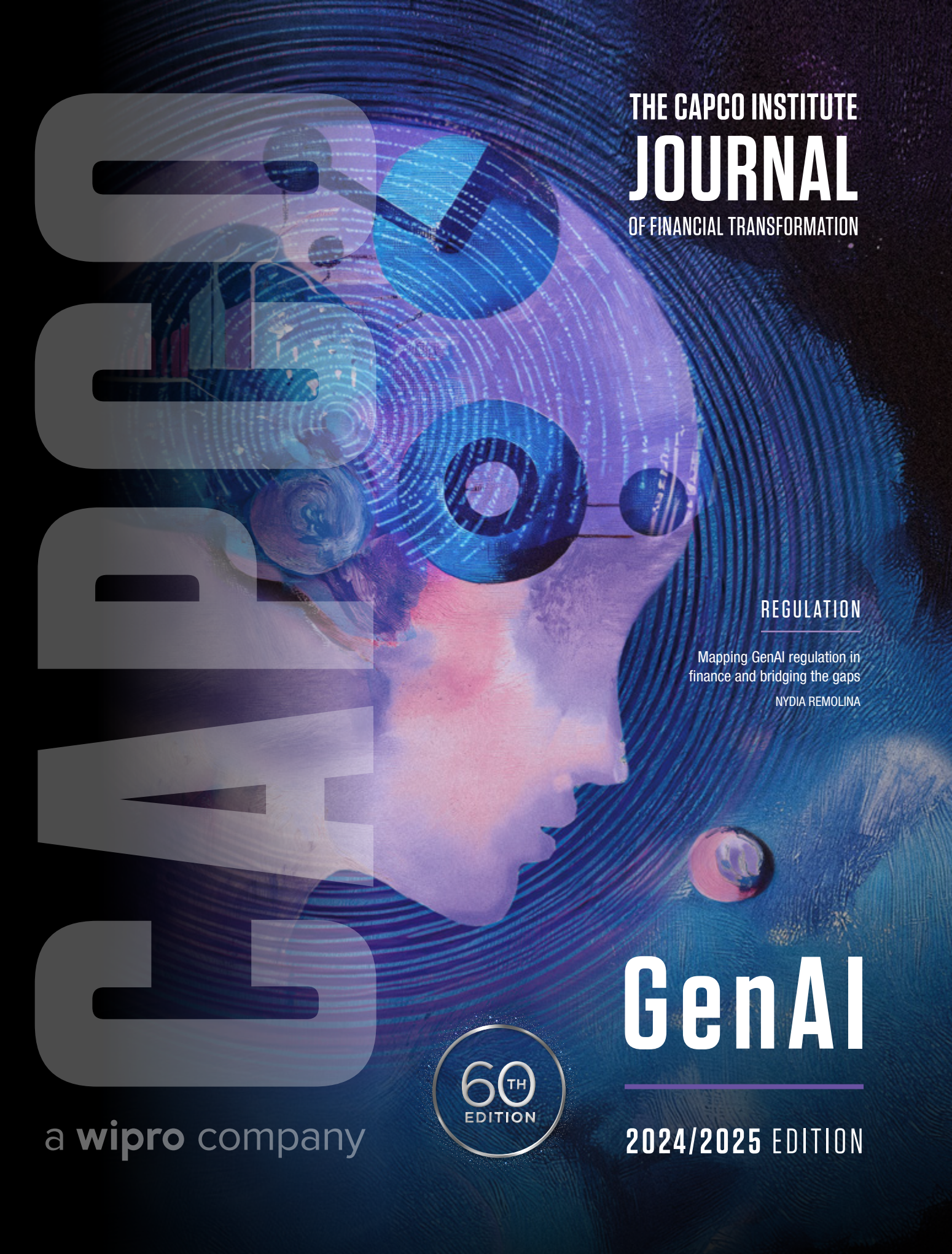

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60TH EDITION

REGULATION

Mapping GenAI regulation in finance and bridging the gaps

NYDIA REMOLINA

GenAI

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DEAR READER,

Welcome to our very special 60th edition of the Capco Journal of Financial Transformation.

The release of this milestone edition, focused on GenAI, reinforces Capco's enduring role in leading conversations at the cutting edge of innovation, and driving the trends shaping the financial services sector.

There is no doubt that GenAI is revolutionizing industries and rapidly accelerating innovation, with the potential to fundamentally reshape how we identify and capitalize on opportunities for transformation.

At Capco, we are embracing an AI infused future today, leveraging the power of GenAI to increase efficiency, innovation and speed to market while ensuring that this technology is used in a pragmatic, secure, and responsible way.

In this edition of the Capco Journal, we are excited to share the expert insights of distinguished contributors across academia and the financial services industry, in addition to drawing on the practical experiences from Capco's industry, consulting, and technology SMEs.

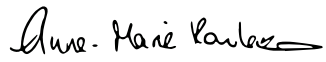
The authors in this edition offer fresh perspectives on the mindful use of GenAI and the implications of advanced GenAI on financial markets, in addition to providing practical and safe frameworks for boards and firms on how to approach GenAI governance.

The latest advancements in this rapidly evolving space demonstrate that the potential of GenAI goes beyond automating and augmenting tasks, to truly helping organizations redefine their business models, processes and workforce strategies. To unlock these benefits of GenAI, I believe that firms need a culture that encourages responsible experimentation and continuous learning across their organization, while assessing the impact of the potential benefits against a strategic approach and GenAI framework.

I am proud that Capco today remains committed to our culture of entrepreneurialism and innovation, harnessed in the foundation of our domain expertise across our global teams. I am proud that we remain committed to our mission to actively push boundaries, championing the ideas that are shaping the future of our industry, and making a genuine difference for our clients and customers – all while ensuring to lead with a strategy that puts sustained growth, integrity and security at the forefront of what we do.

I hope you'll find the articles in this edition both thought-provoking and valuable as you create your organization's GenAI strategy and future direction. As we navigate this journey together, now is the time to be bold, think big, and explore the possibilities.

My greatest thanks and appreciation to our contributors, readers, clients, and teams.



Annie Rowland, **Capco CEO**

MAPPING GenAI REGULATION IN FINANCE AND BRIDGING THE GAPS

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ABSTRACT

Generative artificial intelligence (GenAI) is rapidly reshaping the financial services sector by introducing new avenues for innovation, efficiency, and profitability. GenAI systems, including models like "generative adversarial networks" (GANs) and "transformers", can autonomously generate content such as synthetic data, trading strategies, and fraud detection insights, transforming traditional financial operations. However, these advancements come with new challenges, particularly in ensuring that GenAI is deployed ethically, securely, and in compliance with evolving regulatory frameworks. Current financial regulations, such as those governing anti-money laundering (AML), market integrity, financial consumer protection, among others, were originally designed for human-driven processes and do not fully address the complexities introduced by AI systems. While some jurisdictions, such as the E.U., Singapore, the U.S., and China, have launched AI regulatory initiatives, frameworks specifically tailored to the financial services industry are still a work in progress. This article seeks to provide an overview of these differing regulatory landscapes while raising awareness of the gaps that financial institutions and regulators should address to bridge in the responsible adoption of GenAI in the financial services sector.

1. INTRODUCTION

Generative artificial intelligence (GenAI) is rapidly transforming the financial services sector, ushering in new opportunities for innovation, efficiency, and profitability [Teresa (2023)]. GenAI refers to a class of artificial intelligence systems that can create new, original content or data by learning from existing data patterns. Using advanced models like "generative adversarial networks" (GANs) and "transformers", generative AI can produce text, images, audio, and other types of content that mimic human-like creativity and decision making [Foster (2022)]. In finance, GenAI is used for applications such as synthetic data generation, algorithmic trading strategies, fraud detection, and personalized financial services [Lee et al. (2024), Ramdurai and Adhithya (2023)]. Its ability to autonomously generate content or simulate scenarios sets it apart from traditional AI models that simply analyze or classify data. Hence, these technologies promise to reshape how financial institutions operate, making processes faster and more accurate while reducing costs [Wang (2023)]. However, with these advancements come new challenges, particularly in ensuring that GenAI systems are deployed ethically, securely, and within the bounds of regulatory frameworks that jurisdictions around the world have developed in the last few years to mitigate the risks of AI systems (predictive and generative) [for more on the differences between predictive AI and GenAI, see Hermann and Puntoni (2024), Harrington (2024)].

Despite the rapid uptake of artificial intelligence (AI) in finance, regulatory frameworks have struggled to keep pace [Roberts et al. (2024)]. Many existing regulations, such as those governing anti-money laundering (AML), data privacy, market integrity, financial stability, consumer protection, were designed for human-centered processes and may not fully address the complexities introduced by automated systems [Remolina (2024)]. Additionally, regulations specific to AI offer broad guidelines but often lack the granularity and a sector-specific approach needed for the unique applications of AI

in the financial services sector. Additionally, GenAI has just recently entered into the policy and regulatory conversation for financial regulators in some jurisdictions.

Indeed, Singapore, the E.U., the U.S., and China have each launched initiatives to regulate AI, and some of them to regulate GenAI. However, we are still at an early stage in these developments and none offer a framework tailored to the financial services industry with appropriate enforcement mechanisms to tackle the new risks created by GenAI. In finance, where trust, transparency, and accountability are paramount, these gaps pose real risks that threatens financial consumer protection and even the stability of the financial sector.

This article maps the characteristics of the current regulatory models for GenAI in finance, from some first-mover jurisdictions such as the U.S., the E.U., Singapore, and China, identifying where regulations succeed, where they fall short, and what gaps need to be addressed to ensure safe and ethical AI adoption. By analyzing various jurisdictions and their regulatory approaches, this article seeks to provide an overview of the regulatory landscape while raising awareness of the gaps that financial institutions and regulators should address to bridge the gaps in the responsible adoption of GenAI in the financial services sector.

2. THE STATE OF DEVELOPMENT AND IMPLEMENTATION OF GenAI IN FINANCE

GenAI is gaining significant traction in the financial services sector. Although GenAI's implementation is still at an experimental stage, it has the potential of transforming the way financial institutions operate and interact with both consumers and markets [Aldasoro et al. (2024)]. These AI systems, which can create data, content, and predictions autonomously, are being integrated into various areas such as algorithmic trading, fraud detection, customer service, and personalized financial planning. As the demand for real-time decision making and advanced predictive capabilities grows, GenAI is positioned to play a pivotal role in the future of finance.

For instance, financial institutions such as JP Morgan Chase is using GenAI to enhance fraud detection by creating synthetic transaction data. This synthetic data is fed into machine learning models to train the system without compromising real customer information, which enables better fraud detection and risk management [Trinh (2024)]. Likewise, Mastercard utilizes GenAI to combat fraud by developing AI-generated models that can simulate fraudulent activities and predict patterns of suspicious behavior. This initiative uses AI to create fraud prevention models. These models analyze transactional data in real-time, allowing Mastercard to reduce false positives in fraud detection, improve customer experience, and lower operational costs to the point that Mastercard has reportedly decreased false positives during the detection of fraudulent transactions against potentially compromised cards by up to 200%, and increased the speed of identifying merchants at risk from – or compromised by – fraudsters by 300% [Mastercard (2024)].

Ant Financial, one of the world's largest digital payment platforms, uses GenAI for both risk assessment and customer service [Fan (2024), Asian Banker (2024)]. The company employs AI to create detailed risk profiles for users, leveraging data from various sources to make quick and accurate credit decisions. Maxiaocai, an AI agent, offers users expert-level financial services, customized market insights, simplified complex financial concepts, and tailored investment advice. The AI personal financial manager can generate visual summaries of financial reports, highlighting essential information, and translate intricate financial terminology into easily comprehensible language [Refna (2024)]. Since its public testing began in early 2024, Maxiaocai is claimed to have garnered 70 million monthly active users as of August 2024, with 45% residing in cities below the third tier. The platform now connects with more than 200 financial institutions, including asset management companies and securities firms, as well as over 15,000 financial content creators [Refna (2024)].

Also, Zest AI, a fintech company focused on credit underwriting, uses GenAI in lending decisions. The AI model analyses and generates alternative data, helping lenders assess creditworthiness more accurately without relying solely on traditional credit scores [Deepchecks Community (2024)]. Zest AI's generative models have increased loan approval rates for historically underserved groups by 15-20% [Becky (2024)].

3. THE RISKS OF GenAI IN THE CONTEXT OF FINANCIAL SERVICES

GenAI presents existing concerns related to AI, such as lack of transparency and explainability, fairness challenges, data protection issues, while also introducing new challenges that demand attention from policymakers and the financial services sector. A prominent issue currently discussed in the industry and academia is hallucinations. In the context of financial

services, this would be a "financial hallucination" [Remolina (2024)], where GenAI produces information that is incorrect or misleading [Weidinger (2022), Wachter (2024)]. Hallucinations can lead to inappropriate risk assessments or incorrect advice through AI-supported chatbots, undermining public trust in both the AI systems and the financial institutions using them.

Data privacy and protection are also significant concerns with GenAI, especially in finance, a highly regulated industry. These models are typically trained on large datasets, which may include sensitive financial information. The use of publicly accessible AI platforms within financial institutions can increase the risk of inadvertently exposing confidential data. Many AI platforms do not guarantee data protection, leaving financial institutions vulnerable to breaches. This issue is especially pressing for smaller institutions that lack the resources to develop in-house AI models, which would offer better control over data security [Remolina (2024)].

Fairness is another critical issue with GenAI, particularly when it is used in financial decision making processes like credit scoring. If the training data is biased, the AI's outputs will reflect and potentially amplify those biases, leading to discriminatory outcomes. This is especially problematic in lending markets, where biased AI systems could restrict access to credit for certain groups. Although some regulators, such as the Monetary Authority of Singapore (MAS), encourage financial institutions to assess algorithmic credit scoring through the Veritas Initiative, these recommendations are not mandatory[1] and do not fully address the specific challenges posed by GenAI given that they were proposed in the context of predictive AI [Remolina (2022)].

GenAI also impacts systemic risk in the financial services sector. The widespread and interconnected use of AI increases the risk of market instability, particularly due to the procyclicality of AI-driven decisions and the speed at which they are made. Overreliance on AI-generated reports could result in herd behavior, leading to mispricing and market imbalances [Shabsigh and Boukherouaa (2023)]. Moreover, the concentration of foundational AI model providers could create new concentration problems in a complex new financial infrastructure, as many of these providers operate beyond the reach of financial regulators [Remolina (2023)].

GenAI also raises intellectual property concerns, particularly regarding copyright infringement [Lemley (2024)]. Many GenAI models are trained on proprietary financial analyses and reports without proper authorization, potentially violating copyright laws. Some jurisdictions are exploring licensing solutions and copyright guidelines to address these legal challenges [Samuelson (2023)].

Lastly, the problem of value alignment is significant in GenAI. In finance, ensuring that AI-generated decisions align with human values and ethical standards is crucial. If AI systems generate overly risky or deceptive financial strategies, the consequences could be disastrous, undermining trust in financial institutions and threatening the stability of the financial system.

4. PROBLEMATIC CHARACTERISTICS OF THE EARLY REGULATORY MODELS THAT IMPACT GenAI IN FINANCE

Regulatory frameworks specifically addressing GenAI in finance remain underdeveloped, and the approaches taken by jurisdictions like the U.S., Singapore, the E.U., and China vary significantly, while sharing some similarities. This section compares the main characteristics of the current regulatory models in these regions and explores their impact on the financial services sector.

In the U.S., regulatory oversight for AI in finance is fragmented and sector-specific. There is no centralized AI law governing its use in financial services. Instead, the U.S. relies on existing regulations such as the Equal Credit Opportunity Act (ECOA), which requires fairness in credit decisions, including those made using automated systems [Gillis (2022)]. Additionally, data privacy laws like the California Consumer Privacy Act (CCPA) aim to protect consumer data in AI-driven processes. Financial regulators such as the Federal Trade Commission (FTC) and Securities and Exchange Commission (SEC) also play a role in monitoring the use of AI in financial services, particularly in ensuring transparency, mitigating fraud, and protecting consumers. However, these frameworks do not directly address the unique risks posed by GenAI, such as model explainability or the mitigation of biases that may arise from AI-generated content.

[1] Nonetheless, there is an expectation in Singapore that the industry should comply with these recommendations.

In contrast, several policy initiatives have positioned Singapore as one of the leading advocates of AI governance worldwide. In Singapore, the approach to AI governance and regulation is based on non-mandatory tools for the private sector to develop ethical and responsible AI systems, and a cooperative effort between regulators and the private sector. By 2019, Singapore had launched initiatives such as the Model AI Governance Framework; an international and industry-led advisory council on the ethical use of AI and data;[2] and a research program on the governance of AI, ethics, and data-use established through the Centre for AI and Data Governance at the Singapore Management University [Goh and Remolina (2020)].

The Model AI Governance Framework was published as a guide for organizations to address key ethical and governance issues when deploying AI technologies [PDPC (2020)]. A second edition of the model framework was launched by the Minister for Communications and Information at the World Economic Forum Annual Meeting in 2020. Both editions identify two sets of ethical principles for the responsible adoption of AI in the private sector, namely: decisions made by AI should be explainable, transparent, and fair; and AI systems should be human-centric. The model framework is complemented with the Implementation and Self-Assessment Guide for Organizations (ISAGO), which aims to help organizations decide how their AI governance practices can align with the "model framework". ISAGO provides a set of questions and practical examples to enable organizations to assess their AI governance practices against the model framework [WEF and IMDA (2020)].

In 2023, the AI Verify Foundation was launched to develop AI testing tools for the responsible use of AI [Gurrea-Martinez and Remolina (2024)]. In relation to sector-specific strategies, MAS published, in 2018, a guide on principles to promote fairness, ethics, accountability, and transparency (FEAT) in the use of AI in the financial sector [MAS (2018)]. In addition, MAS launched the Veritas initiative to translate into practice the FEAT principles in specific AI use cases in the financial services sector; for instance, by assessing discrimination and fairness issues in algorithmic credit scoring [MAS (2021)]. Furthermore, in 2023, the Info-communications Media Development Authority (IMDA) unveiled the GenAI evaluation sandbox to test AI governance in concrete GenAI use cases

> *"While significant strides have been made in regulating GenAI in finance, there remain substantial gaps in the current frameworks."*

and the AI Verify Foundation and IMDA published in 2024 a proposed "AI Model Governance Framework for Generative AI" to mitigate the risks enforced and newly created by this type of AI [IMDA and AI Verify Foundation (2024)]. This proposal advocates for a practical, risk-based approach to evaluating GenAI, focusing on six core areas: accountability in AI development, data usage in model training, model development and deployment, third-party evaluations, research on safety and alignment, and using AI to promote public good. The paper also called for more global cooperation to establish a unified platform for GenAI governance.

The E.U. AI Act categorizes AI systems based on risk, with high-risk applications in finance, such as credit scoring, facing stringent oversight. This includes requirements for explainability, transparency, and risk management [European Parliament (2023)]. Additionally, the General Data Protection Regulation (GDPR) imposes data protection requirements on AI systems, ensuring that personal data is handled ethically and responsibly.

4.1 A fragmented approach

There is no comprehensive, globally accepted regulatory framework specifically for AI in finance. Instead, jurisdictions apply existing regulations from areas such as data privacy or data protection (e.g., GDPR), financial integrity (e.g., anti-money laundering regulations), cybersecurity, consumer protection laws, and the unintegrated approaches to GenAI governance that do not necessarily consider its coexistence with all the ecosystem of multiple regulations.

[2] Singapore's Advisory Council on the Ethical Use of AI and Data was established on August 30th, 2018. The 11 Advisory Council members are from diverse backgrounds and comprise of international leaders in AI, including from big technology companies, advocates of social and consumer interests, and local companies. The Advisory Council assists the authorities in engaging with stakeholders to support the development of AI governance through issuing advisory guidelines, practical guides, and codes of practice for voluntary industry adoption. IMDA, 2019, "ANNEX A: Council Members of the Advisory Council on the ethical use of AI and data,"

This patchwork approach has resulted in a fragmented regulatory landscape, with each jurisdiction, and within a jurisdiction, different regulators developing their own rules that dictate or recommend (in the cases of non-mandatory approaches) how GenAI can be implemented in financial services, leading to a lack of uniformity. For instance, the U.S. Equal Credit Opportunity Act (ECOA) indirectly requires fairness in automated decision making, ensuring that AI models do not produce discriminatory outcomes, but similar guidelines are not uniformly adopted across all regions. Data protection laws like the GDPR in the E.U. and the California Consumer Privacy Act (CCPA) in the U.S. further complicate this fragmented approach, as financial institutions must navigate different compliance requirements when deploying GenAI across borders. This fragmented approach creates regulatory uncertainty and increases compliance costs for financial institutions operating globally. Without an effort to coherently integrate GenAI regulation into this complex ecosystem of rules, financial institutions face challenges in aligning their AI systems with the varying expectations of regulators, particularly in areas such as bias mitigation, explainability, and data protection.

4.2 Homogenization of GenAI regulation for all sectors

One of the major gaps in the current regulatory landscape is the lack of a sector-specific approach to GenAI in finance. While general AI regulations such as the E.U.'s AI Act provide broad guidance, they do not address the unique complexities of GenAI in financial services. Financial markets are highly sensitive to issues such as data security, risk management, and market manipulation, which require a specialized regulatory framework.

Additionally, even within the financial services sector, GenAI – and AI – use cases do not create the same risks. For example, AI-generated trading strategies or automated lending decisions may have direct and immediate impacts on market stability, consumer welfare, and systemic risk. However, GenAI for fraud detection does not pose an immediate risk to financial stability while algorithmic trading could pose a greater risk in this area. The existing regulatory models do not fully account for these sector and subsector-specific risks, leaving financial institutions exposed to potential legal and reputational consequences. A sector-specific approach would provide more targeted guidelines and enforcement mechanisms to ensure that GenAI is deployed safely and ethically in financial contexts.

Singapore's approach is one of the first in trying to provide a more tailored approach to the financial services sector in the governance considerations for the use and deployment of GenAI through project MindForge. Project MindForge is driven by the Veritas Initiative and examines the risks and opportunities of GenAI technology for financial services [MAS (2023)]. It aims to develop a clear and concise framework on the responsible use of GenAI in the financial services industry. In phase one, the consortium has developed a comprehensive GenAI risk framework, with seven risk dimensions identified in the areas of:

1. Accountability and governance
2. Monitoring and stability
3. Transparency and explainability
4. Fairness and bias
5. Legal and regulatory
6. Ethics and impact
7. Cyber and data security

4.3 Self-regulation as the main risk-mitigation tool

The reliance on self-regulation is another significant aspect of the regulatory models for GenAI in finance. The E.U. has faced criticism for allowing financial institutions and AI developers to self-regulate in certain areas, leading to concerns about weak oversight and the potential for harm that is not immediately tangible, such as bias or financial losses due to faulty AI systems. Self-certification processes, while intended to encourage innovation, may not provide sufficient safeguards against issues like financial hallucinations or systemic risks.

Similarly, China has adopted a self-regulatory model with its "Interim Measures for the Management of Generative AI Services", which requires AI systems to undergo security assessments and adhere to content governance rules. However, these measures focus more on public safety and political considerations rather than the specific risks associated with GenAI in financial services. While China's approach emphasizes transparency and ethical AI use, it lacks the financial sector-specific focus necessary to address the full range of risks posed by GenAI in finance.

4.4 Materiality and risk assessment

A key challenge in regulating GenAI in finance is the need for clear guidelines on materiality and risk assessment. Financial institutions must assess the material impact of GenAI

models on decision making processes, particularly in areas like lending, trading, and fraud detection. However, current regulatory frameworks often lack concrete standards for how to measure the risks associated with AI-generated outputs, making it difficult for institutions to conduct comprehensive risk assessments.

For example, the potential for AI models to generate misleading financial reports or biased lending decisions requires financial institutions to develop new tools and methodologies for assessing the material risks posed by these systems. Regulatory bodies need to provide clearer guidelines on how to quantify and mitigate the risks associated with GenAI, particularly in the context of systemic risk and financial stability.

Initiatives such as Veritas or the sandboxes could serve this purpose. However, these available tools are not mandatory for the financial services sector. Additionally, when Veritas was launched and proposed, it did not consider the risks exacerbated and created by GenAI and the particularities of GenAI versus predictive AI. Additionally, the GenAI sandbox, launched in 2024 in Singapore, targets SMEs to harness the benefits of GenAI and support their innovation and digitalization journey. It is led by the Infocomm Media Development Authority (IMDA). Thus, this sandbox is not a financial regulation tool and, as such, is not specialized the financial services sector.

Other approaches, such as the E.U. AI Act, have been criticized for the overreliance on self-certification, weak oversight and investigatory mechanisms, and far-reaching exceptions for both the public and private sectors [Wachter (2024)]. The proposed liability frameworks for AI systems in the E.U. have been similarly criticized because they focus on material harm while ignoring harm that is immaterial, monetary, and societal, such as bias, hallucinations, and financial losses due to faulty AI products [Wachter (2024)].

4.5 The use of GenAI by fraudsters

Fraud is an area where GenAI poses exacerbated risks for the financial services sector. Fraudsters are increasingly using sophisticated AI to impersonate clients or legitimate representatives of financial institutions, tricking consumers or financial institutions into authorizing fraudulent payments. AI-generated scams are becoming more credible and difficult to detect, even for highly cautious consumers and financial professionals [Resistant AI (2023)]. A recent example is one where an employee of a Hong Kong-based financial services firm was deceived into transferring $25 million after participating in a deepfake video conference call with someone posing as the company's CFO [Chen and Magramo (2024)]. Financial regulators should think about new approaches to balance the liability of financial institutions and consumers in this new era of authorized push payment fraud taking into consideration the new challenges posed by GenAI in payments systems.

5. CONCLUSION

This article maps the characteristics of the current regulatory models to GenAI in finance. It looks at a number of first-mover jurisdictions, such as the E.U., the U.S., Singapore, and China, identifying where regulations succeed, where they fall short, and what gaps need to be addressed to ensure safe and ethical AI adoption. By analyzing these regulatory approaches, this article seeks to provide a high-level overview of the regulatory models applicable to GenAI in finance and concludes that all models contribute to a fragmented approach to GenAI regulation. Moreover, apart from Singapore, the current approaches of the first movers lack sector-specific focus because they are mostly based on self-regulation tools, and do not provide clear risk assessment methodologies that measure the materiality of GenAI harms and tailor solution accordingly.

Finally, current approaches have not considered that some use cases of GenAI are developed outside regulated entities but still directly affect financial consumers and institutions, as seen with the use of GenAI for fraud. Frameworks such as fraud payment regulations may need recalibration to address the new challenges posed by this technology.

Decoding the issues present in these characteristics of the GenAI regulatory models is a first step for regulators, policy-makers and the industry to propose solutions aimed at bridge the gaps. While significant strides have been made in regulating GenAI in finance, there remain substantial gaps in the current frameworks. A more harmonized, sector-specific approach with enforcement mechanisms, and methodologies that recognize the general and undefined purpose of GenAI models is necessary to ensure that financial institutions can safely and ethically deploy these technologies.

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ABOUT CAPCO

Capco, a Wipro company, is a global management and technology consultancy specializing in driving transformation in the energy and financial services industries. Capco operates at the intersection of business and technology by combining innovative thinking with unrivalled industry knowledge to fast-track digital initiatives for banking and payments, capital markets, wealth and asset management, insurance, and the energy sector. Capco's cutting-edge ingenuity is brought to life through its award-winning Be Yourself At Work culture and diverse talent.

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