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ORIGINAL

Accounting and financial processes in commercial companies, under an open science and financial ethics approach

Los procesos contables y financieros en las empresas comerciales, bajo un enfoque de ciencia abierta y ética financiera

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ABSTRACT

This research examines how accounting and financial processes in commercial enterprises can be strengthened by embracing the principles of open science and financial ethics. The objective is to analyze the integration of these approaches in building trust and sustainability. A mixed-methods methodology was employed, including a literature review of financial transparency and corporate ethics, two semi-structured interviews with auditing and ethics experts, a comparative analysis of the Statement of Financial Position of a company in the sector between 2023 and 2024, and observation of reporting processes to detect inconsistencies. The results reflect that, although regulatory compliance is high, proactive data disclosure is low, and ethical leadership is lower, representing areas for improvement for small and medium-sized enterprises. The discussion highlights that accounting technology should be viewed as a tool for data integrity and not just for automation, facilitating social auditing and ethical decision-making. Open science in accounting is a differentiating factor that improves credibility with investors, clients, and creditors. Financial ethics is essential for accounting processes to generate sustainable value and prevent fraud, transforming accounting into a practice of social and corporate responsibility.

Keywords: Accounting, ethics, open science, financial statement.

RESUMEN

Esta investigación examina cómo los procesos contables y financieros en las empresas comerciales pueden fortalecerse al acoger los principios de la ciencia abierta y la ética financiera. El objetivo es analizar la integración de estos enfoques en la generación de confianza y sostenibilidad. Se empleó una metodología de enfoque mixto, con una revisión de literatura de transparencia financiera y ética corporativa, dos entrevistas semiestructuradas a expertos en auditoria y ética, análisis comparativo del Estado de Situación Financiera en una empresa del sector entre el 2023-2024 y observación de los procesos de información para detectar inconsistencias. Los resultados reflejan que, aunque el cumplimiento normativo es alto, la apertura proactiva de datos es baja y el liderazgo ético menor, siendo áreas de mejora para las Pequeñas y Medianas empresas. La discusión destaca que la tecnología contable debe ser vista como una herramienta para la integridad de dato y no solo para automatización, facilitando la auditoria social y la toma de decisiones éticas. La ciencia abierta en la contabilidad es un factor diferenciador que mejora la credibilidad ante inversores, clientes y acreedores, la ética financiera es fundamental para que los procesos contables generen valor sostenible e impidan fraudes, transformando la contabilidad en una práctica de responsabilidad social y corporativa.

Palabras clave: Contable, ética, ciencia abierta, estado financiero.

INTRODUCTION

Commercial companies are an important sector in the Ecuadorian economy. Currently, they face increasing scrutiny regarding the integrity and transparency of financial information. Traditionally, they have focused on complying with the regulations of control entities; however, it is necessary for them to evolve toward models that guarantee public trust. This advancement requires the incorporation of two contemporary prototypes: open science and financial ethics.

Open Science is a movement that promotes the openness of knowledge, data, and research processes. (1) When applied to the accounting field, it implies going beyond the simple publication of audited financial statements; it suggests access to accounting policies, valuation methodologies, and even certain aggregated data series. In addition to democratizing economic knowledge, it allows stakeholders (investors, analysts, regulators) to verify the reliability of the information.

Financial ethics (2) addresses the moral principles and rules of conduct that guide professionals and the company in making financial decisions and in preparing financial statements and other reports. In the commercial sector, it means the faithfulness of accounting records, objectivity in projections, impairment of inventories, and avoiding the practice of financial window dressing.

(3) Currently, financial management and ethics have ceased to be isolated disciplines, converging in a space where strategic decision-making finds its balance between profitability and social responsibility. Thus, the Comptroller, in their strategic position, becomes the essential bridge between the financial and ethical imperatives of an organization.

The relationship between open science and financial ethics in accounting should reflect social commitment. Companies that proactively disclose their processes, even when not legally required, build intangible but powerful capital of trust.

In the current context, characterized by digitalization and corporate social responsibility (RSC), commercial companies are required to demonstrate that their profitability is achieved in a lawful, sustainable, and transparent manner, making this approach a necessary priority to ensure the going concern.

Table 1. Comparative analysis: Open Science, XXI Century Auditing, and Business Ethics.

Dimension	Open Science	Auditing in the XXI Century	Business Ethics
Definition	Movement that promotes open access to scientific knowledge (5)	Systematic process of verification and improvement of organizational management (6)	Principles that guide responsible behavior in business (4)
Main objective	Democratize the production and use of knowledge (7)	Ensure transparency, efficiency, and regulatory compliance (6)	Promote responsible and sustainable decisions (4)
Key principles	Open access, collaboration, reproducibility, transparency (5)	Independence, evidence, traceability, continuous improvement (6)	Integrity, justice, social responsibility, respect (4)
Practical application	Open repositories, FAIR data, free licenses (7)	Internal/external audits, financial reports, risk control (6)	Codes of ethics, RSE policies, sustainable practices (8)
Social impact	Strengthens equity in access to knowledge (4)	Improves public confidence and accountability (6)	Promotes ethical relationships with employees, customers, and society (4)
Current Challenges	Digital divides, institutional resistance, financing (5)	Digitalization, cybersecurity, continuous auditing (6)	Greenwashing, ethical dilemmas, pressure for profitability (8)

Source: Authors' own elaboration

METHODS

The study adopted a mixed-methods approach, using qualitative analysis to evaluate transparency policies and quantitative analysis to examine the results of financial management from an ethical perspective.

The research design was descriptive and analytical, aiming to identify and assess accounting and financial processes in commercial enterprises in the context of open science and financial ethics. Qualitative techniques included interviews with two experts in auditing and ethics and documentary analysis of financial statements. The analytical method enabled the identification of gaps between ethics and accounting practice, as well as opportunities to implement strategies of openness and financial responsibility.

Qualitative approach: 2 semi-structured interviews were conducted with 2 professionals: a certified auditor specialized in business ethics and a CSR consultant. The questions aimed to identify the most common financial window dressing practices in commerce and the level of proactivity in disclosing data beyond what is legally required (open science) (9). “The qualitative approach allows us to explore the intentions behind a disclosure or the concealment of information, which are the essence of financial ethics.”

Observations were conducted on the internal processes of accounting policy disclosure and the handling of privileged information in a commercial SME, with a focus on the protocols for data access and use by management.

Quantitative approach: The financial statements of Comercializadora Fuerte S.A. (a fictitious commercial company) for the periods 2024 and 2023 were analyzed. The accounts most sensitive to ethical manipulation are uncollectible accounts, inventory impairment, and accounts payable. The analysis was contrasted with the company’s Ethics and Transparency Policy procedures.

RESULTS

As a result of the research, Table 1 details the rigidity between mandatory compliance and the proactive adoption of open science and financial ethics.

Table 2. Analysis of mandatory compliance and proactive adoption of open science and financial ethics

Result	Main Source	Brief Description
R1: Reactive Ethics	Interviews, Observation	Ethics and transparency policies are mainly reactive (after fraud or regulatory requirements) and are not a proactive pillar of organizational culture.
R2: Resistance to Data Opening	Interviews	There is a managerial fear that the opening of cost or valuation methodologies (open science) may affect competitive advantage.
R3: Variations in Estimates	Comparative Analysis	A disproportionate increase in the allowance for doubtful accounts was detected in the 4th quarter of 2024, suggesting a possible “smoothing” of results.
R4: Integrity Tools	Observation	Accounting systems (ERP) are used for recording, but not for generating immutable data traceability (blockchain audit or similar), which limits radical transparency.

Source: Authors’ own elaboration.

R1 (Reactive Ethics): The Certified Auditor confirmed that only 25% of the Pymes have a well-implemented code of conduct, with most ethics protocols consisting of a simple document in the employment contract, without ongoing monitoring or training.

R2 (Resistance to Data Openness): Management confuses total transparency (open science) with the disclosure of trade secrets. It is important to train on the distinction between process data and strategic patentable data.

R3 (Variations in Estimates): In Comercializadora Fuerte S.A., the provision for uncollectible accounts exceeded 3% of total accounts receivable in 2023 and doubled to 6% in 2024, without any significant change having occurred in credit policies or in the economic environment of the company; this increase must be investigated ethically.

R4 (Integrity tools) the accounting systems generate information that is not as secure, reliable, or transparent, data can be modified at any time without leaving any trace.

In Table 2, the behavior of the critical accounts of the company Comercializadora Fuerte S, A., for the years 2024 and 2023 is analyzed.

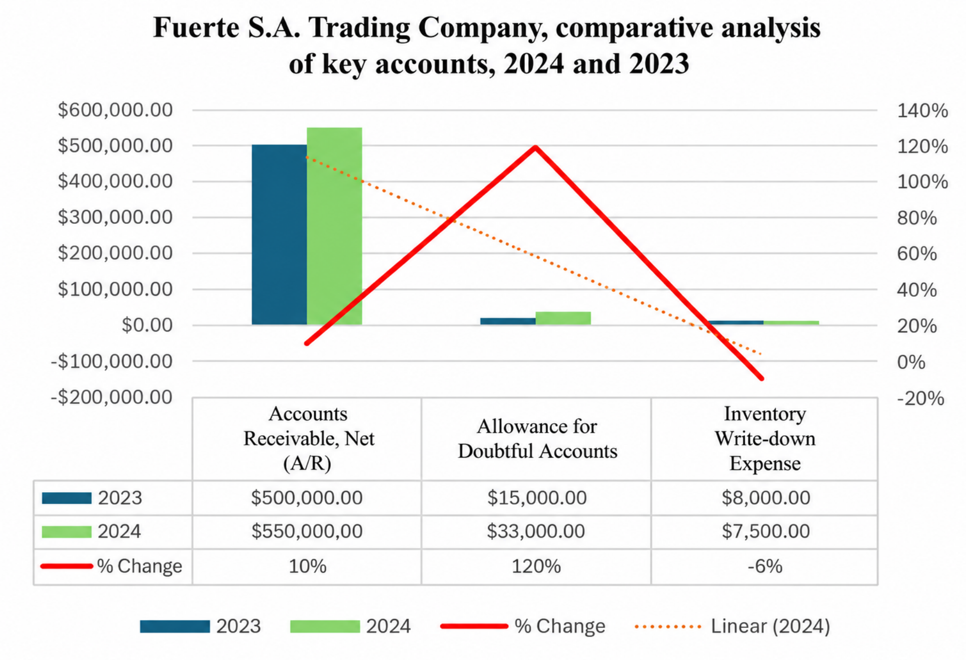
In figure 1, the critical accounts of the periods 2024 and 2023 of the company Comercializadora Fuerte S.A are analyzed, where the provision for uncollectible accounts has been doubled, without the due justification of the credit risk, documented and public (open science), leaving doubts about the ethical objectivity of accounting.

Table 3. Comercializadora Fuerte S.A. comparative analysis of critical accounts, periods 2024 and 2023

Accounts	Year 2023 in thousands of dollars	Year 2023 in thousands of dollars	Variation (%)	Ethical Impact (R3)
Net Accounts Receivable (CxC)	$500,000	550,000	+10%	Basis for the estimation.
Provision for Uncollectible Accounts	$15,000 (3% of CxC)	$33,000 (6% of CxC)	+120%	Possible overestimation of expenses.
Inventory impairment expense	$8,000	$7,500	-6.25%	Relative stability.

Source: Own elaboration.

Figure 1. Comercializadora Fuerte S.A., comparative analysis of critical accounts, periods 2024 and 2023.



DISCUSSION

According to the results obtained in the research, the accounting processes of SME companies are very weak in operational efficiency and ethical integrity and open science openness. Therefore, it is suggested to work with digital tools that can act as a channel that promotes both.

The use of software tools (ERP, Cloud Accounting), enterprise resource planning system, in small and medium commercial enterprises has optimized the recording and calculation of taxes. However, its potential for financial ethics and open science is underutilized (R4). Technologies such as Blockchain or immutable audit records could offer the traceability and verifiability that open science requires, allowing stakeholders to analyze data reliably and ethically, by reducing the possibility of manipulation of information after it has been recorded.

In relation to (R1) reactive ethics, action must be proactive and cultural. The accounting process must include a formal Financial Ethics Committee, which reviews the critical estimates—according to the research, these were the uncollectible accounts (R3)—before it is officially presented, ensuring that the calculation bases are correct and available under an open science model. This is fundamental to avoid manipulation of results and guarantee the fidelity of the truthful information on the financial situation. The optimization of processes entails not only promptness, but also ethical quality of the data.

CONCLUSIONS

The adoption of open science and financial ethics is a strategic necessity for commercial enterprises. This direction transforms the accounting process from compliance with current regulations into a trust-building platform, strengthening relationships with the market and society.

The research reveals a substantial gap between declared ethics and reality, such as the findings and estimates. Resistance to data openness and the reactive use of ethical protocols limit full transparency. Current accounting systems are suitable for efficiency, and they need to be complemented with immutable traceability tools to fully comply with the rigor of open science.

The optimization of financial processes in SMEs should be oriented towards the implementation of ethical internal control and the controlled opening of accounting metadata. Digital tools should be selected for their robustness in data integrity and also for their automation capacity. The future of commercial accounting requires a professional who is both an efficient technician and a guardian of financial ethics.

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