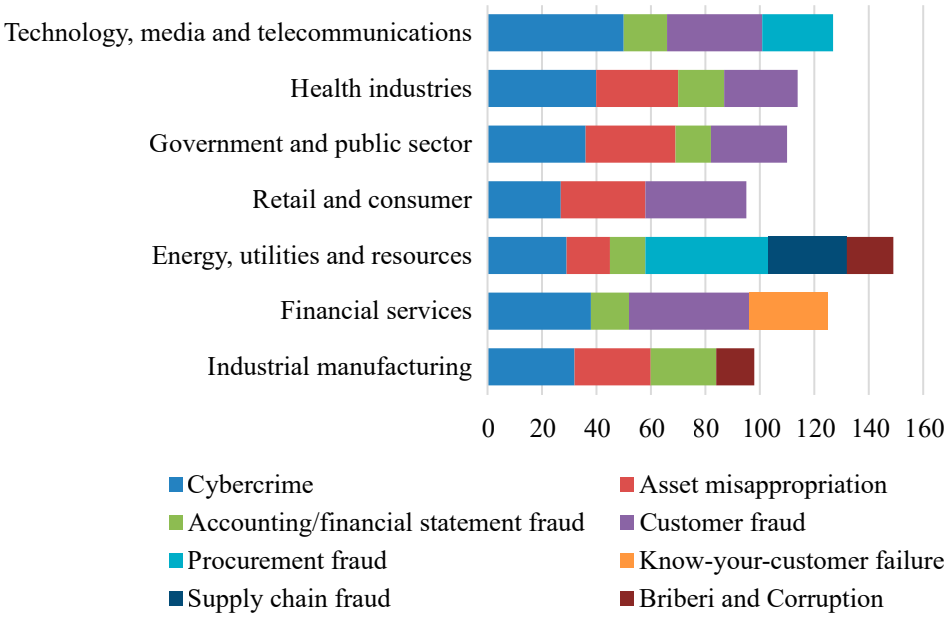
Source: *PwC (2020)*

Comparing the data presented in Figure 1 with PwC's findings (2022), customer fraud (35%) and cybercrime (34%) emerge as the most common types of economic crime globally, followed by asset misappropriation (31%) and financial statement fraud (28%). These figures reflect ongoing vulnerabilities in client interactions, digital systems, and internal controls. Companies face rising fraud risks due to uncertainty, digitalization, and more advanced schemes. PwC (2022) reports that 51% of organizations experienced fraud in the past two years the highest level in 20 years with 70% encountering new incidents tied to COVID-19 related disruptions, particularly via e-commerce and corporate platforms.

The PwC (2024) report reinforces that economic crime remains a pervasive and evolving threat, with customer fraud, cybercrime, and procurement fraud ranking among the most disruptive offenses globally. Despite the availability of advanced analytics, a significant portion of organizations still underutilize these tools nearly 20% of companies report not using data analytics at all to detect procurement fraud, while 32% do not quantify

related losses. This technological and strategic gap highlights the necessity for more robust, data-informed internal controls, particularly as digitalization increases the complexity of fraud schemes.

Figure 2. *Most disruptive fraud events – by industry*



Source: *PwC (2020, 2022)*

American experts from the Association of Certified Fraud Examiners (ACFE, 2022) identify three main categories of fraudulent schemes in accounting: misappropriation of assets, including false accounts, manipulated payment data, and skimming (i.e., accepting payments without supporting documentation); corruption, involving bribes or illicit demands from third parties; and fraudulent financial reporting, such as fabricating income or concealing expenses and liabilities. Financial reporting fraud is the least common but most costly, with an average loss to the government of about two million US dollars (ACFE, 2022).

Digital solutions in accounting to prevent the shadow economy

Reliable and relevant accounting information underpins effective business decision-making and builds trust in financial reporting. Yet, the digital age transforms this landscapedata volumes grow exponentially, while fraud becomes more complex and faster. IT development, evolving business models, and globalization foster new forms of fraud and cybercrime. For instance, while cryptocurrency simplifies payments, it complicates verification of counterparties, and digital payments combined with global reach expand opportunities for cross-border economic crime.

Digital technologies play a crucial role in the prevention and detection of financial crime. The application of artificial intelligence (AI) in accounting enables large-scale data analysis through algorithmic processing, identifying high-risk transactions and preventing money laundering, capital flight, and sanction violations. AI can monitor expenditures and payments, reducing opportunities for bribery by applying extensive validation criteria tailored to organizational risks.

Moreover, AI and machine learning facilitate predictive fraud modeling and real-time monitoring. While accountants gain improved access to relevant data and control mechanisms, digitalization simultaneously expands avenues for fraud most commonly via manipulation of revenues or concealment of liabilities.

AI-driven tools enhance internal audit functions by detecting irregularities such as advance payments without contracts, excessive use of cash, and anomalous patterns involving intermediaries. These systems rely on data visualization, statistics, and text analysis to flag suspicious activities and assess corruption

risks. Forensic accounting remains a key instrument in this process, offering structured approaches to combat shadow operations and economic crime (Crumbley, 2008; Ocansey, 2017).

The digital economy, defined by the integration of advanced information technologies into business processes, transforms products, logistics, sales, and operations, fundamentally altering organizational principles. In this context, the digital transformation of accounting becomes imperative, as competitiveness, timely decision-making, and risk responsiveness depend on it. This transformation also necessitates a revision of accounting theory its principles, objectives, and methodology. Within the framework of the fifth industrial revolution, technologies such as blockchain, Big Data, cloud analytics, and artificial intelligence will facilitate large-scale automation of decision-making. Platforms for document sharing (e.g., Google Drive, Dropbox) and AI-based tools like OCR are increasingly integral to the accounting digital toolkit.

Along with the fact that digital toolkits and the latest information processing technologies relieve accountants of routine work and prevent errors caused by the human factor, their widespread use is accompanied by certain challenges, such as information security and privacy, cyber security, encryption access control, the cost of creating information, etc.The accountancy profession add higher levels of service through Look (monitoring), Shape (policy advisory), Count (measurement and modelling), Resolve (mediation), Automate (technology), Inform (education) (ACCAGlobal, 2017b).

"If all accountants learn what they are capable of doing and apply it to creating sustainable businesses and economies, then they can make a real difference. If they use their ethics, responsibility, and knowledge, they can save the world – Nasir Ahmad FCCA, CIMB Group Chairman and ACCA Council Member (ACCA-Global, 2017b)"

A high level of transparency in accounting information, particularly for external users, along with public disclosure, serves as a deterrent to corruption and economic offenses. To enhance transparency in the digital era, the application of blockchain technology is recommended. However, this requires extending traditional double-entry accounting principles and adopting decentralized ledgers to ensure data authenticity, immutability, and protection against falsification (PwC, 2020). Organizations implementing blockchain can benefit from transaction verification without a central authority, enhanced privacy, and tamper-proof, auditable records (Clements, 2020). Nonetheless, widespread adoption depends on legal regulation and the development of technological frameworks suited to national economic and legal contexts.

The double-entry accounting methodology serves as a prototype for blockchain development, where records are structured as cryptographically linked blocks. Duplication is replaced by multiple replications, ensuring information transparency and immutability. Data is stored in structured blocks, each referencing the previous one, allowing access to historical records. Any change in a block triggers an immediate alert, as discrepancies with replicated data across the chain are detected automatically.

There are studies on the business benefits of adopting blockchain technology, which claim that blockchain will generate an annual business value of more than 3 trillion US dollars until 2030, which will provide greater transparency and traceability for many business processes (Plain Concepts, 2022).

S. Gökten and B. Özdorgan (2020) analyzed the advantages of implementing blockchain in accounting, highlighting the need for specialized software. The limitations in control measures during COVID-19 underscored the relevance of adopting blockchain-based systems for secure information management. Blockchain accounting enables the creation of real-time, tamper-resistant data and prevents manipulation by tracking all transactions and alerting users to changes. Altering records outside system rules would require control over 51% of mining capacity, which is virtually unattainable in large-scale blockchains (Parkins, 2015).

With companies like Amazon and IBM offering reliable, flexible, and scalable blockchain platforms, it's only a matter of time before accounting services come to these platforms. Microsoft, Oracle, SAP and Salesforce have already announced blockchain initiatives. In the future, many core business processes will work on or interact with blockchain-based systems. Using blockchain together with enterprise resource planning platforms will allow companies to streamline processes, facilitate data exchange and improve data integrity.

To introduce blockchain technologies into the practice of accounting, accounting science needs to review the basic principles of accounting and supplement them with the following principles:

- the principle of completeness of information, the interpretation of which is that information is always insufficient for an a priori judgment about all possible results of activity, especially in the future, and therefore it is constantly necessary to study information requests.
- the principle of optimality (efficiency) – all information should be formed with a view to obtaining the optimum from the point of view of corporate and social interests.
- the principle of synergism, according to which the main characteristics of economic activity are not statics, but dynamics, and information in the accounting system is created under the minimal influence of a subjective factor.
- the principle of rational transparency (clarity), which involves considering the information requests of users (country, society, counterparties, stakeholders, etc.) and the openness of information to the extent that it does not affect the economic security interests of the economic agent.

There are researchers who are critical of using blockchain technologies in the accounting system (Coyne & McMickle, 2017) and emphasize the cost aspect and economic justification of its implementation (Fuller & Markelevich, 2019). The introduction of fundamentally new technologies, which will lead to the expansion of the methodology accounting or even its change requires investment, but in the context of our research, blockchain technology can become a powerful toolkit for preventing fraud, economic crime and the spread of the shadow economy.

Blockchain technology enables real-time accounting transparency and more effective fraud prevention. If all transactions are digitized, tax evasion becomes detectable and practically impossible, as the network logs all actions and blocks the creation of shadow schemes. Economic activities are digitized, stored on the blockchain, and displayed on platforms capable of automatic tax calculation. Moreover, blockchain addresses issues such as corruption, collusion, resource misuse, service quality, invoice falsification, and embezzlement. It allows both parties to record transactions simultaneously in a shared ledger, moving beyond traditional methods of invoicing, documentation, and inventory systems.

The need for traditional double-entry bookkeeping may be eliminated, as blockchain enables automated verification of the authenticity and legality of accounting records. This technology is viewed as ideal accounting due to its potential to enhance transparency and public trust. The World Economic Forum estimates that by 2027, 10% of global GDP will be stored on blockchain (Deep Shift Technology Tipping Points and Societal Impact). Data from such systems can serve as audit evidence, support tax calculations, legal proceedings, and lending decisions, given its resistance to falsification. While some economic crimes may remain undetectable, increasing the cost of concealment can act as a deterrent. Clear communication of assurance outcomes will support fraud detection and guide regulation development aligned with blockchain's capabilities (Gordon, 2020).

The perspective of accountants and auditors on the shadow economy and corruption

To deepen both theoretical and empirical analyses concerning the role of accounting and digital technologies in counteracting the shadow economy and corruption, a qualitative study was conducted using semi-structured interviews. The qualitative research presented in this article was carried out using a mixed-mode methodology, which involves applying various implementation techniques to conduct the study based on a single questionnaire. Specifically, the study utilized a combination of IDI (In-Depth Interview) and VIDI (Virtual In-Depth Interview) methods.

The study involved a group of 15 professionals: 10 accountants and 5 auditors working in both the private and public sectors in Poland. The interviews were conducted between May and July 2025. Participants were purposefully selected to reflect a diversity of professional experiences, organizational roles, and levels

of digital tool implementation within their institutions. The aim of the study was to identify practitioners' perceived barriers and opportunities related to the use of modern accounting methods and digital technologies in preventing financial irregularities.

The interview scenario was structured around four thematic blocks: (1) general professional experience in the context of financial transparency and professional ethics, (2) the use of digital tools in accounting and their impact on information transparency, (3) the effectiveness of current control and audit practices in detecting fraud, and (4) perspectives on the implementation of technologies such as blockchain, artificial intelligence, and data analytics in accounting practice. To ensure the scientific rigor of the qualitative component, the interview data were subjected to thematic content analysis, which enabled the identification of recurring patterns and categories within the respondents' statements. The coding process was conducted manually, following the principles of inductive analysis, allowing key themes to emerge directly from the empirical material. The analysis of responses enabled a practical and nuanced understanding of how accounting is perceived as a preventive tool against economic crime within the professional community.

In the following section of the article, we present the results of the qualitative interviews conducted within the thematic block "Professional Experience and Practice." The purpose of this part of the study was to explore the challenges accountants and auditors face in ensuring financial transparency and maintaining ethical standards in their daily work. Questions focused on the realities of accounting operations, areas vulnerable to abuse, and the ways professionals cope with pressures related to ethical decision-making.

Most respondents pointed to the complexity and inconsistency of tax regulations and time pressure as key obstacles to achieving full financial transparency. Many also emphasized the interpretive ambiguity of regulations, particularly within a dynamically changing legal and economic environment. Some participants admitted that, despite good intentions, their efforts often amounted to so-called formal compliance, without true control over the economic substance of transactions. One auditor noted:

"Sometimes the bigger problem than fraud itself is the fact that the accounting system doesn't allow us to clearly detect it–even when we want to be 100% transparent."

Significantly, 11 out of 15 respondents acknowledged having encountered ethically questionable practices. These most frequently involved delayed recognition of expenses, creative revenue recognition, or breaking transactions into parts to stay below control thresholds. Some mentioned managerial pressure to "shape" financial outcomes to match predefined scenarios. One private sector accountant stated:

"Sometimes the expectation is not for accurate information, but for information that fits the management's narrative. The line between professionalism and loyalty to the company can be very thin."

The interviews also revealed that early-career accountants tend to feel less confident in situations requiring ethical resistance toward superiors, whereas more experienced professionals more often cited ethical standards and professional guidelines as grounds for refusing unethical instructions. This highlights the importance of ethics training and the need to foster a culture of compliance and accountability within organizations.

The overall conclusion from this block is that financial transparency is not merely a technical issue it requires an integrated approach that includes information systems, organizational culture, and the personal integrity of accountants. According to respondents, the strong role of professional ethics and independence can significantly reduce the space for abuse provided it is supported by management and the institutional environment.

The second thematic block of the interviews focused on the role of digital technologies in accounting practice. Respondents were asked about the extent of digital tool implementation (e.g., e-invoicing, ERP systems, cloud platforms), their impact on financial transparency, and the risks associated with digital data processing. The objective was to determine to what extent digitalization supports accounting in combating fraud and corruption, and what challenges professionals face during implementation.

Most respondents confirmed that the digitalization of accounting processes has significantly improved efficiency and accuracy in record-keeping and has simplified internal control procedures. Emphasis was placed

on the automation of routine processes (e.g., settlements, reporting), which reduces human error and increases the speed of analysis. As one auditor noted:

"Five years ago, reconciling data from multiple sources took us hours. Now the system does it in seconds, which significantly reduces the room for manipulation."

At the same time, respondents agreed that digitalization does not eliminate the problem of fraud it simply moves it to another level. Several accountants pointed out that advanced IT systems can also be exploited by individuals with malicious intent, for example by falsifying source data, bypassing safeguards, or exploiting so called "system loopholes." One participant observed:

"Dishonesty hasn't disappeared it just changed tools. Now the fraudster doesn't forge paper documents but enters fictitious data into the system."

The most frequently cited challenges included poor-quality implementation and insufficient employee training. Respondents consistently argued that in many organizations, digitalization has been approached as a technical obligation rather than as part of a comprehensive transformation of information governance culture. They also stressed the need for close cooperation between IT, controlling, and accounting departments in the design and oversight of these systems.

Digitalization is therefore a necessary condition for increasing transparency but not a sufficient one. Its effectiveness depends on the parallel implementation of security standards, control procedures, and training in professional ethics and accountability. Practitioners view technology as an essential support tool, but not a "magic solution" only its conscious and integrated application can truly reduce the scale of irregularities.

The third block of interviews focused on practices related to internal and external control, financial auditing, and mechanisms for fraud prevention. The goal was to gather the views of accountants and auditors on the effectiveness of current control tools and their ability to detect and prevent actions that violate law or ethics. Interviewees shared experiences from both their daily operational work and institutional-level audits.

Respondents unanimously emphasized that the effectiveness of internal control systems largely depends on the attitude of management and the degree of independence of accounting and auditing departments. In companies where the management supports a culture of honesty and transparency, control procedures function effectively and allow irregularities to be detected as early as the transaction planning stage. In other organizations, however, control systems are sometimes only superficial existing on paper but ignored in practice. As one auditor observed:

"Having an internal control policy isn't enough you have to actually want to use it. Without support from the top, an audit becomes a formality."

Many respondents identified the most common areas of abuse as: undisclosed liabilities, fictitious external service costs, cash transactions, and unjustified dealings with related parties. In such cases, external audits proved effective especially when conducted by independent entities with full access to source data. However, accountants also noted that external audits are often superficial, particularly in organizations with low transparency or limited control budgets.

It was also emphasized that audits internal or external are not sufficient if not accompanied by personal accountability and the ability to sanction misconduct. Some respondents highlighted the importance of implementing whistleblower mechanisms and professional codes of ethics as essential elements strengthening the prevention system. As one accountant stated:

"A well-designed control system is one thing, but the most important factor is whether someone has the courage to say 'no' and knows they won't be punished for it."

The study also reveals the growing role of data-driven auditing, which uses analytical tools, predictive models, and automatic alerts to detect anomalies. Respondents from larger organizations emphasized that such approaches enable faster detection of irregularities than traditional periodic controls. However, it was noted that smaller entities often lack access to advanced tools and must rely on manual procedures.

In the final thematic block of the interviews, respondents were asked to evaluate the role of modern technologies particularly blockchain, artificial intelligence (AI), and big data in shaping the future of accounting and in combatting the shadow economy. Participants were also invited to reflect on the skills they believe will be essential for accountants and auditors over the coming decade. The conversations revealed both enthusiasm and caution regarding the transformative potential of these technologies.

Some respondents reported familiarity with blockchain mainly at a general level as a decentralized data-recording system while only a few had direct professional experience with it. Nonetheless, its potential to ensure data immutability and full transaction transparency was widely recognized, especially in organizations with complex ownership structures or international operations. One auditor noted:

"Blockchain offers a chance to eliminate fraud at the data-entry level. The problem is that, for now, it's just theory implementation would require massive systemic changes."

Much more frequently, practitioners emphasized the growing role of automation and AI in the analysis of accounting data, particularly in detecting anomalies and modeling risk. Applications cited included monitoring expenses, evaluating the reliability of contractors, flagging irregular payments, and predicting accounting risks. According to the respondents, AI serves as an effective support tool but does not replace professional judgment it requires new skills in data analysis and understanding of algorithms.

Experienced professionals noted that the greatest challenge for future accountants will not be the tools themselves, but rather the ability to critically interpret system-generated data and to resist the pressure of automated decision-making. They also emphasized the need to develop soft skills especially ethical and communication competencies as key elements reinforcing the accountant's role as a guardian of transparency. As one respondent put it:

"Machines can do the counting. We're here to understand what the data means and to have the courage to speak up if something isn't right."

In conclusion, this block shows that technology alone is not a solution to the shadow economy or corruption; rather, it is a powerful tool that can support accounting processes. Respondents agreed that effective use of such tools requires not only the deployment of appropriate systems, but also legal adaptation, a shift in professional education, and a redefinition of the accountant's role as an active participant in risk management rather than a mere recorder of events.

The findings from the 15 semi-structured interviews conducted with 10 accountants and 5 auditors indicate that practitioners view accounting not only as a reporting function but also as a key preventive mechanism in the fight against the shadow economy and financial misconduct. Respondents confirmed that ethical challenges and managerial pressure are a frequent part of their work, particularly in the context of ambiguous regulations and expectations to "adjust" financial information.

Digitalization is perceived as an important step toward greater transparency, but its effectiveness depends on the quality of implementation, team competence, and integration with an ethical organizational culture. Internal controls and auditing are considered effective tools as long as they are accompanied by true independence and supported by management.

In the area of emerging technologies, respondents identified the great potential of blockchain and AI in risk identification and fraud prevention. However, they also emphasized that the future of accounting will depend not only on technology, but also on the development of analytical, ethical, and communication competencies so that accountants can actively uphold the integrity and transparency of financial information.

Conclusions

The era of digital transformation continues to challenge all aspects of business. It enables companies to use technologies such as digital payments, the Internet of Things, robotics, and artificial intelligence. At the same time, it also brings new risks of economic crime, regulatory evasion, and unethical practices. In this context,

accounting is no longer a passive record-keeping system it is increasingly becoming a central instrument in ensuring financial transparency, organizational accountability, and the detection of irregularities.

The central hypothesis of this study that improving accounting and auditing practices, supported by modern technologies, contributes to reducing corruption and the shadow economy has been broadly verified through both theoretical and empirical analysis. Bibliometric and conceptual insights have shown the growing integration of accounting with anti-corruption mechanisms, while qualitative interviews with 10 accountants and 5 auditors confirmed that practitioners recognize accounting as a key preventive tool. Respondents emphasized that digitalization, when combined with professional ethics and organizational support, can significantly enhance transparency and reduce the opportunity for manipulation. Artificial intelligence was seen as a strong analytical aid in detecting anomalies, while blockchain was valued for its promise in ensuring data immutability and traceability, albeit still underutilized in practice.

Importantly, the study revealed that technology alone is not sufficient. The effectiveness of anti-corruption measures in accounting depends on a complex interplay of factors: the design and implementation of digital tools, the competence and ethical sensitivity of professionals, and the organizational culture in which they operate. Interviews highlighted common barriers such as ambiguous legal frameworks, poor-quality digital implementations, and managerial pressure to distort information. As one respondent noted, "Transparency requires not only systems, but also courage and institutional protection to act ethically."

This article contributes to the academic literature by presenting the unique perspective of accounting practitioners like accountants and auditors in the context of dynamic digital transformation and the growing challenges related to combating the shadow economy and financial misconduct. By integrating theoretical insights with empirical observations from the professional field, the study offers a deeper understanding of the organizational conditions, competencies, and tools necessary for accounting to effectively serve a preventive function in the realities of the modern digital economy.

While the findings support the hypothesis, the study is not without limitations. First, the empirical component was limited to 15 professionals in Poland, which may affect generalizability to other national contexts or regulatory environments. Second, the data collection relied solely on self-reported perceptions through interviews, which may be subject to bias, memory errors, or social desirability effects. Given these limitations, several future research directions are recommended comparative studies across countries or regions to assess how regulatory environments and cultural factors shape the role of accounting in anti-corruption efforts.

In conclusion, accounting should be recognized not only as a technical function but as a strategic mechanism of risk governance. The findings of this study suggest that the future of accounting lies in the integration of digital innovation with ethical responsibility, and that professionals in this field must evolve into data interpreters, risk managers, and transparency advocates. Building strong institutional frameworks that support ethical behavior, protect whistleblowers, and encourage cross-functional collaboration will be crucial to harnessing the full potential of accounting in the fight against the shadow economy and corruption.

References

ACCA Global. (2017). *Time to shrink the shadow economy*. CPD Technical Article. https://www.accaglobal.com/gb/en/member/discover/cpd-articles/tax/shrink-shadow-economy.html

ACCA Global. (2017a). *Emerging from the shadows: The shadow economy to 2025*. Professional Insight Report, https://www.accaglobal.com/gb/en/professional-insights/global-economics/Emerging-from-the-shadows.html

ACCA Global. (2022). *Accounting for a better world: Priorities for a transforming profession*. Professional Insight Report, https://www.accaglobal.com/gb/en/professional-insights/pro-accountants-the-future/accounting-for-a-better-world.html

Association of Certified Fraud Examiners. (2022). *Fraud training & education*. http://www.acfe.com/

Bashlakova, V., & Bashlakov, H. (2020). The study of the shadow economy in modern conditions: Theory, methodology, practice. *The Quarterly Review of Economics and Finance.* https://doi.org/10.1016/j.qref.2020.10.032

Plain Concepts. (2022). *Blockchain to reshape businesses: Is it time to implement this technology in your company?* https://www.plainconcepts.com/blockchain-business/

Clements, C. (2020, February 26). *How useful is blockchain, and what benefits can it deliver?* https://pwc.blogs.com/technology-insights/2020/02/how-useful-is-blockchain-and-what-benefits-can-it-deliver.html

Cooper, D.J., Dacin, T., & Palmer, D. (2013). Fraud in accounting, organizations and society: Extending the boundaries of research. *Accounting, Organizations and Society, 38*(6–7), 440–457. https://doi.org/10.1016/j.aos.2013.11.001

Coyne, J.G., & McMickle, P. L. (2017). Can blockchains serve an accounting purpose? *Journal of Emerging Technologies in Accounting, 14*(2), 101–111. https://doi.org/10.2308/jeta-51910

Crumbley, D.L. (2008). Learning about forensic accounting – A novel way. *New Accountant, (723)*, 20.

Cuadrado-Ballesteros, B., Citro, F., & Bisogno, M. (2020). The role of public-sector accounting in controlling corruption: An assessment of Organisation for Economic Co-Operation and Development countries. *International Review of Administrative Sciences, 86*(4), 729–748. https://doi.org/10.1177/0020852318819756

Davis, L.S. (2007). Explaining the evidence on inequality and growth: Informality and redistribution. *The B.E. Journal of Macroeconomics, 7*(1), 1–35. https://doi.org/10.2202/1935-1690.1498

Ergene, S. (2015). Growth, inflation, interest rate and informality: Panel VAR evidence from OECD economies. *Economics Bulletin, 35*(1), 750–763.

Everett, J., Neu, D., & Rahaman, A.S. (2007). Accounting and the global fight against corruption. *Accounting, Organizations and Society, 32*(6), 513–542. https://doi.org/10.1016/j.aos.2006.07.002

Farzanegan, M.R., Hassan, M., & Badreldin, A.M. (2020). Economic liberalization in Egypt: A way to reduce the shadow economy? *Journal of Policy Modeling, 42*(2), 307–327. https://doi.org/10.1016/j.jpolmod.2019.09.008

Feige, E.L. (1979). How big is the irregular economy? *Challenge, 22*(1), 5–13.

Fuller, S.H., & Markelevich, A. (2019). Should accountants care about blockchain? *Journal of Corporate Accounting & Finance, 30*(5), 1–13. http://doi.org/10.2139/ssrn.3447534

Gerxhani, K. (2004). The informal sector in developed and less developed countries: A literature review. *Public Choice, 120*(3–4), 267–300. https://doi.org/10.1023/B:PUCH.0000044287.88147.5e

Goddard, A., Assad, M., Issa, S., Malagila, J., & Mkasiwa, T.A. (2016). The two publics and institutional theory – A study of public sector accounting in Tanzania. *Critical Perspectives on Accounting, 40*, 8–25. https://doi.org/10.1016/j.cpa.2015.02.002

Gökten, S., & Özdoğan, B. (2020). The doors are opening for the new pedigree: A futuristic view for the effects of blockchain technology on accounting applications. In U.S. Bititci & D. Cavalieri (Eds.), *Digital business strategies in blockchain ecosystems: Transformational design and future of global business* (pp. 425–438).

Gonçalves, M.J. A., da Silva, A.C. F., & Ferreira, C.G. (2022). The future of accounting: How will digital transformation impact the sector? *Informatics, 9*(1), Article 19. https://doi.org/10.3390/informatics9010019

González-Fernández, M., & González-Velasco, C. (2014). Shadow economy, corruption and public debt in Spain. *Journal of Policy Modeling, 36*(6), 1101–1117.

Gordon, A. (2020). *How to combat economic crime in a digital age.* EY. https://www.ey.com/en_gl/assurance/how-to-combat-economic-crime-in-a-digital-age

Gutmann, P. M. (1979). Statistical illusions, mistaken policies. *Challenge, 22*(5), 14–17. https://doi.org/10.1080/05775132.1979.11470560

Hart, K. (1973). Informal income opportunities and urban employment in Ghana. *The Journal of Modern African Studies, 11*(1), 61–89. http://www.jstor.org/stable/159873

Hodula, M., Melecky, A., & Machacek, M. (2020). Off the radar: Factors behind the growth of shadow banking in Europe. *Economic Systems, 44*(3), Article 100808. https://doi.org/10.1016/j.ecosys.2020.100808

Kirtley, O.F. (2016, November 29). *The accountancy profession: Fighting fraud and corruption*. International Federation of Accountants (IFAC). https://www.ifac.org/knowledge-gateway/building-trust-ethics/discussion/accountancy-profession-fighting-fraud-and-corruption

Klitgaard, R. (1988). *Controlling corruption* (1st ed.). University of California Press. https://doi.org/10.1525/9780520911185

Korhonen, T., Selos, E., Laine, T., & Suomala, P. (2021). Exploring the programmability of management accounting work for increasing automation: An interventionist case study. *Accounting, Auditing & Accountability Journal, 34*(2), 253–280. https://doi.org/10.1108/AAAJ-12-2016-2809

Kurniawati, E.P., & Achjari, D. (2022). The impact of the adoption of international accounting and auditing standards on corruption perception. *Accounting Research Journal, 35*(6), 737–755. https://doi.org/10.1108/ARJ-08-2021-0230

La Porta, R., & Shleifer, A. (2014). Informality and development. *The Journal of Economic Perspectives, 28*(3), 109–126. https://doi.org/10.1257/jep.28.3.109

Leoni, G., & Parker, L. (2019). Governance and control of sharing economy platforms: Hosting on Airbnb. *The British Accounting Review, 51*(1), 100804. https://doi.org/10.1016/j.bar.2018.12.001

Lisi, G. (2016). Unemployment, underground economy and economic growth in a matching model of behavioural economics. *International Review of Economics, 63*(2), 159–170.

Malagueño, R., Albrecht, C., Ainge, C., & Stephens, N. (2010). Accounting and corruption: A cross-country analysis. *Journal of Money Laundering Control, 13*(4), 372–393. https://doi.org/10.1108/13685201011083885

Mathews, M.R., & Perera, M.H. B. (1991). *Accounting theory and development*. Nelson.

Medina L., Schneider F. (2018). Shadow Economies Around the World: What Did We Learn Over the Last 20 Years? IMF Working Paper # WP/18/17

Rodrigue, M., & Dey, C. (2022). Reflecting on inspiration and orientation. *Social and Environmental Accountability Journal, 42*(3), 129–139. https://doi.org/10.1080/0969160X.2022.2098063

Rodrigue, M., & Dey, C. (2022). Reflecting on inspiration and orientation. *Social and Environmental Accountability Journal, 42*(3), 129–139.

Mogensen, G.V. (1995). *Work incentives in the Danish welfare state*. Aarhus University Press.

Moll, J., & Yigitbasioglu, O. (2019). The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. *The British Accounting Review, 51*(6), Article 100833. https://doi.org/10.1016/j.bar.2019.04.002

Mosteanu, N.R., & Faccia, A. (2020). Digital systems and new challenges of financial management – FinTech, XBRL, blockchain and cryptocurrencies. *Quality – Access to Success, 21*(174), 159–166.

Nabi, M., & Drine, I. (2009). External debt, informal economy and growth. *Economics Bulletin, 29*(3), 1695–1707.

Ndoya, H., Okere, D., Belomo, M.L., & Atangana, M. (2023). Does ICTs decrease the spread of informal economy in Africa? *Telecommunications Policy, 47*(2), Article 102485. https://doi.org/10.1016/j.telpol.2022.102485

Ocansey, E.O. N.D. (2017). Forensic accounting and the combating of economic and financial crimes in Ghana. *European Scientific Journal, 13*(31), 379. https://doi.org/10.19044/esj.2017.v13n31p379

Parkins, D. (2015, October 31). Blockchains – The great chain of being sure about things. *The Economist*. https://www.economist.com/briefing/2015/10/31/the-great-chain-of-being-sure-about-things

Paterson, A.S., Changwony, F., & Miller, P.B. (2019). Accounting control, governance and anti-corruption initiatives in public sector organisations. *The British Accounting Review, 51*(6), Article 100844. https://doi.org/10.1016/j.bar.2019.100844

Pilonato, S. (2022). Accounting can support a "sustainable" corruption network: A case analysis. *Journal of Public Budgeting, Accounting & Financial Management, 34*(1), 120–138. https://doi.org/10.1108/JPBAFM-11-2019-0172

Postea, M.M., & Achim, M.V. (2022). Estimation methods for the shadow economy: A systematic literature review. In *Proceedings of the 24th RSEP International Conference on Economics, Finance & Business – Virtual/Online* (pp. 156–169). RSEP Conferences. https://www.rsepconferences.com

PwC. (2018). *Pulling fraud out of the shadows: Global Economic Crime and Fraud Survey 2018*. https://www.pwc.com/gx/en/news-room/docs/pwc-global-economic-crime-survey-report.pdf

PwC. (2020). *Fighting fraud: A never-ending battle. PwC's Global Economic Crime and Fraud Survey 2020*. https://www.pwc.com/hu/hu/kiadvanyok/assets/pdf/PwC_Global_Economic_Crime_and_Fraud_Survey_2020.pdf

PwC. (2022). *PwC's Global Economic Crime and Fraud Survey 2022*. https://www.pwc.com/gx/en/services/forensics/economic-crime-survey.html

PwC. (2024). *Meeting tomorrow's challenges, embracing risk intelligently. PwC's Global Economic Crime Survey 2024*. https://www.pwc.com/gx/en/services/forensics/gecs/2024-global-economic-crime-survey.pdf

Quintano, C., & Mazzocchi, P. (2010). Some alternative estimates of underground economies in 12 new EU member states. *International Economic Journal, 24*(4), 611–628.

Schneider, F. (2005). Shadow economies around the world: What do we really know? *European Journal of Political Economy, 21*(3), 598–642.

Schneider, F., & Enste, D.H. (2000). Shadow economies: Size, causes and consequences. *Journal of Economic Literature, 38*(1), 77–114.

Schneider, F., & Buehn, A. (2018). Shadow economy: Estimation methods, problems, results and open questions. *Open Economics, 1*(1), 1–29. https://doi.org/10.1515/openec-2017-0001

Semaniuk, V. (2018). *Information theory of accounting in post-industrial society: Monograph* [in Ukrainian]. TNEU.

Shah, S.H., Butt, S.A., & Ali, M.S. (2011). *Creative accounting: A tool to help companies in a crisis or a practice to land them into crises*. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=0180751ae4d3f081e9d06a38f206036adbb03d40

The Economist. (2020, April 18). Who's lost their trunks: The economic crisis will expose a decade's worth of corporate fraud. *The Economist*. https://www.economist.com/business/2020/04/18/the-economic-crisis-will-expose-a-decades-worth-of-corporate-fraud

Yau-Yeung, D., Yigitbasioglu, O., & Green, P. (2020). Cloud accounting risks and mitigation strategies: Evidence from Australia. *Accounting Forum, 44*(5), 421–446.

Yüksel, F. (2020). Sustainability in accounting curriculum of Turkey higher education institutions. *Turkish Online Journal of Qualitative Inquiry, 11*(4), 393–416.

• F I N A N S E I P R A W O F I N A N S O W E •
• JOURNAL OF FINANCE AND FINANCIAL LAW •

Special Issue 2025, vol. 1: 25–38
https://doi.org/10.18778/2391-6478.S1.2025.02

C O P E
Member since 2021
JM15102

Valentyna Panasyuk https://orcid.org/0000-0002-5133-6431
Doctor of Economics Sciences, Head of the Department of Audit, West Ukrainian National University,
e-mail: tina.panasjuk@gmail.com

CLOUD TECHNOLOGIES AND BLOCKCHAIN IN AUDITING: A NEW STAGE IN THE DEVELOPMENT OF CONTROL SYSTEMS

ABSTRACT

The purpose of the article is to study the impact of cloud technologies and blockchain on the development of control systems in auditing, in particular on the effectiveness of internal control procedures and information transparency. The central hypothesis is that the integration of modern digital technologies into accounting and audit processes can significantly increase the transparency of financial transactions, reduce information asymmetry and improve the effectiveness of risk management and internal control procedures. The study is a response to the growing challenges faced by traditional auditing in a dynamic business environment.

Methodology. The methodological approach of the study is theoretical, based on a comprehensive analysis and synthesis of modern scientific literature. The study draws on general scientific methods, including bibliometric analysis, synthesis and systems-structural approaches, to explore the potential of cloud computing and blockchain technologies as tools for increasing financial transparency and control. The study findings were enriched by a multidimensional view of how these technological practices can be shaped by real-world constraints and organizational readiness.

Results of the research. The analysis confirmed that the integration of cloud technologies and blockchain fundamentally transforms auditing into a continuous and proactive process. Key findings demonstrate that these technologies provide unique advantages, such as increased scalability, immutability and transparency, which are crucial for combating fraud and financial crimes. At the same time, the study also identified significant challenges, including cybersecurity threats, dependence on network infrastructure, integration complexity and regulatory uncertainty. The results offer a new perspective on how technology solutions can be applied to improve financial control systems and improve corporate governance.

Keywords: cloud computing, blockchain, audit, internal control systems, digital transformation, transparency, digital tools, digitalization

JEL Class: M42, O33

Introduction

The ongoing digital transformation of economies presents both new challenges and opportunities for guaranteeing the transparency, efficiency, and reliability of financial reporting and internal control systems within organizations. Conventional auditing techniques, despite decades of use, often fail to address the complexity of modern business, fraud risks, and the demand for operational verification of financial transactions. The increasing volume of data, the integration of global financial markets, and the spread of remote work put new demands on internal control and audit systems, compelling organizations to seek more effective technological solutions.

Cloud technologies and blockchain provide unique opportunities for modernizing audit and control, ensuring process automation, secure data storage, increasing transparency and efficiency of control systems. The integration of these technologies allows combining various sources of information, optimizing audit procedures and increasing the ability of organizations to quickly adapt to a changing business environment (Appelbaum & Nehmer, 2019; Banerjee et al., 2024).

Received: 2025.01.14. Accepted: 2025.06.28.

Funding Information: None. **Conflicts of interests:** None. **Ethical Considerations:** The Authors assure of no violations of publication ethics and take full responsibility for the content of the publication.

At the same time, the implementation of digital solutions in audit practices is accompanied by certain challenges. These include cybersecurity threats, the need to comply with regulatory requirements, as well as the need for highly skilled professionals who can effectively manage complex technological audit systems (Wylde et al., 2022; Punia et al., 2024). In addition, organizations have to balance transparency with the protection of confidential information, which is critical to ensuring trust in financial reporting and management decisions.

The purpose of this study is to examine the impact of cloud technologies and blockchain on the development of control systems in auditing, in particular on the effectiveness of internal control procedures and information transparency. The following research hypotheses have been formulated:

1. The introduction of cloud technologies and blockchain into the practical activities of accountants and auditors has a positive effect on their work efficiency, and also has a favorable economic effect on the enterprise.
2. The existing regulatory framework in Ukraine regarding the use of cloud technologies and blockchain in accounting and auditing is fragmentary and needs to be improved.
3. The integration of cloud technologies and blockchain into auditing practice fundamentally transforms auditing from a retrospective process into a proactive and continuous one.

Literature review

Recent academic studies have validated that the digital transformation of accounting and auditing is fundamentally altering control methodologies and enhancing the effectiveness of managerial and financial decisions. The latest research, in particular, focuses on three key areas: integrating cloud technologies, using blockchain, and combining digital tools to automate audit processes.

Cloud technologies are seen as a means of increasing the efficiency and scalability of audit procedures (Moghadasi et al., 2018). They allow for centralized data management, reduce information processing time, and increase the accessibility of financial reporting for auditors and management (Laposha, 2022). In the public sector, the use of digital technologies contributes to increased transparency and efficiency of financial control, which reduces the risks of fraud and errors (Fedenko et al., 2024).

Blockchain is seen as an innovative technology that ensures transparency and reliability of records (Abdullahi & Safiyanu, 2023). It allows for the creation of immutable records, reducing the risk of errors and fraud. The use of closed blockchains provides increased security and control over data access (Liu et al., 2019). Integrating blockchain into internal financial reporting control systems allows for the automation of verification processes and reduces the likelihood of fraudulent manipulation (Adekunle et al., 2024).

Combining blockchain with cloud platforms creates dynamic environments for collaborative auditing and real-time data management, which improves audit quality and prompt risk detection (Sheela et al., 2023; Sheikh et al., 2024).

The combined use of digital tools, including big data analytics and artificial intelligence, allows for the automation of routine management accounting tasks and the focus on the analysis of critical information (Korhonen et al., 2021; Han et al., 2023). This creates a single, reliable information base for all stakeholders and reduces information asymmetry (Islam Priom et al., 2024). At the same time, the use of digital technologies is accompanied by challenges in the field of security and privacy (Wylde et al., 2022; Punia et al., 2024). To ensure the reliability of data control, integrity audit methods are used in encrypted cloud environments, which minimizes the risks of information loss (Song et al., 2021).

The digitalization of accounting and auditing in Ukraine is also actively implemented in internal control systems (Fedenko et al., 2024; Kononenko et al., 2025). Scientists note the need to improve the regulatory framework and train qualified specialists to work with digital technologies. Digitalization also contributes

to the development of sustainable business, monitoring compliance with standards, and optimizing management decisions (Antonini, 2024; Semaniuk & Melnyk, 2022).

Thus, a review of modern literature demonstrates that the integration of cloud technologies, blockchain, and combined digital tools into accounting and auditing contributes to increasing the transparency, efficiency, and reliability of control systems. At the same time, there are challenges related to cybersecurity, regulatory compliance, and staff training, which require a comprehensive approach to implementing digital solutions in audit practice.

Research methodology

Reviewed scientific articles and professional publications issued in the period 2018–2025 were selected for the study, related to the application of cloud technologies and blockchain in auditing. The main search databases were Web of Science, Scopus, Google Scholar, as well as specialized industry journals and conference proceedings. The selection was carried out using the keywords "cloud computing", "blockchain", "audit", "internal control". Attention was paid to both theoretical developments and practical cases, as well as regulatory and legal documents of Ukraine and international auditing standards that regulate the procedure for conducting audits and organizing internal control procedures.

The analysis of the selected materials was conducted according to the following criteria: technological characteristics, impact on internal control and audit efficiency, data transparency and security, economic efficiency, as well as organizational and regulatory aspects of implementation. Repetitive mechanisms, such as record immutability, transparency, automated auditing, and compliance with standards, were systematized and compared across sources. This allowed us to identify the key trends and limitations in the application of cloud technologies and blockchain in audit practice.

Based on the synthesis of theoretical sources, regulatory documents, and practical cases, conclusions were drawn regarding the classification of technologies, their compliance with audit standards, the effectiveness of internal control, and the formulation of recommendations for organizations. Methodological limitations include publication bias, different interpretations of terms in sources in different languages, and rapid changes in the regulatory framework in the field of audit digitalization.

Benefits and challenges of using cloud technologies in auditing

In the context of auditing, as Moghadasi et al. (2018) have noted, cloud technology represents a form of IT outsourcing that allows organizations to use computing resources remotely over the internet. This approach fundamentally alters auditing because the audited data and systems are no longer under the physical control of the organization.

Cloud technology is defined by several key features:

1) ondemand selfservice: users can access resources at their convenience without any direct interaction with the provider;
2) broad network access: services are available over the internet and can be used from various devices;
3) resource pooling: the provider's resources are pooled to serve multiple customers in a multitenancy model;
4) rapid elasticity: resources can be quickly scaled (increased or decreased) to match user needs.

The use of cloud technologies in auditing brings notable benefits that enhance the effectiveness and dependability of inspections. The key advantage is scalability and flexibility, which allows auditors to work with large volumes of data without the need to invest in their own physical infrastructure. This approach provides operational access to the computing power necessary for information analysis. In addition, cloud platforms support the automation of routine processes, which, according to Vasyliuk et al. (2025), minimizes the impact of the human factor and increases the reliability of internal control systems.

One of the most significant advantages is the integration with blockchain technologies. There are different approaches to the application of blockchain in auditing in the literature:

- private blockchains provide access control, protection of confidential data, and high transaction speed, but are less transparent to external parties (Liu et al., 2019);
- public blockchains guarantee full transparency and availability, but can be slower and more difficult to scale in a corporate environment (Adekunle et al., 2024).

Balancing these approaches, modern audit practices often choose hybrid solutions that combine the security of private networks with the transparency of public ledgers. Thanks to this combination, an immutable distributed register containing all financial transactions is created. This, according to Gomaa et al. (2022), solves the problem of data reconciliation between different parties, since there is a "single truth" (single-ledger). Thus, blockchain frameworks, as Assiri and Humayun (2023) point out, can automate auditing, ensuring transparency and immutability of records. These changes define a new stage in the development of audit systems, where technology becomes not only a data collection tool, but also a key factor in increasing the reliability and effectiveness of internal control.

Despite these advantages, the implementation of cloud solutions in auditing faces serious challenges. One of the main ones is data security. Storing confidential information on remote servers increases the risks of unauthorized access and data leakage. To address this problem, researchers are developing advanced public audit schemes for cloud storage that use identification protocols to improve the security and accuracy of audits (Wang et al., 2024).

Another significant challenge is the reliance on a strong network connection. As Bataiev et al. (2025) note, the effectiveness of cloud-based systems is directly tied to the stability and bandwidth of the network, which creates issues in regions with limited infrastructure. This can cause delays that are critical for real-time auditing. To overcome this problem, Yi et al. (2022) propose the use of edge-computing, which allows to reduce delays and increase the efficiency of audits in distributed systems. Also, technical challenges include the complexity of migrating legacy audit systems to the cloud environment, which requires significant efforts and investments. Overcoming these challenges requires a systemic approach and the implementation of new architectures.

Table 1. *Benefits and challenges of using cloud technologies in auditing*

Category	Benefits	Challenges
Technical	Scalability and flexibility for handling large data volumes.	Data security and risks of unauthorized access.
	Integration with blockchain for immutability and transaction transparency.	Complexity of integration with legacy accounting systems.
	Automation of routine processes via cloud platforms.	Dependence on network infrastructure and potential delays.
Organizational	Lower costs for in-house IT infrastructure.	Need for staff training and business process adaptation.
	Operational access to resources from any location.	Legal and regulatory uncertainty regarding data storage.

Source: Own study based on: Bataiev et al. (2025); Wang et al. (2024); Assiri and Humayun (2023).

In our opinion, the main problem hindering the introduction of cloud technologies into Ukrainian accounting and auditing is legislative uncertainty. The current regulatory framework does not contain special provisions that would regulate the use of remote digital environments, which creates significant legal risks for enterprises.

The Law of Ukraine «On Accounting and Financial Reporting in Ukraine" No. 996-XIV (Law No. 996-XIV) defines only general requirements for accounting, document storage and reporting forms. It does not contain any provisions on the admissibility or regulation of the use of cloud services as the main technical environment for recording and archiving accounting information.

Despite the existence of the Law of Ukraine "On Electronic Commerce" No. 675-VIII (Law No. 675-VIII) and the Law of Ukraine "On Electronic Trust Services" No. 2155-VIII (Law No. 2155-VIII), difficulties arise in practice. Not all cloud systems are compatible with a qualified electronic signature (QES), which complicates the granting of legal force to documents and forces enterprises to duplicate the storage of digital documents.

In Ukraine, there is no mandatory certification of cloud accounting systems for compliance with international standards, in particular ISO/IEC 27001:2013. This gap leaves unresolved risks of data loss, unauthorized access and falsification.

When using foreign cloud platforms, such as Google Cloud or Amazon Web Services, there is a potential conflict with the Law of Ukraine "On Personal Data Protection" No. 2297-VI (Law No. 2297-VI). This is due to the fact that not all foreign providers guarantee the localization of financial data in Ukraine or its compliance with national requirements, which creates risks for information confidentiality.

The tax administration system, which is regulated by the Tax Code of Ukraine and the Order of the Ministry of Finance No. 987 dated 31.12.2022, is often incompatible with the technical capabilities of cloud platforms. Many cloud services do not have built-in modules for exporting reporting in the formats required by the State Tax Service.

Among the positive legislative steps of Ukraine that create conditions for the implementation of blockchain and cloud technologies in practice, it is worth noting the Law of Ukraine "On Cloud Services" (Law No. 2075-IX), which audits the legal framework for the provision and use of cloud services, and also introduces the first cloud principle for the public sector. In addition, Resolution of the Cabinet of Ministers No. 154 of 2025 regulates the activities of cloud providers and provides for the possibility of their official registration for work with state bodies, which paves the way for the integration of cloud technologies into the sphere of financial control and audit.

An important step towards the digitalization of financial processes is also the Law of Ukraine "On Virtual Assets" No. 2074-IX (Law No. 2074-IX), which creates a regulatory framework for the use of blockchain technologies in the storage and processing of financial data. In combination with existing laws on electronic document management and electronic trust services, these acts form a legal basis for the dissemination of innovative technologies in the audit system, ensuring transparency, reliability and increasing trust in financial reporting.

Thus, the lack of special regulations for storing accounting information in the cloud, problems with the compatibility of electronic signatures, unclear regulation of data protection when using foreign providers, and the lack of mandatory certification of cloud platforms are key challenges. Overcoming these problems requires not only technical adaptation, but also harmonization of legislation, which will ensure the proper level of information security and legal reliability of data required for auditing in a modern digital environment.

Characteristics of blockchain in the audit system

Blockchain is a distributed ledger technology that provides immutability, transparency, and decentralization of data (Liu et al., 2019). These properties make it an ideal tool for strengthening internal control systems in organizations, as it creates an immutable chain of transactions that is accessible to all network participants. In today's economy, where existing centralized control systems are vulnerable to manipulation and fraud, blockchain offers a new, more reliable solution (Adekunle et al., 2024).

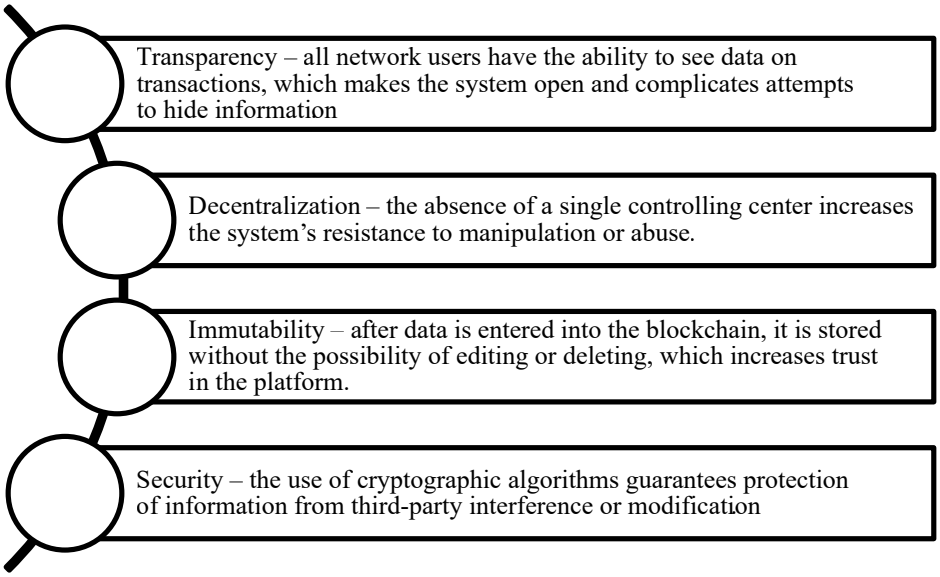
It allows you to track all financial transactions in real time, which significantly reduces the risks of corruption and fraud. Because each record in the chain is immutable, it is impossible to secretly alter or delete

transaction information. This creates a reliable digital trail that auditors can use to quickly verify data integrity. This in turn increases trust in financial reporting and strengthens internal controls.

Focusing on access rights and transaction verification permissions, blockchain technology can be configured in different ways to grant different users different access rights, as well as the rights to write, update, and verify transaction records. Typically, public and private blockchains differ in the scale of the network (i.e., the number of nodes involved), permissions to join the network, and the approach to transaction verification, suggesting that control, ownership, confidentiality, and access describe the dominant key design decisions that help organizations understand which type of blockchain best suits their needs (Han et al., 2023).

Scientists include transparency, immutability, security, and decentralization as the main characteristics of blockchain (Figure 1).

Figure 1. *Main characteristics of blockchain*



Source: Own study based on: Vasyliuk et al., 2025.

The use of cloud and blockchain technologies enables collaborative auditing, a process where multiple parties – including internal and external auditors and the client – work together on a shared technological platform.

Instead of performing audits sequentially and manually exchanging documents, collaborative auditing allows all participants to access data simultaneously. Cloud technologies and blockchain establish a single, trustworthy source of information. This ensures transparency, as every auditor's action and every transaction are recorded and available for review by all parties. This significantly boosts efficiency by reducing the time spent on data reconciliation and information exchange.

For instance, in the dynamic framework proposed by Sheikh et al. (2024), blockchain serves as a common register. This enables different auditors to examine data simultaneously, ensuring everyone is working with identical, unchangeable records. This removes the requirement for traditional and often time-consuming verification procedures by relying on technological trust rather than human factors alone.

Practical possibilities for use in conducting an audit

Modern audit firms and IT departments are actively implementing specialized software based on cloud technologies to optimize audit processes. These solutions not only automate routine tasks, but also provide the opportunity for continuous monitoring and in-depth data analysis.

Table 2 lists possible software products and their applications in auditing, taking into account current research in this area.

Table 2. *Cloud and Blockchain Solutions for Auditing*

Software / Technology	Audit Application Capabilities
SAP S/4HANA Cloud, Oracle ERP Cloud	Centralizing all business processes in a cloud environment simplifies data collection for audits. This allows auditors to focus on strategic analysis rather than routine data verification.
Apache Spark on AWS/ Google Cloud AI	They enable the processing of massive financial data arrays to detect anomalies and patterns that may indicate fraud. This facilitates a shift towards predictive auditing.
Blockchain Frameworks (e.g., Hyperledger, Ethereum)	Using blockchain as a foundation for auditing allows for the creation of immutable transaction logs, which eliminates the need for data reconciliation. This is the basis for the „single truth" concept in accounting.
Public Audit Systems (e.g., Cumulus)	Using blockchain as a foundation for auditing allows for the creation of immutable transaction logs, which eliminates the need for data reconciliation. This is the basis for the „single truth" concept in accounting.
Edge-Computing	Specialized blockchain-based platforms enable auditing of data stored in the cloud while guaranteeing its confidentiality and integrity. This addresses the problem of trust in cloud storage.
Audit Automation Tools	Specialized cloud-based tools can automatically collect, reconcile, and analyze data, allowing auditors to focus on complex issues. This is key to increasing efficiency.

Source: Own work.

Blockchain is currently becoming increasingly popular in auditing. Leading firms such as Deloitte and PwC from the Big Four are already actively integrating this technology into their accounting practices (Nezhyva et al., 2021).

In the field of auditing, Redchenko (2018) proposes two key directions for the development of blockchain technology. The first one is to apply this technology directly within accounting systems to guarantee the reliability of financial reporting and to perform client-approved procedures. The second direction involves offering audit services to companies that have already implemented blockchain in their own operations.

According to the Global Entrepreneurship Monitor survey conducted in 2024/2025, 27.7% of Ukrainian companies use cloud technologies in their operations, while among newly created enterprises this figure is 18.6% (GEM, 2025). This is to indicate that, although cloud solutions remain increasingly popular, their implementation is still not widespread, especially in the initial stages of business development. In particular, according to forecasts by the research company 6Wresearch, the volume of the public cloud market in Ukraine should grow by 18.86% by 2029 (Rai, 2025).

The use of cloud technologies and blockchain in audit practice directly depends on the level of implementation of these technologies in institutions and enterprises subject to audit. The higher the level of digitalization of clients, the greater the opportunities for the application of modern audit tools.

According to the research of Rudan and Pysmenny (2025), the implementation of cloud technologies in local governments demonstrates both significant potential and certain challenges. The study shows that 36.3% of surveyed local governments no longer accept cloud technologies, and another 27.4% express interest in their implementation, which worsens the spread of popularity of these solutions. However, 34.8% of respondents still do not offer cloud services, and 1.5% do not plan to implement them at all. This indicates the presence of serious obstacles, such as limited funding, lack of qualified personnel, and outdated IT infrastructure (Table 3).

Table 3. *Use and assessment of the impact of cloud technologies in local governments of Ukraine*

Category	Use of cloud technologies	Assessing the impact of cloud technologies
Use of these technologies / Significant efficiency improvement	36,30%	36,30%
Interested in implementation / Partial improvement	27,40%	46,90%
Do not use / No impact	34,80%	9,30%
Do not plan to use / Possible negative consequences	1,50%	7,50%

Source: Own study based on: Rudan and Pysmenny (2025).

The survey results show that cloud technologies are perceived mostly positively due to their ability to increase work efficiency. Thus, 46.9% of survey participants noted a partial improvement, and 36.3% - a significant increase in efficiency. Only 9.3% saw no impact, while 7.5% indicated the possibility of negative consequences. This data emphasizes that, given the existing barriers, most users consider cloud services to be an effective tool for optimizing work processes.

The results of the study by Prasad et al. (2025) prove that the implementation of blockchain technology in auditing creates a noticeable economic effect, in particular by reducing costs and increasing the efficiency of work processes. A survey of 120 auditors showed that the use of blockchain made it possible to reduce the duration of audits by an average of 25%, and operating costs by 20%. This became possible due to automated verification of transactions in real time, reducing the need for re-verification of data and optimizing document flow. In addition to direct savings, blockchain contributes to a more rational use of labor resources, reduces the burden on auditors and increases labor productivity. Thanks to constant access to reliable data, auditing is transformed from a periodic process into a continuous monitoring of financial statements, which minimizes the number of errors and reduces the need for re-verification. As a result, enterprises receive more accurate and faster analytical information, and auditors can focus on strategic aspects of control.

A separate area of economic effect is the reduction of losses from fraudulent actions. The blockchain system, due to its transparency and immutability of records, allows for faster identification of suspicious transactions. According to the results of the study, 65% of the surveyed auditors noted a decrease in the number of financial violations after the implementation of the technology. Thus, blockchain not only optimizes costs, but also increases the level of confidence in audit conclusions, providing a comprehensive economic effect – from reducing inspection time to reducing financial risks and strengthening the reputational stability of companies.

In his study, Semenenko (2024) emphasizes that the implementation of cloud technologies is a powerful factor in increasing the efficiency of companies. By moving from capital investments in physical IT infrastructure to operating expenses under a subscription model, the company maintains financial flexibility and reduces the risks of overspending. The author proves that cloud solutions cannot optimize costs for equipment, maintenance and energy consumption, while ensuring the scalability of resources in accordance with business needs. Thus, the use of cloud technologies contributes to the sustainable development of companies, ensures their competitiveness and allows for more efficient management of financial resources.

Modern auditing has reached a critical turning point, as traditional methods no longer meet the needs of a dynamic digital economy. Historically, auditing has been a backward-looking process, based on analyzing selective data from past periods. This approach is labor-intensive, prone to human error, and often fails to uncover complex fraud schemes in real time. Blockchain alters the role of the auditor from a "detective" who searches for past errors to a "trust architect" who designs systems to prevent problems. This allows auditing to become proactive and continuous, rather than a periodic check. Thanks to the immutability and transparency of a distributed ledger, auditors gain direct access to the full history of transactions, which eliminates the need for manual reconciliation and cross-checking of data.

This technological synergy not only increases efficiency, but also transforms the very foundations of auditing. It affects all key practices, from evidence gathering to financial reporting. Table 4 details how blockchain impacts traditional auditing approaches, creating a new, more reliable paradigm.

Table 4. *Transformation of auditing practice under the influence of blockchain*

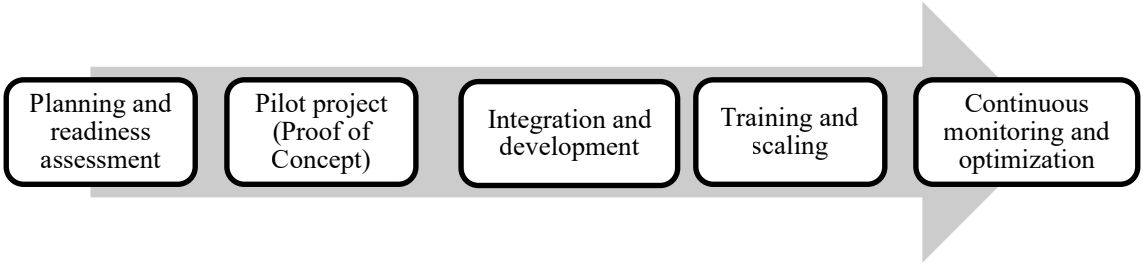
Auditing practice	Traditional approach	Blockchain's impact (new paradigm)
Evidence gathering	Selective document analysis. Labor-intensive, prone to errors	Whole-population analysis: direct access to the complete transaction history in real time, eliminating the need for sampling
Transaction validation and verification	Manual reconciliation and cross-checking of data	Automated verification: transactions are validated by the network community. The auditor verifies not the data itself, but the validation process
Compliance evaluation	Checking samples for compliance with regulations after operations are completed	Embedded control: compliance with standards and laws is built into smart contracts. Violations are detected instantly
Transaction reconciliation	A lengthy process of data reconciliation between various parties	Instant reconciliation: thanks to the ‚single source of truth' (single-ledger), reconciliation becomes unnecessary, which significantly increases efficiency
Financial reporting	Reporting for a specific period (month, quarter, year)	Real-time reporting: data is continuously updated, allowing reports to be generated at any moment
Planning and advising	Based on historical data	Forecasting and strategy: complete and accurate records allow for quick identification of problem areas, prioritization of plans, and finding long-term patterns
Decision support	Conclusions are based on verified data from past periods	Proactive control: providing reliable information for analytics and forecasting the consequences of actions

Source: Own study based on: Liu et al., 2019; Shu et al., 2021.

The process of implementing blockchain in auditing

Implementing blockchain into audit practice is not just a technical project, but a strategic investment in the company's future. We propose to use a structured, phased approach, which, in our opinion, will allow for the effective and minimal risk integration of this technology into existing control systems (Figure 2).

Figure 2. *Stages of implementing blockchain in auditing*



Source: Own work.

1. Planning and Readiness Assessment. A thorough review of the existing audit framework, including identifying problem areas and assessing the required resources (financial, human, and technical) for implementation. At this stage, the project strategy and objectives are defined.

2. Pilot Project (Proof of Concept). Launching the project in a limited area to test the technology under real conditions. This step allows for the identification of potential issues early on and demonstrates the blockchain's value without risk to the entire company.
3. Integration and Development. The technical development and integration of the blockchain solution with current systems. During this phase, smart contracts are created to automate auditing procedures, and the network architecture is configured.
4. Training and Scaling. Comprehensive training for auditors and IT staff. After successful training and stability testing, the system is gradually expanded to other departments and processes.
5. Continuous Monitoring and Optimization. Ongoing surveillance of the system's effectiveness following implementation. Data analysis is performed to identify new opportunities and to develop recommendations for optimizing processes and expanding functionality.

Currently, private and consortium blockchains are likely to be the first to be adopted in business for several key reasons. First, they provide better protection for a company's sensitive information. Second, they allow for tiered access for stakeholders, ensuring better control over who can view or update the ledger. These systems also lower the cost of verifying transactions, as the consensus mechanism is less resource-intensive. Furthermore, they facilitate a quicker exchange of accounting records with both internal and external parties. Private blockchains strengthen control over participants, allowing for faster transaction verification, and they offer greater flexibility in committing or reversing transactions, which is a significant advantage in modern business.

Conclusions

The study confirmed that the integration of cloud technologies and blockchain marks a new stage in the development of control systems, transforming auditing from a retrospective review to a continuous and proactive process. This is due to the key properties of these technologies. Cloud solutions provide the necessary scalability and flexibility to process huge amounts of data, which allows auditors to effectively analyze information and optimize their procedures. Blockchain, for its part, guarantees the immutability, transparency and authenticity of transactions, which is critical for combating fraud and corruption. The analysis showed that the implementation of blockchain in auditing creates a noticeable economic effect, in particular, by reducing the duration of audit inspections and operating costs. The use of these technologies contributes to the automation of routine procedures, which allows auditors to focus on strategic analysis and risk forecasting.

Despite the significant advantages and economic effect, key challenges that hinder the widespread implementation of these solutions have been identified. These include cybersecurity threats, dependence on network infrastructure, difficulty in integrating with existing systems, and Ukraine's fragmented regulatory framework.

Taken together, these factors create a challenging transition period for Ukrainian audit practice. Innovations provide powerful tools for improving efficiency, but their full implementation is possible only after overcoming existing legislative and organizational barriers. Only harmonization of legislation, adaptation of standards, and development of strategies to overcome organizational challenges will allow the full potential of cloud technologies and blockchain to be realized, ensuring reliability and transparency of financial control in the conditions of the modern digital economy.

To realize the full potential of cloud and blockchain in auditing, future studies should focus on several key areas. First, it is crucial to create hybrid audit models that combine traditional and digital methods to build flexible and adaptable systems that minimize risk. Furthermore, it is advisable to establish standards for private and consortium blockchains to build trust and encourage their widespread use. Additionally, it is essential to investigate the new skills and competencies that auditors and accountants will need to operate effectively in a digital environment, as well as to develop training programs to prepare these professionals.

To fully unlock the potential of cloud technologies and blockchain in auditing, future research should focus on several key areas that will help bridge existing theoretical and practical gaps.

1. Research on efficiency and economic impact. Despite the theoretical advantages, there is an urgent need for empirical data confirming the economic effectiveness of implementing these technologies. Future research should include quantitative methods, such as surveys of audit firms and case studies of specific enterprises. This will allow assessing the impact of cloud solutions and blockchain on reducing time, operating costs and risks, as well as on increasing auditor productivity.
2. Study of the regulatory environment. The existing regulatory framework in Ukraine remains fragmented, which is a significant challenge for the implementation of innovations. Further research should focus on a comparative analysis of the legislation of Ukraine and countries with a developed digital market. This will allow developing specific recommendations on harmonizing the regulatory framework, adapting standards, and creating favorable conditions for the widespread use of digital technologies in auditing. The methodological approach may include an analysis of regulatory acts and interviews with experts from regulatory authorities.
3. Analysis of new skills and competencies. The implementation of innovative technologies requires auditors and accountants to acquire new knowledge. Research should be conducted to determine which competencies (in the field of data analysis, cybersecurity, and programming) will become key in the future. The methodology may include indepth interviews with leading auditors and an analysis of educational programs to develop recommendations for updating curricula in higher education institutions and professional certification programs.

The implementation of these areas will not only deepen scientific knowledge, but will also provide a practical basis for the successful digital transformation of auditing in Ukraine.

References

Abubakar, A.G., & Abubakar, S.G. (2023). Revolutionary applications of trending block chain innovation in accounting and auditing. *World Journal of Advanced Engineering Technology and Sciences*, *10*(1), 040–053. https://doi.org/10.30574/wjaets.2023.10.1.0245

Adekunle, B. I., Chukwuma-Eke, E. C., Balogun, E. D., & Ogunsola, K. O. (2024). Optimizing internal control systems through blockchain-based financial reporting: Opportunities and risks. *International Journal of Management and Organizational Research*, *3*(1), 213–222. https://doi.org/10.54660/ijmor.2024.3.1.213–222

Antonini, C. (2024). Accounting digitalization in the quest for environmental sustainability. *Current Opinion in Environmental Sustainability*, *66*, 101399. https://doi.org/10.1016/j.cosust.2023.101399

Appelbaum, D., & Nehmer, R.A. (2019). Auditing cloud-based blockchain accounting systems. *Journal of Information Systems*, *34*(2), 5–21. https://doi.org/10.2308/isys-52660

Assiri, M., & Humayun, M. (2023). A blockchain-enabled framework for improving the software audit process. *Applied Sciences*, *13*(6), 3437. https://doi.org/10.3390/app13063437

Banerjee, P., Nikam, N., Mazumdar, S., & Ruj, S. (2024). Cumulus: Blockchain-enabled privacy preserving data audit in cloud. *Distributed Ledger Technologies: Research and Practice*. *4*(3) https://doi.org/10.1145/3672570

Bataiev, S., Shyshatska, O., & Syniavskyi, Yu. (2025). Analiz perevah i vyklykiv vykorystannia khmarnykh rishen u biznesi ta inshykh sferakh. *Nauka i tekhnika sohodni*, *4*(45), 1098–1111. https://doi.org/10.52058/2786–6025–2025–4(45)–1098–1111

Fedenko, S., Plekan, M., & Yurchenko, O. (2024). Didzhytalizatsiia bukhhalterskoho obliku: Suchasni tendentsii ta instrumenty avtomatyzatsii. *Ekonomika i rehion/ Economics and region*, *4*(95), 189–195. https://doi.org/10.26906/eir.2024.4(95).3625

GEM [Global Entrepreneurship Monitor]. (2025). *Global Entrepreneurship Monitor 2024/2025 Global Report: Entrepreneurship Reality Check*. London: GEM.

Gomaa, A., Gomaa, M., Boumediene, S. L., & Farag, M. (2022). The creation of one truth: Single-ledger entries for multiple stakeholders using blockchain technology to address the reconciliation problem. *Journal of Emerging Technologies in Accounting*. https://doi.org/10.2308/jeta-19–06–01–28

Han, H., Shiwakoti, R.K., Jarvis, R., Mordi, C., & Botchie, D. (2023). Accounting and auditing with blockchain technology and artificial Intelligence: A literature review. *International Journal of Accounting Information Systems*, *48*, 100598. https://doi.org/10.1016/j.accinf.2022.100598

Islam Priom, M.A., Lopa Mudra, S., Ghose, P., Islam, K.R., & Hasan, M.N. (2024). Blockchain applications in accounting and auditing: Research trends and future research implications. *International Journal of Economics, Business and Management Research*, *08*(07), 225–247. https://doi.org/10.51505/ijebmr.2024.8715

Kononenko, L.V., Nazarova, H.B., & Savchenko, V.M. (2025). Orhanizatsiia obliku ta audytu u konteksti vykorystannia novitnikh tsyfrovykh tekhnolohii: Suchasnyi stan, problemy ta perspektyvy. *Problemy suchasnykh transformatsii. Seriia: Ekonomika ta upravlinnia*, (18). https://doi.org/10.54929/2786–5738–2025–18–09–03

Korhonen, T., Selos, E., Laine, T., & Suomala, P. (2021). Exploring the programmability of management accounting work for increasing automation: An interventionist case study. *Accounting, Auditing & Accountability Journal*, *34*(2): 253–280. https://doi.org/10.1108/aaaj-12–2016–2809

Laposha, D. (2022). Implementation of digital technologies when executing control of public finances in the territorial community. *Management of Development of Complex Systems*, (51), 58–68. https://doi.org/10.32347/2412–9933.2022.51.58–68

Liu, M., Wu, K., & Xu, J. J. (2019). How will blockchain technology impact auditing and accounting: Permissionless versus permissioned blockchain. *Current Issues in Auditing*, *13*(2), 19–29. https://doi.org/10.2308/ciia-52540

Moghadasi, M., Majid, S., & Fazekas, G. (2018). Cloud computing auditing. *International Journal of Advanced Computer Science and Applications*, *9*(12). 467–472. https://doi.org/10.14569/ijacsa.2018.091265

Nezhyva, M., Zaremba, O., & Nehodenko, V. (2021). Application of blockchain technology in accounting and audit: International and domestic experience. *SHS Web of Conferences, 107, 02001.* https://doi.org/10.1051/shsconf/202110702001

Prasad, K.D., Mubeen, S.A. & Rajani, B. (2025). The impact of blockchain technology on audit quality: An empirical study. *Academy of Accounting and Financial Studies Journal, 29*(S2), 1–7.

Pro bukhhalterskyi oblik ta finansovu zvitnist v Ukraini, Zakon Ukrainy № 996-XIV (2024) (Ukraina). https://zakon.rada.gov.ua/laws/show/996–14#Text

Pro elektronni dovirchi posluhy, Zakon Ukrainy № 2155-VIII (2024) (Ukraina). https://zakon.rada.gov.ua/laws/show/2155–19#Text

Pro elektronnu komertsiiu, Zakon Ukrainy № 675-VIII (2024) (Ukraina). https://zakon.rada.gov.ua/laws/show/675–19#Text

Pro khmarni posluhy, Zakon Ukrainy № 2075-IX (2024) (Ukraina). https://zakon.rada.gov.ua/laws/show/2075–20#Text

Pro virtualni aktyvy, Zakon Ukrainy № 2074-IX (2024) (Ukraina). https://zakon.rada.gov.ua/laws/show/2074–20#Text

Pro zakhyst personalnykh danykh, Zakon Ukrainy № 2297-VI (2025) (Ukraina). https://zakon.rada.gov.ua/laws/show/2297–17#Text

Punia, A., Gulia, P., Gill, N.S., Ibeke, E., Iwendi, C., & Shukla, P.K. (2024). A systematic review on blockchain-based access control systems in cloud environment. *Journal of Cloud Computing*, *13*(1), 146. https://doi.org/10.1186/s13677–024–00697–7

Rai, S.K. (2025). Ukraine cloud computing market (2025–2031) outlook: Forecast, growth, analysis, revenue, size, trends, share, companies, industry & value, 1–16. https://www.6wresearch.com/industry-report/ukraine-cloud-computing-market

Redchenko, K.I. (2018). Audit services on the ICO market: Opportunities and prospects. *Statistics of Ukraine*, *80*(1), 85–92. https://doi.org/10.31767/su.1(80).2018.01.11

Rudan V., & Pysmennyi V. (2025). *Zvit za rezultatamy opytuvannia shchodo vykorystannia shtuchnoho intelektu, chat-botiv i khmarnykh tekhnolohii v orhanakh mistsevoho samovriaduvannia*. Ternopil: FOP Rudan V.Ya.

Semaniuk, V., & Melnyk, N. (2022). Impact of digital technologies on the business information environment in the context of the fifth industrial revolution. *Herald of Economics*, (3), 203–212. https://doi.org/10.35774/visnyk2022.03.203

Semenenko, Yu. (2024). Khmarni tekhnolohii yak faktor pidvyshchennia efektyvnosti diialnosti KOMPANII. *Herald of Khmelnytskyi National University. Economic Sciences*, 334(5), 211–218. https://doi.org/10.31891/2307–5740–2024–334–29

Sheela, S., Ali, A.A., Tanaraj, K., & Izani, I. (2023). Navigating the future: Blockchain's impact on accounting and auditing practices. *Sustainability,* 15(24), 16887. https://doi.org/10.3390/su152416887

Sheikh, A.I., Sadish Sendil, M., Sridhar, P., Thariq Hussan, M.I., Abidin, S., Kumar, R., Irshad, R.R., Muniyandy, E., & Phani Kumar, S. (2024). Revolutionizing collaborative auditing: A dynamic blockchain-based cloud storage framework for data updates and assurance. *Journal of Intelligent & Fuzzy Systems*, 1–12. https://doi.org/10.3233/jifs-237474

Shu, J., Zou, X., Jia, X., Zhang, W., & Xie, R. (2021). Blockchain-Based decentralized public auditing for cloud storage. *IEEE Transactions on Cloud Computing, 1.* https://doi.org/10.1109/tcc.2021.3051622

Song, M., Hua, Z., Zheng, Y., Huang, H., & Jia, X. (2023). Blockchain-Based deduplication and integrity auditing over encrypted cloud storage. *IEEE Transactions on Dependable and Secure Computing,* 1–18. https://doi.org/10.1109/tdsc.2023.3237221

Vasyliuk, M.M., Lubenchenko, O.E., Kuzmin, T. L., & Ivaniuk, H.-Yu. V. (2025). Avtomatyzatsiia protsesiv obliku i kontroliu yak chynnyk prozorosti ta efektyvnoho upravlinnia. *Aktualni pytannia ekonomichnykh nauk*, (12). https://doi.org/10.5281/zenodo.15863873

Wang, H., Zhang, Y., Wang, X.A., & Yang, X. (2024). An improved identity-based public audit protocol for cloud storage. *Heliyon*, *10*(16), Stattia e36273. https://doi.org/10.1016/j.heliyon.2024.e36273

Wylde, V., Rawindaran, N., Lawrence, J., Balasubramanian, R., Prakash, E., Jayal, A., Khan, I., Hewage, C., & Platts, J. (2022). Cybersecurity, data privacy and blockchain: A review. *SN Computer Science,* 3(2), 127. https://doi.org/10.1007/s42979–022–01020–4

Yi, Z., Wei, L., Yang, H., Wang, X. A., Yuan, W., & Li, R. (2022). An improved secure public cloud auditing scheme in edge computing. *Security and Communication Networks*, *2022*, 1–9. https://doi.org/10.1155/2022/1557233

• F I N A N S E I P R A W O F I N A N S O W E •
• JOURNAL OF FINANCE AND FINANCIAL LAW •

Special Issue 2025, vol. 1: 39–48
https://doi.org/10.18778/2391-6478.S1.2025.03

C O P E
Member since 2021
JM15102

Andrii Papinko https://orcid.org/0000-0001-8515-9376
PhD in economics, West Ukrainian National University, Corresponding Author, e-mail: a.papinko@wunu.edu.ua

Vitalii Mazuryk https://orcid.org/0009-0009-0504-9202
PhD student, West Ukrainian National University

Maksym Bandurka https://orcid.org/0009-0000-9471-7763
PhD student, West Ukrainian National University

ACCOUNTING STRATEGIES AND CORPORATE SOCIAL RESPONSIBILITY UNDER CONDITIONS OF WAR

ABSTRACT

The purpose of the article. The purpose of this article is to substantiate the role of strategic accounting in integrating corporate social responsibility (CSR) into business practices under wartime conditions. The study aims to identify how accounting tools can be adapted to reflect the social and ethical responsibilities of enterprises, ensure transparency, and support decision-making processes in an unstable environment. Particular attention is paid to the development of indicators for assessing CSR activities, the challenges of their implementation in accounting systems, and the potential of CSR to enhance business resilience and social trust during military conflict.

Methodology. The research combines theoretical and empirical methods. On the theoretical side, the study applies analysis, synthesis, bibliometric review, and historical-logical approaches to conceptualize the relationship between accounting, CSR, and wartime resilience. On the empirical side, 15 semi-structured interviews were conducted with professional accountants and auditors representing both private enterprises and public organizations in Ukraine. Respondents were asked about challenges of financial transparency, ethical dilemmas in CSR reporting, and accounting for wartime social initiatives. Interview data was analyzed through thematic coding, which allowed for the identification of recurring patterns across organizational practices.

Results of the research. The research findings demonstrate that under wartime conditions, corporate social responsibility (CSR) has shifted from a reputation-building tool to a critical element of enterprise resilience. Expenditures on shelters, alert systems, employee support, and humanitarian initiatives have become an integral part of management accounting. This requires systematic documentation and analysis of socially oriented costs in order to assess their effectiveness and broader societal impact. The study also revealed that the absence of standardized approaches to recording and evaluating CSR activities complicates transparency and comparability of financial information. Voluntary disclosure of CSR-related data does not ensure consistency, creating risks for the reliability of financial reporting. At the same time, accountants and auditors emphasize the need to develop internal indicators that reflect the social, environmental, and security effects of enterprise activities. Finally, the results indicate that strategic accounting, when combined with CSR, can strengthen trust between business, government, and society. Integrating socially responsible practices into management and reporting systems not only enhances the quality of decision-making but also contributes to the overall resilience of the country during war. This highlights the transformation of CSR from a voluntary initiative into a factor of survival and development for both enterprises and society.

Keywords: Corporate Social Responsibility, strategic accounting, management accounting, business ethics, wartime economy, social impact

JEL Class: M14, M41, M42

Received: 2025.01.14. Accepted: 2025.06.28.

Funding Information: None. **Conflicts of interests:** None. **Ethical Considerations:** The Authors assure of no violations of publication ethics and take full responsibility for the content of the publication.

Introduction

In wartime conditions, businesses face unprecedented challenges that demand not only adaptation to rapidly changing economic realities but also active engagement in supporting the communities in which they operate. Corporate Social Responsibility (CSR) and accounting strategies gain special significance in this context, evolving from voluntary initiatives into existential necessities. This article explores how strategic accounting can support the alignment of financial objectives with social and ethical commitments, especially amid uncertainty, risk, and disruption caused by war.

Accounting, as a tool for reflecting the societal impact of business operations, becomes a pillar of transparency, trust, and social stability. Particular attention is given to the need for developing new indicators that capture the costs of socially responsible activities within management accounting systems and non-financial reporting. The article seeks to answer how companies can build responsible and effective accounting and CSR practices in times of armed conflict, and how these practices can contribute to societal resilience and sustainable development.

The main hypothesis of this research is that the integration of Corporate Social Responsibility (CSR) indicators into the strategic accounting system positively correlates with enterprise resilience and public trust during wartime conditions in Ukraine. To test this hypothesis, the study addresses the following key research questions: The integration of CSR indicators into strategic accounting enhances the transparency and credibility of corporate reporting during wartime; Enterprises that systematically record and assess CSR-related expenditures demonstrate higher resilience and stakeholder trust under crisis conditions; Strategic accounting serves not only as a financial management tool but also as a mechanism for embedding ethical and social responsibility in business decision-making.

Ukrainian social enterprises currently face unprecedented challenges. In wartime conditions, businesses face significant losses and various risks, including financial, logistical, and security challenges, leading to potential business halts. As noted in the MIT Sloan Management Review, «War subjects businesses to unprecedented tests. With governments stretched to their limits, businesses must step in and assume responsibilities far beyond their conventional mandates, profoundly transforming the notion of corporate social responsibility (CSR). As national survival and corporate survival become more and more intertwined, we see questions shift from ‘Should we do something?’ to ‘What could we do?’ – transforming CSR from a voluntary initiative to an existential necessity» (Sytch, Rider, Christopher, 2024).

Literature review

Corporate Social Responsibility (CSR), in the context of fair resource use and balancing the impact of business on economic, social, and environmental values, has been studied in economic literature for over 30 years. In contemporary research on wartime conditions, several key approaches to the study of Corporate Social Responsibility (CSR) and accounting strategies can be identified. Bamiatzi V. et al. analyze the phenomenon of so-called “partisan CSR,” where companies are compelled to adopt a clear political stance in response to aggression by supporting affected communities and distancing themselves from the aggressor state (Bamiatzi *et al*., 2025). Similar findings are presented by Patel P.C., Richter J.I., who demonstrate that the withdrawal of Western companies from the Russian market was driven by a combination of ethical and pragmatic factors, including reputational and financial risks (Patel, Richter, 2025).

Danjue Clancey-Shang, Chengbo Fu examine the impact of CSR disclosure on market quality in the context of political risk and argue that transparency in reporting reduces market volatility and strengthens investor confidence (Clancey-Shang, Fu, 2024). Comparable conclusions are reached by Mina Glambosky, Stanley Peterburgsky, who show how corporate activism in the early months of the full-scale war influenced the assessment of companies by the international financial community (Glambosky, Peterburgsky, 2022). Melnyk V., Iermolenko O., Cordery C. emphasize the emotional dimension of accounting practices, highlighting

that financial and non-financial reporting under wartime conditions serves not only a technical but also a social function, becoming a means of public communication and moral support (Melnyk, Iermolenko, Cordery, 2024). In turn, N. Kharchenko et al. (2024) analyze the management of CSR strategies by transnational corporations operating in Russia during the war against Ukraine and demonstrate the complexity of balancing local risks, international sanctions, and global reputation (Kharchenko *et al.*, 2024).

The study by Evenett S., Pisani N. shows that companies actively revised their business models and corporate structures in response to geopolitical risks (Evenett, Pisani, 2022), while Balyuk T., Fedyk A. describe the withdrawal of U.S. companies from the Russian market as a typical mechanism of reputation risk management (Balyuk, Fedyk, 2023). Tsougkou E. et al. introduce the concept of peace brand activism (PBA), which encompasses symbolic and practical initiatives aimed at supporting communities in times of crisis and shaping new standards of corporate behavior (Tsougkou, *et al.*, 2024).

A study conducted by the United Nations Development Programme (UNDP) shows that «companies mostly mentioned human rights issues in their Codes of Ethics or in non-financial reports when they described the employment practices of people with disabilities» (UNDP, 2023). This practice indicates the growing importance of non-financial reporting in times of crisis and conflict, particularly in the context of social integration. These trends have been reflected in the accounting system through non-financial and integrated reporting, the use of non-financial indicators, as well as in the increasing number of studies dedicated to overcoming information asymmetry between enterprises, the state, and society.

Particular attention is paid to social business strategies and the role of the accounting profession, which is acquiring a new social value in the conditions of martial law and must meet high ethical standards. The study by A. Marchuk emphasizes the importance of generalizing the experience of Ukrainian companies in the field of CSR under wartime conditions, as well as formulating recommendations for the future: «the aim of the research is to study and promote the experience of corporate social responsibility of Ukrainian companies during martial law, as well as to formulate recommendations for consolidating best practices in the future» (Marchuk, 2023). Under the conditions of implementing social initiatives, the accurate reflection of expenditures on their implementation in the accounting system becomes especially relevant. In order to take advantage of tax preferences, as well as to obtain marketing and competitive benefits, information about expenditures on socially responsible activities should be formed on the basis of reliable, methodologically sound approaches. This ensures transparency in decision-making and increases the level of trust in the company from both external and internal stakeholders.

Overall, the literature indicates that under wartime conditions accounting and corporate social responsibility extend beyond their traditional financial functions, transforming into a means of articulating political and social positions, managing risks and reputation, and serving as an instrument for sustaining societal resilience. In modern CSR accounting practices, a concept of integrating non-financial indicators with financial reporting has been developed, allowing a broader interpretation of the results of socially oriented activities. At the same time, the problem of monitoring and evaluating the effectiveness of such activities within the framework of multidimensional social interests – often lacking unified forms of quantitative expression – remains unsolved. Thus, social entrepreneurship and CSR in wartime conditions are gaining critical importance not only as tools for supporting social stability, but also as objects of accounting reflection, requiring the development of new strategic approaches and standards in the field of accounting.

Evolution of Corporate Social Responsibility in Wartime

Using a comparative method based on business survey data and sociological studies of CSR in Ukraine during 2022 - 2025, it can be concluded that under wartime conditions Corporate Social Responsibility (CSR) becomes a fundamental element of enterprise functioning. Faced with financial, logistical, and security risks, many businesses would not be able to sustain operations without embedding social responsibility into their

strategies. Ukrainian practice demonstrates that socially responsible initiatives – ranging from ensuring workplace safety to supporting local communities – have become not only tools of survival but also means of sustaining the economy. In this context, CSR is interpreted as a mindset that obliges business entities to consider societal interests, operate sustainably, and generate social benefits. Importantly, maintaining business continuity and paying taxes on time are also regarded as socially responsible behaviors, as they directly contribute to national resilience.

The results of business surveys illustrate the scale of challenges faced by Ukrainian companies. Among the most frequently mentioned obstacles to business activity in wartime are insufficient solvent customers (49,7%), unpredictability of domestic developments (46,1%), inconsistent state actions (34,0%), insufficient capital (32,4%), regulatory and fiscal barriers (26,1%), high taxation (23,2%), and limited access to credit (23,0%) (CSR Ukraine, 2025). These tables underline the fragility of the wartime business environment and highlight the increasing relevance of CSR as a stabilizing factor.

Furthermore, recent research underscores that CSR is expanding beyond its traditional boundaries, as Bamiatzi, V., Brieger, S.A., Karakulak Ö argue, the war has revealed new forms of "partisan CSR," in which companies adopt explicit political positions by strengthening Ukraine's economy, contributing to citizen safety, and engaging in symbolic acts of support (Bamiatzi, *et al*., 2025). This type of CSR demonstrates that business behavior is no longer neutral but actively embedded in the wider struggle for survival and national resilience.

Table 1. *Key Barriers to Business Activity in Ukraine during Wartime (Survey Results)*

Obstacle	Percentage of Respondents (%)
Not enough solvent customers	49,7
Unpredictability of developments in Ukraine and the domestic market	46,1
Unpredictable state actions that can worsen the state of business	34,0
Lack of sufficient capital	32,4
Obstacles from regulatory and/or fiscal authorities	26,1
High taxes and fees	23,2
Unavailability of credit funds	23,0

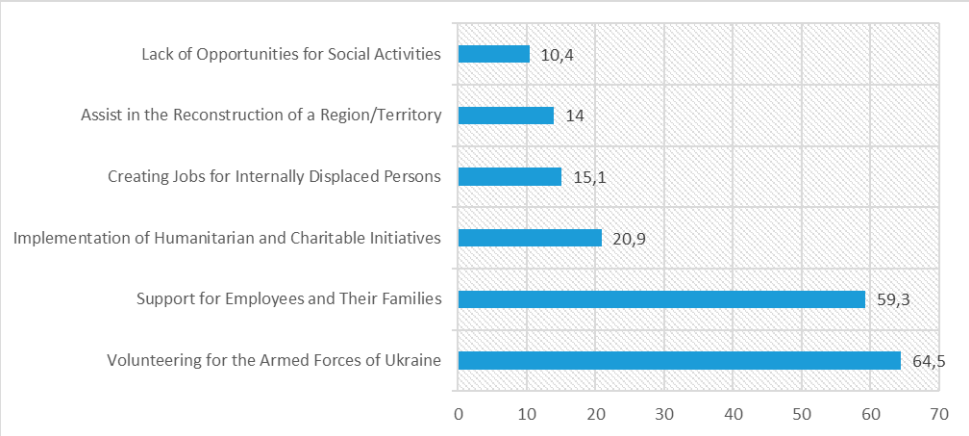
Source: Own research based on CSR Ukraine, 2025.

In the academic discourse, CSR and social entrepreneurship are increasingly recognized as mechanisms for sustaining resilience. Pokynchereda V. et al., emphasize that socially responsible practices improve corporate reputation, labor productivity, and competitiveness, while also contributing to sustainable development (Pokynchereda et al., 2023). She also proposes a system of indicators to evaluate CSR, including responsibility to employees, environmental engagement, public involvement, and wartime-specific initiatives. Similarly, O. Fomina highlights that wartime CSR policies must be distinguished from the traditional ones, stressing the importance of human rights, workplace safety, tax compliance, and terminating cooperation with aggressor states (Fomina, 2023). Building on this, scholars and practitioners propose a range of indicators to reflect CSR in accounting systems, such as expenditures on shelter infrastructure and alert systems, pollution prevention and cleanup costs, materials for volunteer activities, and data on employee participation in the war effort. These indicators, while difficult to standardize, allow companies to demonstrate the multifaceted impact of CSR.

The practice of Ukrainian enterprises during the war also illustrates a shift in the perception of business responsibility. Many companies are investing in social programs and humanitarian aid, while society is reinterpreting values and recognizing the importance of collective responsibility. Businesses face not only financial losses but also new categories of risks – security issues for employees and their families, staffing shortages

caused by mobilization, environmental risks, and the burden of maintaining energy supply. Addressing these issues through CSR has become integral to business survival.

Figure 1. *Social Responsibility of Ukrainian Business during the War*



Source: Own research based on UNDP, October 2023.

The role of accountants in wartime has become particularly complex. Beyond measuring economic impacts, they must also evaluate and report on social and ethical dimensions of business activity. Voluntary disclosure, while common, has drawbacks: it can reduce comparability across firms and even create tensions with fiscal authorities when linked to tax preferences. As a result, mandatory reflection of CSR information in financial reporting is becoming a necessity in Ukraine. This would not only strengthen transparency but also reduce information asymmetry and improve stakeholder trust. At the same time, internal users require reliable CSR information to guide decision-making. This necessitates integrating CSR into management accounting processes, enabling accountants to reflect socially responsible activities consistently and methodologically.

In addition, the need to evaluate the costs of CSR has generated proposals for new approaches to measurement. Suggested indicators include expenditures on environmental protection, data on workforce participation in defense activities, costs of constructing shelters and alert systems, and resources devoted to volunteer efforts. Because such initiatives are difficult to capture in standardized financial categories, professional judgment rooted in ethical principles becomes necessary. This approach ensures that CSR expenditures are treated not as ancillary but as integral to management accounting and corporate strategy.

Nevertheless, challenges remain. Monitoring and evaluating the effectiveness of CSR is complicated by the lack of standardized measures, and many initiatives are difficult to capture in monetary terms. In such cases, professional judgment grounded in ethical standards is essential. The integration of non-financial indicators with financial reporting is one promising direction, as it broadens the interpretation of social initiatives and links them with business performance. Ultimately, CSR in wartime is both an ethical imperative and a strategic accounting object, requiring innovative approaches, reliable indicators, and strengthened professional practices. By embedding CSR into strategic accounting frameworks, Ukrainian businesses can reinforce social trust, enhance resilience, and contribute to sustaining the state during conflict.

Strategic Accounting as a Tool for Corporate Social Responsibility

The importance of strategic accounting for the development of corporate social responsibility (CSR) during wartime is becoming increasingly evident. Traditionally confined to financial planning and performance control, strategic accounting in the current environment expands its scope and assumes new responsibilities (Papinko, 2006; Semanyuk, 2017). It transforms into a comprehensive framework capable of capturing not only economic outcomes but also the social, ethical, and environmental dimensions of business activities. In Ukraine,

where enterprises face unprecedented challenges linked to security risks, logistical disruptions, and workforce shortages, strategic accounting allows for the integration of CSR into management systems and thereby strengthens both business resilience and public trust. Scholars argue that CSR in times of war is no longer a voluntary activity but rather a crucial factor for survival, competitiveness, and national (Bamiatzi, *et al*., 2025; Pokynchereda et al., 2023).

An essential step in advancing this integration lies in the formulation of indicators that can adequately reflect the multifaceted nature of CSR. The development of robust indicators is a prerequisite for embedding CSR into the strategic accounting framework. Such indicators must capture not only financial outcomes but also the broader societal and ethical impacts of business activities. Based on empirical studies in Ukraine and international best practices, we propose the following categories of indicators (tabl.2).

Wartime practice demonstrates that the protection of employees and the provision of safe working conditions, including the construction of shelters, alert systems, and access to medical support, require systematic accounting treatment.

Table 2. *Indicators of Strategic Accounting for CSR*

Indicators	Characteristic
Employee and Social Protection Costs	Expenditures on ensuring workplace safety, building shelters, establishing alert systems, and providing medical assistance to employees. In wartime conditions, accounting systems must capture these costs to reflect the full scale of CSR commitments.
Community Support Expenditures	Humanitarian aid, assistance to internally displaced persons (IDPs), and contributions to local recovery projects represent direct investments in societal resilience. By accounting for these expenditures, companies can demonstrate how their activities extend beyond financial objectives.
Tax Compliance Indicators	Unlike in peacetime, when tax compliance is often perceived merely as a legal obligation, in war it becomes a crucial contribution to sustaining state capacity. Strategic accounting should therefore monitor tax-related indicators, such as the share of taxes in total expenditures and the avoidance of deferrals, to highlight their role in social responsibility.
Human Capital Resilience	Number of employees retained, the proportion of workers mobilized, and investments in training or reskilling. In the Ukrainian context, many enterprises face significant workforce shortages due to mobilization, migration, and psychological stress. Accounting for these factors provides insight into how companies are managing their human capital
Environmental and Energy Safety Indicators	Wartime brings new ecological and energy-related risks, from environmental damage caused by hostilities to disruptions in energy infrastructure. Expenditures on pollution prevention, cleanup, and energy security measures must be systematically recorded, as they reflect the broader social and environmental responsibility of businesses.
Volunteer and Symbolic Activities	Resources allocated to volunteer initiatives, pro bono services for defense or humanitarian purposes, and symbolic acts of solidarity (such as public support campaigns) represent a unique dimension of wartime CSR. Although difficult to quantify, these activities reinforce social cohesion and legitimacy, and thus require appropriate accounting reflection.

Source: Own research.

At the same time, expenditures on community support such as humanitarian aid, assistance to internally displaced persons, or local recovery projects illustrate how companies contribute directly to societal resilience. Even tax compliance, often viewed in peacetime as a matter of legal obligation, acquires a socially responsible dimension in war, since timely payments to the state budget sustain public services and defense capacities (Fomina, 2023). Attention must also be given to the resilience of human capital: companies record the retention of staff, the proportion of employees mobilized, and investments in training or reskilling. Environmental and energy-related risks, amplified by wartime conditions, create another layer of responsibility, as businesses invest in pollution prevention, cleanup, and energy infrastructure maintenance. Finally, volunteer and symbolic activities - though more difficult to quantify - carry significant weight, reinforcing social

cohesion and national morale, and therefore also deserve recognition within accounting frameworks (Lazorenko, 2023).

The accurate measurement and reporting of CSR activities demand methodological innovation. Strategic accounting must adapt existing frameworks and develop new tools tailored to the wartime environment. We identify five methodological approaches:

1. Integration with Management Accounting Systems. Under this approach, CSR projects are incorporated into management accounting systems as distinct cost centers or dedicated activity categories. This ensures continuous monitoring, enables performance comparisons across business units, and optimizes resource allocation, emphasizing that social responsibility is an integral component of strategic management.
2. Application of International Reporting Standards with Wartime Adaptation. Under this approach, CSR initiatives are represented in accordance with international standards such as IR, GRI, and ESG, with additional emphasis on wartime specificities: expenditures on personnel safety, humanitarian programs, and other social initiatives. This adaptation allows for the systematic reporting of risks and outcomes arising under crisis conditions.
3. Hybrid Valuation Methods. Under this approach, CSR projects are analytically assessed using both financial and qualitative indicators. Monetary valuation of direct costs is combined with surveys, stakeholder feedback, and other methods of social impact assessment, providing a comprehensive view of socially responsible activities' outcomes.
4. ScenarioBased Accounting. Under this approach, social initiatives are modeled across different conflict scenarios (escalation, stabilization, postwar recovery). Scenario analysis enables the anticipation of potential risks, the evaluation of the resilience of CSR commitments, and the facilitation of strategic planning even under high uncertainty.
5. EthicsBased Professional Judgment. Under this approach, CSR projects that cannot be directly quantified are evaluated through the lens of professional ethical judgment. This ensures that symbolic contributions and longterm social effects are acknowledged within strategic accounting, guaranteeing that their impact is not overlooked by management or stakeholders.

Capturing these diverse activities demands methodological innovation. One of the most significant directions is the integration of CSR-related information into management accounting systems so that such activities are treated not as exceptional but as routine components of corporate decision-making. This requires adapting established reporting frameworks, including integrated reporting and ESG disclosure models, to wartime conditions by introducing categories that reflect safety expenditures, humanitarian initiatives, and symbolic contributions (Golovko, Oriekhova, 2024; Burlay, 2024). Hybrid valuation approaches, which combine monetary measures of direct costs with qualitative assessments of social impact, enable a more balanced picture of CSR outcomes. Scenario-based accounting, in turn, allows enterprises to simulate the potential consequences of different levels of escalation or stabilization, providing a strategic tool for anticipating future social obligations. Yet there are also cases where CSR activities cannot be easily expressed in financial terms, and here the professional judgment of accountants, guided by ethical standards, becomes decisive. Such judgment ensures that symbolic and long-term social effects, which resist quantification, are still acknowledged within the broader framework of strategic accounting.

The implementation of these approaches confirms that CSR is not an auxiliary activity but a central element of strategic management. By embedding CSR into accounting systems, companies enhance transparency, reduce information asymmetry, and strengthen their legitimacy in the eyes of both the state and society. Ukrainian practice during the war vividly demonstrates that socially responsible actions – whether in the form of maintaining employment, providing humanitarian aid, or ensuring tax compliance–are not only ethical choices but also determinants of business continuity and resilience. Strategic accounting thus provides the infrastructure for making these contributions visible, measurable, and comparable, ensuring that businesses are recognized as active agents of social stability during wartime.

Conclusions

The study demonstrates that under wartime conditions, corporate social responsibility (CSR) in Ukraine has evolved into a non-negotiable function, crucial for maintaining business continuity and national sustainability. Strategic accounting provides the methodological basis for integrating CSR into management systems, ensuring transparency, ethical compliance, and effective decision-making. The empirical findings confirm that socially responsible expenditures – including humanitarian aid, employee protection, and tax compliance – should be systematically recorded and assessed within accounting systems. This approach allows companies to measure not only financial efficiency but also social, environmental, and security impacts. The research highlights the need to develop standardized indicators for CSR accounting, adapt international reporting frameworks (GRI, ESG, IR) to wartime conditions, and strengthen the professional judgment of accountants in assessing non-financial outcomes.

Overall, strategic accounting and CSR together form a foundation for rebuilding societal trust, enhancing business legitimacy, and ensuring long-term recovery in the post-war period.

References

Sytch, M., & Rider, C. (2024). How Ukrainian Companies Are Transforming Wartime Challenges Into Lifelines. *MIT Sloan Management Review*. November 25, https://sloanreview.mit.edu/article/how-ukrainian-companies-are-transforming-wartime-challenges-into-lifelines/

Bamiatzi, V., Brieger, S.A., & Karakulak, Ö. *et al.* (2025). The rise of partisan CSR: Corporate responses to the Russia–Ukraine war. *Journal of Business Ethics, 198*(2), p. 263–291. https://doi.org/10.1007/s10551-024-05795-9

Patel, P. C., & Richter, J. I. (2024). Self-Interest over Ethics: Firm Withdrawal from Russia After the Ukraine Invasion. *Journal of Business Ethics,* 199, p. 365–391. https://doi.org/10.1007/s10551-024-05836-3

Clancey-Shang, D., & Fu, C. (2024). CSR disclosure, political risk and market quality: Evidence from the Russia-Ukraine conflict. *Global Finance Journal*, Volume 60, 100938, https://doi.org/10.1016/j.gfj.2024.100938.

Glambosky, M., & Peterburgsky, S. (2022). Corporate activism during the 2022 Russian invasion of Ukraine. *Economics Letters*, Volume 217, 110650, https://doi.org/10.1016/j.econlet.2022.110650.

Melnyk, V., Iermolenko, O., & Cordery, C. (2024). The emotive power of accounts during war time. *Public Money & Management*, *45*(3), p. 217–227. https://doi.org/10.1080/09540962.2024.2425053

Kharchenko, T., Sokhan, I., Shalimov, V., Baistriuchenko, N., & Klietsova, N. (2024). Management of social responsibility strategies of multinational corporations in russia during the war against Ukraine. *Problems and Perspectives in Management*, 22(4), p. 95–107. https://doi.org/10.21511/ppm.22(4).2024.08

Evenett, S. J., & Pisani, N. (2023). Geopolitics, conflict, and decoupling: evidence of Western divestment from Russia during 2022. *Journal of International Business Policy,* 6, p. 511–540. https://doi.org/10.1057/s42214-023-00167-y

Balyuk, T., & Fedyk, A. (2023). Divesting under Pressure: U.S. firms' exit in response to Russia's war against Ukraine. *Journal of Comparative Economics*, Volume 51, Issue 4, p. 1253–1273, https://doi.org/10.1016/j.jce.2023.08.001.

Tsougkou, E., Sykora, M., Elayan, S., Ifie, K., & Oliveira, J.S. (2024). Peace Brand Activism: Global Brand Responses to the War in Ukraine. *Journal of Public Policy & Marketing*, *44*(1), p. 100–121. https://doi.org/10.1177/07439156241289079

United Nations Development Programme (UNDP) (2023). *Responsible business conduct during war in Ukraine: Context Assessment Study.*. https://www.undp.org/sites/g/files/zskgke326/files/2023-10/undp-ua-report_responsible_business_conduct_during_war_in_ukraine_eng.pdf

Marchuk, O. (2023). Adapting international social responsibility experience to Ukrainian content. *Bulletin of V.N. Karazin Kharkiv National University. Series "Sociological Studies of Contemporary Society"*, (24). https://periodicals.karazin.ua/fcs/article/view/24520

CSR Ukraine (2025). *Ukrainian Business and War: A Unique Catalog by CSR Ukraine*. Center for CSR Development. https://csr-ukraine.org/news/ukrainskiy-biznes-i-viyna-unikalni/

Pokynchereda, V., Bondarenko, V., Pravdiuk, N., Ivanchenkova, L., & Sokoliuk, I. (2023). Corporate Social Responsibility in Ukraine Under Martial Law: Accounting Aspects. *Management Theory and Studies for Rural Business and Infrastructure Development*, *45*(4), p. 427–437. https://doi.org/10.15544/mts.2023.42

Fomina, O. (2023). Corporate reporting on social responsibility under martial law. *Scientia Fructuosa*. 149. p. 44–58. https://doi.org/10.31617/1.2023(149)04.

Papinko, V. (2006). Development of controlling as an objective necessity for improving management. *Scientific discoveries*, Vol. 15. http://www.library.tane.edu.ua/images/nauk_vydannya/XV3ZmQ.pdf. [in Ukrainian]

Semanyuk, V. (2017). The Theory of Accounting in the Context of Modern Paradigm of Scientific Knowledge. *Studia I Materiały Instytutu Transportu I Handlu Morskiego*, (14), 325–334. https://doi.org/10.26881/sim.2017.4.21

Lazorenko, L. (2023). Social responsibility of business in times of war. *Economics. Management. Business*, 3(42), p. 50–55. URL: https://journals.dut.edu.ua/index.php/emb/article/view/2857/2759

Golovko, O. & Oriekhova, K. (2024). Adapting international social responsibility experience to Ukrainian content. *Financial and Credit Systems: Prospects for Development*, 3(14), p. 101–110. https://doi.org/10.26565/2786-4995-2024-3-09

Burlay, T. (2024). New meaning of CSR in business: Support for Ukraine's societal resilience in wartime. In *8th FEB International Scientific Conference: Challenges in the turbulent economic environment and organizations' sustainable development*. University of Maribor Press. https://doi.org/10.18690/um.epf.5.2024.14.