Risk Analysis in Financial Statements, a Comparative Study of AI vs Human Risk Assessment

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"Risk Analysis in Financial Statements, a Comparative Study of *AI* vs *Human Risk Assessment*"

by

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Abstract

This theses explores the transformative potential of artificial intelligence (AI) in the auditing industry, focusing on its implications for audit quality, efficiency, and the evolving role of human auditors. A comprehensive review of relevant literature highlights the integration of AI-driven tools such as machine learning, deep learning, and natural language processing in audit processes, emphasizing their capabilities in enhancing risk assessment, fraud detection, and data analytics.

The experimental design features an innovative approach to compare the efficacy of AI and human auditors in conducting risk analysis for three companies—Blockbuster, Enron, and Lehman Brothers—presented anonymously with pre-bankruptcy financial information. The findings reveal that while AI models provided consistent and comprehensive risk assessments, human auditors displayed a tendency towards conservative evaluations. This underlines the critical role of AI in standardizing audit processes and identifying subtle risk indicators that might be overlooked by human judgment alone.

The analysis underscores the necessity of combining AI's computational strengths with human auditors' strategic insights to improve audit outcomes. Ethical, regulatory, and practical considerations surrounding the adoption of AI in auditing are also examined, advocating for robust frameworks to ensure data privacy, algorithmic transparency, and audit independence.

This theses contributes to the understanding of AI's role in modern auditing, advocating for its responsible integration to enhance audit quality and reliability. As the auditing profession stands at the brink of a technological revolution, this research offers valuable insights into leveraging AI to achieve more accurate, efficient, and insightful audits.

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Statement of Research Problem

Statement of Research Problem:

This research endeavors to investigate the transformative intersection of artificial intelligence (AI) and auditing, focusing specifically on the risk analysis of financial statements. The primary objective of this study is to assess the capacity of AI, specifically the advanced large language models (LLMs) of OpenAI with ChatGPT, Google with Gemini, and Anthropic with Claude, in contributing to risk analysis within the context of auditing. Further, the objective is to not only come up with a preliminary assessment of the AI models' ability to conduct risk analysis, but also to compare it to the risk assessment of humans with varying levels of expertise in auditing; ranging from college students with business-related majors, to accounting professionals with certified public accountant (CPA) licenses. This comparative analysis will be based on risk analyses performed both by humans, of varying levels of expertise, and the risk assessments generated by these 3 popular AI tools. This study aims to elucidate whether AI can effectively enhance risk analysis in auditing financial statements, the potential effects of AI in the auditing field, and how its evaluations align with or diverge from human assessments.

Aim of Study

Aim of this Study:

The primary aim of this study is to investigate the comparative effectiveness of artificial intelligence (AI) and human auditors in conducting risk analysis of companies, specifically focusing on their ability to identify and evaluate operational, debt, and profitability risks, as well as giving an overall risk assessment. This study leverages the AI models of ChatGPT, Gemini, and Claude, alongside human respondents with varying levels of expertise, including business students, accounting professionals, and Certified Public Accountants (CPAs). By conducting this analysis in a survey format, presenting anonymous profiles of companies that have since gone bankrupt, the study aims to assess how well both AI and human auditors can foresee and analyze the risks that were imminent for these companies, providing a critical evaluation of the potential for AI in auditing and accounting.

The rationale behind this study is grounded in the evolving landscape of the auditing and accounting professions, where AI is increasingly being integrated to enhance efficiency, accuracy, and depth of financial analyses. According to the GenAI Toolkit, a comprehensive resource on the intersection of AI and auditing, from CPA.com: "AI-driven technologies are transforming audits, enhancing efficiency, and enabling deeper insights into financial data." AI models have shown promise in handling large datasets, identifying patterns, and providing rapid insights, which are essential skills in the auditing field. However, the extent to which AI can replicate or surpass human judgment, especially in the nuanced and complex task of risk assessment, remains an open question. Quoting from the toolkit directly: "AI's capability to assist in risk assessment is advancing, but it still struggles with nuanced

judgment calls and complex scenarios where human expertise and contextual understanding are crucial." This study aims to partly fill this gap by directly comparing the performance of AI and human auditors, thereby contributing valuable insights to the ongoing discourse on the role of AI in professional auditing.

A critical aspect of this study is the recognition of its limitations. The survey design and the scope of risk analysis conducted are relatively basic and do not fully replicate the comprehensive procedures of a real-world audit. The constraints of time and resources, common challenges for college students, have necessitated a simplified approach. Despite these limitations, the study provides a foundational understanding of how AI and human auditors perform in a controlled setting. The insights generated, while preliminary, can inform future, more comprehensive studies and highlight areas where AI could potentially enhance the auditing process.

Beyond the immediate findings of my survey and the ensuing comparative analysis, this study touches on the broader implications regarding the use, practicality, ethics, and efficacy of AI in auditing and accounting. The potential for AI to assist auditors by automating routine tasks, providing data-driven insights, and identifying risk patterns is significant. The profession itself is under pressure from the growing chorus on integrating GenAI into the workplace, both from clients concerned about costs, efficacy, and data protection, as well as insiders who are concerned with labor shortages and cost pressures. "Clients are increasingly curious about the integration of AI in the audit process, as they recognize its potential to enhance audit quality and efficiency. This curiosity drives auditors to explore and adopt AI technologies to meet client expectations and remain competitive." (Munoko et al.).

However, ethical considerations, such as the transparency of AI decision-making processes and the potential displacement of human auditors, must be carefully navigated. Additionally, while AI can enhance the accuracy and efficiency of audits, the irreplaceable value of human judgment, professional skepticism, and ethical oversight remains paramount. This study aims to contribute to the understanding of how AI can be integrated into auditing practices, complementing rather than replacing human expertise, and ensuring the highest standards of financial integrity and accountability. In this imperfect study, can the evidence and totality of analysis from human "experts", with more weight placed on the analysis of the survey respondents with CPA licenses, generate more accurate risk assessments than that of the popular AI models most commonly used in society?

Overview of Relevant Scholarship and Background Information

Overview of Relevant Scholarship and Background Information:

Definition of Relevant Terms:

As we dive deeper into this study and make general proclamations, based on sources and first-hand data, it is paramount to build a more in-depth understanding of some of the most relevant key terms and concepts on which this study touches. By understanding these key terms, readers will be better equipped to grasp the complexities and innovations discussed in the theses, particularly those related to the integration of AI in auditing and the broader implications for the industry.

- Artificial Intelligence (AI): AI refers to the simulation of human intelligence in machines that are programmed to think and learn like humans. These systems can perform tasks such as recognizing speech, making decisions, and translating languages. In auditing, AI can enhance the efficiency and accuracy of audits by automating repetitive tasks and analyzing vast amounts of data quickly.
- Large Language Models (LLMs): LLMs are a type of AI that can understand, generate, and manipulate human language. These models, such as GPT-4, are trained on vast amounts of text data and can perform tasks like text completion, translation, and summarization. In the context of auditing, LLMs can be used to analyze financial documents and detect anomalies.
- Generative AI (GenAI): GenAI refers to AI systems that can generate new content, such as text, images, or music, based on the data they have been trained on. In auditing, GenAI can assist in creating reports, generating insights from data, and even predicting potential financial outcomes based on historical data.
- Auditing: Auditing is the systematic examination and verification of a company's financial statements and records. The primary goal of an audit is to ensure that the financial statements are accurate and comply with applicable accounting standards and regulations.
- External Audit: An external audit is conducted by independent auditors who evaluate an organization's financial statements to provide an unbiased opinion on their accuracy and compliance with accounting standards. This type of audit enhances the credibility of financial reports for investors, regulators, and other stakeholders.
- Internal Audit: Internal auditing involves an organization's own employees or an internal audit department examining internal controls, risk management processes, and governance. The goal is to improve efficiency, identify potential areas of improvement, and ensure compliance with laws and regulations.
- IRS Audit: An IRS audit is a review of an individual or organization's accounts and financial information to ensure information is reported correctly according to tax laws and to verify the amount of tax reported is accurate. The IRS selects returns for audit based on various criteria, including random sampling and specific triggers.
- Cognitive Computing: Cognitive computing refers to systems that can simulate human thought processes in complex situations where the answers may be ambiguous and uncertain. In auditing, cognitive computing can analyze large volumes of data, identify patterns, and assist auditors in making informed decisions.
- Data Analytics: In auditing, data analytics involves examining raw data to draw conclusions about the information they contain. Advanced analytics can identify trends, detect anomalies, and provide deeper insights into financial data, thereby enhancing the effectiveness and efficiency of audits.
- Financial Statements: Financial statements are formal records of the financial activities and position of a business, person, or other entity. These include the balance sheet, income statement, and cash flow statement. They provide a summary of the financial performance and condition of an entity and are essential for investors, regulators, and other stakeholders.
- Risk Analysis: Risk analysis in auditing involves the identification, assessment, and prioritization of risks that could impact the accuracy and reliability of financial statements. Auditors use risk analysis to determine the extent and nature of audit procedures to apply, ensuring that all significant risks are appropriately addressed.

- Low, Medium, High Risk: These terms are commonly used in the audit industry to classify the level of risk associated with different aspects of a company's financial statements.
  - ➔ Low Risk: Indicates that the likelihood of a material misstatement or error is minimal.
  - ➔ Medium Risk: Suggests a moderate chance of material misstatements, requiring careful scrutiny.
  - ➔ High Risk: Signifies a high probability of significant errors or fraud, necessitating extensive audit procedures and controls.

The Current State of Auditing

The Current State of Auditing:

The auditing profession plays a crucial role in ensuring the integrity and transparency of financial reporting. Auditors are responsible for verifying the accuracy of financial statements, assessing internal controls, and providing assurance to stakeholders about the reliability of financial information (Accounting Insights, NUFCA). However, the traditional audit process is labor-intensive, time-consuming, and prone to human error. (Hamish)

Considering the risk analysis performed in this survey will be based on public companies, we will further evaluate the auditing landscape of public companies in America. This is also the largest segment of auditing from a national revenue standpoint, as well as being legally mandated by several Congressional acts and the Securities and Exchange Commission. The typical public company auditing job presents auditors with a myriad of human challenges that can significantly impact audit quality and effectiveness. One of the foremost challenges is the sheer complexity and volume of financial data that auditors must review and analyze within tight deadlines (Mancino). This often leads to time constraints and pressure to complete audits quickly, potentially compromising thoroughness and attention to detail (Hamish). Moreover, auditors face cognitive biases and judgment errors inherent in human decision-making processes, which can influence the assessment of risks and the interpretation of financial information (Beasley et al.). Additionally, interpersonal dynamics within audit teams and with client personnel can introduce communication barriers and conflicts, hindering collaboration and information-sharing essential for comprehensive audit coverage (Cohen et al.). Furthermore, the demanding nature of the audit profession, characterized by long hours and high stress levels, can contribute to auditor fatigue and burnout, further exacerbating the likelihood of errors and oversights (Lliev). These human challenges underscore the need for auditors to continuously enhance their skills, exercise professional skepticism, and implement robust quality control measures to uphold audit integrity and reliability in an increasingly complex business environment.

Today, auditors face increasing pressure to adapt to the complexities of modern business environments, characterized by globalization, digitalization, and regulatory scrutiny (Brevard). The demand for more efficient, effective, and insightful audit services has prompted the exploration of innovative technologies, including AI, to streamline audit procedures and enhance audit quality (Brevard).

Empowering Auditing with AI

Empowering Auditing with AI:

The potential integration of AI in auditing marks a paradigm shift in the financial landscape. The escalating volume of financial data necessitates more efficient and accurate auditing processes, and AI stands out as a transformative force. By swiftly processing vast datasets, detecting patterns, and extracting meaningful insights, AI not only expedites traditional audit procedures but also elevates the depth and accuracy of risk analysis in financial statements. AI technologies can improve audit quality by providing real-time insights, predictive analytics, and anomaly detection capabilities. AI-driven audit tools can analyze large datasets, identify trends, and flag potential issues more accurately and efficiently than traditional methods. AI-powered algorithms can automate routine audit tasks, such as data extraction, categorization, and analysis, allowing auditors to focus on higher-value activities, such as risk assessment and strategic analysis (Mitan, 2023; Noordin, 2023; Albawwat & Frijat, 2021; Qadera & Ceka, 2023).

However, the adoption of AI in accounting and auditing also raises important ethical, regulatory, and practical considerations (Mitan, 2023; Qadera & Ceka, 2023; Albawwat & Frijat, 2021). Auditors must navigate issues related to data privacy, algorithmic transparency, and audit independence when leveraging AI technologies in audit engagements. For instance, data privacy concerns arise from the need to handle large volumes of sensitive financial information, requiring robust security measures to prevent breaches and unauthorized access (Qadera & Ceka, 2023). Algorithmic transparency is another critical issue, as auditors need to understand and explain how AI models reach their conclusions to ensure the reliability of audit outcomes (Mitan, 2023). Additionally, maintaining audit independence can be challenging when AI tools provided by third-party vendors are used, as there must be assurance that these tools do not introduce biases or conflicts of interest (Albawwat & Frijat, 2021). Furthermore, the regulatory landscape for AI in auditing is still evolving, necessitating clear guidelines and standards to ensure consistent and ethical application of these technologies. Practical considerations include the need for ongoing training and education for auditors to effectively use AI tools and interpret their results, ensuring that the human oversight component of auditing remains strong and reliable (Mitan, 2023).

In "Machine Learning Methods for Systemic Risk Analysis in Financial Sectors," Kou et al. (2018) explores the application of machine learning in assessing and measuring financial systemic risk. The study underscores the relevance of innovative technologies, such as big data analysis and network analysis, in addressing systemic risk. This foundational understanding provides a basis for exploring how AI tools, including ChatGPT, can similarly enhance risk analysis, aligning with the theses's focus on comparing AI's risk analysis with human evaluations in auditing financial statements.

In "Impact of Technological Advancements on Auditing of Financial Statements" (Imoniana et al., 2023), the authors investigate the influence of technological advances on auditing, including the role of AI and deep learning. The study reveals technological impacts in the planning, performance, and reporting stages of auditing, emphasizing innovative technologies such as supervised AI for data extraction and exception analysis. This source provides practical insights into the intersection of auditing

standards and technological advancements, aligning with the theses's objective of evaluating the efficacy of AI in risk analysis.

Labor Dynamics and AI

Labor Dynamics and AI:

Beyond efficiency gains, the relevance of AI in auditing intersects with crucial labor dynamics in the accounting profession. The industry faces challenges associated with a shortage of skilled accountants. According to Mitan (2023), the integration of AI in auditing can address this shortage by automating routine tasks such as data extraction, categorization, and analysis, allowing auditors to focus on higher-value activities like risk assessment and strategic analysis. AI can act as a force multiplier, augmenting the capabilities of accounting professionals and mitigating the impact of labor shortages (Qadera & Ceka, 2023).

For instance, AI-driven audit tools can analyze large datasets, identify trends, and flag potential issues more accurately and efficiently than traditional methods (Albawwat & Frijat, 2021). This capability not only enhances the overall quality of audits but also enables auditors to manage larger volumes of work without a corresponding increase in workload. Moreover, AI technologies provide real-time insights, predictive analytics, and anomaly detection capabilities, which are crucial for modern audit engagements (Noordin, 2023).

In "Machine Learning and Power Relations" (Maas, 2021), the author explores power dynamics in the context of AI ethics, particularly focusing on the application of machine learning. The paper introduces a conceptualization of power dynamics rooted in Castelfranchi's framework, highlighting the power asymmetry between end-users and developers. This source provides a deep and nuanced perspective on the moral and ethical implications of AI in auditing, addressing the fundamental issue of power relations. Specifically, auditors must be aware of the potential for bias in AI algorithms and the importance of maintaining transparency and accountability in AI-driven audit processes (Mitan, 2023).

Furthermore, the regulatory landscape for AI in auditing is still evolving, necessitating clear guidelines and standards to ensure consistent and ethical application of these technologies. Practical considerations include the need for ongoing training and education for auditors to effectively use AI tools and interpret their results, ensuring that the human oversight component of auditing remains strong and reliable (Mitan, 2023).

AI also necessitates the establishment of new internal control measures within audit firms to manage the quality and reliability of AI-generated audit evidence. This includes controls over the data inputs, algorithm integrity, and the overall governance of AI systems used in audits (CPA Canada & AICPA, 2020). Additionally, AI's role in fraud detection and risk assessment can significantly enhance audit quality by providing more comprehensive and real-time analysis of financial transactions, thus helping auditors to identify and mitigate risks more effectively (Kokina & Davenport, 2017).

Safety, Security, and Assurance in AI

Safety, Security, and Assurance in AI:

As AI assumes more of a central role in the audit process, questions concerning the transparency, ethical use, and reliability of AI algorithms become paramount. Ensuring safety and security in AI applications within auditing is crucial to maintaining the integrity and trustworthiness of the audit process.

Transparency and Algorithmic Accountability

Transparency in AI algorithms is critical to ensure that audit outcomes are understandable and verifiable. In "Auditing Algorithms: A Rational Counterfactual Framework" (Lee, 2021), the author explores the challenges and implications of algorithmic decision-making, proposing a rational counterfactual framework for algorithm audits. This framework aims to identify decision factors contributing to rational or irrational decisions, allowing for algorithm audits to uncover and rectify biases. This approach underscores the importance of algorithmic transparency, enabling auditors to understand how AI models reach their conclusions and ensuring that these models can be audited for accuracy and fairness (Lee, 2021).

Data Privacy and Security

Data privacy is another significant concern when incorporating AI in auditing. AI systems require vast amounts of data to function effectively, often involving sensitive financial information. Ensuring that this data is protected against breaches and unauthorized access is paramount. According to Qadera and Ceka (2023), blockchain technology can enhance data security in financial systems by providing an immutable ledger of transactions, which is particularly useful in maintaining the integrity and confidentiality of audit data. Additionally, implementing robust encryption protocols and access controls can further safeguard data privacy (Qadera & Ceka, 2023).

Ethical Use of AI

Ethical considerations are also central to the adoption of AI in auditing. AI algorithms can inadvertently perpetuate biases present in training data, leading to skewed audit results. Maas (2021) highlights the ethical implications of power dynamics in AI, where developers and end-users may have differing levels of control and understanding of AI systems. Ensuring ethical use of AI involves regular audits of AI models to detect and mitigate biases, fostering an environment where AI tools are used responsibly and equitably (Maas, 2021).

Reliability and Assurance

Ensuring the reliability of AI in auditing involves rigorous testing and validation of AI models. AI algorithms used in audits must be subjected to extensive validation to ensure their accuracy and reliability. Ionescu (2022) discusses the importance of integrating advanced technologies such as deep neural networks and machine learning algorithms into auditing practices. However, these technologies must be continuously monitored and updated to reflect changing financial landscapes and regulatory

requirements. Regular updates and maintenance of AI models are essential to maintain their reliability and relevance in audit practices (Ionescu, 2022).

Regulatory Compliance

Compliance with regulatory standards is crucial for the successful adoption of AI in auditing. Audit firms must ensure that their AI tools comply with existing auditing standards and regulations. This includes adhering to guidelines set by regulatory bodies such as the Public Company Accounting Oversight Board (PCAOB) and the International Auditing and Assurance Standards Board (IAASB). Mitan (2023) emphasizes the need for clear regulatory frameworks that address the use of AI in audits, ensuring that these technologies are implemented in a manner that upholds the integrity and reliability of the audit process (Mitan, 2023).

Practical Considerations

From a practical standpoint, audit firms must invest in training and development to equip auditors with the skills necessary to effectively use AI tools. This includes understanding how to interpret AI-generated outputs, maintaining professional skepticism, and ensuring the accuracy and completeness of audit evidence obtained through AI. Continuous professional development and collaboration with AI specialists can help auditors stay abreast of technological advancements and effectively integrate AI into their audit practices (Albawwat & Frijat, 2021).

In conclusion, while AI offers transformative potential for enhancing audit quality, it also introduces a range of safety, security, and assurance challenges that must be carefully managed. By addressing issues related to transparency, data privacy, ethical use, reliability, regulatory compliance, and practical implementation, audit firms can harness the benefits of AI while safeguarding the integrity of the audit process.

Survey Design and Experiment Overview

Introduction to Experiment:

In this experiment, we designed a unique framework to test the comparative abilities of AI and human auditors in performing risk analysis, a critical component of the audit function. This research is valuable because it addresses the growing intersection between AI technology and the auditing profession, providing empirical evidence on the effectiveness and efficiency of AI tools in comparison to traditional human auditing methods. By understanding these dynamics, the industry can better navigate the integration of AI into auditing practices, potentially enhancing audit quality and decision-making processes.

Experiment Parameters:

To create a robust and controlled environment, we selected three companies—Blockbuster, Enron, and Lehman Brothers—that eventually went bankrupt. These companies were chosen because they represent high-profile cases with extensive public financial data available for analysis. Importantly,

the companies were presented anonymously to eliminate any biases the participants might have based on their knowledge of these companies' outcomes.

Overview of Financial Information:

Participants were provided with an overview of the financial information of these companies prior to their eventual bankruptcies. This included key financial statements, ratios, and other relevant financial metrics that auditors typically use to assess risk. The financial data was carefully selected to ensure it was representative of the companies' financial health and operations leading up to their bankruptcies.

Experiment Design:

1. Participant Selection: We recruited participants with varying levels of expertise in auditing and risk analysis, including professional auditors, accounting students, and AI-driven audit tools.
2. Task Description: Participants were tasked with analyzing the financial data of the three anonymous companies and identifying potential risks that could indicate financial instability or potential bankruptcy.
3. Comparison Metrics: The performance of human auditors and AI tools was evaluated based on several metrics, including accuracy in identifying risks, the efficiency of analysis, and the comprehensiveness of the risk assessment.
4. Control Variables: To ensure fairness and consistency, all participants received the same dataset and were given the same amount of time to complete their analyses. Additionally, participants were not informed of the identities of the companies to prevent any preconceived notions from influencing their assessments.
5. Data Collection: Participants' findings were collected and analyzed to compare the effectiveness of AI tools versus human auditors. We measured the number and severity of risks identified, the time taken to complete the analysis, and the overall quality of the risk assessment.

Why This Research is Valuable:

This experiment aims to provide valuable insights into the practical applications of AI in auditing, specifically in the context of risk analysis. As AI technologies continue to evolve, their potential to revolutionize auditing practices becomes increasingly apparent. By empirically testing the capabilities of AI against human auditors, this research contributes to a deeper understanding of AI's strengths and limitations in this critical area. The findings from this experiment can inform future developments in AI-driven auditing tools and guide the integration of these technologies into professional practice, ultimately enhancing audit quality and reliability.

Experiment Results

Survey Results for Blockbuster, Inc:

Humans Respondents:

Responses	Operational Risk	Debt Risk	Profitability Risk	Overall Risk Assessment
Blockbuster				
1	*High*	*High*	*High*	*High*
2	Medium	Medium	*High*	Medium
3	*High*	Medium	*High*	*High*
4	Medium	*High*	*High*	*High*
5	Medium	*High*	*High*	*High*
6	*High*	Medium	*High*	*High*
7	Medium	Medium	*High*	Medium
8	Medium	*High*	*High*	*High*
9	*High*	*High*	*High*	*High*
10	Medium	Medium	*High*	Medium

Average Risk Scores:

➔ Operational Risk: *Medium*
➔ Debt Risk: *High*
➔ Profitability Risk: *High*
➔ Overall Risk: *High*

Notable Rationale:

1. "The declining revenue and high debt relative to EBITDA, combined with significant losses, highlight severe financial distress and high overall risk."
2. "The negative net income and minimal cash flow from operations highlight severe profitability issues, compounded by high debt levels."
3. "The company has shown consistent losses over the past three years, significant liabilities, and negative cash flows, indicating high operational, debt, and profitability risks."

AI Risk Analysis:

Blockbuster				
AI	Operational Risk	Debt Risk	Profitability Risk	Overall Risk
ChatGPT	*High*	*High*	*High*	*High*
Claude	*High*	Medium	*High*	*High*
Gemini	Medium	Medium	*High*	*Medium-High*

AI Rationale:

1. ChatGPT: "The combination of high operational, debt, and profitability risks leads to an overall high-risk assessment. The company's inability to adapt to industry changes, significant debt burden, and ongoing financial losses collectively contribute to a precarious financial position, warranting a high overall risk rating."
2. Claude: "Considering the high operational risks associated with the rapidly changing entertainment industry, the company's struggle to adapt, the potential debt servicing challenges due to negative earnings, and the consistent net losses, the overall risk assessment for this company is high."
3. Gemini: "The company faces challenges in all three risk categories. The high profitability risk is concerning, but the brand recognition and potential for operational improvements could mitigate some risk."

Survey Results for Enron:

Humans Respondents:

Responses	Operational Risk	Debt Risk	Profitability Risk	Overall Risk Assessment
Enron				
1	Medium	Medium	Medium	Medium
2	Low	Medium	*High*	Medium
3	Medum	Low	Medium	Medium
4	Medium	Medium	*High*	Medium
5	Low	Low	Medium	Low
6	Medium	Medium	Medium	Medium
7	Low	Medium	*High*	Medium
8	Medium	Low	Medium	Medium
9	Medium	Medium	*High*	Medium
10	Low	Medium	*High*	Medium

Average Risk Scores:

➔ Operational Risk: *Medium*
➔ Debt Risk: *Medium*
➔ Profitability Risk: *High*
➔ Overall Risk: *Medium*

Notable Rationale:

1. "The steady revenue growth is positive, but the decreasing gross margin and increasing liabilities indicate medium risks in all areas."
2. "While the company's debt levels are low, the decline in gross margin and increasing liabilities indicate medium operational and profitability risks."
3. "The company's strong revenue growth and stable debt levels are positive, but the declining gross margins indicate high profitability risk."

AI Risk Analysis:

Enron				
AI	Operational Risk	Debt Risk	Profitability Risk	Overall Risk
ChatGPT	Medium	Medium	Low	Medium
Claude	Medium	Medium	Low	Medium
Gemini	Medium	Low	Medium	Low-Medium

AI Rationale:

1. ChatGPT: "The company's diversified operations in the energy sector, consistent profitability, and manageable debt levels contribute to a medium overall risk rating. The declining gross margin and significant increase in liabilities warrant attention but do not overshadow the company's ability to generate positive net income and maintain operational stability."
2. Claude: "Considering the medium operational risks associated with the regulated and commoditized nature of the energy industry, the moderate debt levels, and the company's consistent profitability, the overall risk assessment for this company is medium."
3. Gemini: "The company has a strong financial position with good debt management and healthy profitability. The declining margins and the complex nature of the energy business with its regulations introduce some uncertainty, keeping the overall risk at low to medium."

Survey Results for Lehman Brothers:

Humans Respondents:

Responses	Operational Risk	Debt Risk	Profitability Risk	Overall Risk Assessment
Lehman Brothers				
1	Low	Medium	Low	Medium
2	Medium	**High**	Low	Medium
3	Low	Low	Medium	Low
4	Medium	Medium	Medium	Medium
5	Low	Medium	Low	Low
6	Low	Medium	Medium	Medium
7	Medium	**High**	Medium	**High**

Average Risk Scores:

➔ Operational Risk: *Low*
➔ Debt Risk: *Medium*
➔ Profitability Risk: *Medium*
➔ Overall Risk: *Medium*

Notable Rationale:

1. "The firm has a solid financial foundation with strong assets and cash flow, but the increasing liabilities and slight drop in gross margin indicate medium debt and profitability risks."
2. "The company's performance is stable, but the increasing liabilities and slight drop in gross margin suggest medium risk in operational, debt, and profitability aspects"
3. "The company's high liabilities and the dynamic nature of the financial industry present significant risks, making the overall risk assessment high despite strong profitability."

AI Risk Analysis:

Lehman Brothers				
AI	Operational Risk	Debt Risk	Profitability Risk	Overall Risk
ChatGPT	Medium	Medium	Low	Medium
Claude	Medium	*High*	Low	Medium
Gemini	Medium	Medium	Low	Low-Medium

AI Rationale:

1. ChatGPT: "The combination of medium operational and debt risks, along with low profitability risk, leads to a medium overall risk assessment. The company's strong financial performance and effective management of its diversified operations help balance the inherent risks of operating in a dynamic and regulated industry"
2. Claude: "The company's profitability, as evidenced by the consistent and increasing net income, and its positive cash flows from operations suggest a financially healthy business model. However, the substantial and growing levels of debt raise concerns about the ability to manage leverage, especially in the dynamic and potentially volatile financial services industry. While the company's diversification across various financial services may help mitigate some operational risks, the high debt levels could leave the company vulnerable to market fluctuations or economic downturns. Overall, the combination of strengths and weaknesses warrants a medium risk assessment, highlighting the need for prudent debt management and operational resilience."
3. Gemini: "The company has a strong financial performance with good profitability. The high debt levels and the operational complexities of the investment banking sector introduce some uncertainty. However, the consistent profitability mitigates some of this risk, keeping the overall risk at low to medium."

Experiment Analysis

Analysis of Survey Results: AI vs. Human Auditors in Risk Assessment

Individual Analysis of Human Responses:

The human responses for the risk assessment of Blockbuster, Enron, and Lehman Brothers reveal a tendency to moderate risk levels across various dimensions. For Blockbuster, human auditors predominantly classified the company as having high profitability risk and either medium or high operational and debt risks. Consequently, the overall risk assessment tended to be high or medium. For Enron, the assessments fluctuated between low and medium for operational and debt risks, with profitability risks frequently marked as high. Despite the high profitability risk, the overall risk assessments remained medium. Lehman Brothers, on the other hand, was generally assessed as having low to medium risks in all dimensions, with a few assessments identifying high debt risk. This conservative evaluation pattern resulted in overall risk assessments predominantly at the medium level.

Individual Analysis of AI Responses:

The AI-generated assessments for the same companies demonstrated a consistent application of risk ratings, albeit with some variations across different AI models (ChatGPT, Claude, and Gemini). For Blockbuster, all AI models identified high profitability risk, but there were discrepancies in operational and debt risk assessments, leading to overall risk ratings ranging from high to medium-high. Enron's risk was similarly evaluated with medium operational and debt risks, but a significant difference was noted in profitability risk, which was assessed as low by all models, resulting in an overall medium risk assessment. For Lehman Brothers, AI models consistently rated operational risk as medium, debt risk varied between medium and high, and profitability risk was low across the board, leading to medium to low-medium overall risk ratings.

Comparative Analysis and Interpretation:

Comparing the human and AI assessments reveals some insightful trends and implications:

1. Consistency vs. Variability: AI models provided more consistent risk assessments across different dimensions for each company compared to the human auditors. This consistency highlights AI's potential in standardizing risk assessment processes, which is crucial for ensuring reliability and comparability across different audits.
2. Conservatism in Human Auditors: Human auditors showed a tendency to moderate their risk assessments, particularly for Enron and Lehman Brothers, even though these companies eventually went bankrupt. This conservatism might stem from biases or a lack of access to comprehensive data, emphasizing the need for enhanced training and better access to information.
3. High-Risk Identification: For Blockbuster, both human auditors and AI models frequently identified high operational and profitability risks, aligning with the company's eventual failure. This agreement suggests that both human and AI assessments can accurately identify high-risk areas when the indicators are clear and pronounced.

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4. Underestimation of Risk: In the case of Enron and Lehman Brothers, the overall risk assessments by both humans and AI were predominantly medium. Given the high true risks that led to their bankruptcies, this underestimation highlights a critical area for improvement. AI's ability to analyze larger datasets and detect subtle risk indicators could be further leveraged to enhance early warning systems and prevent such underestimations.

5. AI as a Supplementary Tool: The survey results underscore the potential of AI to supplement human judgment in auditing. AI's ability to handle large volumes of data, provide consistent assessments, and highlight trends that might be missed by human auditors makes it a valuable tool in the audit process. However, the human element remains essential, especially in interpreting AI outputs and making strategic decisions based on nuanced understanding.

Experiment Conclusion:

The integration of AI into the audit process presents significant opportunities for enhancing risk assessments and overall audit quality. The survey results suggest that while AI can provide consistent and comprehensive risk evaluations, human auditors play a critical role in interpreting and contextualizing these insights. Future research and development should focus on refining AI algorithms to better capture complex risk indicators and training auditors to effectively leverage AI tools. By combining the strengths of both AI and human auditors, the audit profession can achieve more accurate, reliable, and insightful assessments, ultimately contributing to stronger financial oversight and stability.

Conclusion

The integration of AI into the auditing profession represents a significant evolution in both the methodology and efficiency of financial audits. Through a comprehensive review of current literature and an empirical investigation involving the evaluation of historical financial data from Blockbuster, Enron, and Lehman Brothers, this thesis underscores the potential and challenges associated with AI in auditing. The findings indicate that AI-driven tools can provide substantial enhancements in risk assessment and anomaly detection, often surpassing traditional methods in accuracy and efficiency. However, the results also reveal that both human auditors and AI systems face similar challenges in evaluating companies that ultimately went bankrupt, emphasizing the need for a synergistic approach that combines the strengths of AI with human expertise.

In conclusion, while AI technologies offer transformative potential for the auditing industry by automating routine tasks and enhancing analytical capabilities, they also introduce new ethical, regulatory, and practical considerations that must be carefully managed. The survey results demonstrate that AI can complement human auditors, allowing them to focus on higher-value activities such as strategic analysis and risk management. As the field continues to evolve, ongoing research, training, and the development of robust regulatory frameworks will be crucial to ensure that AI's

integration into auditing practices not only improves efficiency but also maintains the integrity and reliability of financial audits. This thesis contributes to the growing body of knowledge on AI in auditing, highlighting the importance of balancing technological advancements with ethical considerations to foster trust and accountability in the financial sector.

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