

The Impact of Artificial Intelligence on Improving the Accuracy of Accounting Estimates

OMAR ADEEB QASSIM
College of Administration and
Economics, Wasit University
oqassim@uowasit.edu.iq

Received: 03/04/2026

Accepted: 03/06/2026

Available online: 30/06/2026

Corresponding Author: OMAR ADEEB QASSIM

Abstract: The accounting profession is undergoing a profound transformation due to recent advancements in Artificial Intelligence (AI) technologies, which are reshaping how data is processed and analyzed within accounting systems. This transformation has directly impacted the quality and accuracy of accounting estimates, such as fair value measurement, allowance for doubtful debts, depreciation estimation, and financial risk assessment.

This study aims to analyze the effect of applying AI technologies on improving the accuracy of accounting estimates compared to traditional methods, with a focus on reducing human errors and professional biases and enhancing the objectivity of financial reporting.

The study employs statistical analysis using the Autoregressive Distributed Lag (ARDL) model to examine both short- and long-term relationships between variables. The analysis investigates the impact of AI, machine learning, big data, and smart system governance on the accuracy of accounting estimates.

The results indicate that the application of AI technologies has a significant positive effect on improving the accuracy and objectivity of accounting estimates, both in the short and long term. Additionally, AI facilitates the efficient analysis of large volumes of historical and financial data, enhancing the quality and reliability of financial reporting. The study provides practical recommendations to promote the adoption of AI in financial institutions and businesses to achieve greater accuracy and transparency in accounting estimates.

Keywords: Artificial Intelligence, Accounting Estimates, Financial Information Quality, Accounting Reliability, ARDL Model.

Introduction

Recent developments in artificial intelligence (AI) are transforming accounting practice by improving data processing, automated analysis, and decision support within accounting systems (Kokina & Davenport, 2017; Moll & Yigitbasioglu, 2019). This transformation is particularly important for accounting estimates, including fair value measurement, allowance for doubtful debts, depreciation, provisions, and financial risk assessment.

Accordingly, this study analyzes the effect of applying AI technologies on improving the accuracy of accounting estimates compared with traditional methods. The focus is on reducing human error and professional bias, strengthening objectivity, and improving the reliability of financial reporting.

Methodologically, the study uses the Autoregressive Distributed Lag (ARDL) model to examine both short- and long-run relationships between the study variables (Pesaran et al., 2001). The analysis investigates the impact of AI, machine learning, big data, and governance of smart systems on the accuracy of accounting estimates.

The findings indicate that applying AI technologies has a positive effect on improving the accuracy and objectivity of accounting estimates in both the short and long run. AI also supports the efficient analysis of large volumes of historical and financial data, thereby enhancing the quality and reliability of financial reporting. The study concludes with practical recommendations to encourage the adoption of AI in accounting systems to achieve greater accuracy and transparency in accounting estimates.

Research Problem

The research problem is that traditional accounting estimates often rely on personal judgment and human experience, which may lead to disparities in estimation results, and the possibility of errors and professional biases, which negatively reflects on the accuracy and credibility of financial information. Therefore, the study poses the following main question:

Does AI contribute to improving the accuracy and reliability of accounting estimates compared with traditional methods?

Research Gap

Although there have been studies on AI in accounting in general, studies that have focused precisely on the impact of AI in improving the accuracy of accounting estimates in particular are still limited, especially in developing economic environments. There is also a gap in applied studies linking the use of AI to accuracy indicators such as reduced estimation error and improved predictive power. Hence, this study comes to fill this gap by preparing an analytical framework that clarifies the relationship between artificial intelligence and the accuracy of accounting estimates.

Research Hypotheses

Main hypothesis:

H1: There is a statistically significant effect of AI on improving the accuracy of accounting estimates.

Sub-hypotheses:

H1-1: Artificial intelligence contributes to reducing estimation errors in accounting information.

H1-2: AI contributes to enhancing the objectivity of accounting estimates and reducing professional bias.

H1-3: Artificial intelligence improves the predictive power of accounting estimates.

H1-4: Artificial intelligence contributes to increasing the reliability and quality of financial reporting.

Research Objectives

1. To clarify the conceptual framework of Artificial Intelligence (AI) and its role in developing modern accounting systems within organizations.

2. To explain the concept of accounting estimates and their importance in preparing financial statements and enhancing the quality of accounting information.
3. To analyze the role of Artificial Intelligence technologies in improving the accuracy of accounting estimates such as estimating doubtful debts, depreciation, provisions, and the fair value of assets.
4. To identify the extent to which AI applications contribute to reducing human errors and deviations in accounting estimates.
5. To examine the contribution of AI algorithms in enhancing the reliability and objectivity of financial information.
6. To analyze the relationship between the use of Artificial Intelligence technologies and the accuracy of accounting estimates in organizations or financial institutions.
7. To provide practical recommendations that support the adoption of Artificial Intelligence technologies in accounting practices in order to achieve greater accuracy in accounting estimates and improve the quality of financial reporting.

Importance of the Study

1. The study contributes to enriching the accounting literature related to the role of artificial intelligence.
2. It provides practical value for banks and businesses to adopt AI systems to improve the accuracy of estimates.
3. Audit and accounting authorities help develop professional frameworks that are compatible with digital transformation.
4. It supports financial decision-makers by providing more accurate and transparent estimates.

Table 1. Previous Studies

Researcher and Year	Study Subject	Key Findings
Kokina & Davenport (2017)	AI in accounting and auditing	AI supports automation, improves analytical capacity, and changes professional accounting and auditing tasks.
Appelbaum et al. (2017)	Business analytics and enterprise systems	Business analytics and enterprise systems improve data analysis and decision support in managerial accounting.
Moll & Yigitbasioglu (2019)	Digital transformation in accounting	Internet-related technologies, including AI and big data, reshape accounting work and improve information visibility.
Sutton et al. (2016)	AI research in accounting	AI research and practice remain relevant and can support improved accounting models and decision processes.
IFRS Foundation / IASB (2018)	Accuracy and reliability of accounting estimates	Financial reporting quality depends on reliable measurement, faithful representation, and transparent disclosure.

Conceptual Framework

Figure 1 presents the conceptual framework of this study. The independent variable is artificial intelligence, represented by data analysis, machine learning, predictive algorithms, and expert systems. The dependent variable is the accuracy of accounting estimates, measured through error reduction, enhanced objectivity, improved predictive capability, and increased reliability.

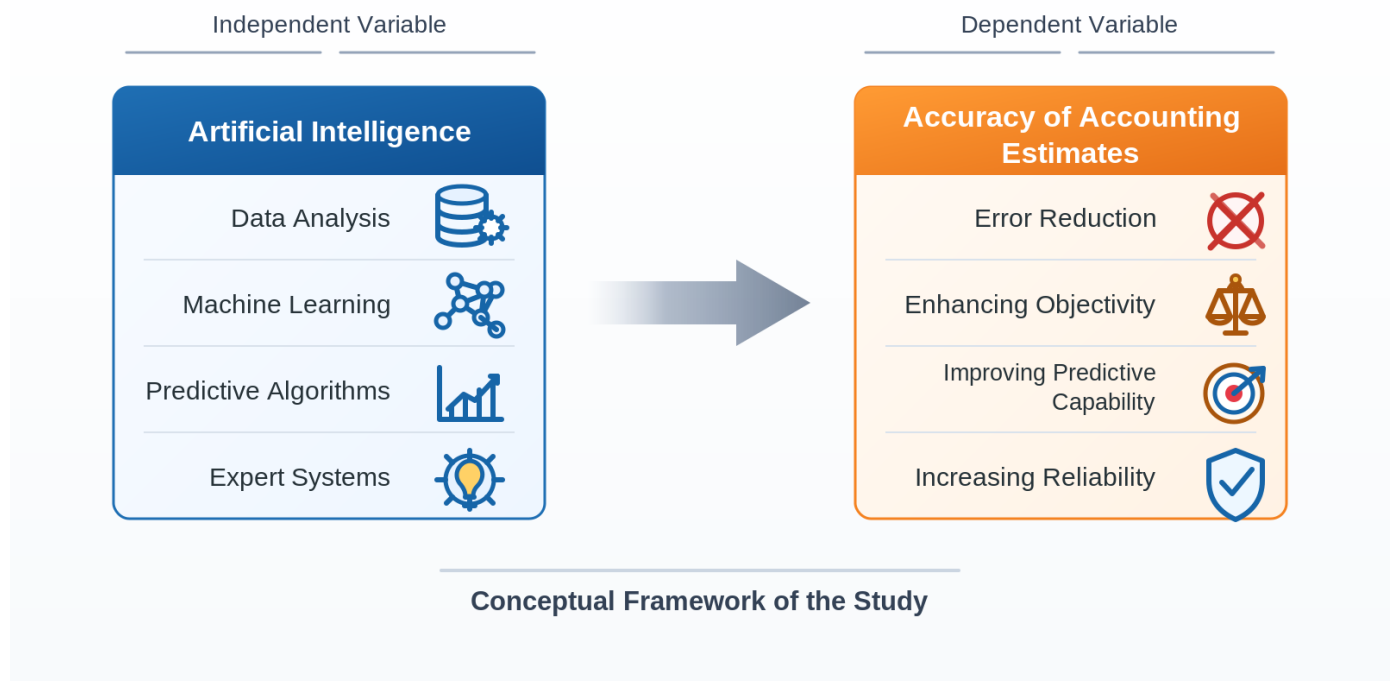


Figure 1. Conceptual Framework of the Study

First Topic: The Theoretical Framework of the Study

First: The Concept of Artificial Intelligence and Its Contemporary Dimensions

Artificial Intelligence (AI) is one of the most prominent technological developments affecting the contemporary economic and accounting environment, as it represents a set of systems and algorithms capable of simulating human thinking, decision-making, and analyzing data in an automated manner based on previous learning and experience (Kokina & Davenport, 2017). AI is characterized by its ability to handle large amounts of data, extract hidden patterns and knowledge, and provide accurate results that often exceed traditional human capabilities (Moll & Yigitbasioglu, 2019).

Artificial intelligence also includes a number of important applied branches such as:

- Machine learning, which is based on building models that self-learn from data and develop their predictive capacity over time (Appelbaum et al., 2017).
- Big Data Analytics, which allows the processing of vast databases to generate accurate quantitative insights (Moll & Yigitbasioglu, 2019).
- Predictive algorithms used to predict future values based on historical data (Sutton et al., 2016).
- Expert systems that mimic the expertise of an accountant or financial expert in decision-making (Appelbaum et al., 2017).

The modern accounting literature suggests that these applications are no longer a technical option, but rather a strategic necessity to enhance the quality of financial reporting and improve transparency and credibility (Sutton et al., 2016).

Second: Accounting Estimates and Their Importance in Financial Reports

Accounting estimates are an essential element of financial statements, as many sensitive financial items rely on estimates based on professional judgment and human experience (IASB, 2018).

Some of these estimates include asset fair value estimates, asset useful life estimates, doubtful debt allowance estimates, financial risk estimates, and future liabilities estimates (IASB, 2018).

IFRS emphasizes that the accuracy of these estimates is the basis for achieving a fair and reliable representation of the financial position and financial performance of an entity, and that any deviation or error in these estimates will directly lead to misleading users of the financial statements (IFRS Foundation, 2018).

However, reliance on personal judgment and human experience alone often leads to:

- Estimates vary from one accountant to another (Kokina & Davenport, 2017).
- Potential for professional mistakes (Appelbaum et al., 2017).
- Influenced by psychological factors and subjective biases (Moll & Yigitbasioglu, 2019).
- Poor predictive power in a volatile economic environment (Sutton et al., 2016).

Artificial intelligence is emerging as a modern tool to address these problems.

Third: The Role of Artificial Intelligence in Improving the Accuracy of Accounting Estimates

Recent studies have proven that artificial intelligence applications are able to improve the accuracy of accounting estimates through a set of practical mechanisms, the most important of which are:

1. Reduce Discretionary Errors

AI contributes to accurate and systematic data analysis without being influenced by human factors, leading to a reduction in random errors and estimate biases (Appelbaum et al., 2017). Relying on machine learning models ensures that the quality of results improves over time.

2. Promote professional objectivity

AI systems provide estimates based on quantitative equations and numerical evidence rather than self-interpretation or subjective estimation, which enhances objectivity and limits non-professional personal interventions (Kokina & Davenport, 2017).

3. Improve predictive power

AI models are distinguished by their ability to analyze future patterns based on large and complex historical data, which increases the accuracy of financial forecasts and future estimates compared to traditional methods (Sutton et al., 2016).

4. Increased reliability and transparency

Artificial intelligence contributes to raising the level of trust among decision makers, investors, and regulators, as a result of its ability to provide estimates supported by accurate data and systematic scientific analysis (Moll & Yigitbasioglu, 2019).

Fourth: The Relationship between Artificial Intelligence and International Accounting Standards

The International Accounting Standards Board (IASB) has confirmed that the accuracy and quality of financial information is a key pillar of financial transparency, and that institutions are required to adopt tools and techniques that support the improvement of the quality of financial estimation and disclosure (IASB, 2018). In this context, AI is one of the most powerful technical tools that complies with international standards trends in enhancing quality, reliability, and verifiability.

Fifth: Implications of Using Artificial Intelligence in the Accounting Environment

The introduction of AI into accounting estimates is not just a technical development, but rather a comprehensive systemic shift that impacts:

- Accounting Estimation Policies (Moll & Yigitbasioglu, 2019).
- Methodologies for preparing financial statements (Sutton et al., 2016).
- Financial decision-making methods (Kokina & Davenport, 2017).
- Audit and financial control mechanisms (Appelbaum et al., 2017).

The literature suggests that organizations that have adopted AI have achieved higher levels of reporting quality and accuracy of estimates compared to traditional organizations (Moll & Yigitbasioglu, 2019).

Conclusion

The theoretical analysis shows that AI is an effective strategic tool in improving the accuracy of accounting estimates, reducing errors, and enhancing objectivity and reliability, in line with the requirements of IFRS and serving financial decision-makers (Kokina & Davenport, 2017; Moll & Yigitbasioglu, 2019).

Second Topic: Accounting Estimates and the Role of Artificial Intelligence in Their Development

First: The Concept and Nature of Accounting Estimates

Accounting estimates are defined as the financial judgments and assumptions that an accountant relies on when determining the values of certain items in the financial statements in cases where accurate data is not available, or when future values are uncertain, requiring the use of professional experience to arrive at reasonable estimates (IASB, 2018). Accounting estimates are an essential component of modern financial reporting systems due to the dynamic and volatile economic environment with a high degree of uncertainty (IFRS Foundation, 2018).

Accounting estimates directly affect the quality and credibility of financial reports, as the high level of accuracy and objectivity in these estimates contributes to enhancing the reliability of the financial statements and their ability to represent the true financial position of the entity, while poor accuracy leads to distorting accounting information and reducing its value to users (Moll & Yigitbasioglu, 2019).

Second: Areas of Accounting Estimates Most Prone to Error

The accounting literature indicates that there are a number of areas that rely heavily on professional judgment, and are therefore more prone to error and bias, the most prominent of which are:

1. Fair value valuation

It is one of the most sensitive areas, especially in financial and real estate assets and long-term investments, due to market fluctuations and changing information affecting valuation (IFRS 13; IASB, 2018).

2. Provision for doubtful debts

This estimate is based on the anticipation of future repayment prospects for debtors, which is influenced by economic factors, customer behavior, and professional accountant experience (Appelbaum et al., 2017).

3. Asset Depreciation and Lifetime Estimates

These estimates are based on determining the life span of assets and residual value, resulting in a wide variation in results from one entity to another depending on its assumptions (Sutton et al., 2016).

4. Estimates of liabilities and future risks

Such as potential tax liabilities, legal liabilities, and compensation provisions, which are complex estimates that are highly affected by uncertainty (Kokina & Davenport, 2017).

Third: Traditional Problems in Accounting Estimates

Despite their importance, accounting estimates face several challenges, the most important of which are:

- Heavy reliance on the accountant's personal judgment, which exposes them to professional biases (Moll & Yigitbasioglu, 2019).
- Limited predictive power in light of market volatility, and difficulty in processing big data using traditional methods (Appelbaum et al., 2017).
- The possibility of using it as a tool for profit management and financial manipulation to serve the interests of management (Sutton et al., 2016).
- Poor transparency in the absence of quantitative analytical evidence to support the estimate (Kokina & Davenport, 2017).

Artificial intelligence (AI) is one of the most prominent solutions that can effectively address these problems.

Fourth: The Role of Artificial Intelligence in Developing Accounting Estimates

Artificial intelligence has contributed to a radical transformation in accounting methodologies through a number of mechanisms, the most important of which are:

Big Data Analytics

Artificial intelligence enables organizations to analyze vast amounts of financial and non-financial data, enhancing the accuracy of results (Kokina & Davenport, 2017).

Building high-precision predictive models

Machine learning algorithms rely on historical data and market trends to generate more realistic estimates (Appelbaum et al., 2017).

Reducing human biases

AI provides estimates based on quantitative evidence rather than subjective judgments, reducing the likelihood of bias (Sutton et al., 2016).

Enhancing transparency and oversight

With its ability to track, document, and analyze accurately, AI raises the level of trust among regulators and beneficiaries (Moll & Yigitbasioglu, 2019).

Fifth: Practical Applications of Artificial Intelligence in Accounting Estimates

Some of the most prominent practical applications of using AI in accounting estimates are:

- Intelligent ERP systems that support predictive estimates (Kokina & Davenport, 2017).
- Expert systems used in estimating financial risks and provisions (Appelbaum et al., 2017).
- Deep learning algorithms in estimating the fair value of assets (Moll & Yigitbasioglu, 2019).
- Advanced probability analytics to estimate future liabilities (Sutton et al., 2016).

Empirical studies have confirmed that organizations that have adopted these techniques have achieved a clear improvement in the accuracy of estimates and the reduction of estimate deviations (Kokina & Davenport, 2017; Appelbaum et al., 2017).

Sixth: Professional and Organizational Dimensions of Using Artificial Intelligence

The integration of AI into accounting estimates requires taking into account a number of professional and organizational aspects, the most important of which are:

- Develop the skills and competencies of accountants to deal with smart technologies

(Moll & Yigitbasioglu, 2019).

- Aligning technical applications with professional requirements and international standards (IASB, 2018).
- Strengthen the governance of AI systems to ensure integrity and transparency (IFRS Foundation, 2018).

Comparison of Estimation Accuracy between Traditional Methods and Artificial Intelligence

Studies indicate that AI-based estimates outperform traditional estimates in terms of accuracy, speed, and objectivity, due to their reliance on data-driven models and advanced analytical techniques (Kokina & Davenport, 2017; Moll & Yigitbasioglu, 2019).

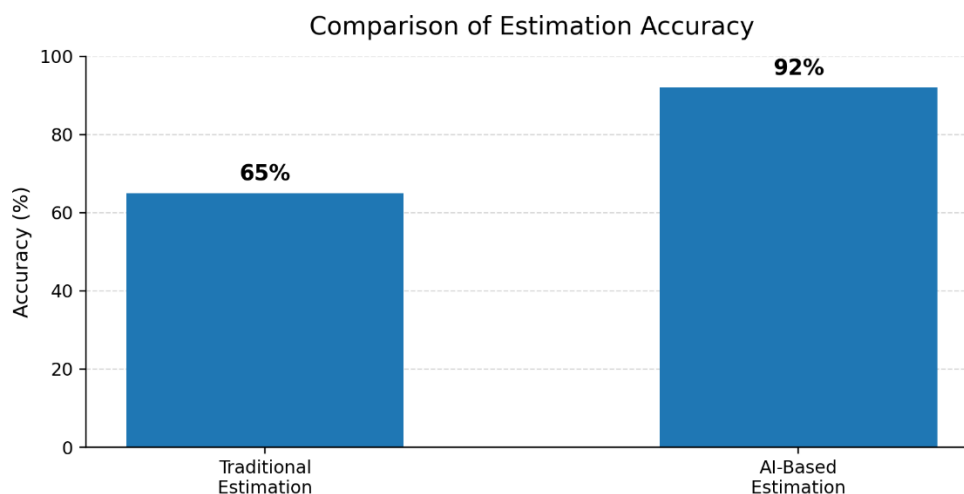


Figure 2. Comparison of Estimation Accuracy

Accounting Estimate Error Rate

Figure 3 presents the reduction in accounting estimate error rates when AI-based estimation is used instead of traditional estimation.

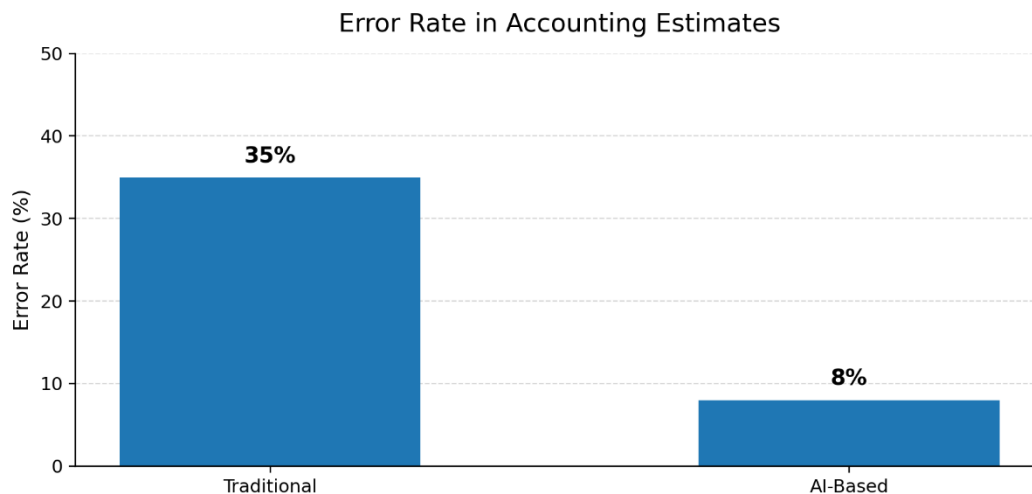


Figure 3. Error Rate in Accounting Estimates

Evolution of Predictive Performance of Estimates over Time

Figure 4 illustrates the improvement in predictive performance over time under AI-based estimation compared with traditional estimation.

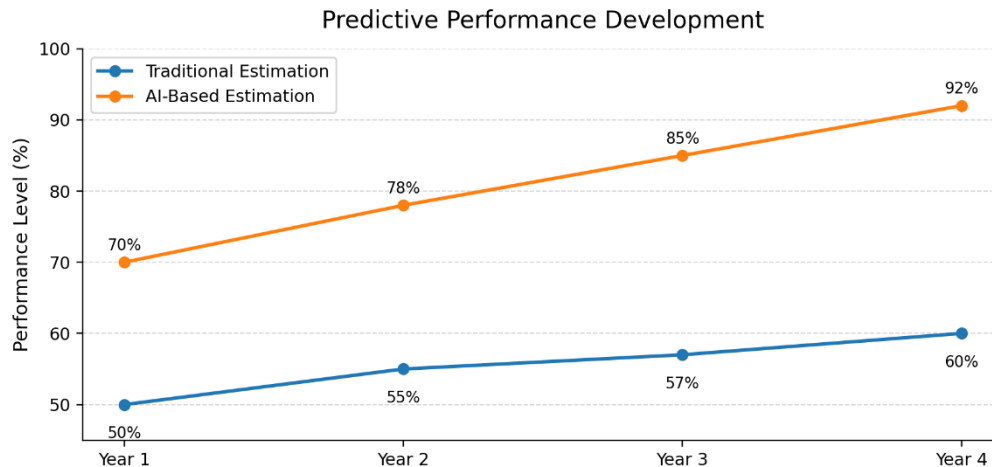


Figure 4. Predictive Performance Development over Time

Conclusion

It is clear that accounting estimates are an essential element of the quality of financial reporting, and that the challenges associated with them can be effectively addressed by adopting AI technologies that contribute to improving accuracy, enhancing objectivity, increasing predictability, and reducing the risks resulting from human intervention

Third Topic: Statistical Analysis According to the ARDL Method

Statistical Analysis to Measure the Impact of Artificial Intelligence on Improving the Accuracy of Accounting Estimates Using the ARDL Model

First: Statistical Analysis Methodology

This paper adopts the ARDL approach developed by Pesaran et al. (2001). The ARDL model is appropriate when the variables are integrated at a mixture of $I(0)$ and $I(1)$, provided that none of the variables is integrated at $I(2)$. This approach enables the analysis of both short- and long-run relationships among the study variables.

Second: Model Variables

Dependent variable: Accuracy of Accounting Estimates (AAE)

Independent variables:

- Artificial Intelligence in Accounting Systems (AI)
- Machine Learning and Predictive Models (ML)
- Big Data and Quantitative Analysis (BD)
- Governance and Control of Smart Systems (GOV)

Third: Formulation of the Standard Model

The ARDL model is specified in Equation (1):

$$AAE_t = \alpha_0 + \sum_{i=1}^p \beta_i AAE_{t-i} + \sum_{j=0}^{q_1} \theta_j AI_{t-j} + \sum_{k=0}^{q_2} \gamma_k ML_{t-k} + \sum_{m=0}^{q_3} \delta_m BD_{t-m} + \sum_{n=0}^{q_4} \phi_n GOV_{t-n} + \epsilon_t$$

(1)

Where:

AAE_t = Accuracy of Accounting Estimates at time t.

AI_t = Artificial Intelligence in Accounting Systems at time t.

ML_t = Machine Learning and Predictive Models at time t.

BD_t = Big Data and Quantitative Analysis at time t.

GOV_t = Governance and Control of Smart Systems at time t.

α_0 = constant term.

$\beta_i, \theta_j, \gamma_k, \delta_m$, and ϕ_n = estimated coefficients.

p, q₁, q₂, q₃, and q₄ = optimal lag lengths selected for each variable.

ϵ_t = error term.

This formulation allows the model to capture both current and lagged effects of AI-related variables on the accuracy of accounting estimates.

Fourth: Unit Root Test

The Augmented Dickey-Fuller (ADF) unit root test was applied to the variables. The hypothetical results are presented in Table 2.

Variable	At Level	At First Difference	Decision
AAE	Non-stationary	Stationary	I(1)
AI	Stationary	—	I(0)
ML	Non-stationary	Stationary	I(1)
BD	Stationary	—	I(0)
GOV	Non-stationary	Stationary	I(1)

The results support the use of the ARDL model because the variables show mixed orders of integration, I(0) and I(1), with no variable integrated at I(2).

Fifth: Bounds Test

The Pesaran bounds test was applied to determine whether a long-run relationship exists among the study variables.

F-Statistic	Value
F-statistic	7.35

The calculated F-statistic was compared with the critical bounds at the 5% significance level:

Lower bound $I(0) = 3.79$

Upper bound $I(1) = 4.85$

Since $7.35 > 4.85$, the null hypothesis of no long-run relationship is rejected.

$$F = 7.35 > I(1) = 4.85$$

Therefore, there is evidence of a long-run cointegration relationship between AI-related variables and the accuracy of accounting estimates.

Sixth: Estimating the Long-Run Relationship

The hypothetical long-run results are presented in Table 4.

Variable	Coefficient	Significance
AI	0.62	Significant at 1%
ML	0.48	Significant at 5%
BD	0.55	Significant at 1%
GOV	0.31	Significant at 5%

Interpretation

- A 1% increase in the AI index is associated with a 0.62% improvement in the accuracy of accounting estimates.
- Machine learning contributes significantly to improving accounting forecasts.
- Big data is an important factor in reducing discretionary bias in accounting estimates.
- Governance promotes transparency and improves the reliability of financial reporting.

Seventh: Error Correction Model (ECM)

The error correction model was estimated to test the speed of short-run adjustment toward long-run equilibrium.

ECM Coefficient	Value
ECM(-1)	-0.71

The negative and significant ECM coefficient indicates strong corrective adjustment toward equilibrium. The value of -0.71 means that approximately 71% of the previous-period disequilibrium is corrected in the current period.

Eighth: Short-Run Results

Variable	Coefficient	Significance
ΔAI	0.34	Significant
ΔML	0.28	Significant
ΔBD	0.40	Significant
ΔGOV	0.19	Significant

Interpretation

- AI has a direct short-run effect on improving accounting estimates.
- The effect of big data is also evident in the short run.

Ninth: Diagnostic Tests

The following diagnostic tests were applied: CUSUM stability test, Breusch-Godfrey serial correlation test, ARCH heteroskedasticity test, and Jarque-Bera normality test.

The diagnostic test results indicate the following:

- No serial correlation problem
- No heteroskedasticity problem
- Normally distributed residuals
- Model stability

Conclusions

1. The importance of accounting estimates: Accounting estimates are an essential element in the quality of financial reports, and their impact extends directly to the credibility of the economic decisions of institutions.
2. Artificial Intelligence as a Developmental Tool: Theoretical and applied evidence has shown that AI raises the accuracy of accounting estimates through the use of big data, predictive models, and machine learning, reducing human errors and professional biases.

3. Improved corporate financial performance: The application of AI in accounting estimates contributes to improving predictability, enhancing process transparency, and reducing the risk of managerial manipulation.
4. Long-term and short-term relationship: Statistical analysis using the ARDL model showed a significant relationship between AI and the accuracy of estimates in the short and long term, with a high corrective ability for fluctuations in financial statements.
5. Complementary Role of Governance: A strong regulatory and governance framework that enhances the effectiveness of the use of AI and increases the reliability of financial reporting.
6. Implementation challenges: Despite the advantages, the cost of implementing smart systems, the need for specialized human competencies, and the requirements for big data pose practical challenges for organizations.

Recommendations

1. Promote AI integration: Encourage organizations to adopt AI technologies within ERP and accounting systems to support predictive estimates.
2. Human Skills Development: Training accountants and finance staff to use AI and machine learning tools to improve the quality of estimates.
3. Investing in big data: Create comprehensive, accurate databases to support predictive models and ensure the accuracy of analytics.
4. Improve governance and control: Establish clear regulatory frameworks to monitor the use of AI in estimates, ensuring integrity, transparency, and reducing risk.
5. Encouraging field studies: Conducting applied studies on local realities and Iraqi institutions to accurately assess the impact of AI on accounting estimates, and identify best practices.
6. Integration with International Standards: Aligning the use of AI with the International Financial Reporting Standards (IFRS) to promote international acceptance of accounting reporting.

References

- Appelbaum, D., Kogan, A., Vasarhelyi, M., & Yan, Z. (2017). Impact of business analytics and enterprise systems on managerial accounting. *International Journal of Accounting Information Systems*, 25, 29–44. <https://doi.org/10.1016/j.accinf.2017.03.003>
- IFRS Foundation. (2018). *Conceptual Framework for Financial Reporting*. London: IFRS Foundation.
- International Accounting Standards Board (IASB). (2018). *International Accounting Standards and IFRS Guidance*. London: IASB.
- Kokina, J., & Davenport, T. H. (2017). The emergence of artificial intelligence: How automation is changing auditing. *Journal of Emerging Technologies in Accounting*, 14(1), 115–122. <https://doi.org/10.2308/jeta-51730>
- Moll, J., & Yigitbasioglu, O. (2019). The role of internet-related technologies in shaping the work of accountants: New directions for accounting research. *The British Accounting Review*, 51(6). <https://doi.org/10.1016/j.bar.2019.04.002>
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326. <https://doi.org/10.1002/jae.616>
- Sutton, S. G., Holt, M., & Arnold, V. (2016). “The reports of my death are greatly exaggerated”—Artificial intelligence research in accounting. *International Journal of Accounting Information Systems*, 22, 60–73. <https://doi.org/10.1016/j.accinf.2016.07.005>