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The Impact of Artificial Intelligence Adoption on Financial Decision-Making Effectiveness: The Mediating Role of Data Analytical Capability and the Moderating Effect of Firm Size

Mubashir Zaman[1], Dr. Noor Fatima[2]

Mubashir Zaman[1]
Research Scholar, Institute of Business Management Sciences, University of Agriculture, Faisalabad, Pakistan. (Corresponding Author, Email: Mubashirkhan0237490@gmail.com)
Dr. Noor Fatima[2]
Assistant Professor, Department of Economics, National University of Modern Languages, Islamabad, Pakistan. (Email: noor.fatima@numl.edu.pk)

Abstract

The purpose of this study is to examine the impact of artificial intelligence (AI) adoption on financial decision-making effectiveness (FDME), while investigating the mediating role of Data Analytical Capability (DAC) and the moderating effect of firm size. The increasing adoption of AI technologies has transformed organizational decision-making processes, particularly in financial management. This study adopts a quantitative research approach and collects data from 300 managers and financial professionals working in different organizations. Data were analyzed using SPSS. Descriptive statistics, reliability analysis, correlation analysis, multiple regression analysis, mediation analysis, and moderation analysis were conducted. The findings reveal that AI adoption significantly enhances financial decision-making effectiveness. Data analytical capability partially mediates the relationship between AI adoption and financial decision-making effectiveness. Furthermore, firm size significantly moderates the relationship, indicating that larger firms derive greater benefits from AI adoption. The study contributes to the literature by integrating technological, organizational, and analytical perspectives into financial decision-making.

Keywords: Artificial Intelligence, Financial Decision-Making Effectiveness, Data Analytical Capability, Firm Size, SPSS

1. Introduction

Artificial Intelligence has emerged as one of the most influential technological innovations in modern business environments. Organizations increasingly utilize AI-powered systems for forecasting, risk assessment, budgeting, investment analysis, and strategic financial planning (Schmidt, 2019) . Financial decision-making effectiveness depends on the availability of accurate information, analytical capabilities, and technological resources (Lawrence, 1991).Despite increasing investments in AI technologies, organizations often experience varying outcomes in financial decision-making. Such variations may be explained by data analytical capabilities and organizational characteristics such as firm size. The significance of AI's ability to make judgments more quickly and correctly and to facilitate adaptive strategy planning in unpredictable environments is highlighted by recent studies.

Whether correctly or not, every person believes that they have frequently had to choose between several options. Another (philosophical) subject we avoid is whether he uses his free will or yields to some sort of causal inevitability (Pomerol, 1997). (Maheshwari, H., & Samantaray, 2026) also examines how these biases are mitigated among Indian Gen Z investors through the AI-led Adoption of Digital Advisory Services (ADAS). AI-related regulations, they decide how these regulations are implemented in businesses. They make decisions about how to incorporate AI, whether to replace or retrain staff, and how to strategically react to or comply with new regulations. Because managers act as a bridge between policy and results, their viewpoints are crucial to comprehending the political and policy ramifications of AI adoption (Weisstanner & van Kersbergen, 2026).

1.1 Problem Statement

From a theoretical perspective, the existing literature lacks an integrated framework that simultaneously examines AI adoption, data analytical capability, financial decision-making effectiveness, and firm size within a single model. Most previous studies have focused on technological adoption or organizational performance independently, creating a significant gap in understanding the mechanisms and boundary conditions that influence AI-driven financial decision-making. Therefore, this study seeks to address gaps by investigating the impact of Artificial Intelligence adoption on Financial Decision-Making Effectiveness, examining the mediating role of Data Analytical Capability, and exploring the moderating effect of Firm Size. The findings are expected to contribute to both theory and practice by providing a comprehensive understanding of how organizations can maximize the value of AI investments to improve financial decision-making outcomes.

1.2 Research Objectives

1. To examine the impact of AI adoption on financial decision-making effectiveness.
2. To investigate the impact of AI adoption on data analytical capability.
3. To determine the effect of data analytical capability on financial decision-making effectiveness.
4. To examine the mediating role of data analytical capability.
5. To investigate the moderating effect of firm size.

1.3 Research Questions

1. Does AI adoption significantly influence financial decision-making effectiveness?
2. Does AI adoption improve data analytical capability?
3. Does data analytical capability improve financial decision-making effectiveness?
4. Does data analytical capability mediate the relationship between AI adoption and financial decision-making effectiveness?
5. Does firm size moderate the relationship between AI adoption and financial decision-making effectiveness?

1.4 Hypotheses

H1: AI Adoption positively affects Financial Decision-Making Effectiveness.

H2: AI Adoption positively affects Data Analytical Capability.

H3: Data Analytical Capability positively affects Financial Decision-Making Effectiveness.

H4: Data Analytical Capability mediates the relationship between AI Adoption and Financial Decision-Making Effectiveness.

H5: Firm Size moderates the relationship between AI Adoption and Financial Decision-Making Effectiveness.

2. Review of Literature

The rapid advancement of Artificial Intelligence (AI) has significantly transformed organizational operations, particularly in finance, accounting, investment management, and strategic planning. Organizations increasingly utilize AI technologies to enhance decision-making quality, improve forecasting accuracy, automate financial processes, and strengthen risk management capabilities. (Hong, S., Zhong, D., & Um, 2026) examined the main elements affecting the use of artificial intelligence (AI) in current organizational administration. The main focus is on the problems and advancements affecting modern enterprises around the globe with the advent of artificial intelligence.

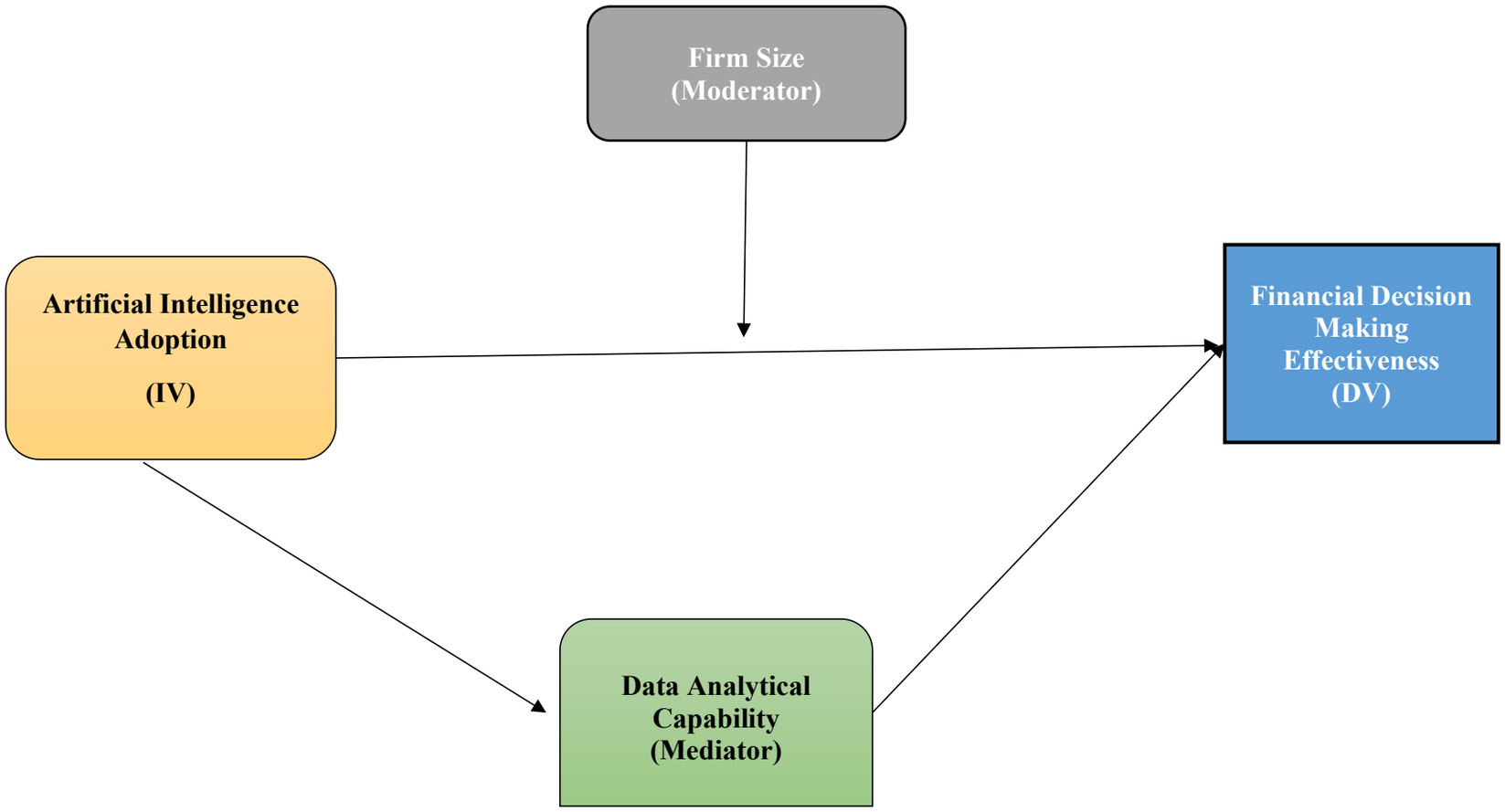
(Shrestha et al., 2019) highlighted the differences between human and AI-based decision making along five main contingency factors: decision-making speed, replicability, size of the alternative set, interpretability of the decision-making process and result, and specificity of the choice search space. (Dear, 2019) argued public sector organizations has examined how AI affects decision-making, primarily focusing on efficiency and rationalization. (Herath Pathirannehelage et al., 2025) explained Information systems (IS) experts are becoming increasingly interested in artificial intelligence (AI) applications due to their proliferation. AI-powered analytics has become a common feature of modern organizations, offering efficient and affordable decision augmentation.

(Martins, 2025) highlighted AI improves operational effectiveness, reduces cognitive bias in strategic decision-making, and allows for real-time flexibility in markets with intense competition. (Maiti et al., 2025) argued businesses may make well-informed decisions by gaining insights into customer behavior, societal trends, and community needs thanks to AI's ability to evaluate large datasets. (Siswanto et al., 2025) investigated the combination of artificial intelligence, data-driven decision making, and market trend research in the context of boosting corporate competitiveness. Using Smart PLS and a quantitative method, the correlation between important factors like Market Trend Analysis (MTA).

2.1 Theoretical Framework

Resource-Based View (RBV) and Dynamic Capability Theory provide the theoretical foundation for understanding how AI resources and analytical capabilities enhance organizational performance.

2.2 Conceptual Framework



3. Research Methodology

3.1 Research Design

This study adopted a quantitative research approach to examine the impact of Artificial Intelligence (AI) Adoption on Financial Decision-Making Effectiveness (FDME), with Data Analytical Capability (DAC) serving as a mediating variable and Firm Size acting as a moderating variable. A quantitative approach was considered appropriate because it allows researchers to objectively measure relationships among variables and test hypotheses through statistical analysis. The study employed a cross-sectional and explanatory research design, where data were collected from respondents at a single point in time. The explanatory design was selected because the primary objective of the research was to investigate cause-and-effect relationships among the study variables and determine the extent to which AI adoption contributes to financial decision-making effectiveness.

3.2 Population of the Study

The target population of this study comprised financial managers, accountants, finance officers, chief financial officers, business analysts, and senior executives working in organizations that have adopted or are in the process of adopting artificial intelligence technologies. These professionals were selected because they are directly involved in financial planning, budgeting, forecasting, investment analysis, risk assessment, and strategic decision-making processes within their organizations. Their experience and knowledge regarding AI implementation and financial management make them suitable respondents for the study.

3.3 Sampling Technique and Sample Size

A non-probability convenience sampling technique was utilized to collect data from respondents. This sampling method was considered appropriate due to its practicality, accessibility, and ability to obtain responses from professionals possessing relevant expertise in financial decision-making and AI implementation. Following recommendations from previous quantitative studies and structural relationship analyses, a sample size of 300 respondents was selected. This sample size was considered sufficient to achieve statistical reliability and validity while providing adequate power for regression, mediation, and moderation analyses.

3.4 Data Collection Method

Primary data were collected through a structured questionnaire administered electronically and physically to respondents. The questionnaire was designed based on established measurement scales adopted and adapted from previous empirical studies on artificial intelligence adoption, data analytical capability, and financial decision-making effectiveness. Before full-scale data collection, a pilot study was conducted to evaluate the clarity, reliability, and validity of the questionnaire items. Necessary modifications were incorporated based on respondents' feedback to improve the quality and comprehensibility of the instrument.

3.5 Measurement of Variables

The questionnaire consisted of two sections. The first section collected demographic information, including gender, age, education level, organizational position, work experience, and firm size. The second section measured the study constructs using multiple-item scales. Artificial Intelligence Adoption was measured using eight items reflecting the extent to which organizations utilize AI technologies in financial and operational activities. Data Analytical Capability was measured using seven items assessing the organization's ability to collect, process, analyze, and interpret data for decision-making purposes. Financial Decision-Making Effectiveness was measured using eight items evaluating the quality, speed, accuracy, and effectiveness of financial decisions. Firm Size was measured through indicators related to the number of employees, annual revenue, and organizational scale. All measurement items were assessed using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

3.6 Data Analysis Techniques

The collected data were coded, entered, and analyzed using Statistical Package for Social Sciences (SPSS) Version 26. Initially, descriptive statistics such as frequencies, percentages, means, and standard deviations were computed to summarize respondent characteristics and variable distributions. Reliability analysis was then conducted to assess the internal consistency of the measurement scales. Pearson correlation analysis was used to examine the strength and direction of relationships among the study variables.

To test the direct effects of Artificial Intelligence Adoption and Data Analytical Capability on Financial Decision-Making Effectiveness, multiple regression analysis was employed. Mediation analysis was conducted to determine whether Data Analytical Capability mediated the relationship between Artificial Intelligence Adoption and Financial Decision-Making Effectiveness. The significance of indirect effects was evaluated using regression procedures and bootstrapping techniques. Furthermore, moderation analysis was performed to examine whether Firm Size strengthened or weakened the relationship between Artificial Intelligence Adoption and Financial Decision-Making Effectiveness through the inclusion of interaction terms in the regression model.

3.7 Ethical Considerations

Ethical principles were strictly observed throughout the research process. Participation in the study was voluntary, and respondents were informed about the purpose and objectives of the research before completing the questionnaire. Confidentiality and anonymity of respondents were ensured, and no personal identifying information was disclosed. Respondents were also informed of their right to withdraw from the study at any stage without any consequences. The collected data were used solely for academic purposes and were stored securely to maintain privacy and confidentiality.

4. Data Analysis and Results

Table 1. Gender Distribution

Gender	Frequency	Percentage
Male	186	62%
Female	114	38%

Total	300	100%

Table 2. Age Distribution

Age Group	Frequency	Percentage
20-30	90	30%
31-40	120	40%
41-50	60	20%
Above 50	30	10%

Table 3: Cronbach's Alpha

Variables	Items	Cronbach Alpha
Al Adoption	90	0.892
Data Analytical Capability	120	0.881
Financial Decision-Making Effectiveness	60	0.904
Firm Size	30	0.841

The results presented in Table 3 demonstrate that all study constructs achieved Cronbach's Alpha values above the recommended threshold of 0.70. Artificial Intelligence Adoption recorded a Cronbach's Alpha value of 0.892, indicating a high level of internal consistency among its measurement items. Data Analytical Capability achieved a reliability coefficient of 0.881, suggesting that the items consistently measure the intended construct. Financial Decision-Making Effectiveness exhibited the highest reliability coefficient of 0.904, indicating excellent internal consistency and measurement reliability. Similarly, Firm Size reported a Cronbach's Alpha value of 0.841, reflecting good reliability.

Overall, the reliability analysis confirms that all measurement scales used in this study are reliable and internally consistent. Therefore, the questionnaire items are appropriate for further statistical analyses, including correlation, regression, mediation, and moderation analyses. The findings suggest that respondents interpreted the questionnaire items consistently, enhancing the credibility and validity of the research results.

Table 4: Descriptive Statistics

Variables	Mean	Standard Deviation
Al Adoption	4.12	0.58
Data Analytical Capability	4.01	0.63
Financial Decision-Making Effectiveness	4.18	0.55
Firm Size	3.76	0.72

The results indicate that Artificial Intelligence Adoption has a mean value of 4.12 and a standard deviation of 0.58. This suggests that respondents generally agreed that their organizations have adopted AI technologies in various financial and operational activities. The relatively low standard deviation indicates a high level of consistency among respondents' perceptions regarding AI adoption.

Data Analytical Capability recorded a mean score of 4.01 with a standard deviation of 0.63. This finding implies that respondents perceive their organizations as possessing strong capabilities in collecting, processing, analyzing, and interpreting data for decision-making purposes. The moderate standard deviation further indicates that respondents' views regarding analytical capabilities are relatively homogeneous.

Financial Decision-Making Effectiveness exhibited the highest mean value of 4.18 and a standard deviation of 0.55. This result suggests that respondents strongly believe that financial decisions within their organizations are generally effective, accurate, timely, and strategically valuable. The low standard deviation reflects substantial agreement among respondents concerning the effectiveness of financial decision-making processes.

Firm Size reported a mean score of 3.76 and a standard deviation of 0.72. Compared with the other variables, Firm Size shows a relatively lower mean and higher standard deviation, indicating greater variation among the participating organizations regarding their operational scale, workforce size, and financial resources.

Table 5: Pearson Correlation Matrix

Variables	AI	DAC	FDME
Al	1	0.712**	0.689**
DAC	0.712**	1	0.742**
FDME	0.689**	0.742**	1

Level of Significance: P < 0.01

The results reveal a strong positive and statistically significant relationship between Artificial Intelligence Adoption and Data Analytical Capability ($r = 0.712$, $p < 0.01$). This finding suggests that organizations with higher levels of AI adoption tend to possess stronger data analytical capabilities. The result indicates that the implementation of AI technologies enhances an organization's ability to collect, process, analyze, and interpret data for strategic and operational purposes.

Similarly, Artificial Intelligence Adoption demonstrates a strong positive relationship with Financial Decision-Making Effectiveness ($r = 0.689$, $p < 0.01$). This implies that organizations that extensively utilize AI technologies are more likely to make effective financial decisions characterized by greater accuracy, timeliness, and quality. The finding provides preliminary support for the proposition that AI contributes positively to financial decision-making processes.

The strongest correlation was observed between Data Analytical Capability and Financial Decision-Making Effectiveness ($r = 0.742$, $p < 0.01$). This result suggests that organizations with superior analytical capabilities are better able to generate meaningful insights from data, leading to more effective financial decisions. The strong relationship highlights the critical role of analytical capability in supporting financial planning, forecasting, investment evaluation, and risk management activities.

Table 6: Regression Analysis

Dependent Variable: Financial Decision-Making Effectiveness

Variables	Coefficient	Std. Error	T-Statistics	Probability Value
Constant	0.684	0.187	3.658	0.000
Artificial Intelligence Adoption	0.412	0.046	8.910**	0.000
Data Analytical Capability	0.473	0.045	10.440**	0.000
R-Squared				0.617
Adj. R-Squared				0.613

Level of Significance: P < 0.01

The regression coefficients indicate that both Artificial Intelligence Adoption and Data Analytical Capability have significant positive effects on Financial Decision-Making Effectiveness. Artificial Intelligence Adoption has a standardized beta coefficient of 0.412 ($t = 8.910$, $p < 0.001$), indicating that a one-unit increase in AI Adoption leads to a significant increase in Financial Decision-Making Effectiveness. Therefore, Hypothesis H1 is supported.

Similarly, Data Analytical Capability exhibits a standardized beta coefficient of 0.473 ($t = 10.440$, $P< 0.001$), demonstrating a significant positive impact on Financial Decision-Making Effectiveness. This suggests that organizations with stronger analytical capabilities achieve more effective financial decisions. Therefore, Hypothesis H3 is supported.

Comparing the standardized beta coefficients reveals that Data Analytical Capability ($\beta = 0.473$) exerts a slightly stronger influence on Financial Decision-Making Effectiveness than Artificial Intelligence Adoption ($\beta = 0.412$). This finding highlights the importance of analytical capability in translating technological investments into improved financial outcomes. The R value of 0.786 demonstrates a strong relationship between the predictors and the dependent variable. The R^2 value of 0.617 indicates that approximately 61.7% of the variation in Financial Decision-Making Effectiveness is explained by Artificial Intelligence Adoption and Data Analytical Capability. The Adjusted R^2 value of 0.613 confirms the robustness of the model after adjusting for the number of predictors included in the analysis.

Table 7: ANOVA

Dependent Variable: Financial Decision-Making Effectiveness

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	56.032	2	28.016	239.180	0.000
Residual	34.791	297	0.117		
Total	90.823	299			

Level of Significance: P < 0.01

The ANOVA table evaluates the overall significance of the regression model. The F-statistic is 239.180 with a significance value of 0.000, which is less than the threshold value of 0.05. This result indicates that the regression model is statistically significant and capable of explaining variations in Financial Decision-Making Effectiveness. Therefore, the overall model provides a good fit to the observed data.

Table 9: Mediation Results

Path	Beta	Sig
AI → DAC	0.712	0.000
DAC → FDME	0.473	0.000
AI → FDME Direct	0.412	0.000
AI → DAC → FDME Indirect	0.337	0.000

Level of Significance: P < 0.01

The results indicate that Artificial Intelligence Adoption has a significant positive effect on Data Analytical Capability ($\beta = 0.712$, $p < 0.001$). This finding suggests that organizations adopting AI technologies are more likely to develop stronger capabilities in collecting, processing, analyzing, and interpreting data. Therefore, AI adoption significantly enhances organizational analytical competence.

Furthermore, Data Analytical Capability has a significant positive effect on Financial Decision-Making Effectiveness ($\beta = 0.473$, $p < 0.001$). This result implies that organizations possessing stronger analytical capabilities are better able to make accurate, timely, and effective financial decisions. Enhanced analytical capabilities allow managers to transform data into valuable insights that support strategic financial planning and decision-making.

The direct effect of Artificial Intelligence Adoption on Financial Decision-Making Effectiveness remains significant ($\beta = 0.412$, $p < 0.001$) even after including Data Analytical Capability in the model. This indicates that AI adoption directly contributes to improved financial decision-making effectiveness.

The indirect effect of Artificial Intelligence Adoption on Financial Decision-Making Effectiveness through Data Analytical Capability is also significant ($\beta = 0.337$, $p < 0.001$). This finding confirms that Data Analytical Capability serves as a mediating mechanism through which AI adoption influences financial decision-making effectiveness.

Since both the direct effect and indirect effect are statistically significant, the results indicate the presence of **partial mediation** rather than full mediation. In other words, Artificial Intelligence Adoption improves Financial Decision-Making Effectiveness both directly and indirectly through the enhancement of Data Analytical Capability.

These findings support Hypothesis H4, which proposed that Data Analytical Capability mediates the relationship between Artificial Intelligence Adoption and Financial Decision-Making Effectiveness. The results further suggest that organizations can maximize the benefits of AI investments by strengthening their analytical capabilities, as these capabilities play a crucial role in converting AI-generated information into effective financial decisions.

Table 10: Moderation Results

Variable	Beta	t-value	Sig.
AI Adoption	0.401	8.56	0.000
Firm Size	0.236	4.77	0.000
AI × Firm Size	0.174	3.91	0.000

Level of Significance: P < 0.01

The results indicate that Artificial Intelligence Adoption has a significant positive effect on Financial Decision-Making Effectiveness ($\beta = 0.401$, $t = 8.56$, $p < 0.001$). This finding suggests that organizations with higher levels of AI adoption tend to achieve more effective financial decision-making. The result confirms that AI technologies contribute positively to the quality, accuracy, and timeliness of financial decisions.

Firm Size also demonstrates a significant positive effect on Financial Decision-Making Effectiveness ($\beta = 0.236$, $t = 4.77$, $p < 0.001$). This indicates that larger organizations generally possess greater resources, technological infrastructure, and managerial expertise, which enhance their ability to make effective financial decisions.

Most importantly, the interaction term between Artificial Intelligence Adoption and Firm Size (AI Adoption × Firm Size) is positive and statistically significant ($\beta = 0.174$, $t = 3.91$, $p < 0.001$). The significance of the interaction effect confirms the presence of moderation. This result indicates that Firm Size influences the strength of the relationship between Artificial Intelligence Adoption and Financial Decision-Making Effectiveness.

The positive interaction coefficient suggests that the beneficial effect of AI adoption on financial decision-making effectiveness becomes stronger as firm size increases. In other words, larger firms are able to derive greater value from AI technologies compared to smaller firms. This may be attributed to their superior financial resources, advanced technological infrastructure, skilled workforce, and greater capacity to integrate AI systems into organizational processes.

Conversely, although smaller firms may also benefit from AI adoption, their limited resources and technological capabilities may restrict the extent to which AI can enhance financial decision-making effectiveness. Therefore, the positive impact of AI adoption is more pronounced in larger organizations.

These findings support Hypothesis H5, which proposed that Firm Size moderates the relationship between Artificial Intelligence Adoption and Financial Decision-Making Effectiveness. The results indicate that firm size serves as an important contextual factor that influences the effectiveness of AI implementation in financial decision-making processes.

Table 11: Hypotheses Testing Summary

Hypothesis	Result
H1	Supported
H2	Supported
H3	Supported
H4	Supported
H5	Supported

5. Discussion

The findings of this study demonstrate that Artificial Intelligence (AI) Adoption has a significant positive impact on Financial Decision-Making Effectiveness. The results indicate that organizations utilizing AI technologies are better able to improve the accuracy, speed, and quality of financial decisions. This finding supports previous studies suggesting that AI enhances forecasting, risk assessment, budgeting, and strategic financial planning through advanced data processing and predictive analytics.

The study further reveals that AI Adoption significantly improves Data Analytical Capability. Organizations implementing AI technologies develop stronger capabilities in collecting, processing, and analyzing data, enabling managers to derive valuable insights from complex datasets. This finding is consistent with the argument that AI serves as a catalyst for enhancing organizational analytical competencies.

In addition, Data Analytical Capability was found to have a significant positive effect on Financial Decision-Making Effectiveness. Organizations with stronger analytical capabilities are better positioned to transform data into actionable information, resulting in more effective financial decisions. The relatively stronger effect of Data Analytical Capability highlights its critical role in converting technological resources into organizational benefits.

The mediation analysis confirmed that Data Analytical Capability partially mediates the relationship between AI Adoption and Financial Decision-Making Effectiveness. This suggests that AI enhances financial decision-making not only directly but also indirectly by strengthening organizations' analytical capabilities. Therefore, the value of AI investments can be maximized when supported by robust analytical infrastructure and expertise.

Furthermore, the moderation analysis revealed that Firm Size significantly strengthens the relationship between AI Adoption and Financial Decision-Making Effectiveness. Larger organizations appear to benefit more from AI adoption due to greater access to financial resources, technological infrastructure, and specialized expertise. Although AI positively influences organizations of all sizes, larger firms are generally better equipped to exploit its full potential.

5.1 Conclusion

This study examined the impact of Artificial Intelligence Adoption on Financial Decision-Making Effectiveness, with Data Analytical Capability as a mediator and Firm Size as a moderator. The findings revealed that AI adoption significantly enhances financial decision-making effectiveness in organizations. The study also confirmed that AI adoption strengthens data analytical capability, which in turn improves the effectiveness of financial decisions, indicating a partial mediation effect. Furthermore, Firm Size was found to significantly moderate the relationship between AI adoption and financial decision-making effectiveness, suggesting that larger firms benefit more from AI implementation due to stronger resources and infrastructure. Overall, the study concludes that AI-driven financial decision-making is most effective when supported by strong analytical capabilities and adequate organizational size. The results highlight the importance of integrating advanced technologies with analytical competencies to achieve improved financial decision outcomes and sustainable organizational performance.

5.2 Recommendations

Based on the findings of this study, organizations should increase their investment in Artificial Intelligence technologies to enhance the effectiveness of financial decision-making processes. However, AI implementation should be accompanied by the development of strong Data Analytical Capabilities through employee training, analytical skill development, and improved data management systems. Since Data Analytical Capability was found to partially mediate the relationship between AI adoption and financial decision-making effectiveness, organizations should focus not only on acquiring advanced technologies but also on strengthening their ability to analyze and utilize data effectively.

Furthermore, managers should establish data-driven decision-making cultures that encourage the use of AI-generated insights in financial planning, forecasting, budgeting, and risk management activities. Given the moderating role of Firm Size, small and medium-sized enterprises (SMEs) should gradually build technological infrastructure and analytical expertise to maximize the benefits of AI adoption. Policymakers and industry stakeholders may also provide financial and technical support to assist smaller firms in adopting AI technologies. By integrating AI systems with strong analytical capabilities and organizational support, firms can improve the quality, accuracy, and timeliness of their financial decisions and achieve sustainable competitive advantage.

5.3 Limitations of the Study

This study has several limitations that should be acknowledged. First, the research employed a cross-sectional design, meaning that data were collected at a single point in time. As a result, the study is unable to capture changes in Artificial Intelligence Adoption, Data Analytical Capability, and Financial Decision-Making Effectiveness over time, limiting the ability to draw strong causal inferences. A longitudinal approach could provide more comprehensive insights into how these relationships evolve.

Second, the study used a convenience sampling technique, which may limit the generalizability of the findings. Since respondents were selected based on accessibility rather than random selection, the sample may not fully represent all organizations or industries. Therefore, the results should be interpreted with caution when applying them to a broader population.

Third, the data were collected through self-reported questionnaires, which may introduce response bias, including social desirability bias and common method bias. Respondents may have provided subjective or overly positive assessments of AI adoption and financial decision-making effectiveness, which could affect the accuracy of the results.

Fourth, the study focused only on three main constructs—Artificial Intelligence Adoption, Data Analytical Capability, and Financial Decision-Making Effectiveness—along with Firm Size as a moderator. Other potentially important variables such as organizational culture, technological readiness, leadership support, and environmental uncertainty were not included, which may also influence financial decision-making effectiveness.

Finally, the study was conducted within a limited geographical and organizational context, which may restrict the applicability of the findings to other countries or industries with different technological and economic conditions. Future research should address these limitations by using longitudinal designs, probability sampling techniques, and additional contextual variables to enhance the robustness and generalizability of the results.

5.4 Future Research Directions

Future research should extend this study by employing longitudinal research designs to better capture the dynamic and evolving impact of Artificial Intelligence Adoption on Financial Decision-Making Effectiveness over time. Comparative studies across different industries and countries are also recommended to enhance the generalizability of findings and to understand contextual variations in AI effectiveness. Additionally, future studies should incorporate other relevant mediating variables such as organizational culture, technological readiness, innovation capability, and leadership support to provide a more comprehensive understanding of the mechanisms influencing financial decision-making. Researchers may also explore additional moderating variables, including environmental uncertainty, digital maturity, and regulatory frameworks, to further refine the conceptual model. Moreover, the use of qualitative or mixed-method approaches is encouraged to gain deeper insights into how AI technologies are practically integrated into financial decision processes within organizations.

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