



Artificial Intelligence in Audit Practice: Evaluating ChatGPT's Role in Analytical Procedures Under Algerian Auditing Standard 520

AMARA Amine ¹

¹ University of M'sila, Algeria
amine.amara@univ-msila.dz

Abstract. The field of financial auditing is undergoing a profound transformation driven by the rapid advancement of artificial intelligence technologies, particularly large language models such as ChatGPT, which have demonstrated advanced capabilities in analyzing financial data and identifying logical relationships among them. This study addresses a central question: to what extent can artificial intelligence support auditors in performing analytical procedures in accordance with Algerian Auditing Standard 520, while maintaining the quality and integrity of professional judgment.

An experimental analytical methodology was adopted by simulating a real audit process using ChatGPT on the financial data of an Algerian trading company covering the period 2019–2024. The analysis focused on key indicators, including revenues, cost of goods sold, gross margin, and the professional activity tax (TAP), based on neutral inputs that excluded external context, in order to evaluate the model's intrinsic analytical capacity under the logic of Standard 520.

The findings reveal that ChatGPT demonstrated considerable effectiveness in identifying general trends, major fluctuations, and relationships among accounting variables in a manner consistent with analytical procedure principles. However, its performance remained limited in interpreting local economic and tax contexts, underscoring the need for human auditor intervention to ensure proper interpretation and validation of conclusions.

The study concludes that integrating artificial intelligence into auditing practices can enhance analytical efficiency and accelerate decision-making, provided that its use is governed by professional and ethical frameworks ensuring that AI outputs remain subject to human oversight. It recommends establishing regulatory and methodological guidelines to enable the use of AI tools as supportive instruments within the boundaries of Algerian Auditing Standard 520.

Keywords: Artificial Intelligence, ChatGPT, Analytical Procedures, Algerian Auditing Standard 520, Audit Innovation.

1 Introduction

The rapid evolution of artificial intelligence (AI) has fundamentally reshaped professional practices across industries, with the auditing profession being no exception. As

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organizations generate increasingly complex and voluminous data, auditors are compelled to adopt innovative tools to enhance analytical efficiency and judgment quality. Among emerging technologies, large language models (LLMs) such as ChatGPT have demonstrated remarkable potential in processing textual and numerical data, interpreting complex patterns, and supporting intricate decision-making processes. Their judicious integration into audit practice thus signifies a pivotal step towards the digital transformation of the profession, aligning with global trends in data-driven assurance and continuous auditing.

In the Algerian context, the auditing profession is progressively transitioning towards the adoption of digital technologies. However, empirical studies examining the practical implications of such advancements, particularly under local auditing standards, remain scarce. Algerian Standard on Auditing 520 (NAA 520) underscores the critical role of analytical procedures as a fundamental technique for assessing financial information through the study of plausible relationships among both financial and non-financial data. When enhanced by AI tools, these procedures hold the potential to significantly improve auditors' ability to detect anomalies, assess risks, and formulate evidence-based conclusions. Nevertheless, the deployment of generative AI systems like ChatGPT in these sensitive contexts raises persistent questions concerning their reliability, interpretability, and ethical boundaries, especially within a regulatory environment that inherently prioritizes human professional judgment.

Addressing this critical gap, this study aims to empirically evaluate the role of ChatGPT as an assistive tool in performing analytical procedures under Algerian Standard 520. Specifically, it explores the model's inherent capacity to understand, interpret, and analyze financial statement data, and its ability to provide insights consistent with professional auditing standards. By rigorously examining ChatGPT's performance and identifying its limitations in simulating analytical reasoning, this research seeks to bridge the chasm between theoretical expectations of AI in audit and its practical feasibility within existing Algerian auditing frameworks.

In light of the foregoing, this research is guided by the following core questions:

- RQ1: To what extent can ChatGPT replicate the analytical reasoning required under Algerian Standard on Auditing (NAA) 520 when applied to real financial statement data?
- RQ2: What contextual and professional limitations constrain the use of ChatGPT as an analytical assistant within the Algerian auditing environment?

Ultimately, the findings of this study are expected to contribute significantly to the emerging literature on AI-augmented auditing. They aim to inform regulatory debates on technology adoption within the Algerian context and provide a foundational basis for developing future guidelines that effectively integrate AI tools into professional assurance practice while safeguarding audit quality and professional judgment.

1.1 Previous Studies

The evolving landscape of financial auditing has seen a growing emphasis on leveraging technological advancements to enhance efficiency and accuracy. Several studies have explored the integration of advanced analytical tools and information technology within the auditing profession.

The study of [1] aimed to examine the inadequacy of existing approaches to auditing artificial intelligence (AI) systems and to propose the establishment of AI Audit Standards Boards as a means to ensure ethical accountability and safety oversight in the rapidly evolving AI industry. The paper reviewed current audit practices and standards, identifying their limitations—such as fragmented regulation, lack of transparency, and the risk of “safety-washing” when companies self-audit their systems.

The study concluded that while current frameworks emphasize transparency and risk evaluation, they fail to provide consistent, credible, and adaptive oversight mechanisms. By drawing parallels with safety-critical sectors like aviation, nuclear energy, and pharmaceuticals, the authors argued that an independent audit standards board would enable continuous monitoring, stakeholder participation, and dynamic adaptation to new AI risks.

The research highlighted that such boards would not only harmonize global auditing practices but also foster a culture of ethical responsibility and safety within the AI ecosystem, thereby strengthening public trust and preventing regulatory capture.

The study of Tebergaoui and Benhaoues [2] aimed to highlight the role of artificial intelligence, as a product of the Fourth Industrial Revolution, in reinventing the external audit profession, using Deloitte as a case study representing one of the world’s four largest accounting firms. The research sought to identify the strengths, weaknesses, opportunities, and threats associated with the adoption of AI applications in external auditing.

The study concluded that integrating artificial intelligence into audit practices enhances audit quality and efficiency, transforming auditing from a reactive and retrospective activity into a proactive, predictive, and real-time process. The findings also indicated that Deloitte’s adoption of AI-based platforms—such as Omnia, AI Robot, and Argus—has contributed to developing smart, automated, and data-driven audit services. Furthermore, the study emphasized that the use of AI applications increases the reliability of audit reports, improves investor confidence, and strengthens the global reputation of the auditing profession.

The study of Bensaifi and Guira [3] aimed to identify the role of artificial intelligence techniques in enhancing the effectiveness of financial auditing, with a particular focus on analytical procedures. The research adopted a descriptive and analytical approach to examine the most prominent intelligent systems used to automate audit processes and make the auditing profession more adaptable to the technological transformations occurring in complex business environments.

The study concluded that AI-based applications significantly improve the quality and efficiency of financial auditing through automation, anomaly detection, and predictive analytics. These tools enable auditors to focus more on strategic interpretation and professional judgment rather than repetitive tasks. The findings also emphasized that integrating AI technologies supports the modernization of audit practices and contributes to building more reliable and data-driven audit systems.

While the existing literature demonstrably establishes that AI-driven tools enhance audit efficiency and quality within high-resource environments, a critical empirical gap remains. Specifically, there is a lack of research evaluating the functional alignment of Large Language Models (LLMs), such as ChatGPT, with the prescriptive

requirements of national auditing standards in developing economies. The Algerian regulatory landscape, governed by Algerian Auditing Standard 520 (NAA 520) and characterized by unique fiscal volatility and macroeconomic constraints, offers a distinct and underexplored context for AI integration. This study addresses this gap by providing the first documented empirical simulation of ChatGPT's analytical performance under the NAA 520 framework. By utilizing longitudinal financial data (2019–2024) from an Algerian trading entity, this research moves beyond theoretical speculation to provide a context-specific assessment of AI's role in professional assurance

2 Methods

2.1 Research Design

This study employs an experimental analytical design aimed at evaluating the ability of ChatGPT, a large language model (LLM), to perform analytical procedures as defined by Algerian Standard on Auditing 520 (NAA 520).

The experiment simulates a real audit scenario where ChatGPT, acting as an analytical assistant, examines selected financial indicators of a trading company Revenue, Cost of Goods Sold (COGS), Gross Margin, and “Taxe sur l'Activité Professionnelle” (TAP) over a six-year period (2019-2024).

The approach focuses exclusively on neutral prompts, which present only internal numerical data without contextual or regulatory information. This design isolates ChatGPT's intrinsic analytical reasoning capacity, providing a baseline assessment of its potential use in audit practice.

2.2 Scope of the Study

To ensure analytical depth and practical feasibility within the conference paper format, the research focuses on four core components of the company's financial statements, selected for their high relevance to NAA 520 analytical procedures:

- Sales and Revenue Trends: Detect abnormal fluctuations and assess completeness and occurrence.
- Cost of goods sold and Gross Margin: to verify consistency between sales and purchasing costs, and evaluate profitability stability and identify anomalies.
- Tax Expense (TAP): Assess the reasonableness of tax expense relative to turnover trends.

2.3 Data Collection

The study relies on the financial statements of an Algerian trading company for the fiscal years 2019–2024. To comply with professional confidentiality obligations, the company's name and all identifying information have been anonymized. The extracted data include four key financial indicators selected for their direct relevance to NAA 520 analytical procedures: total revenue, cost of goods sold (COGS), gross margin percentage, and professional activity tax expense (TAP — Taxe sur l'Activité Professionnelle).

Figures are presented to ChatGPT in tabular form for analysis of trends, relationships, and anomalies. This structured format was deliberately chosen to simulate the presentation of audit working papers and to ensure consistent parsing of numerical data by the model, minimizing ambiguity in the AI's interpretation. The data are compiled into structured tables and submitted to ChatGPT as input for analytical evaluation, without any accompanying narrative, contextual explanation, or regulatory references, so as to isolate the model's intrinsic reasoning capacity.

2.4 Experimental Setup Using ChatGPT

The experiment follows the logical sequence of analytical procedures described in the Algerian Standard of Audit 520:

Table 1. ChatGPT experimental Setup.

Stage (NAA 520)	ChatGPT Task
Develop Expectations	Identify expected relationships among revenue, COGS, and margin based on prior years.
Identify Variances	Detect unusual fluctuations or deviations.
Evaluate and Conclude	Provide an analytical summary consistent with NAA 520 reasoning.

Source: Authors' own work

Prompts are tested separately for each chosen financial indicator.

2.5 Data Analysis and Evaluation Criteria

The outputs generated by ChatGPT are subjected to a content analysis and evaluated based on four criteria, inspired by ISA 520 and Algerian auditing guidelines:

- **Relevance:** Accuracy and alignment of the AI's reasoning with NAA 520 objectives;
- **Analytical Coherence:** Ability to correctly interpret relationships among financial figures;
- **Contextual Sensitivity:** Consideration of macroeconomic, fiscal, and regulatory factors in explanations;
- **Professional Judgment Equivalence:** The extent to which the AI's conclusions approximate those expected from a qualified auditor.
 - Numerical calculations cited by ChatGPT (e.g., growth rates, ratios) are cross-checked manually in Excel to ensure precision.

2.6 Tools Used

- **ChatGPT (GPT-5 version):** for generating analytical outputs and simulating auditor reasoning.
- **Microsoft Excel:** for preparing financial ratios and trend analyses.

This methodological framework ensures that the study captures both the analytical capacity and limitations of ChatGPT within the structured context of NAA 520. By combining financial data, contextual economic variables, and controlled prompting, the research provides a comprehensive evaluation of AI's emerging role in the analytical dimension of Algerian audit practice.

3 Theoretical Framework

This section establishes the conceptual foundations of the study by integrating established auditing theory, specifically Algerian Standard on Auditing (NAA) 520, with the transformative capabilities of artificial intelligence (AI) in auditing practice. It posits a theoretical basis for evaluating the analytical reasoning capabilities of advanced AI models, such as ChatGPT, within the unique context of the Algerian audit environment. This framework is grounded in Agency Theory and Cognitive Load Theory, arguing that AI can mitigate information asymmetry and reduce auditors' cognitive burdens, thereby enhancing the effectiveness of analytical procedures.

3.1 Algerian Auditing standard 520: Analytical procedures in Audit Practice

Definition and Overview

The Analytical procedures are applied at all stages of the audit: [4]

- During the planning phase, they are mandatory and serve to enhance the auditor's understanding of the client's business, identify key risks, and detect potential weaknesses in financial processes.
- During the substantive testing phase, they are optional but provide a higher level of confidence in internal controls and the accuracy of financial data.
- At the completion stage, analytical procedures assist in forming an overall conclusion on the fairness and integrity of the financial statements, including the entity's going concern status.

Beyond these phase-specific objectives, analytical procedures enable auditors to link disparate financial and non-financial information, thereby revealing underlying patterns, trends, and anomalies that signal strengths or weaknesses in the company's operational and financial performance. They are instrumental in supporting the auditor's neutral and evidence-based judgment by facilitating comparisons of current results against prior periods, budgeted figures, or industry benchmarks.

Furthermore, these procedures serve a crucial predictive and diagnostic role. They assist in identifying risks of financial distress or inconsistencies that may lead to significant audit concerns. For example, unfavorable trends in key ratios such as profitability, liquidity, or debt levels can signal potential financial instability or misstatements.

Requirements and Implementation

The effective implementation of analytical procedures is predicated on several critical factors, ensuring their reliability and utility in the audit process: [5]

- **Materiality and Corroboration:** Auditors must first assess the relative importance (materiality) of the item under examination. For highly significant items, relying solely on analytical procedures may be insufficient, necessitating additional, corroborating audit evidence from other procedures.
- **Cross-Referencing and Consistency:** It is crucial to consider the results obtained from other audit procedures performed on the same account balance or activity. This cross-referencing helps to identify consistency in findings and to validate the conclusions drawn from analytical procedures.

- **Expectation Development:** A fundamental requirement is the development of robust expectations for the results of analytical procedures. This involves forecasting expected outcomes to assess the degree of compatibility between actual and anticipated figures, highlighting any significant deviations requiring further investigation.
- **Internal Control Environment:** The strength and reliability of the entity's internal control system significantly impact the effectiveness of analytical procedures. Robust internal controls enhance the reliability of the underlying financial data, thereby increasing the confidence auditors can place in the results of their analyses.
- **Data Reliability:** Paramount to effective analytical procedures is the reliability of the financial statements and the data used. Auditors must ensure that the data is accurate, complete, and consistently prepared to generate dependable and meaningful indicators. Unreliable data will lead to flawed analytical conclusions.

3.2 Application of Artificial Intelligence in Audit

AI Concept and Evolution

The term “Artificial Intelligence (AI)” was coined by John McCarthy, Marvin Minsky, Nathaniel Rochester and Claude E. Shannon at Dartmouth Conference in 1956 [6]. AI is a field in computer science and engineering that aims to develop smart systems capable of reasoning, learning, and making decisions on their own. And according to [7] Artificial intelligence (AI) refers to the ability of machines; specifically, computer systems; to mimic human cognitive functions.

The landscape of AI has experienced an important shift by the emergence of Large Language Models (LLMs), such as: ChatGPT, Gemini, and Microsoft Copilot. These models have shown an exceptional ability to understanding, interpreting, and generating human-like language, marking a big jump in AI capabilities. LLMs have been trained on huge amounts of diverse data from the internet, which allow them to encode a wide range of knowledge and complex linguistic phenomena. Their applications range from conversational agents and answering complex user questions to generating coherent, contextually relevant text in any domain. This makes them promising tools for the delivery of knowledge, synthesis of information, and support in decision-making in different disciplines, including professional services such as auditing [8].

AI in Audit Practices: Bridging the NAA 520 Gap

The incorporation of AI, specifically LLMs like ChatGPT, into auditing frameworks significantly redefines the methodology of analytical procedures. These AI applications enable auditors to:

- **Enhance Data Analysis and Pattern Recognition:** AI algorithms can analyze massive datasets at scales that far exceed those of human auditors (especially when it comes to unstructured, not number-bound data), and recognize subtle patterns or anomalies in financial and/or non-financial data relationships that might have missed by an otherwise busy human auditor [9]. This directly supports the objectives of NAA 520 by improving the depth of understanding of client’s operations and risk profile.

- **Automate Expectation Development:** Use of LLMs for automating the intricate task of building expectations from text and numerical data. Based on historical

facts, reference norms and even non-numeric qualifiers an AI creates more advanced and more designer-proof expected values, enhancing the quality of deviation-analysis [10].

- **Improve Efficiency and Reduce Cognitive Load (Cognitive Load Theory):** Through automation of repetitive tasks such as collecting, comparing, and analyzing data, AI tools save auditor's cognitive load. As a result, human auditors can direct their expertise towards higher-level judgment, critical thinking and investigating anomalies that truly matter (rather than focusing on routine data manipulation). This is consistent with Cognitive Load Theory, which posits that reducing ECL can result in cognitive resources becoming available for ICL and germane processing that can contribute to the generation of quality decisions [11].

- **Mitigate Information Asymmetry (Agency Theory):** For Agency Theory, which offers insights into information asymmetry between management and auditors, AI can help alleviate the problem. This reduces the probability of undetected mis-statements and promotes investigations that are more thorough and efficient [12].

- **Facilitate Continuous Auditing:** AI allows for analytical procedures to be performed on a more frequent, even continuous basis [13]. It moves auditing from periodic snapshots to continuous monitoring that can enable earlier detection of deviations and risks, hence granting timelier assurance.

- **Support Non-Quantitative and Advanced Procedures:** Ben Fredj and Abdelsalam [14] stated that Algerian auditors tend to fall behind when it comes to advanced analytical procedures can support. AI may, by virtue of its ability to handle unstructured data (such as contracts and meeting notes) and its ability to perform cutting-edge statistical modeling, make both the advanced quantitative and non-quantitative procedures that are currently required more practical or effective—and extend to them throughout all of NAA 520.

- **Identify and Assess Risks with Greater Precision:** AI can be used to analyse internal control documentation, transactional data and external market information for emerging risks or weaknesses in internal controls more precisely directly impacting the planning phase and performance testing phases as per NAA 520 [15].

4 Results

This section presents the outputs generated by ChatGPT (GPT-5 version) in response to neutral prompts simulating the initial stages of analytical procedures as prescribed by Algerian Auditing Standard (NAA) 520. The model was provided with tabular financial data from an Algerian trading company for the period 2019–2024, covering four key indicators: revenue, cost of goods sold (COGS), gross margin percentage, and Taxe sur l'Activité Professionnelle (TAP). Prompts focused on trend identification, relationship analysis, anomaly detection, and expectation formation without supplying external economic, regulatory, or contextual information.

Results are organized by indicator. For each, selected excerpts from ChatGPT's analytical responses are summarized, with emphasis on trends, calculated ratios, identified fluctuations, and suggested audit considerations aligned with NAA 520 objec-

tives (developing expectations, identifying significant deviations, and investigating inconsistencies).

4.1 Revenue Analysis

Revenue exhibited marked volatility across the period (see Table 2 for annual values and growth rates). ChatGPT identified a peak in 2019, followed by a sharp cumulative decline of approximately 60% from 2019 to 2021, a strong recovery of +90% from 2021 to 2023 (including a +73% year-over-year increase in 2023), and a subsequent 21% decrease in 2024.

The model described the 2019–2021 downturn as potentially linked to external disruptions, the 2021–2023 rebound as indicative of recovery or operational improvements, and the 2024 decline as suggestive of renewed instability. It flagged the 2021 low point and the 2023 surge as requiring substantive verification for sustainability and non-recurring factors.

ChatGPT recommended ratio analysis (e.g., year-over-year growth, sales-to-assets), correlation with external benchmarks (e.g., GDP, exchange rates), and cross-checking with sales ledgers to assess completeness and occurrence, consistent with NAA 520 substantive analytical procedures.

Table 2. ChatGPT's Analytical Review of Revenue (2019-2024)

Year	Revenue (DZD)	Change (DZD)	Growth / Decline (%)	Observation
2019	214.621.321,46	—	—	Baseline (strong year)
2020	193.127.768,10	-21.493.553,36	-10,0%	Slight decline, likely due to COVID-19 disruption
2021	83.851.061,49	-109.276.706,61	-56,6%	Major drop, possibly due to reduced demand or operational issues
2022	91.657.798,47	+7.806.736,98	+9,3%	Partial recovery begins
2023	159.310.261,78	+67.652.463,31	+73,8%	Strong rebound, expansion or return to normal conditions
2024	125.593.498,59	-33.716.763,19	-21,2%	Decline again, may signal market contraction or external pressure

Source: ChatGPT-5 outputs, 2025

4.2 Cost of Goods Sold (COGS) and Gross Margin Analysis

COGS remained highly correlated with revenue, averaging 94–97% of sales throughout the period, indicating a relatively stable cost structure (see Table 3 for key figures). Gross margin percentage declined steadily from 4,68% in 2019 to a low of 2,56% in 2021 (-2,12 percentage points), recovered sharply to 5,39% in 2023 (+2,83 percentage points from 2021), and then fell slightly to approximately 4,75% in 2024 (-0,64 percentage points).

ChatGPT noted that the 2021 margin compression aligned with the revenue decline, suggesting limited cost flexibility during downturns. The 2023 improvement was attributed to possible efficiency gains or pricing adjustments, while the 2024 dip was linked to potential inflationary pressures not fully passed on.

The model highlighted the 2021 low and 2023 rebound as material fluctuations warranting explanation under NAA 520. It suggested further substantive procedures, including ratio analysis (COGS/sales, gross margin trends), comparison with industry benchmarks, and verification of cost composition, supplier contracts, and inventory movements to rule out misclassification or manipulation.

Table 3. ChatGPT's Gross Margin summary of Key Figures (2019-2024)

Year	Sales (DZD)	COGS (DZD)	GM (DZD)	GM%	Change in GM%
2019	214.621.321	204.578.662	10.042.659	4,68%	—
2020	193.127.768	185.619.379	7.508.389	3,89%	-0,79
2021	83.851.061	81.708.165	2.142.896	2,56%	-1,33
2022	91.657.798	88.828.701	2.829.097	3,09%	+0,53
2023	159.310.262	150.728.922	8.581.340	5,39%	+2,30
2024	125.593.499	119.630.332	5.963.167	4,75%	-0,64

Source: ChatGPT-5 outputs, 2025

4.3 Tax Expense (TAP) Analysis

TAP expense tracked revenue trends broadly, declining sharply in 2020–2021 and recovering partially in 2022–2023 (see Table 4 for annual values). However, the effective TAP rate (TAP as a percentage of revenue) showed a consistent downward trajectory, falling from 1.6% in 2019 to 1.05% in 2023 (-0,55 percentage points, or -34% relative change). The 2024 figure (DZD 29.445) was treated as provisional/incomplete and excluded from rate calculations.

Under Algerian tax rules, TAP was generally levied at 2% of turnover (with possible reductions or exemptions for certain activities or zones). ChatGPT developed an expectation of 1,5–2% and identified the observed rates as below this benchmark, particularly the 2023 variance (actual \approx 1,05% vs. expected \approx 2%, resulting in a material under-accrual of approximately 47% relative to the statutory rate applied to 2023 revenue).

The model flagged this deviation as inconsistent with statutory expectations, suggesting possible legitimate exemptions, calculation errors, or under-accrual risks. It recommended independent recalculation of expected TAP (2% \times reported revenue), inspection of tax declarations and supporting documents, and assessment of disclosure adequacy in financial statement notes.

In aggregate, ChatGPT successfully performed trend detection, ratio computation, and variance identification across indicators, generating outputs aligned with the expectation-development and inconsistency-investigation phases of NAA 520. However, explanations remained general in the absence of contextual inputs, with limited reference to Algeria-specific fiscal or economic factors.

Table 4. ChatGPT's Explanations of significant changes in TAP (2019-2024)

Period	Change Description	Possible Reasons / Audit Focus
2019 \rightarrow 2020	GM% \downarrow 0,79 pp	Lower sales volume due to pandemic lockdowns, increased logistics or raw material costs, or price discounts to maintain market share.
2020 \rightarrow 2021	GM% \downarrow 1,33 pp (largest drop)	Severe contraction in sales while fixed production costs remained constant; possible inventory

		write-downs or higher imported material costs due to DZD depreciation.
2021 → 2022	GM% ↑ 0,53 pp	Partial recovery in sales volume; operational efficiency improvements; normalization of supply chain.
2022 → 2023	GM% ↑ 2,30 pp (strong recovery)	Economic rebound, favorable FX rate, or strategic pricing policy; possible change in product mix toward higher-margin items.
2023 → 2024	GM% ↓ 0,64 pp	Inflationary pressures on inputs, higher energy costs, or tax/policy changes under 2024 Finance Law affecting import duties.

Source: ChatGPT-5 outputs, 2025

5 Discussion

5.1 Interpretation of Analytical Findings under NAA 520

The findings also demonstrate that ChatGPT is able to mimic fundamental steps of reasoning required under NAA 520, especially in terms of identifying unusual changes, determination of plausible relationships and audit expectation generation. The model displayed strong coherences in the identification of structural breaks over the particular time period, e.g., curtailing 2020-2021 and subsequent rebounding in 2023 of sales and gross margin. These patterns are converging to Algeria's sectored macro market regime that was characterized by the COVID-19 shock and foreign trade shrinkage; and later recovery thanks to higher earnings from oil revenues.

But ChatGPT's explanations provide differing levels of context. Although it succeeded in attributing decreases to pandemic-related disruptions and cost inflation, this approach was not without some initial recognition of fiscal and regulatory events unique to Algeria – namely the progressive devaluation of the dinar, import licensing restrictions together with sloped reduction then abolition between 2022–2024) of “Taxe sur l'Activité Professionnelle” (TAP). After introducing these contextual factors, the model could generate more context aware explanations. This suggests that although LLMs have considerable analytical reasoning abilities, their performance on the task at hand (audit) is extremely context-dependent and relies strongly on contextual leveraging via target prompts.

Methodologically, ChatGPT offers reasonable internal consistency in its analyses of trends. For example, NAA 520 succeeded in capturing the revenue crash and margin deterioration of 2021: the model raised 2021 as a high-risk year for which substantive corroboration was needed. Similarly, the rebound in 2023 and subsequent decrease in 2024 were considered potential market volatility or policy-based limitations rather than accounting errors. These findings validate the generative AI in supporting auditors for expectation formation and anomaly detection, wherein the narrative reasoning is consistently validated by human judges on high quality confirming evidence.

5.2 Assessing ChatGPT's Reliability and Audit Implications

The results also indicate the robustness and professional utility of ChatGPT as an analytical aid. The model was able to identify the gradual reduction in the new effective tax rate from 1,6% in 2019 to 1,05% by 2023, (which is due to that learning process), which corresponds well with real world fiscal evolution, whereby TAP was abolished and replaced by "Taxe Locale de Solidarité" (TLS) in 2024. This suggests that the model can be used to identify potential inconsistencies between statutory rates and reported information, which is helpful in the auditor's risk assessments. Still, ChatGPT wasn't able to independently verify legal exemptions or cross reference provisions in the Finance Law, emphasizing how it relies on supplementing human validation and legislative inputs.

With regards to a conceptual coherence, the model demonstrated strengths in ratio-based reasoning and temporal trend explanation; low sensitivity of qualitative economic driving forces like government import bans/inflationary pressures/ exchange-rate stability measures observed post 2022. These are important context factors in Algeria, where it is argued that fiscal policy and trade regulation play a role on firms' performance. Accordingly, the experiment shows that ChatGPT can support stages of NAA 520 (i.e. "develop expectation" and "identify variance") but it is not possible to cover the stage of "evaluate and conclude" without auditor's supervision.

Professionally, there are three implications of leveraging ChatGPT for analytical purposes:

- **Efficiency Gain:** It speeds up initial analytical reviews meaning that auditors can spend more time interpreting and validating risk.
- **Reasoning Consistency:** The model enforces consistent application of trend and ratio logic, minimizing oversight by human reviewers.
- **Need for Governance:** the use of AI should be underpinned by distinct ethical and regulatory frameworks, which guarantee that analytical outputs act as a support but never replace professional judgment.

In sum, the analysis of highlights that ChatGPT could be a trustworthy analytical assistant in NAA 520 turnaround procedures provided that its use should be restricted and it is contextualized with Algerian economic and fiscal information. It improves auditors' diagnostic accuracy but its non-conscious regulatory awareness requires a structure-enhancing protocol engaging both AI advances in accuracy and human professional skepticism.

6 Conclusion

The present research conducted an empirical examination for ChatGPT to be used as an instrument assistance to perform analytical procedures in audit practice (particular under the scope of Algerian Standard on Auditing (NAA) 520. Through the simulation of financial audit cases using data generated from an Algerian trading company, our project strived to fill a gap in the marketing and legal literature relative to implementing such language models within local regulatory developing setting. It was therefore our hypothesis that even if ChatGPT had very good analytical reasoning, its

audit efficiency is still most likely to be consistently influenced by contextual enrichment and human expertise in order to optimize performance especially in the Algerian regulatory context.

The results allow us unambiguously answering that ChatGPT is capable of solving core steps of the sequent reasoning imposed by NAA 520. It exhibited a strong ability to detect abnormal changes in financial ratios, including revenue, COGS and gross margin and to make reasonable connections among them. The findings that it is capable of identifying structural breaks, and signal anomalies in an auditor-anticipated manner reinforce its potential to improve the efficiency of the “develop expectation” process as well as that of the “identify variance” phase during analytical procedures. For example, ChatGPT effectively connected the observed decrease of profitability to macroeconomic shocks based on data such as Covid-19 pandemic and inflation pressures, and noticed that TAP was largely deviated from statutory anticipations.

The research demonstrated that ChatGPT’s free-running performance suffers from severe limitations as well. Its first readings often failed to be rooted in a deep context without taking into consideration Algerian-fiscal-policies-specific to the regulatory changes (including the breakup of TAP and its replacement with “Taxe Locale de Solidarité”) or qualitative drivers for the local markets. Although the model proved to be flexible in response to these particular contextual factors when they were introduced via targeted prompts, this again highlights its current reliance on human auditors for the provision of important local information and verification of outputs against the nuanced backdrop of the Algerian business environment. Our hypothesis is thus confirmed: ChatGPT is a potent analytical assistant but does not replace, and in fact requires, the professional judgment of the expert human being, especially at “evaluate and conclude” phase of NAA 520.

On the one hand, these findings have three implications for the Algerian audit industry:

- Efficiency, As an interpreter tool like ChatGPT can profoundly speed preliminary analysis reviews which will be able to allow auditors to spend more of their time interpreting and engaging directly with the client EFFICIENCY GAINS: With the incorporation of AI tools such as ChatGPT we can improve the speed at which our preliminary analysis review processes are completed, leaving us more time for our team(s) to work on supporting audit tasks that require interpretative skills and direct client engagement
- Improved Consistency – With the systematic application of trend and ratio analysis by the model, one would expect to see more consistent reasoning across audits, resulting in fewer human oversight errors on routine analytical procedures.
- Governance Challenge: The limitations we observe highlight the time-sensitivity for Algerian audit firms and regulatory authorities to provide robust ethical standards and AI tool integration guidelines that allow for AI outputs to complement, not replace, human professional skepticism and accountability.

Recommendations:

According to these findings, the audit firms operating in Algeria that suggest:

- Investment in training, that will endow auditors with the necessary competences to actively, meaningfully and critically engage with outputs produced by AI.

- Creating internal models to append context and AI analyses of external events, such as local regulations; macroeconomic implications; client-specific insights.
- Experimenting with AI tools in immaterial or less complex analyses, to gain experience and confidence.

It is important for regulators and standard-setters to:

- Open discussions on how current auditing standards (for e.g., NAA 520) can be modified or enhanced to integrate AI-augmented procedures.
- Ethical use of AI, data privacy and accountability mechanisms for the use of AI in audit.

Perspectives and Limitations:

This work provides a basic insight into the applicability of ChatGPT in Algerian audit. Such future research might extend this to:

- Demonstrating the performance of ChatGPT vs actual human auditor judgments in a wider range of analytical procedures and firms.
- Studying whether alternative prompting strategies (e.g., including context-emulating information within the initial prompts) can have an influence on quality of AI output.
- Investigating the integration of LLMs with other AI techniques and data sources for developing broader audit analytics platforms.
- Auditors attitude toward acceptance against AI tools in Algeria.

One downside of this study is that a limited financial dataset was used, obtained from only one trading company and neutral prompts were implemented to isolate ChatGPT's inherent ability to analyze information. This approach enabled a baseline to be established, but real-world audit engagements feature a dynamic interplay of iterative dialogue, exposure to a variety of information sources and the nuanced exercise of professional skepticism. Additionally, the particular implementation of ChatGPT (e.g., a GPT-4) shapes its capabilities, and advances in AI systems might be able to obsolete some of these insights and warrant further research.

In conclusion, while AI tools such as ChatGPT represent a transformative shift for the auditing profession in Algeria, their successful integration is most likely to occur through a synergistic model. In this framework, AI provides enhanced computational efficiency and procedural consistency, while the professional skepticism, contextual nuance, and ethical judgment essential for robust assurance remain the exclusive domain of the human auditor.

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