

Differences in Bankers' Perceptions towards Artificial Intelligence across Bank Ownership

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Abstract

This research paper explores the variation in the perception of bankers towards Artificial Intelligence (AI) based on the ownership of a bank, that is, between public and private sector banks. The study uses an Independent Sample t-test to compare the differences across five key AI dimensions which include customer service, loan approval and credit scoring, fraud detection, operational efficiency, and compliance and risk management. The results show that there are minor differences in the mean scores of perception in the two groups. The bankers of the private sector present a bit higher perception in the area of customer service, fraud detection, and compliance-related applications. On the contrary, the mean scores of the loan approval and operational efficiency are higher in the case of the public sector bankers, showing a stronger adoption of AI in decision making and optimization of the processes in the institutions. Statistically, only operational efficiency is characterized by a significant difference ($p < 0.05$) with the public sector banks reporting a stronger perception of AI effectiveness in improving workflow and productivity. There are no significant differences in the rest of the dimensions, indicating that there is a convergence point in the adoption and perception of AI across bank ownership types. The research finds that though implementation of AI in the banking sector is increasingly becoming uniform, the public sector banks consider it more beneficial in terms of operational efficiency. On the whole, the findings reflect the increased significance of the AI as a strategic instrument in banking, being independent of ownership.

Keywords: Artificial Intelligence, Public Sector Banks, Private Sector Banks, Fraud Detection

Introduction

Artificial Intelligence (AI) has emerged as one of the most transformative technologies in the banking and financial services industry. AI-powered applications such as machine learning, natural language processing, predictive analytics, robotic process automation, and intelligent chatbots are reshaping the way banks deliver services, manage risks, detect fraud, and improve operational efficiency. The rapid digital transformation of the banking sector has compelled both public and private sector banks to invest in AI-enabled solutions to enhance customer experience and maintain competitiveness.

In India, the adoption of AI has accelerated due to increasing digital banking, government initiatives promoting financial inclusion, and changing customer expectations. AI is now widely used in customer service through virtual assistants, credit scoring, fraud detection, compliance monitoring, and process automation. While both public and private sector banks are embracing AI, differences may exist in their perception and implementation due to variations in organizational structure, technological infrastructure, investment capability, and innovation orientation.

Public sector banks generally operate with larger customer bases, extensive branch networks, and standardized operational procedures, whereas private sector banks are often characterized by greater

technological agility and customer-centric innovation. These institutional differences may influence how bankers perceive the effectiveness and usefulness of AI applications.

Although previous studies have extensively examined AI adoption in banking, limited empirical research has compared bankers' perceptions across different ownership structures. Understanding these differences is important because employees' perceptions significantly influence successful technology adoption and organizational performance. Therefore, this study investigates whether bankers working in public and private sector banks differ in their perceptions regarding the application of Artificial Intelligence across major banking functions including customer service, loan approval and credit scoring, fraud detection, operational efficiency, and compliance and risk management.

Literature Review

The application of Artificial Intelligence (AI) in the banking sector has evolved significantly over the past decade, transforming traditional banking operations into intelligent, data-driven systems. Early research primarily focused on the technological capabilities of AI, while recent studies emphasize customer perception, operational efficiency, sustainability, and governance.

Arner et al. (2016) introduced the concept of FinTech as a new paradigm that emerged after the global financial crisis. The authors argued that technological innovations, including Artificial Intelligence, are reshaping the financial services industry by encouraging banks to adopt digital technologies to remain competitive. Their study highlighted AI as a key driver of innovation, improving financial services and operational performance.

Brynjolfsson and McAfee (2017) emphasized that AI technologies improve organizational productivity by automating repetitive tasks, reducing operational costs, and enhancing decision-making. They suggested that AI enables financial institutions to process large volumes of data efficiently, making banking operations faster, more accurate, and cost-effective.

During the same period, **Gomber et al. (2017)** examined the impact of digital technologies on banking and financial services. Their study found that AI-based automation streamlines banking operations, reduces manual intervention, improves workflow efficiency, and increases overall organizational productivity. They identified operational efficiency as one of the primary benefits of AI adoption in financial institutions.

Davenport and Ronanki (2018) identified three major organizational applications of Artificial Intelligence: business process automation, data-driven insights, and customer engagement. According to the authors, banks increasingly use AI for credit scoring, fraud detection, customer service automation, and intelligent decision support systems, resulting in enhanced organizational performance.

Similarly, **Huang and Rust (2018)** highlighted the growing importance of AI in customer service. Their research demonstrated that AI-powered chatbots and virtual assistants provide personalized, real-time customer support, improving service quality, customer satisfaction, and operational responsiveness. AI was recognized as a critical technology for enhancing customer experience in the banking sector.

In the same year, **Lee and Shin (2018)** observed that private sector banks tend to adopt AI technologies more rapidly than public sector banks due to stronger competitive pressures and innovation-oriented strategies. Their findings suggested that ownership structure influences the pace of technological adoption, particularly in customer-focused banking services.

Kshetri (2020) investigated the role of Artificial Intelligence in fraud detection and cybersecurity. The study concluded that AI systems effectively identify abnormal transaction patterns and detect financial fraud in real time, thereby strengthening banking security and minimizing financial risks. However, differences in technological infrastructure and investment capacity may influence AI adoption across banking institutions.

Recent research has increasingly focused on Artificial Intelligence as a strategic enabler of digital banking transformation. **Kalyani and Gupta (2023)** conducted a systematic literature review and concluded that AI and machine learning have fundamentally transformed banking operations by

improving operational efficiency, enhancing customer trust, and supporting data-driven decision-making processes.

Likewise, **Mehroliya et al. (2023)** examined AI-enabled chatbots and found that they significantly improve customer engagement and service quality while reducing operational costs. However, the study also noted that perceived risk remains an important factor influencing customers' willingness to adopt AI-powered banking services.

Another recent contribution by **Lee et al. (2023)** investigated AI-enabled mobile banking applications and found that perceived usefulness, ease of use, and customer trust positively influence customer satisfaction and continuance intention. Their findings support the Technology Acceptance Model (TAM), emphasizing that user perception plays a critical role in AI adoption.

Noreen et al. (2023) described Artificial Intelligence as the foundation of "Banking 4.0." According to the authors, AI facilitates automation, personalization, predictive analytics, and real-time decision-making, enabling banks to deliver faster, more efficient, and customer-centric financial services.

Research published in **2024** expanded the scope of AI beyond operational applications. **Bhatnagar et al. (2024)** found that perceived intelligence, interaction quality, and customer experience significantly influence customers' continued use of AI-enabled digital banking platforms. Their study highlighted customer perception as a crucial determinant of successful AI implementation.

Similarly, **Shaik et al. (2024)** reported that AI adoption positively influences customer satisfaction in Indian banking by reducing waiting time, improving service efficiency, and delivering personalized banking experiences.

The relationship between AI and financial stability was explored by **Wan and Cui (2024)**, who demonstrated that AI-based FinTech solutions reduce information asymmetry, improve risk assessment capabilities, and strengthen financial system stability through intelligent decision-making. Beyond operational improvements, **Xu (2024)** examined the integration of Artificial Intelligence with Environmental, Social, and Governance (ESG) practices. The study concluded that AI enhances sustainability reporting, improves governance transparency, and supports more effective risk assessment within financial institutions.

Similarly, **Tkachenko (2024)** emphasized the importance of incorporating AI-related risks, including environmental and governance challenges, into banking risk management frameworks to ensure responsible and sustainable AI implementation.

The most recent evidence is provided by **John et al. (2025)**, who examined AI-based fraud detection systems in financial institutions. Their research confirmed that AI significantly improves anomaly detection, reduces financial fraud, and strengthens cybersecurity. However, the effectiveness of AI implementation depends on organizational readiness, technological infrastructure, regulatory compliance, and investment capability.

Research Questions

- 1 Do public and private sector bankers have different perceptions about the applications of AI across bank ownership?
- 2 Do Bankers have a significant positive perception of AI in customer service?

Research Objectives

1. To see if there is any significant difference in perception of the applications of Artificial Intelligence among public sector banks and private sector banks by the bankers.
2. To evaluate the perceptions of banks about the use of Artificial Intelligence (AI) in customer service.

Hypotheses

- **H₀:** There are no significant differences in bankers' perceptions towards Artificial Intelligence across bank ownership (public and private sector banks).
H₁: There are significant differences in bankers' perceptions towards Artificial Intelligence across bank ownership (public and private sector banks).
- **H₀:** Bankers do not have a significant positive perception of AI in customer service.

H₂: Bankers have a significant positive perception of AI in customer service.

Sample Size

The sample consisted of:

Bank Ownership	Sample Size (N)
Public Sector Banks	233
Private Sector Banks	232
Total Sample	465

Interpretation of Results

Mean Scores of Bankers' Perceptions towards AI across Bank Ownership

This section presented the **mean scores and standard deviations** of bankers' perceptions towards various AI dimensions across public and private sector banks. The results indicate **minor variations in mean scores** between the two groups across most AI dimensions. In general, private sector bankers report slightly higher mean values for certain AI dimensions, suggesting comparatively greater acceptance and exposure to AI-driven banking practices.

This section analyzes whether significant differences exist in bankers' perceptions towards Artificial Intelligence (AI) across public and private sector banks. An Independent Sample t-test was conducted at a 5 per cent level of significance ($\alpha = 0.05$) to compare the mean scores of five AI dimensions between the two ownership groups.

Table 1: Mean scores of Banker's perceptions towards Artificial Intelligence across Bank Ownership

	Banks category	N	Mean	Std. Deviation
Customer service	Public	233	3.4066	.87414
	Private	232	3.4735	.90093
Loan approval and Credit scoring	Public	233	3.7646	.70774
	Private	232	3.7402	.82933
Fraud Detection	Public	233	3.4922	.82317
	Private	232	3.4991	.82374
Operational efficiency	Public	233	4.0880	.95706
	Private	232	3.8955	1.08991
Compliance and Risk Management	Public	233	2.4983	1.06785
	Private	232	2.6010	1.10675

Source: Calculated through SPSS

Independent Sample T-Test: Differences in AI dimensions across Bank Ownership

Table 2: Independent Sample T-Test

		F	Sig.	t	df	Sig. (2-tailed)
Customer service	Equal variances assumed	.789	.375	-.903	572	.367
	Equal variances not assumed			-.903	571.479	.367
Loan approval and Credit scoring	Equal variances assumed	3.396	.066	.379	572	.705
	Equal variances not assumed			.379	558.201	.705
Fraud Detection	Equal variances assumed	.082	.775	-1.667	572	.096
	Equal variances not assumed			-1.667	571.996	.096
Operational efficiency	Equal variances assumed	4.156	.042	2.248	572	.025
	Equal variances not assumed			2.248	562.601	.025
Compliance and Risk Management	Equal variances assumed	1.216	.271	-1.132	572	.258
	Equal variances not assumed			-1.132	571.269	.258

Source: Calculated through SPSS

The t-test results reveal that Operational Efficiency ($p = 0.025$) is the only AI dimension showing a statistically significant difference between public and private sector banks. Public sector bankers report significantly higher perceptions of AI-enabled operational efficiency, indicating that AI tools in public banks are more strongly associated with workflow optimization, process standardization, and productivity enhancement.

For the remaining dimensions—Customer Service ($p = 0.367$), Loan Approval and Credit Scoring ($p = 0.705$), Fraud Detection ($p = 0.096$), and Compliance and Risk Management ($p = 0.258$)—no statistically significant differences are observed. This suggests that bankers across both ownership types hold similar perceptions regarding the application of AI in these functional areas.

Independent Sample T-Test Results

The results of the Independent Sample t-test are presented in **Table-2**. Levene's Test for Equality of Variances was conducted to determine the appropriate t-test results, and the corresponding significance values were considered.

An Independent Samples t-test was used to examine whether significant differences existed between the two groups. Levene's Test for Equality of Variances was performed before conducting the t-test. The level of significance was set at 5% ($\alpha = 0.05$).

Summary of Hypothesis Testing

This section examines the differences in bankers' perceptions towards Artificial Intelligence (AI) across bank ownership, namely public sector banks and private sector banks. An Independent Sample t-test was employed to identify whether significant differences exist in the mean perceptions of bankers belonging to the two ownership categories (public and Private sector bank) with respect to various AI dimensions.

The testing of hypotheses was carried out at a 5 per cent level of significance ($\alpha = 0.05$), which is widely accepted in social science research. The Independent Sample t-test is considered appropriate as it compares the mean scores of two independent groups—public sector bankers and private sector bankers—on multiple AI-related dimensions.

Table 3: Summary of Hypothesis Testing Results

AI Dimension	p-value	Decision
Customer Service	0.367	Not Significant
Loan Approval & Credit Scoring	0.705	Not Significant
Fraud Detection	0.096	Not Significant
Operational Efficiency	0.025	Significant
Compliance & Risk Management	0.258	Not Significant

The findings indicate that Operational Efficiency is the only AI dimension where perceptions differ significantly between public and private sector bankers, while perceptions regarding customer service, loan approval, fraud detection, and compliance and risk management are statistically similar across ownership types.

Conclusion

The Independent Samples t-test was conducted to examine whether bankers' perceptions of Artificial Intelligence (AI) differ significantly between public sector and private sector banks across four key dimensions: Customer Service, Credit Scoring and Loan Approval, Fraud Detection, and Operational Efficiency. The results reveal that the null hypothesis is **partially rejected**, as a statistically significant difference exists only for the **Operational Efficiency** dimension, whereas no significant differences are observed for the remaining three dimensions.

The absence of significant differences in Customer Service, Credit Scoring and Loan Approval, and Fraud Detection suggests that bankers from both public and private sector banks share similar perceptions regarding the effectiveness and benefits of AI in these functional areas. This finding indicates that AI technologies have become widely accepted across the banking industry irrespective of ownership structure. The increasing adoption of AI-driven chatbots, automated customer support, intelligent credit assessment systems, fraud monitoring tools, and regulatory compliance solutions has created a common technological environment for both sectors. Moreover, guidelines issued by regulatory authorities, rising customer expectations for digital banking services, and the growing emphasis on financial security have contributed to a standardized approach toward AI implementation across the industry.

However, a significant difference is found in the dimension of Operational Efficiency, indicating that bankers' perceptions vary based on bank ownership. Public sector bank employees demonstrate a relatively stronger perception of AI's contribution to improving operational efficiency compared to their counterparts in private sector banks. This difference may be attributed to the extensive implementation of AI-enabled process automation, centralized banking systems, digital workflow management, and government-led digital transformation initiatives in public sector banks. AI has helped these institutions streamline routine operations, reduce processing time, improve resource utilization, minimize manual errors, and enhance service delivery across large branch networks. Consequently, public sector bankers may perceive greater operational benefits from AI adoption.

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