

GEORGETOWN
UNIVERSITY

**Psaros Center for Financial
Markets and Policy**

McDONOUGH SCHOOL *of* BUSINESS

Revolution in Data: Artificial Intelligence in Financial Services

Marshall Lux
Visiting Fellow

Michelle Chen
Research Assistant

*Georgetown Psaros Center for Financial
Markets and Policy*

McDonough School of Business

September 2024

Executive Summary

Artificial Intelligence (AI) is poised to transform the financial services industry over time, promising unprecedented efficiency, accuracy, and innovation. Leading financial institutions are working to take a significant step forward by integrating AI to enhance their operations and services. In July 2024, JPMorgan-Chase rolled out the LLM Suite AI platform to over 50,000 asset and wealth management employees¹, while Morgan Stanley launched AI @ Morgan Stanley Debrief, a second-generation addition to their AI toolbox that summarizes video meetings and generates follow-up ideas.² BNP Paribas inked a partnership with model builder Mistral AI³, TD Bank announced its own collaboration with Cohere⁴, and there are a multitude of other prominent examples. Against this backdrop, this white paper investigates how we can harness the power of emerging technologies for greater productivity across the financial services industry while also addressing the risks and challenges they present, from data quality and biases to privacy concerns.

AI-powered technologies can be understood through a framework based on their goals and targets. The first group focuses on labor replacement and effacement, where AI automates or copilots tasks traditionally handled by workers, such as KYC and AML in financial services. The second category involves software budgets, where AI platforms shift interfaces to intelligent command lines, rethinking how software operates. Finally, embedded AI integrates its AI capabilities directly into existing processes—often without its own user interface—to optimize functions like stock exchange matching engines, making them more efficient and resilient against high-frequency trading strategies.

Companies can explore where they generate significant amounts of data to discover ways in which AI can make a difference. By automating labor-intensive, repetitive tasks, AI can make many jobs exponentially more effective and efficient, like basic call center operations, routine risk management, or credit and insurance underwriting. For other roles, it can redirect additional time to higher-value, strategic activities like client relationship management or new research. These models may also democratize access to high-quality information, enabling faster, more informed decision-making by integrating and analyzing data from various aspects of financial services—such as investment, credit, and insurance—as well as unique datasets representing different facets of a client’s life such as transaction history and banking information. This shift may not only streamline operations but also improve areas like research and credit underwriting, creating better financial outcomes.

AI applications span various sub-sectors within the financial industry, whether it be payments, wealth advisory, or trading/hedge funds. In payments, AI enhances transaction security and fraud detection, ensuring safer financial transactions. Wealth advisory services may benefit from AI-driven personalized investment strategies and risk assessments, offering tailored

¹ Janakiram MSV, “JPMorgan Chase Leads AI Revolution in Finance With Launch of LLM Suite,” *Forbes*, July 30, 2024, [\[LINK\]](#).

² “AI @ Morgan Stanley Debrief Launch,” *Morgan Stanley*, June 26, 2024, [\[LINK\]](#).

³ “BNP Paribas and Mistral AI Sign a Partnership Agreement Covering All Mistral AI Models,” *BNP Paribas*, [\[LINK\]](#).

⁴ “TD Bank and Cohere Enter Large Language Model Partnership,” *The Logic*, [\[LINK\]](#).

financial advice to clients. Hedge funds and traders can leverage AI for sophisticated market analysis and automated trading strategies, improving investment returns.

While AI holds immense potential for financial services, its integration must be approached carefully in consideration of several key challenges. Ensuring high-quality data is critical as AI systems trained on biased or inaccurate information can perpetuate those issues. Data privacy is another major concern as firms must protect client information. Much of the work with AI remains internal and largely invisible to consumers; however, as these solutions begin to migrate toward direct-to-consumer interfaces, they will need to be carefully tailored to meet customer needs. Currently, the cost to provide high-quality financial advice and services is prohibitive for many consumers, but AI has the potential to lower these fees, making personalized financial advising more accessible. Offering affordable, AI-driven advice could open up financial planning and investment opportunities to a broader audience, democratizing access to services traditionally reserved for higher-income clients. While self-service AI tools are still in early development and have yet to see widespread market adoption, their potential is promising.

Lastly, regulatory compliance may pose a significant challenge, as firms must navigate evolving laws and standards while integrating AI. Striking the right balance between fostering innovation and maintaining rigorous compliance is critical to avoiding hefty penalties, reputational damage, and unintended biases. Establishing robust governance frameworks may be crucial to address these challenges and ensure ethical use, data privacy, and regulatory compliance, thereby capturing AI's full potential while protecting stakeholders' interests.

Key Terms

Artificial Intelligence (AI) refers to the simulation of human intelligence through machines designed to think and act like humans. These systems follow programmed rules and are capable of learning, problem solving, planning, and understanding natural languages. AI applications in financial services can be traced as far back as the 1950s to rudimentary fraud detection, credit scoring, and risk assessment.⁵

Traditionally, AI has focused on predictive analysis, classification, and performing specific tasks intelligently. For years, this type of machine learning dominated the AI landscape, but a new generation, known as generative AI (gen-AI), has captured the world's attention.⁶ Traditional AI analyzes data and reports findings. However, gen-AI goes beyond recognizing patterns; it creates new ones.⁷ Advanced Large Language Models (LLMs), like ChatGPT (Generative Pre-trained Transformer), excel at understanding text and generating entirely new, human-like outputs, from lists of ideas to coherent narratives and even art.⁸ This capability carries significant implications for the business world, allowing machines to perform tasks

⁵ Bonnie G. Buchanan, "Artificial Intelligence in Finance," *The Alan Turing Institute*, April 2019, [\[LINK\]](#).

⁶ "How Artificial Intelligence Is Transforming Payments," *Wired*, sponsored by JPMorgan, [\[LINK\]](#).

⁷ Bernard Marr, "The Difference Between Generative AI and Traditional AI: An Easy Explanation for Anyone," *Forbes*, July 24, 2023, [\[LINK\]](#).

⁸ "ChatGPT," *OpenAI*, [\[LINK\]](#).

previously thought to be exclusive to humans at an unprecedented pace, whether that be drafting hundreds of emails or summarizing research into an organized report within minutes.

Generative AI has the potential to add \$2.6 trillion to \$4.4 trillion in annual value across 63 use cases, with the banking sector alone seeing an opportunity worth \$200 billion to \$340 billion, primarily through increased productivity across corporate and retail segments.⁹ Stanford's 2024 Artificial Intelligence Index Report reveals that global corporate AI investments have multiplied thirteenfold over the past decade, totaling over \$760 billion in the last three years (2021-2023), while private investment in gen-AI has grown eight times in the past year.¹⁰ This surge of investment has led to a proliferation of gen-AI startups like Zest AI¹¹, which leverages the technology for credit underwriting, Ocrolos¹², which automates Human-in-the-Loop financial document analysis, and Humanlike¹³, which uses AI to manage accounts payable and receivable 80% more efficiently than traditional Business Process Outsourcing (BPO). Given the abundance of new and available options, companies are exploring the potential of AI-driven services, from financial planning to real-time risk assessment, and also off-the-shelf products to in-house solutions. In order to enhance their workflows, organizations are looking to invest in technologies that can either improve employee performance or replace others altogether.

AI in Financial Services: Key Advantages

Productivity & Cost Effectiveness:

AI's computing power has increased, and the costs associated with its implementation have begun to decrease significantly, making it more attractive and accessible for adoption across the financial services industry. It can drive gains in productivity and efficiency by automating labor-intensive processes, allowing firms to reallocate working capital and human resources to higher-value activities. AI can breathe new life into legacy systems by integrating advanced analytics and automation capabilities. Embedded AI systems are further optimizing processes by integrating directly into existing infrastructure without a complete overhaul. By transforming traditional workflows, AI can make operations more intuitive and enhance overall performance, eliminating inefficiencies across business lines while significantly reducing the need for manual intervention.

- 1. Task Automation:** Many firms have relied on Business Process Outsourcing (BPO) to cut costs and free up time, moving labor-intensive roles like call center operations offshore or under the management of a third-party provider. Now, AI is targeting these same tasks, aiming to automate, copilot, and eventually replace them entirely. It is reshaping the traditional BPO model and driving a shift towards greater automation in core business processes, attractively offering significant cost savings by further reducing the need for expensive human labor.

⁹ "Capturing the Full Value of Generative AI in Banking," *McKinsey & Company*, December 5, 2023, [\[LINK\]](#).

¹⁰ Ray Perrault, Jack Clark, et al., *AI Index Report 2024*, Stanford University, [\[LINK\]](#).

¹¹ Zest AI, [\[LINK\]](#).

¹² Ocrolos, [\[LINK\]](#).

¹³ Humanlike, [\[LINK\]](#).

In call centers, chatbots and virtual assistants are taking over routine inquiries, such as balance checks and call routing, reducing the need for certain jobs. This shift allows companies to hire fewer workers, enabling them to focus on more complex tasks that require human engagement. Platforms like Observe.AI capture and transcribe call interactions, using large language models (LLMs) to interpret customer sentiments and compliance issues while providing real-time guidance and post-call feedback to agents.¹⁴ The scale of the problem is significant — for example, many banks flag millions of calls each year related to compliance issues like unfair lending, but, as Swapnil Jain, CEO and co-founder of Observe.AI, notes, they often lack the manpower to fully investigate them, leading to fines and reputational damage. Observe.AI automates these reviews at scale, helping financial institutions maximize their call centers by improving agent performance and customer satisfaction, leading to cost reductions of 10-20% and revenue growth of 12-15%, all while enhancing compliance and optimizing operations. The integration of AI into call centers is expected to save up to \$240 billion in labor costs by 2031 as AI takes on an increasing share of customer interactions, projected to rise from 2% in 2022 to over 30% by 2031.¹⁵

Beyond call centers, firms are decomposing job descriptions into individual tasks to identify those with potential for automation, revealing opportunities in equity research, junior-level investment banking work, contract management, and more. However, Matthew Kropp, CTO of BCG¹⁶ X, cautions that AI adoption should be a gradual and carefully managed process, not just a simple replacement of all human staff. He emphasizes that while AI has the potential to greatly enhance operational efficiency and service delivery, the path to widespread adoption will require time, fine-tuning, and continued re-evaluation.

- 2. *Workforce Augmentation:*** AI is not just about automating jobs; it also provides new tools that allow humans to do their jobs better, augmenting their capabilities. With the shift to command-line interfaces powered by gen-AI, employees can now communicate with systems through natural language commands, making advanced technology more accessible than ever. For example, no-code/low-code platforms can enable non-technical staff with minimal programming knowledge to create applications and automate workflows through user-friendly, visual interfaces.¹⁷ These platforms, combined with AI co-pilot tools for technical teams, can boost productivity across the board, allowing employees to offload busywork and focus on more complex, high-value projects. Freeing up time and resources, AI empowers teams and individuals to contribute more strategically, drive innovation, and maximize their value-add across the organization.

¹⁴ Observe.AI, [\[LINK\]](#). Marshall Lux is an advisor to this company.

¹⁵ “AI in call centres could save businesses \$80bn,” *TechMonitor*, September 1, 2022, [\[LINK\]](#).

¹⁶ Marshall Lux is an advisor to this company.

¹⁷ “What Is Low-Code/No-Code?,” *SAP*, [\[LINK\]](#).

A new day-to-day for employees will emerge — data can be processed faster, decisions can be made faster, and collaboration within and across teams can become more efficient. Time-consuming tasks like generating follow-up client emails, drafting pitchbooks, and summarizing large volumes of company reports to due diligence can be done at unprecedented speed.

For engineering, data science, and IT departments of financial firms, AI can generate code, assist in debugging, clean data, and create preliminary models. Despite the significant potential, like a nearly 55% productivity boost using tools like GitHub Copilot, adoption remains a challenge across the board.¹⁸ Many developers find that these tools disrupt their workflow with irrelevant or incorrect suggestions, known as “hallucinations,” or add more work through additional debugging.¹⁹ However, others appreciate the efficiency and support for repetitive tasks, finding the tools helpful for speeding up routine coding. This mixed response highlights the need for a more deliberate approach to better align AI tools with team workflows.

Most companies are still in the early stages of digital transformation, exploring off-the-shelf solutions for common needs like content generation, while opting for in-house development for proprietary or niche applications, like the pitchbook creation and client advisory. Introducing a system is one step; however, the key to realizing AI’s maximum potential lies in adjusting workflows, relationships, and interfaces, making a cultural shift over time.

Massive Data Analytics:

AI is data-hungry. It’s a non-specialist tool that’s capable of ingesting and analyzing extensive, complex datasets generated across various disciplines, also known as massive data.²⁰ AI uses advanced algorithms to process massive data by identifying trends, correlations, and anomalies often overlooked by the human eye. This synergistic relationship enables real-time analysis and predictive insights, leading to more informed decisions, enhanced efficiency, and competitive advantage within the industry.

This ability to ingest vast amounts of data can allow organizations to process and analyze information on a scale previously unattainable, opening up new possibilities for democratizing access to financial insights. For hedge funds, by processing data from global markets, economic indicators, and alternative data sets, AI can enable funds of all sizes to make more informed decisions. This democratization allows smaller funds to compete with larger ones, as they can now harness the same depth of analysis to refine investment strategies and uncover opportunities that were previously out of reach.²¹

Historically, data was siloed and accessible mainly to specialists within narrow verticals. Today, increasing specialization, growing data volumes, and the need for cross-functional

¹⁸ Sida Peng, Eirini Kalliamvakou, Peter Cihon, and Mert Demirel, “The Impact of AI on Developer Productivity: Evidence from GitHub Copilot,” [\[LINK\]](#).

¹⁹ Mohit Pandey, “Why Developers Are Ditching GitHub Copilot,” *Analytics India Magazine*, August 12, 2024, [\[LINK\]](#).

²⁰ “What is Big Data?,” *Oracle*, [\[LINK\]](#).

²¹ “Unlocking the Power of Data: AI for Data Democratization,” *Google Cloud Community*, November 16, 2023, [\[LINK\]](#).

decision-making are driving change. AI-driven massive data analytics overcomes these barriers by synthesizing vast, multidisciplinary datasets and making them accessible to a wider audience.²² This democratization allows non-specialists to benefit from AI's ability to process and integrate complex information, generating insights that bridge multiple domains. However, the true value of massive data analytics is realized when these insights are aligned with the strategic goals and needs of stakeholders, turning raw data into actionable intelligence.

Expanding Access and Equitable Opportunities:

Access to financial services—like savings accounts, payments, credit, and insurance—is essential for economic empowerment and opportunity. Yet, 1.4 billion adults worldwide remain excluded from formal financial systems, with low-income individuals, marginalized communities, and developing countries disproportionately affected.²³ Exclusion from financial services has far reaching consequences as it traps individuals in a cycle where they lack the tools to build credit, manage risks, or invest in opportunities, making financial setbacks harder to overcome and stability hard to achieve.

However, AI is emerging as a force for transformative change. As Kanwaljit Singh, Senior Program Officer of the Gates Foundation, describes it, AI-driven technologies are “in many ways the modern-day equivalent of the roads and bridges that helped reshape economies in the 19th century.”²⁴ By connecting people, facilitating cash flow, and enabling information access, AI can begin bridging the gap between traditional financial institutions and underserved communities. Utilizing alternative data to power innovative lending platforms, AI may not only be transforming financial services but also redefining what financial inclusion looks like on a larger, global scale.

For example, Pagaya says that they've built an AI network that can create new lending opportunities by analyzing alternative data sources and dynamically assessing credit risk in real-time.²⁵ This would allow lenders to offer financial products and services, like loans and credit cards, to individuals who may have been overlooked by traditional models. Similarly, OneMain Financial seeks to leverage AI to provide tailored credit and loan options for individuals with limited or subprime credit histories, without any impact on their traditional credit score during the application process.²⁶ With over 1400 branches across the United States, OneMain combines digital convenience with in-person support, in hopes of creating a more personalized lending experience. Tazama, an open-source fraud monitoring tool housed at the Linux Foundation, plays a critical role in protecting new and vulnerable financial system participants by detecting and preventing scams.²⁷ This is particularly important because these new entrants, who may have limited resources, are more susceptible to significant setbacks if defrauded. By safeguarding these users, Tazama helps build trust in the system, encouraging

²²C. Dessimoz, P.D. Thomas, “AI and the democratization of knowledge,” *Sci Data*, 2024, [\[LINK\]](#).

²³ “Financial Inclusion,” *World Bank Group*, [\[LINK\]](#).

²⁴ “Inclusive Financial Systems,” *Bill & Melinda Gates Foundation*, [\[LINK\]](#).

²⁵ Pagaya, [\[LINK\]](#).

²⁶ One Main Financial, [\[LINK\]](#).

²⁷ Tazama, [\[LINK\]](#).

continued participation and growth. Through these new, AI-powered offerings, financial services are working to connect more people to opportunities that will support their financial growth and stability.

Specific Use Cases & Applications

The adoption of AI in financial services has evolved rapidly, but many of its most transformative applications are still emerging or have yet to be discovered. Sri Ramanathan, Chief Solutions Officer at Mphasis — a leading IT transformation company partnered with Kore.ai to enhance customer and employee experiences using AI — notes that while most AI applications today remain internally focused and production-level (apart from chatbots), the industry’s imagination has been sparked, leading to new use cases being explored.²⁸ However, many of these applications are still in development, requiring further iteration and adaptation to fully realize their value. As organizations recognize AI’s broader potential, they are looking beyond routine automation toward more strategic applications, such as integrating AI into decision-making frameworks, enhancing customer experiences, and uncovering novel market insights. Below, we explore some specific use cases in these areas.

Research:

AI can drive advancements in research across wealth management, buy-side, and sell-side operations by automating complex data analysis, uncovering insights, and optimizing investment strategies. In wealth management, AI tools like natural language processing (NLP) and machine learning can analyze client portfolios, behavior patterns, and financial history in real-time to deliver hyper-personalized advice, potentially catching preferences overlooked by the human eye. On the buy-side, hedge funds and asset managers use AI-driven algorithms to scan alternative data sources like satellite imagery, news sentiment, and social media in an attempt to predict market movements and inform high-frequency trading strategies. For example, firms like Two Sigma and Renaissance Technologies (among many others) rely heavily on their in-house AI models to process massive datasets and identify hidden correlations in the market, giving them a competitive edge.²⁹

On the sell-side, AI can enhance junior level work in areas like equity research and financial modeling. By automating the analysis of earnings reports and calls, economic indicators, and market trends, AI systems can generate detailed research reports and predictive models more quickly and accurately than traditional methods.³⁰ AI-driven sentiment analysis tools also help identify shifts in market sentiment, giving analysts a timely edge in their recommendations to clients. Across the board, AI’s research applications are enabling financial institutions to process vast amounts of information in ways that were previously impossible, empowering analysts to make more informed, data-driven decisions and firms to develop a critical advantage in a competitive market.

²⁸ “Mphasis AI Partnership,” *Mphasis*, May 2023, [\[LINK\]](#). Marshall Lux is an advisor to this company.

²⁹ Kristy Westgard, “Two Sigma Hires Google Scientist Mike Schuster for AI Expansion,” *Bloomberg*, April 16, 2018, [\[LINK\]](#).

³⁰ “AI & digital transformation in the sell-side,” *Bloomberg Professional Services*, June 12, 2024, [\[LINK\]](#).

Risk Management:

AI is becoming integral to risk management due to its ability to swiftly detect, analyze, and respond to potential threats. By automating the evaluation of massive datasets, AI-driven tools allow auditors to scrutinize entire datasets, ensuring even minor transactions are thoroughly reviewed. As a result, AI not only improves the accuracy of risk assessments but also reduces operational costs and response times, leading to more efficient and effective risk management.

For example, Bayesian networks are increasingly used to model systemic risks, helping financial institutions understand how factors like asset prices and interest rates influence each other, which makes them crucial for dynamic assessments and proactive decision making.³¹ These networks can be particularly beneficial in stress testing, where they can simulate extreme events, like widespread defaults, and assess how interconnected variables could cause cascading failures. Banks and asset managers can also leverage Bayesian models to analyze complex risk scenarios and forecast the impact of various factors on loan portfolios. On the behavioral side, User and Entity Behavior Analytics (UEBA) looks for patterns and deviations in user activity to identify potential security breaches that often bypass traditional systems. Unlike rigid, rule-based methods, UEBA focuses on behavior, allowing it to identify insider threats, vulnerabilities, and sophisticated attacks with more accuracy.³² This reduces false positives which helps institutions respond more quickly to emerging threats.

Furthermore, WorkFusion has built its AI models into highly skilled digital employees capable of working alongside real-world colleagues to perform specialized tasks.³³ These digital workers, like “Tara” for sanctions screening and “Evelyn” for adverse media checks, are fully integrated into risk management teams and marketed as virtual employees with names, faces, and specific roles.³⁴ This approach enhances user adoption by making the transition to AI smoother, allowing teams to feel like they’re still working with an individual while benefiting from the consistency and efficiency of automation. WorkFusion’s digital worker strategy has been particularly effective in helping resource-constrained regional banks, which face high turnover and overwhelming workloads in these areas. With limited staffing and increasing demands, these institutions have embraced digital workers to handle repetitive tasks more efficiently and at scale. By providing 24/7 coverage, these AI-driven employees help reduce operational costs, improve risk management outcomes, and enhance overall efficiency.

Transaction Monitoring & Anti-Money Laundering (AML):

In particular, AI is playing a transformative role in transaction monitoring to prevent anti-money laundering (AML) activities, including human trafficking. Peter Reynolds, CEO of ThetaRay, explains that “AI has the ability to scan massive transaction volumes, identify trends in your normal behavior, then flag what’s not,” offering a significant upgrade over legacy rule-based systems that rely on static criteria like “reject all transactions from [specific

³¹ Lupe S.H. Chan et al., “A moving-window bayesian network model for assessing systemic risk in financial markets,” *PloS one*, January 20, 2023, [\[LINK\]](#).

³² “What is user and entity behavior analytics (UEBA)?,” *IBM*, [\[LINK\]](#).

³³ Workfusion, [\[LINK\]](#). Marshall Lux is an advisor to this company.

³⁴ “What is an AI Digital Worker?,” *WorkFusion*, [\[LINK\]](#).

individual].” ThetaRay’s comprehensive, AI-driven transaction monitoring platform delivers over 80% detection-worthy results compared to the industry benchmark of 5%, earning them the Best Use of Data award for Human Trafficking and Modern Slavery Detection with Santander UK.^{35,36}

The impact of AI in this area is particularly significant given that banks currently spend about twenty percent of their expenses on combating financial crime.³⁷ Compliance isn’t a choice for these institutions; it’s a costly necessity driven by regulations and the need to manage high-risk transactions. Traditional rule-based systems lead to overwhelming volumes of false positives, requiring substantial human resources to review. By incorporating AI, banks can drastically reduce these inefficiencies, enabling them to focus resources on actual threats and save on compliance costs while maintaining competitive service in high-risk corridors. As financial crime grows more sophisticated in the digital world, AI’s ability to identify complex patterns across accounts and networks provides a critical advantage, helping banks balance the demands of growth, compliance, and security in an increasingly competitive landscape.

Credit and Insurance Underwriting:

AI is increasingly being leveraged in insurance underwriting to achieve three main objectives.³⁸ First, insurers would like to improve customer experiences by automating routine tasks using generative AI virtual assistants. For example, AI can assist clients with initial claims inquiries, provide real-time policy information, and guide them through basic application processes. Second, AI can enhance productivity by automating the more complex aspects of underwriting and claims management. This could include using deep learning models to analyze uploaded photos of auto or home damage and compare them against historical data to generate faster, more accurate assessments. Third, AI can play a critical role in compliance management by automating monitoring processes, detecting fraud, and generating training content, helping firms stay aligned with regulatory requirements. Altogether, these applications have the potential to streamline operations and reduce the claims lifecycle, while offering clients more personalized and efficient service.

In credit underwriting, AI-driven models are transforming how firms assess credit risk by incorporating nontraditional data sources beyond conventional financial metrics. For instance, AI can analyze alternative data like online shopping behavior, utility payments, rent payments, and even social media activity to evaluate creditworthiness.³⁹ These additional data points provide a more comprehensive and personalized view of a borrower’s financial behavior, potentially reducing default rates and improving approval processes for both firms and clients. By leveraging these alternative metrics, AI can expand access to financial opportunities, enabling more inclusive lending practices for individuals who may have limited or no credit history.

³⁵ ThetaRay, [\[LINK\]](#). Marshall Lux is an advisor to this company.

³⁶ “Winners 2024,” *Digital Transformation Awards*, [\[LINK\]](#).

³⁷ Conversation with Peter Reynolds, CEO of ThetaRay, August 2024

³⁸ Chris Raimondo, Vidhya Sekhar, “How insurers can leverage the power of generative AI,” *EY*, August 28, 2023, [\[LINK\]](#).

³⁹ Pavithra Ravi, “AI Credit Scoring: The Future of Credit Risk Assessment,” *LatentView*, July 10, 2024, [\[LINK\]](#).

However, a key challenge lies in the “black box” nature of these models, where the decision-making process lacks transparency.⁴⁰ The CFPB has issued guidance requiring lenders to comply with the Equal Credit Opportunity Act (ECOA) by providing clear reasons for credit denials, even when using complex AI algorithms.⁴¹ Lenders cannot bypass this responsibility by claiming the models are too complex to explain. This effort is part of a broader push to ensure transparency and fairness in AI-driven credit decisions.

To navigate these challenges, banks are increasingly adopting supervised machine learning models—a subcategory of AI that uses labeled training data to create audit trails and identify the variables influencing credit decisions.⁴² This approach ensures compliance with legal explainability requirements. Many financial institutions are also developing “open-box” models that utilize clear, traceable logic, such as decision trees, which can be reviewed by auditors and regulators to enhance transparency. By making the decision-making process more interpretable, these models help ensure that AI-driven credit assessments remain both effective and compliant with regulatory standards. These applications collectively hold the potential to streamline operations, enhance productivity, and generate cost savings while maintaining compliance and improving customer outcomes

AI in Financial Services: Key Risks

Low Quality Data, Low Quality Output:

The effectiveness of an AI product depends primarily on two factors: the quality and scope of the data it has access to, and the sophistication of the model it utilizes. However, many datasets remain fragmented and unharmonized, often littered with underlying biases, which can limit AI’s full potential. If AI models, including the most intelligent machine and deep learning models, rely on biased, incomplete, or erroneous data, their outputs will reflect those flaws. Foundation models, like GPT and BERT⁴³, are trained to generalize across many tasks based on extremely broad datasets, which makes them powerful but especially prone to inheriting biases from the data they learn from. Firms have attempted to combat this challenge by building their own in-house systems, but these solutions remain susceptible to the same flaws.

In financial services, the consequences of bias in models can perpetuate unfair credit scoring, discriminatory lending practices, or imbalanced risk assessments. For instance, if an AI model used for credit scoring is trained on biased data, it may replicate or even exacerbate discriminatory practices. In algorithmic trading, the historical data used to train models may not always be reflective of future market conditions, leading to erroneous predictions and flawed strategies that can put portfolios under risk. AI models can also generate “hallucinations”—inaccurate or fabricated outputs that appear credible but are misleading—further complicating trust and decision-making in critical financial processes. Thus, addressing bias requires not only

⁴⁰ “How Artificial Intelligence Is Transforming Payments.”

⁴¹ “CFPB Acts to Protect the Public from Black-Box Credit Models Using Complex Algorithms,” *Consumer Financial Protection Bureau Newsroom*, May 26, 2022, [\[LINK\]](#).

⁴² Yizhu Wang, “Banks, credit unions testing AI models for underwriting in credit cycle,” October 10, 2023, [\[LINK\]](#).

⁴³ Jacob Devlin, Ming-Wei Chang, Kenton Lee, Kristina Toutanova, “BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding,” *ACL Anthology*, May 24, 2019, [\[LINK\]](#).

cleansing and balancing training data but also implementing rigorous testing and monitoring processes. Without high-quality data, even the most advanced AI models can produce misleading insights, ultimately eroding trust in AI-driven decisions and potentially leading to financial losses or regulatory penalties.

Regulatory Compliance:

The regulatory environment for AI in financial services is increasingly complex, with new rules emerging to address transparency, accountability, and fairness. The EU's General Data Protection Regulation (GDPR) and the AI Act, which was voted on in May 2024 and takes effect in August 2024 as the first comprehensive legal framework on AI, impose strict requirements on how AI systems handle data and make decisions in the continent.⁴⁴ Financial institutions face the challenge of navigating everchanging guidelines and varying standards across regions, especially since many existing frameworks were not designed with AI in mind. For example, AI systems must comply with anti-money laundering (AML) and know-your-customer (KYC) regulations, which demand transparency and explainability—features that complex models like deep learning often struggle to provide.

Regulators are beginning to scrutinize how AI impacts market stability, adding another layer of compliance. For instance, the CFPB has issued guidance on using AI in credit decisions, highlighting the need for specific, accurate explanations for credit denials.⁴⁵ As previously discussed, financial institutions will also need to account for potential bias within AI models, which can arise from poor data inputs or flawed algorithmic design, leading to discriminatory outcomes. Thus, ensuring that AI-driven models remain transparent, fair, and compliant may require firms to maintain robust audit trails and documentation to satisfy regulatory scrutiny. Failure to adhere can lead to fines, legal battles, and reputational damage, making regulatory compliance one of the most significant challenges for the industry.

Data Privacy:

Beyond compliance issues, AI systems rely heavily on vast amounts of sensitive customer data, raising significant privacy concerns. Customers are increasingly wary of how their information is being used, especially as AI can combine data from multiple sources to create detailed profiles that go beyond what they've knowingly shared. Compliance with regulations like GDPR and California Consumer Privacy Act (CCPA) is essential yet complex, and the risk of unintentional data leaks has also made institutions wary of using public third-party AI chatbots.⁴⁶ Firms like JPMorgan Chase, Wells Fargo, and Goldman Sachs have banned the use of ChatGPT for business communication while they develop and refine in-house AI solutions to safeguard sensitive information.⁴⁷ As AI continues to evolve, financial institutions must find a balance between its benefits and potential risks to data security, ensuring that both client privacy concerns and regulatory requirements are addressed. By prioritizing

⁴⁴ "AI Act," *European Commission*, [\[LINK\]](#).

⁴⁵ "CFPB Acts to Protect the Public from Black-Box Credit Models Using Complex Algorithms."

⁴⁶ Evisort, "Maintaining Data Privacy Compliance When Using AI in Finance," *Nasdaq*, May 3, 2023, [\[LINK\]](#).

⁴⁷ "Maintaining Data Privacy Compliance When Using AI in Finance."

secure data practices and transparency, firms can protect client trust while still driving innovation.

CFPB’s Stance on Regulation: Balancing Innovation and Protection

In a recent letter to Treasury Secretary Janet Yellen in response to a request for information on the uses, opportunities, and risks of AI in financial services, the Consumer Financial Protection Bureau (CFPB) has made it clear that AI in financial services must adhere to existing consumer protection laws, with no exceptions for new technologies. Their firm stance on AI regulations is rooted in concerns about transparency and fairness in financial services—particularly regarding the opacity of “black-box [AI] models” and their potential to discriminate and then deny credit without clear explanations. They write that technological innovation is best supported “when regulators ensure that all market participants adhere to the same set of rules and compete on a level playing field.”⁴⁸ However, the bureau has previously issued multiple statements encouraging innovation through flexible programs like regulatory sandboxes and No Action Letters, which allowed companies to test new financial products under relaxed oversight.^{49,50} The CFPB’s focus on protecting consumers is clear, but it may be beneficial to balance this with enough flexibility that allows emerging technologies to continue unlocking new benefits and opportunities.

While well-intentioned, overly prescriptive regulations may create unintended consequences, stifling innovation and access while imposing heavy compliance costs. This is particularly relevant since emerging AI technologies, like those used in transaction monitoring, play a crucial role in combating financial crimes tied to money laundering and human trafficking—areas the CFPB has strong reasons to prioritize. By enabling banks to more effectively identify suspicious activity, these new AI platforms strengthen efforts to combat crime and protect consumers in ways that outdated legacy systems cannot, underscoring the importance of encouraging innovation. Supporting these innovations would align directly with the bureau’s mission to promote financial security and consumer protection while keeping pace with evolving threats.

Moreover, although these rules are aimed at eliminating biases that favor incumbents, they may end up overwhelming smaller fintechs and startups, limiting their ability to compete. Larger incumbents, with more resources to navigate complex regulations, would only solidify their market dominance. Ironically, this would strengthen their position and reduce overall market diversity and innovation in the long run, countering the intended goal of competition on a level playing field.

Zooming out to the global stage, the CFPB’s stance could potentially hinder U.S. competitiveness as other regions adopt more flexible approaches to promote advancement. The EU’s AI Act, for example, uses a risk-based approach that tailors regulations to the potential

⁴⁸ “CFPB Comment on Request for Information on Uses, Opportunities, and Risks of Artificial Intelligence in the Financial Services Sector,” *Consumer Financial Protection Bureau Newsroom*, August 12, 2024, [\[LINK\]](#).

⁴⁹ “CFPB Office of Innovation proposes “disclosure sandbox” for companies to test new ways to inform consumers,” *Consumer Financial Protection Bureau Newsroom*, September 13, 2018, [\[LINK\]](#).

⁵⁰ “§ 1010.18 No Action Letter,” *Consumer Financial Protection Bureau*, [\[LINK\]](#).

impact of AI systems, allowing lower-risk applications more freedom while placing stricter controls on high-risk technologies.⁵¹ This balanced framework protects consumers while encouraging innovation by avoiding blanket restrictions that can overburden emerging technologies. On the other side of the world, Australia applies a voluntary AI Ethics Framework with flexible, non-binding guidelines, allowing companies to self-regulate and adapt the core principles⁵² to their specific needs as they develop and integrate AI technologies.⁵³ South Korea's Personal Information Protection Commission (PIPC) is promoting a similarly flexible, self-regulatory approach to AI that emphasizes voluntary compliance through industry-led guidelines, encouraging companies to take initiative in developing ethical AI practices while allowing adaptability as technology evolves.⁵⁴

The right approach to AI governance is still evolving, and the ideal balance between protecting consumers and fostering innovation has yet to be fully defined. To discover the best path forward, regulators may consider a “test-and-learn” mindset, remaining adaptable and open to adjusting policies based on outcomes and multi-perspective feedback. Flexibility would allow for continuous improvement, ensuring that regulations keep pace with technological advancements while maintaining fairness and promoting growth in the financial services sector.

Governance

The Role of Boards:

As AI transforms financial services, boards have a crucial role in guiding organizations through both opportunities and risks. Effective governance goes beyond technical knowledge and requires a strategic approach, similar to sustainability governance. Boards should ensure AI is integrated into decision-making rather than being siloed, aligning deployments with strategic goals while managing risks like bias, data privacy, and operational disruptions.⁵⁵ Rather than relying on single-issue directors to fill expertise gaps, boards may benefit from seeking opportunities to educate all members on the company's stakeholders, their priorities, and how value is created across the organization. A coordinated approach with management will be key—monitoring risks, setting metrics, and educating leadership on AI's implications. Directors don't need to be experts but should play their part in overseeing AI initiatives and embedding ethics, transparency, and accountability into governance. Regular evaluation and adjustments as technology and regulations evolve will be vital to staying ahead.

A Need for Education:

A significant challenge in AI governance is the need for, at least, fundamental AI literacy across all levels of an organization. It's not enough for just board members or senior management to be knowledgeable; the entire workforce must be educated on AI's potential and

⁵¹ Param Gopaldasamy, “Navigating the EU AI Act,” *Onetrust Blog*, November 13, 2023, [\[LINK\]](#).

⁵² AUS Eight Core Principles: Human and societal well-being, human-centered values, fairness, privacy protection and security, reliability and safety, transparency and explainability, contestability, accountability.

⁵³ “Australia's AI Ethics Principles,” *Australian Government, Department of Industry, Science and Resources*, [\[LINK\]](#).

⁵⁴ Yan Luo, Xuezi Dan, Laurie-Anne Grelier, “Overview of AI Regulatory Landscape in APAC,” *Global Policy Watch*, April 29, 2024, [\[LINK\]](#).

⁵⁵ Kurt Harrison, Laura Mantoura, Emily Meneer, “The Board's Role in AI and Sustainability,” *Harvard Law School Forum on Corporate Governance*, July 3, 2024, [\[LINK\]](#).

risks. Recognizing this need, S&P Global, in collaboration with Accenture, has launched a generative AI learning program aimed at equipping all 35,000 of its employees with the necessary skills to work effectively with AI.⁵⁶ This program is designed to enhance AI fluency across the organization, from front-line staff to executives, ensuring that everyone is prepared to leverage AI responsibly and effectively. Building this type of foundation prepares firms to continually adapt as the technology and its applications evolve rapidly, positioning themselves to lead the transformation in the industry.

Moreover, leadership may not need deep technical expertise, but they should be able to grasp how AI and sustainability add value, where AI should or shouldn't be deployed, and the risks of doing nothing. Leaders are responsible for ensuring the organization engages diverse stakeholder perspectives, considering both the opportunities and unintended consequences of AI deployment, like perpetuating bias or environmental impacts. This broad understanding is crucial for guiding strategic decisions and maintaining a long-term focus.

This trend is reflected in the strategies of major financial institutions. JPMorgan Chase, a recognized leader in AI among banks, employs over 2,000 AI and machine learning experts and has integrated more than 400 AI-driven use cases. During the bank's investor day in May, Mary Erdoes, head of JPMorgan's asset and wealth management division, emphasized that every new hire will receive AI training.⁵⁷ Similarly, Accenture is committing \$1 billion to a global AI education initiative aimed at upskilling its 700,000 employees, emphasizing not just AI tool usage but also the subject knowledge needed to craft effective prompts and achieve meaningful outputs. The program recognizes that while AI can assist with tasks, understanding the underlying concepts remains essential for guiding AI to deliver accurate and useful results.⁵⁸ These actions underscore the industry-wide acknowledgment that comprehensive education and skill development are crucial for staying competitive in an increasingly AI-driven financial sector.

Developing a Comprehensive Framework:

The implementation of AI in financial services demands a robust governance framework that goes beyond traditional risk management. This framework could include clear policies and guidelines on AI ethics, model validation, accountability, and continuous monitoring. A comprehensive governance framework ensures that AI systems are not only compliant with regulatory standards but also aligned with organizational values and stakeholder expectations. Key components include establishing cross-functional AI governance committees, setting ethical standards, implementing audit trails for AI decisions, and defining escalation protocols for AI-related incidents. This framework should be adaptable, allowing for revisions as AI technologies and regulatory landscapes evolve. By formalizing AI governance through structured frameworks, organizations can manage risks while fostering innovation and trust in AI-driven financial services.

⁵⁶ Rocio Fabbro, "A major finance firm is requiring its 35,000 employees to take a generative AI bootcamp," *Quartz*, August 6, 2024, [\[LINK\]](#).

⁵⁷ "JPMorgan: All New Employees Will Receive AI Training," *PYMTS*, May 20, 2024, [\[LINK\]](#).

⁵⁸ "\$1 Billion AI Education Platform Aims to Upgrade Employee Skills," *PYMTS*, March 7, 2024, [\[LINK\]](#).

Conclusion

This paper has explored the potentially transformative impact of AI in financial services, demonstrating how it can boost operational efficiency, streamline processes, and drive innovation across the industry. From automating tasks to enhancing decision-making through massive data analytics, AI offers significant potential to improve productivity while allowing firms to reallocate resources to higher-value activities. The diverse applications of AI, from fraud detection and risk management to research automation and personalized financial advisory, highlight the broad scope of innovation available across financial services. However, it's important to recognize that AI is a means to an end, not an end in itself. Fully unlocking AI's potential requires ongoing adaptation, collaboration across teams, and the continuous adjustment of workflows as the technology evolves. These opportunities are accompanied by risks such as biased data outputs, regulatory challenges, and data privacy concerns, all of which need careful management.

As AI becomes more integrated into financial services, effective governance will be essential. Leadership will play a key role in guiding AI adoption by ensuring that AI strategies align with organizational goals and managing risks such as bias and privacy issues. Furthermore, corporations should invest in retraining their workforce to use this technology in a compliant and ethical manner. A broad-based education approach, reaching all levels of the organization, may be critical for navigating AI's complexities and ensuring responsible use.

On the regulatory front, a balanced approach is critical. While effective regulation is crucial for safeguarding consumers and maintaining fairness, it must be carefully calibrated to avoid stifling the innovation that keeps the U.S. competitive on a global scale. Overly restrictive rules could slow down technological advancements, limiting the potential benefits AI can bring to financial services. At the same time, regulators should remain vigilant about the risks of AI-driven consolidation, where the scale benefits of AI solutions could disproportionately favor large institutions, potentially reducing competition and increasing industry concentration. Striking the right balance between fostering innovation and ensuring equitable market dynamics will be key to shaping a resilient and competitive financial ecosystem.

Acknowledgments

We are deeply grateful for the support of the Psaros Center for Financial Markets and Policy and the Georgetown University McDonough School of Business, especially Reena Aggarwal, David Vandivier, Maude Astra, Téa Anderson, and Andrew Devine. We also appreciate and would like to acknowledge the valuable insights provided by Matthew Kropp, Ian Sigalow, Peter Reynolds, Sri Ramanathan, Adam Famularo, Jessica Cassady, and Swapnil Jain. The purpose of this paper is to offer an overview of AI in the financial services industry, with the intention of the authors to follow up in the future with a more comprehensive analysis that includes profiles of major financial institutions developing their own AI tools. All errors are our own.