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Public sector auditing. Fraud prevention in state-owned enterprises: the role of balance sheet auditing
Auditoria no setor público. Prevenção de fraudes em empresas estatais: o papel da auditoria no balanço patrimonial
Auditoría en el sector público. Prevención de fraudes en empresas estatales: el papel de la auditoría del balance general

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Abstract: Auditing and corporate accounting face the continuous challenge of preventing and detecting financial fraud, a problem that compromises the reliability of financial reports and results in significant global losses, estimated at 5% of organizations' annual revenue. This challenge is particularly critical in state-owned enterprises due to their hybrid nature, which combines market operations with the administration of public resources under political influence, exposing them to specific vulnerabilities. The general objective of this study is to analyze the importance and effectiveness of auditing on the balance sheet as an instrument for preventing financial fraud in these institutions. Methodologically, the research is classified as exploratory and descriptive, with a qualitative approach, developed through a narrative literature review and Content Analysis technique. The results indicate that, although misappropriation of assets is the most common fraud, the manipulation of financial statements ("balance sheet window-dressing") causes the greatest losses. It is concluded that conventional auditing methods are insufficient, making it necessary to adopt predictive technologies (such as Artificial Intelligence and Data Analytics) combined with behavioral models (Fraud Triangle, Diamond, and Hexagon) and strong corporate governance. The effectiveness of auditing in inhibiting illicit acts depends on its integration with robust internal controls, specialized committees, and protected whistleblowing channels, acting preventively and independently.

Keywords: Auditing. Financial Fraud. State-Owned Enterprises. Corporate Governance. Balance Sheet.

Resumo: A auditoria e a contabilidade corporativa enfrentam o desafio contínuo de prevenir e detectar fraudes financeiras, um problema que compromete a fidedignidade dos relatórios financeiros e resulta em perdas significativas em nível global, estimadas em 5% da receita anual das organizações. Este desafio é particularmente crítico em empresas estatais devido à sua natureza híbrida, que combina operações de mercado com a administração de recursos públicos sob influência política, expondo-as a vulnerabilidades específicas. O presente estudo tem como objetivo geral analisar a importância e a eficácia da auditoria sobre o balanço patrimonial como instrumento de prevenção de fraudes financeiras nessas instituições. Metodologicamente, a pesquisa classifica-se como exploratória e descritiva, com abordagem qualitativa, desenvolvida por meio de revisão narrativa da literatura e técnica de Análise de Conteúdo. Os resultados indicam que, embora a apropriação indébita de ativos seja a fraude mais comum, a manipulação das demonstrações financeiras ("maquiagem de balanço") causa os maiores prejuízos. Conclui-

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se que os métodos de auditoria convencionais são insuficientes, tornando necessária a adoção de tecnologias preditivas (como Inteligência Artificial e Análise de Dados) aliadas a modelos comportamentais (Triângulo, Diamante e Hexágono da Fraude) e a uma forte governança corporativa. A eficácia da auditoria na inibição de atos ilícitos depende da sua integração com controles internos robustos, comitês especializados e canais de denúncia protegidos, atuando de forma preventiva e independente.

Palavras-chave: Auditoria. Fraudes Financeiras. Empresas Estatais. Governança Corporativa. Balanço Patrimonial.

Resumen: La auditoría y la contabilidad corporativa se enfrentan al desafío continuo de prevenir y detectar fraudes financieros, un problema que compromete la fiabilidad de los informes financieros y ocasiona pérdidas significativas a escala mundial, estimadas en el 5% de los ingresos anuales de las organizaciones. Este desafío es especialmente crítico en las empresas estatales debido a su naturaleza híbrida, que combina operaciones de mercado con la administración de recursos públicos bajo influencia política, exponiéndolas a vulnerabilidades específicas. El objetivo general de este estudio es analizar la importancia y la eficacia de la auditoría del balance general como instrumento de prevención de fraudes financieros en estas instituciones. Metodológicamente, la investigación se clasifica como exploratoria y descriptiva, con enfoque cualitativo, desarrollada mediante una revisión narrativa de la literatura y la técnica de análisis de contenido. Los resultados indican que, aunque la apropiación indebida de activos es el fraude más común, la manipulación de los estados financieros («maquillaje del balance») ocasiona las mayores pérdidas. Se concluye que los métodos convencionales de auditoría son insuficientes, por lo que resulta necesario adoptar tecnologías predictivas, como la inteligencia artificial y el análisis de datos, combinadas con modelos conductuales —triángulo, diamante y hexágono del fraude— y una sólida gobernanza corporativa. La eficacia de la auditoría para inhibir actos ilícitos depende de su integración con controles internos robustos, comités especializados y canales de denuncia protegidos, actuando de manera preventiva e independiente.

Palabras clave: Auditoría. Fraudes financieros. Empresas estatales. Gobernanza corporativa. Balance general.

1. Introduction

Auditing and corporate accounting face one of their greatest contemporary challenges: the prevention and detection of financial fraud. In a globalised scenario, where trade operations and the volume of transactions grow in unprecedented speed and complexity, the reliability of financial reports has become the non-negotiable basis for maintaining confidence in capital markets and decision-making by investors and regulators. However, this integrity is systematically threatened by corporate illicit practices, which, according to research by the Association of Certified Fraud Examiners (ACFE), result in the loss of approximately 5% of organizations' annual revenue worldwide.

The problem of fraud acquires even more critical contours when analysed in the context of state-owned or mixed-economy enterprises. These organizations have a hybrid nature: they

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operate under the logic of the financial market, capturing investments, but administer resources of public origin, suffering strong influence from political and governmental gears. This duality often exposes them to singular vulnerabilities, such as the loosening of internal governance, agency conflicts and institutional pressures for artificial results. Faced with this reality, the integrity of the Balance Sheet of these institutions is not only a technical requirement, but a pillar of administrative probity and economic security.

Traditionally, external auditing, using conventional methods based on sampling and isolated compliance checks, has proved insufficient to detect sophisticated financial manipulations in a timely manner. Historical corporate scandals attest to the failure of reactive supervisory models, driving the audit area to incorporate new paradigms. Thus, predictive models based on behavioral theories — such as the Fraud Triangle and Fraud Hexagon — emerge, and more recently, the massive application of Artificial Intelligence and Data Analytics. This technological arsenal aims to identify "red flags" (warning signs) in the tangle of asset data before fraud is consolidated.

The present course conclusion paper therefore raises the following research problem: how does the audit work contribute to the prevention of fraud in the balance sheet in state-owned enterprises? To answer this question, the general objective of this study is to analyze the importance and effectiveness of auditing on the balance sheet as an instrument for preventing financial fraud in state-owned enterprises.

To enable this primary purpose, the following specific objectives were outlined:

a) identify the main types of fraud and the most common vulnerabilities affecting the balance sheet structure of state-owned enterprises;
b) describe the audit procedures, techniques and standards most appropriate for the early detection of irregularities in financial statements; and
c) evaluate the impact of auditing and internal controls on consolidating corporate governance and preventing unlawful acts in these institutions.

The study is justified by the urgent need to understand and mitigate the systemic impacts of corruption and accounting manipulation in the public business sector, promoting the evolution of control practices in the face of the digitization of fraud.

To achieve the proposed objectives, this work is structured in five chapters, including this introduction. The second chapter presents the theoretical basis, addressing the types of fraud in the balance sheet, audit procedures for prior identification of irregularities and integration of internal controls to corporate governance. The third chapter details the

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methodology adopted, characterizing the study as a qualitative narrative review. The fourth chapter aims to analyze and discuss the results, promoting the intersection between the theoretical framework and the data collected. Finally, the fifth chapter exposes the conclusion and final considerations, responding to the research problem and suggesting directions for future studies.

2. Theoretical basis

2.1 – Typologies of fraud and the balance sheet of state-owned enterprises

Accounting and corporate fraud is consolidated as a systemic and persistent challenge in the management of organizations, representing a global problem that affects both developed and developing countries. Since the 1950s, the theme has been a cause of growing concern in academic and corporate circles, as its consequences are devastating for shareholders, employees and communities, threatening the very existence and efficiency of capital markets (AMIRAM et al., 2018; BEKIARIS; PAPACHRISTOU, 2017). In the contemporary business environment, characterized by turbulence and successive crises, the scenario has become even more conducive to the occurrence of irregularities. Soltani highlighted how “corporate fraud occurs at a deeper level within the company and the environment in which it operates” (SOLTANI, 2014, p. 252). The COVID-19 pandemic and the consequent economic downturn accentuated financial pressures, creating fertile ground for the expressive increase of fraudulent schemes, which, according to Grandstaff and Solsma (2021), have lasted longer and generated increasingly large losses. Karpoff (2021, p. 1) emphasizes that the COVID-19 pandemic and the consequent economic downturn will increase fraud in the next period.

Fraud has distinctive dynamics in state-owned enterprises. Several studies indicate that organizations with government participation have intrinsic characteristics that may paradoxically protect them against bankruptcy while exposing them to a high risk of corruption and accounting manipulation. Wang, Ashton and Liu (2024) emphasize that, because these enterprises enjoy government financial backing, they depend less on the rigorous scrutiny imposed by capital markets when raising funds. Moreover, senior executives' political connections affect key financial indicators, from return on equity to credit risk ratings (BABENKO; FEDASEYEU; ZHANG, 2020; BHANDARI; GOLDEN, 2021). Although State support provides a favorable financial foundation, it also facilitates a higher incidence of

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corporate fraud, since regulators tend to treat state-owned enterprises more leniently, allowing financial irregularities to escape detection and appropriate punishment (SAIKHU et al., 2025).

To understand how the structure of the balance sheets is affected, it is necessary to classify the types of occupational fraud. According to the Association of Certified Fraud Examiners (ACFE, 2022), corporate fraud, understood as the misconduct committed by individuals against the organizations that employ them, is divided mainly into three major categories: corruption, misappropriation of assets and fraud in financial statements. Global surveys indicate that the losses resulting from these practices represent approximately 5% of the annual turnover of companies, totaling trillions of dollars in losses, although the vast majority of the schemes remain undetectable for long periods.

Asset misappropriation is consistently the most frequent type of fraud worldwide. Examining its evolution over time, Bartulović, Perkušić and Kovačević (2024) show that this category accounts for approximately 86% of cases globally. The diversion of resources directly affects an entity's asset structure, falsely inflating assets or draining cash for unlawful purposes. In state-owned enterprises and the public sector, identified as highly exposed environments, perpetration is directly related to the fraudster's hierarchical position and length of service, since the act requires privileged access to information and the ability to circumvent internal controls. Complementary studies by Junger et al. (2020) found that asset misappropriation by CEOs occurs predominantly through digital means, whereas operational staff are involved through fraudulent contracts and fictitious invoices offline.

Although asset misappropriation is more frequent, financial statement fraud, or accounting fraud, has the most destructive consequences for balance sheet reliability. Although report manipulation accounts for approximately 10% of documented cases, its average losses are exponentially greater than those from corruption or internal theft. Romney and Steinbart (2014) define it as deliberate falsification of financial information, concealing losses or simulating unreal growth to deceive creditors, investors and oversight bodies. An emblematic case involving Indonesian state-owned enterprises illustrates so-called balance sheet window dressing. PT Garuda Indonesia substantially manipulated its figures to report sudden, unreal profits of millions of dollars, while PT Asuransi Jiwasraya incurred trillion-scale deficits concealed through complex accounting schemes, leading independent auditors to issue disclaimers of opinion (AGUSTINA; PRATOMO, 2019).

Academic understanding of these vulnerabilities draws on theoretical frameworks mapping conditions that favor corporate fraud. The pioneering model was Donald Cressey's

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Fraud Triangle (1953), which proposed that fraud results from three combined factors: pressure, opportunity and rationalization (MARFUAH; RASYIDAH; PRASETYO, 2026). An individual facing financial pressure that cannot be resolved legally, encountering control weaknesses that provide opportunity, and able to justify the act morally through rationalization finds conditions conducive to fraud. Wolfe and Hermanson (2004) later added the fraudster's technical and hierarchical capability to conduct and conceal the scheme, creating the Fraud Diamond. More recently, scholarship incorporated arrogance, or hubris, in Crowe's Fraud Pentagon (2010), and collusion in the Fraud Hexagon formulated by Vousinas (2019) and applied to detecting corporate control failures (JAIYANTI; SAFELIA; RIDWAN, 2024).

The application of these theoretical frameworks directly in the indicators of the balance sheet allows mapping the main foci of financial vulnerability of state-owned enterprises. The 'pressure' factor is mostly assessed by the financial stability of the company, measured by changes in total assets (ACHANGE). Skousen et al. (2009) and Annisya et al. (2016) demonstrate that an accelerated and atypical growth of assets proportionally increases the probability of manipulations in balance sheet accounts, as executives feel pressured to maintain sound appearances to ensure fundraising or fulfilling political goals. Similarly, profitability indices such as Return on Assets (ROA) are used as management performance parameters; extreme demands for high profits push corporate agents to tamper with balance sheets, as predicted by Agency Theory (SATRIA; FACHRIYAH, 2025).

Regarding the other dimensions of fraud, the literature confirms that control-environment vulnerabilities, representing opportunity and reflected in ineffective board and audit monitoring, directly influence the spread of financial irregularities. Factors such as CEOs' education and profiles, related to arrogance and capability, also appear in some empirical findings as facilitators of fraud. However, Jaiyanti, Safelia and Ridwan (2024) indicate that individual elements, such as the frequency of CEO photographs in reports, do not necessarily determine accounting fraud. Collusion between executives and members of oversight bodies, for example when directors hold multiple positions, nevertheless shows a strong statistical association with distorted balance sheets and accounting disclosures in public enterprises.

In summary, the examination of the structure of the balance sheets of state-owned enterprises reveals that the vulnerability to accounting fraud exceeds the mere technical failures of financial registration. This is an intricate problem, where political factors, lack of market scrutiny, regulatory privileges and institutional pressures collide, resulting in environments of low supervision and high opportunity. In order for these anomalies — which include diversion

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of funds and deep asset manipulation — to be mitigated, state-owned enterprises require acute compliance reforms. These improvements primarily involve restructuring corporate governance through rigorous audits, strengthening the independence of boards of directors and implementing an internal control system sensitive to the detection of symptoms that make up the hexagon of fraud.

2.2 – Audit procedures for prior identification of irregularities in the financial statements

The accuracy and reliability of financial reports are the basis of trust in modern economic systems, being essential to guide decision-making by investors, regulators and other stakeholders. However, the integrity of capital markets is often threatened by recurrent cases of corporate fraud (ACFE, 2022). Historically, external auditing and traditional verification methods face difficulties to detect complex fraudulent schemes, often hidden under the vast volume of transactional data and the increasing opacity of modern accounting information. According to Rezaee (2002), despite the improvement of regulatory standards and compliance policies, the detection of financial distortions, when based exclusively on conventional manual procedures (such as samples and isolated checks), is insufficient to curb irregularities in a timely manner.

The fraud audit, in response to this challenging scenario, has evolved into a specialized discipline that combines the traditional functions of auditing with forensic accounting and advanced organizational research techniques. Unlike the regular audit — whose main scope is to ensure that the statements do not contain material misstatements by unintentional errors — the fraud audit is specifically directed towards the identification of premeditated unlawful acts (SINGLETON; SINGLETON, 2010). As noted by Albrecht et al. (2015), auditors need to overcome routine accounting checks by applying more incisive techniques such as complex index analysis, digital forensics, trend assessment and continuous monitoring in search of anomalies, known as warning signals or red flags.

In this context of modernization, the integration of data analysis (data analytics) into the audit process radically transformed the investigative capacity of the profession. The possibility of processing large masses of information allowed auditors to abandon dependence on sampling methods in favor of the comprehensive analysis (total population) of financial records, revealing irregular patterns that would otherwise go unnoticed (BIERSTAKER; BRODY; PACINI, 2006). Recent studies, such as that conducted by Gkegkas, Kydros and Pazarskis

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(2025), demonstrate, from an extensive systematic review, that the adoption of statistical techniques for detecting anomalies, text mining and predictive models transformed the audit of a historically reactive activity into a proactive function.

The major recent technological and methodological advance lies in Artificial Intelligence (AI) and machine learning. Onyenahazi (2025) highlights that auditing is at a digital turning point where AI has evolved from a complementary resource into a transformative tool. Machine learning technologies, combined with natural language processing and robotic process automation, offer auditors an unprecedented ability to analyze large, heterogeneous transactional systems in real time. This development has improved critical procedures such as journal entry testing, automated contract reviews and rapid identification of unusual transactions. These innovations represent more than a technical advance: they redefine the profession's boundaries, requiring human skepticism to work together with algorithmic capabilities (ONYENAHAZI, 2025).

The application of these analytical technologies becomes truly efficient, however, when combined with solid conceptual structures of behavioral accounting. Models such as the Cressey Fraud Triangle (1953) — based on pressure vectors, opportunity and rationalization — and its extension, the Wolfe and Hermanson Fraud Diamond (2004) — which adds the technical 'capacity' element of the fraudster — have provided the theoretical basis needed to structure prediction algorithms. Sánchez-Aguayo et al. (2021) show, however, that the simple conceptual use of these models is insufficient. The contemporary challenge has been to operationalize these behavioral and organizational vectors, converting them into metrics, accounting indicators and verifiable variables that machines can interpret.

A practical example of this union between theory and data analysis is evidenced by Tieu and Tran (2026), who demonstrated how complex algorithms (such as Random Forest and XGBoost) have exponentially superior predictive performance to traditional statistical methods, such as logistic regression, in fraud detection. The research by Nguyen Thanh and Phan Huy (2025), focused on the use of AI on two analytical bases (the M-score and audit opinions), also corroborates the fact that the selection of multiple parameters based on Fraud Diamond maximizes the effectiveness of technologies in tracking manipulations in the financial statements of emerging countries.

Among the prediction and quantitative analysis procedures often integrated into accounting audits, we highlight the use of analytical models established in forensic accounting, such as Beneish M-Score and the Roxas model. Developed in the late 1990s, M-Score relies on

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a compilation of accounting indices (such as asset quality, depreciation, sales growth and leverage) to predict mathematical probabilities of irregular earnings management (manipulation). The model became essential for functioning as an early warning (early warning system). In a study covering Indonesia's construction companies between 2019 and 2023, Safitri, Anissa Yuniar and Mugayat (2025) concluded that although the aggregate result may suggest stability, the isolated and inconsistent behavior of internal variables pointed to fraud in subsequent years. This finding demonstrates that predictive models should be read holistically by auditors, especially in complex accounting sectors that predict the gradual recognition of revenue.

The need for prior adoption of these techniques is reflected perfectly in the list of historical corporate scandals in which financial statements were issued with independent unqualified audit opinions days before the entity's economic collapse. The bankruptcy of Enron (2001) and Carillion (2018) symbolizes the systematic flaws of the old passive audit methods. Poyda-Nosyk et al. (2026) emphasize, through empirical tests with forensic models, that these gaps should be filled not only with the adoption of AI technologies, but also with the definitive insertion of statistical predictive procedures in the planning and execution phase of the audit scope. When the auditor is able to identify early signs of anomalies (through joint analysis of financial statements and automated tests) the risk of fraud taking large proportions falls considerably.

To sustainably strengthen modern corporate ecosystems against malicious acts, the approaches proposed by Aros, Morales and Hernández (2026) become primordial. They developed a multilevel structure for audits focused on fraud in financial statements, structured in five dimensions: nature of irregularity, execution, participation, organizational impact and regulatory environment. The structure includes new factors not addressed by the old behavioral models (such as the degree of external cyber collaboration and the use of robots in inserting manipulated journal entries). This perspective emphasizes that fraud today constitutes a complex sociotechnical phenomenon, where humans and virtual networks operate interconnected to camouflage distortions and circumvent the IT security of companies.

It is therefore concluded that the most appropriate audit procedures for the prior detection of contemporary fraud derive from the inseparable fusion between technological innovation (Artificial Intelligence, machine learning and continuous mining) and structured forensic methods (analytical indices and causal triangles) aligned with institutional governance. The transition from the sampling evaluation technique to a predictive model based on

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intelligence and the full volume of data enables increased transparency, strengthening corporate integrity and, above all, ensuring accurate reporting, reaffirming the indispensable role of the accounting profession and independent audit in protecting global financial markets.

2.3 – Audit and internal controls as tools for corporate governance and fraud prevention in state-owned enterprises

The consolidation of corporate governance within state-owned enterprises has proved to be a complex challenge, especially with regard to the prevention of illicit acts and the guarantee of institutional integrity. Due to their mixed nature, which involves the administration of public resources under market logics, these organizations are exposed to unique vulnerabilities that require robust supervisory structures. In this scenario, contemporary literature points to auditing and internal control systems not only as compliance tools, but as essential pillars for risk mitigation, reduction of corporate fraud and protection of the public interest. The effectiveness of these mechanisms, however, transcends their mere formal existence, depending on a continuous, integrated and aligned implementation to a culture of accountability and transparency.

The intrinsic relationship between internal controls and fraud prevention has been widely documented. Investigating the scenario of state-owned enterprises in Bandung, Indonesia, Astuti (2024) shows that the systemic implementation of internal controls exerts a significant influence on the inhibition of fraudulent practices. The research shows that the existence of strict control procedures, when accompanied by the performance of trained and independent professionals, allows the timely identification of inconsistencies and continuous monitoring of operations, drastically reducing the opportunities for fraud. It is clear, therefore, that the audit should not be understood only from a reactive perspective — focused on identifying irregularities already consummated — but rather as a proactive and preventive mechanism, capable of increasing the chances of detection and accountability of those involved before the damage worsens (ASTUTI, 2024).

However, the structural presence of control mechanisms alone does not guarantee effective oversight. Studying internal controls and audit quality in Indonesian state-owned enterprises, Natalia, Apandi and Widarsono (2024) report striking findings: monitoring as a core internal control component strongly influences audit quality, whereas risk assessment, the control environment and control activities, communication and information have limited influence. This finding warns that paper compliance, or checking the box, is insufficient.

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Meaningful corporate governance requires internal controls to be incorporated into everyday administration through continuous monitoring and active participation by managers and oversight bodies (NATALIA; APANDI; WIDARSONO, 2024).

This need for practical effectiveness is reinforced by Celestin (2015), who explores the correlation between governance mechanisms, the quality of financial reports and risk management. The author emphasizes that corporate governance plays a crucial role in ensuring the integrity of financial statements and the prevention of irregularities (CELESTIN, 2015, p. 550). The study highlights the importance of the independence of the board of directors and technical competence of audit committees. The results indicate a negative and significant association between the specialization of the members of the audit committee and the occurrence of fraud, which suggests that inspection structures formed by technically prepared professionals are determinants for the inhibition of manipulations. Thus, governance depends not only on the isolated performance of auditors, but on an integrated supervisory system that prevents inadequate administrative decisions capable of compromising public resources and institutional credibility (CELESTIN, 2015).

In state-owned enterprises, where political influence often overrides administrative rationality, the literature emphasizes organizational integrity and whistleblowing structures. Examining state-owned enterprises listed on the Indonesian stock exchange, Marcella, Aspahani and Susanto (2025) found that frequent audit committee meetings have a positive and significant effect on fraud prevention. However, committee size did not translate into efficiency gains, and whistleblowing systems surprisingly had a negative, although statistically insignificant, influence (MARCELLA; ASPAHANI; SUSANTO, 2025). This supports the argument that a whistleblowing channel's effectiveness depends on its operating conditions rather than its mere existence. Real protection for whistleblowers and confidence in the system are essential for it to function as an instrument of integrity.

The need for deeper integration between these variables was confirmed by Melinda, Zakaria and Anwar (2026) in their study focused on state banks. The authors demonstrated that internal auditing, whistleblowing systems, corporate governance and audit quality have positive and simultaneous effects on fraud mitigation. Among all the factors analyzed, audit quality stood out as the most influential element in the statistical model, reaffirming that only synergistic integration between supervisory procedures and governance mechanisms is able to significantly reduce corporate irregularities (MELINDA; ZAKARIA; ANWAR, 2026).

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The systematic literature review by Saikhu et al. (2025), based on studies published between 2014 and 2023, reinforces the urgency of integration. It finds that preventing unlawful acts in state-owned enterprises requires holistic approaches and permanent risk assessment and transparency programs. Despite the subject's relevance, research specifically addressing factors that favor public-sector fraud remains limited, highlighting auditing as a vital instrument for reducing institutional vulnerabilities (SAIKHU et al., 2025).

International experience, particularly evidence from China, shows that governance assumes different configurations, but with similar risk mitigation objectives. Tang and Wu (2026) identified that governance mechanisms in Chinese state-owned organizations contribute directly to the reduction of corporate violations, inhibition of earnings manipulation and blocking the receipt of undue benefits by administrators. It is concluded that there is undeniable complementarity: robust governance structures favor the implementation of high-quality internal controls, while consistent controls discipline the actions of managers, restricting opportunities for practices contrary to the principles of legality and administrative responsibility (TANG; WU, 2026).

Finally, the consolidation of governance is not exhausted in technological or procedural arrangements, but it permeates the cultural dimension. Jati, Widjaja and Yustanti (2025) stress that the optimization of governance in state-owned enterprises requires not only the strengthening of supervisory institutions (internal and external) and the use of digital governance, but fundamentally a transformation of organizational culture focused on ethics. In addition, Mawaddah Hadi and Julaihah (2026) point out that the integration of controls improves the coordination of supervisory activities, while transparent supervision — through documented monitoring and effective whistleblowing systems — strengthens confidence in state-owned enterprises, reducing the risks of corruption. In short, it is concluded that auditing and internal controls are the heart of modern corporate governance in state-owned enterprises; however, their effectiveness to inhibit illicit acts depends on their integration into a culture of transparency, accountability and technical independence of supervisory boards.

3. Methodology

The methodology of an academic work outlines the paths to achieve the proposed objectives, establishing the criteria, methods and techniques of scientific research. According to Gil (2022), the research is characterized as a rational and systematic procedure aimed at solving problems whose responses require rigorous application of the scientific method. In this

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context, the present study is methodologically structured to respond to the problem of how auditing contributes to the prevention of fraud in the balance sheet in state-owned enterprises.

Regarding its objectives, the research is classified as exploratory and descriptive. According to Prodanov and Freitas (2013), exploratory research aims to provide greater familiarity with the problem, in order to make it explicit or to build hypotheses. The descriptive approach, in turn, has as its primary purpose the detailed description of the characteristics of a given population or phenomenon (GIL, 2022). In the present study, this double scope is observed at the time when typologies of fraud and vulnerabilities are explored in the balance sheets of state-owned enterprises (exploratory), and in the description of the most appropriate audit techniques for its detection and prior mitigation (descriptive).

From the perspective of technical procedures, the study was developed in the form of a narrative review of the literature. Rother (2007) explains that, unlike the systematic review, the narrative review does not use exhaustive or restricted criteria for the selection of literature. Instead, it is guided by the author's experience, providing itself fundamentally to the updating of knowledge and to the debate of a broad theme, constituting an appropriate approach to describe and discuss the state of the art of the topic addressed (ROTHER, 2007). Thus, the literature was selected in order to promote a critical and comprehensive analysis of audit effectiveness as an instrument for consolidation of corporate governance in the public enterprise sector.

Regarding the approach to the problem, the research has a strictly qualitative nature. Minayo (2014) asserts that qualitative research answers very particular questions and works with the universe of meanings, motives, aspirations, beliefs, values and attitudes, characteristics that cannot be reduced to quantification. Thus, the study does not intend to measure the number of frauds statistically, but rather understand the meaning of control mechanisms, qualitatively evaluating the impact and limitations of innovations in auditing against illicit acts.

The universe and sample of this study consisted of the collection of technical documents, scientific articles, specialized journals, dissertations, books and public accounting regulations published in recent decades. The search was conducted in consolidated databases in the academic and accounting community (Google Scholar, Scielo, Web of Science and accounting journals), and the selection was based on the theoretical relevance of the authors for the conceptual foundation of topics such as governance, data analysis and forensic accounting, without a rigid time frame due to the characteristic of narrative research.

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For data analysis and treatment, the Content Analysis technique was used. According to Bardin (2016), this is a set of communication analysis techniques aimed at obtaining indicators (quantitative or non-quantitative) that allow the inference of knowledge related to the conditions of production of these messages. In the context of this study, the selected texts were submitted to analytical reading, and the information was categorized according to the specific objectives proposed, allowing the construction of a solid theoretical argument capable of elucidating the intersection between the balance sheets of state-owned enterprises, the contemporary audit methods and corporate governance.

4. Analysis and discussion of results

The analysis of the literature shows that the structure of the balance sheet of state-owned enterprises is particularly susceptible to specific types of fraud, motivated largely by the pressures inherent to their political governance. The results show that, although the asset misappropriation is the most frequent irregularity in the global corporate environment (correspondendo a mais de 80% dos casos), it is fraud in financial statements — the direct manipulation of accounting balances — which generates the most destructive economic and reputational damages.

According to the research analyzed, government financial backing often mitigates these companies' immediate bankruptcy risk, reducing their dependence on capital markets for funding. Paradoxically, this support weakens incentives for rigorous transparency. Analyses show that efforts to meet political targets imposed by controlling governments induce balance sheet window dressing: assets and growth (ACHANGE) are artificially inflated, or major losses are hidden through complex expense-recognition operations. Applying the Fraud Diamond and Fraud Hexagon to state-owned enterprises reveals that collusion among politically appointed executives and managerial arrogance, or hubris, combined with supervisory board failures, creates the opportunity structure enabling asset distortion.

With regard to audit procedures, the theoretical discussion demonstrates the obsolescence of purely reactive and sampling-based methods. The transition required for prior detection requires the systematic incorporation of Data Analysis (Data Analytics) and Artificial Intelligence. Studies attest that machine learning algorithms (Machine Learning) exponentially overcome classical statistical approaches in the identification of manipulations, allowing auditing to monitor the entire universe of real-time transactions. Moreover, the combined use of consolidated predictive models, such as the Beneish M-Score, with the behavioral indicators

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of the Fraud Triangle has proven to be highly effective. M-Score demonstrated the ability to signal earnings management in state infrastructure companies years before the materialization of financial collapse, evidencing the power of skepticism supported by quantitative data.

Finally, the assessment of the impact of the audit on corporate governance of state-owned enterprises confirms that internal controls should not operate in isolation, such as mere compliance exercises (check the box). The results show that efficiency in illicit inhibition requires organic integration between internal auditing, technically specialized and independent audit committees, and whistleblowing channels that ensure real protection for the whistleblower. Complementarity between these instances inhibits accounting manipulation, restricting undue benefits and reinforcing ethical culture. In short, the data suggest that the audit only consolidates governance in state-owned enterprises when it acts as a continuous preventive system, based on technical independence and supported by algorithmic prediction technology.

5. Conclusion and final considerations

The intrinsic complexity of state-owned enterprises requires oversight and governance systems that go beyond pro forma regulatory compliance. This study's main objective was to analyze the importance and effectiveness of balance sheet auditing as a tool for preventing financial fraud, demonstrating that the integrity of these entities' financial statements has systemic effects on the economy and on institutional credibility before society.

In response to the first specific objective, it was found that the asset misappropriation is the most recurrent typology, but the manipulation of financial statements (balance sheet window dressing) is the method that causes the most significant and devastating losses. The partial shielding provided by state financial support, linked to the political influence and turnover of board members, creates acute vulnerabilities in the structure of internal controls. Such conditions, when explained by the vectors of the Fraud Diamond and Fraud Hexagon models (pressure, opportunity, rationalization, capacity, arrogance and collusion), reveal that accounting instability in state-owned enterprises is predominantly systemic and sociotechnical.

In meeting the second objective, the research unequivocally demonstrated that the effectiveness of the audit in prevention requires the abandonment of exclusively manual, sample and retrospective techniques. The adoption of forensic accounting tools, combined with continuous data mining, artificial intelligence and mathematical prediction models, such as the Beneish M-Score model, represent the state of the art in early identification of anomalies (red

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flags). These procedures provide the auditor with the technical capacity to act not after the failure of the structures, but before the control failures turn into irrecoverable fraud.

Regarding the third objective, the study found that auditing, whether internal or independent, and sound controls positively affect corporate governance when aligned with an ethical culture of transparency. Specialized committees and whistleblowing channels protected against retaliation are key components of this institutional compliance framework.

Auditing therefore plays an invaluable role in preventing fraud in state-owned enterprises' balance sheets, provided it performs its public duty proactively, equipped with predictive technologies and protected by independent boards of directors. The study's exclusively bibliographic nature is a limitation. Future research should therefore apply machine learning tools and Big Data analysis empirically to actual balance sheets from a defined sample of Brazilian state-owned enterprises, quantifying in practice the predictive capacity of artificial intelligence within the national legislative framework.

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