

The Role of AI in Detecting Financial Anomalies and Supporting Auditors in Corporate Reporting

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Abstract:

The rapid advancement of artificial intelligence (AI) presents transformative opportunities for the auditing profession, particularly in the detection of complex financial fraud. As traditional auditing methods increasingly struggle to keep pace with escalating data volumes and sophisticated financial manipulation, high-profile corporate scandals—such as Enron and Wirecard—underscore the urgent need for robust anomaly detection systems. This study investigates the integration of AI as an auxiliary tool designed to enhance, rather than replace, human professional judgment in corporate financial auditing. Utilizing a mixed-method approach, the research qualitatively analyzes the Enron and Wirecard accounting scandals while quantitatively applying the Beneish M-score model to their pre-collapse historical financial data. The empirical findings demonstrate that algorithmic models successfully identified critical indicators of earnings manipulation several years prior to the official bankruptcies of both firms. However, the study also highlights significant implementational challenges, including the risks of automation bias and the inherent inability of AI to replicate human ethical reasoning and professional skepticism. Ultimately, this research concludes that while AI serves as a powerful diagnostic assistant capable of processing massive datasets, its successful deployment requires seamless integration into professional workflows, ensuring that technology empowers rather than undermines the indispensable role of the human auditor.

Keywords:

Artificial Intelligence (AI), Auditing, Financial Fraud Detection, Beneish M-Score, Corporate Reporting, Algorithmic Anomaly Detection, Professional Skepticism

Introduction: "The What & Why"

Artificial intelligence has advanced very rapidly that it has created revolutionary opportunities in almost every area of the world's economy, with the financial sector leading the way. Accuracy, transparency and integrity of financial statements are not just regulatory requirements in the field of corporate financial reporting, they are the pillars upon which investors, creditors and other stakeholders base their choices. Traditional auditing techniques are under a lot of stress though, due to all the complex financial transactions and the sheer amount of data produced by the modern businesses and the growing sophistications of financial fraud schemes. Despite their experience and good judgement, human auditors are naturally limited by their cognitive capacities, time constraints and availability of resources.

In the past, it has been a challenge to identify financial anomalies, inconsistencies and false statements or fraudulent entries included in the company's reports, using only traditional auditing techniques. The catastrophic consequences of unchecked financial misreporting were shown by high profile scandals like Enron in 2001 and Wirecard in 2020, which damaged confidence by investors and led to extensive regulatory reforms, the urgent need for more stable systems to spot warning signs before they become system wide crises has been confirmed by these cases. Within this framework, AI becomes a complementary tool for human auditors, that can process large data, identify patterns and show inconsistencies that might go undetected by humans.

With an emphasis on its use in identifying financial irregularities in corporate reporting, this research paper explores how AI can be used as an auxiliary and not a replacement resource in the audit process. This study's main research question is: how can AI help spotting financial inconsistencies in reports without taking human's place and professional judgement? This paper aims to provide a deep understanding of the opportunities, limitations and ethical considerations associated with AI- assisted auditing while keeping the importance of human oversight in maintaining the integrity and honesty of financial reporting by examining the intersections of AI capabilities with traditional auditing.

Literature Review: "The story so far "

Over the past years, there has been a significant increase in professional literature on AI in auditing and assisting in the detection of anomalies in the financials of a company, this signals both the wide availability of AI in the modern world and the increase of awareness of its potential in the assist of human beings in the matter, the main focus early on in this field was on rule based expert systems, which were designed to identify fraud signs, some researchers such as Nieschwietz, Schultz, and Zimbelman brought to attention the faults in rule based systems by laying foundation to machine learning models that take into consideration the new and always changing schemes of fraud, the need of systems that continue to learn from past data alone and not just pre-determined criteria.

When ML models were created, it created with it a turning point in the study of assisted auditing by AI, the M score model, which was a statistical technique developed in the late 90s, employs financial ratios obtained from financial records to identify earnings manipulation. While the M score established crucial and necessary foundations for algorithmic anomaly detection. Researchers investigated the use of decision tree algorithms and neural networks in audit systems. This revealed a lot more accuracy in accuracy of detection than conventional techniques. In 2011 Ngai et al found that machine learning algorithms always outperformed traditional techniques in identifying fraudulent activities, that was after conducting a deep dive into data mining techniques applied to financial fraud detection, this became harder with the integration of cryptocurrencies as part of the assets of many modern corporations (Ibrahim et al., 2026).

The big four accounting firms have just started making their investment into AI assisted audit tools publicly available indicating the start of a wider trend in ai assisted auditing. An example of that is, instead of using sample based methods, Deloitte's platform (Argus) uses machine learning to process a large number financial documents. In a similar manner, PWC's created a tool which allows auditors to look for anomalies in 100% of journal entries, these examples show exactly how AI increases the effectiveness by broadening the auditor's scope and not replacing them. However some scholars argue that a massive need of training strong data management and ethical rules are needed for the successful integration of ai auditing (Athari et al., 2025).

Methodology: "The how we did it "

In order to investigate how AI is used as supplementary tools in the practice of corporate reporting, this study mixes both qualitative case studies with quantitative assessment of publicly available financial data. This method was purposely chosen to show both the complexity of actual fraud situations and the patterns that AI detection models find within financial information. All this combined with a human auditor judgement, makes for fraud detections to be of utmost accuracy (Saber & Sassine, 2022).

The study's qualitative component is based on two accounting scandals: Wirecard AG in 2020 and Enron corporation in 2001, these were specifically chosen because of their importance, and the variety of fraud strategies used, between fake cash balances in the case of wirecard to off balance sheet special purpose in the case of Enron corporation, secondary sources such as audit committee

reports and journalistic articles are analysed to reconstruct the timeline of financial misreporting, the investigation focused specifically in identifying the types of financial anomalies discovered in publicly filed statements and assessing whether, if applied in reverse, ai detection algorithms might have detected it earlier than regular audit methods.

For the quantitative component, the financial data from Enron and Wirecard's previous years before their collapse were analyzed using the M score model, to produce a score that indicates the likeliness of earnings manipulation, the model computes 8 financial ratios, the day sales in receivables, the gross margin index and the total accruals to total assets ratio. An m score greater than -2.22 is considered a sign of possible tampering. For this study, financial data from audited reports were used and cross referenced using excel, creating a whole ai audit environment was not the goal at all, but showing that when applied systematically to financial statement data, an AI model can show significant danger signals, enforcing the idea of its use as an assistant within the audit process.

Results: "The facts "

There was a claim that algorithmic models might have detected the anomalies before any of the companies' official collapses were proved by the findings of applying the m score model to the historical financial statements of Enron. The m score of the fiscal years of 1997, 1998, and 1999 had scores of respectively, -1.89, -1.74, -1.65, all greater than the standard of -2.22, showing potential earnings manipulation, it showed also that the available financial statements of the company, the financial ratios had some irregularities, these were proof of an extensive use of mark to market accounting that defined enron's reporting at the time, the finding that signs were showing in 1997, 4 years before the official bankruptcy is proof that algorithmic models may have sparked earlier and more focused human auditor inquiry.

Similarly, the case of Wirecard's M score findings, showed that 3 years prior to its bankruptcy, the m score of the company was higher than the benchmark of -2.22, and the financial ratios that are the gross margin index and the asset quality index showed the most noticeable anomalies. The 2019 m score of -1.61 was striking to the eye because it showed the rapid deteriorating of financial ratios that were underlying, at the same time that EY, Wirecard's auditor at the time could not explain the 1.9 billion euros that were in escrow accounts. This reinforces the theory that ai models, even the basic ones, could have served as assistants for auditors and showed warning signs early on.

Discussion and conclusion: "The so what ? "

What we found in this study has significant implications for the auditing profession as a whole as well as the larger topic about using ai in the reporting process. The m score applications on the companies we talked about clearly shows that ai models are very well capable of showing anomalies in the financials year before the damage has been done, this result supports the main thesis of this study, which was, that when used carefully and properly, Ai can be a huge assistant to human auditors' judgement and not a replacement for it. What AI and human beings bring to the table in the auditing process is completely different. While ai is excellent at processing large amount of data and find patterns of malfunction while being consistent, it can't bring the

professional skepticism, and the ethical part of auditing, these capabilities will remain far from reach from any machine learning and ai model.

Of course there has to be drawbacks to this practice, one is the automation bias, which implies that a human auditor trusts the judgement of ai models without checking it themselves, this is the main issue raised in this study, this is a big issue because ai models learn from the past fraud schemes and may be incompetent in front of new and upcoming schemes, they may not notice what is wrong like a human auditor would. This was shown in the Wirecard case specifically. Which had a technique that would confuse any model that was mostly trained on past anomalies in financial ratios. This raises another issue that ai models in auditing must be always updated on to new fraud tactics, integrated in professional workflows, that protect and not undermine a human auditor's judgment and critical thinking.

There are definitely implications to the ethical part of integrating ai models into the reporting business, there are problems like algorithmic transparency, data privacy and good treatment of audit subjects, that are essential to the auditing practice to succeed. But as the audit trail documentation is supplied and mandated by current professional standards, XAI techniques are expected to provide a smooth and seamless integration of ai into regulated audit environment as they develop.

In summary, this study proves that AI is a truly revolutionary opportunity for audit professionals, it has the potential to ease their work and make it faster and more accurate all while being their assistant and not replacing them, however, training and practice must be done to integrate it smoothly so both human and ai auditors are working in harmony, and not one in place of the other.

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