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The Role of Artificial Intelligence in the Regulation of Financial Liabilities in International Law

Rola sztucznej inteligencji w regulacji zobowiązań finansowych w prawie międzynarodowym

ABSTRACT

The regulation of financial liabilities in international law presents significant challenges due to the complexity and interconnectedness of global financial transactions. In this context, the emergence of artificial intelligence (AI) offers transformative potential to enhance regulatory mechanisms and mitigate financial risks. The article explores the role of AI in regulating financial liabilities across borders, highlighting its impact on risk identification, compliance, etc. By leveraging advanced algorithms and data analytics capabilities, AI systems enable real-time monitoring of financial transactions, enhance due diligence processes, and facilitate proactive risk management. However, the deployment of AI in financial regulation raises ethical considerations regarding data privacy, algorithmic bias, and accountability. International collaboration and standardization efforts are crucial for fostering regulatory convergence and ensuring a level playing field in the global financial landscape. By embracing AI responsibly, stakeholders can pave the way for a more resilient and equitable international financial system.

Keywords: international law; artificial intelligence; finance; liabilities; legal regulations

INTRODUCTION

The intricate web of international financial transactions forms the backbone of the global economy, facilitating trade, investment, and economic growth across

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borders.¹ However, the complexity and interconnectedness of these transactions often give rise to significant challenges in ensuring regulatory compliance and managing financial liabilities within the framework of international law. In this dynamic landscape, the emergence of AI presents a transformative opportunity to enhance the efficacy and efficiency of regulatory mechanisms governing financial activities on a global scale.

AI'S TRANSFORMATIVE IMPACT

The concept of artificial intelligence has attracted the attention of many civilizations and cultures throughout history. In ancient Greek mythology, Prometheus is said to have brought fire to humans, giving them intelligence and knowledge. Similarly, there are mythological stories and legends about machines in ancient Chinese, Indian, and Egyptian cultures. However, the modern history of AI emerged more clearly in the 20th century.

The modern development of AI has accelerated with the increasing interest in computer science. In the 1950s, A. Turing's article *Computing Machinery and Intelligence* laid the theoretical foundations of AI.² In the same period, the term "artificial intelligence", one of the first terms used for AI, was coined by J. McCarthy. In 1956, the Dartmouth Conference played an important role in establishing AI as a field of research. Later, a distinction emerged between symbolic and contextual approaches to AI.³ Significant progress has been made in the field of AI with the development of different approaches such as semantic networks, expert systems, and artificial neural networks.

In the 1960s and 1970s, AI research and application grew rapidly. At that time, the processing power and memory capacity of computers were limited, so AI studies were also limited. However, important developments were made during this period. For example, a program called ELIZA was a groundbreaking work in the field of natural language processing and simulated a program capable of having a human-like conversation. Additionally, interest in AI has increased with the emergence of expert systems. Expert systems were computer systems that could make human-like decisions in a particular area of expertise.⁴

¹ S. Garcia, *Ethics in AI: Navigating the Legal Landscape*, "Journal of Financial Ethics" 2023, vol. 12(3), pp. 34–52; United Nations, *Guidelines for Ethical AI Use in Global Financial Systems*, "UN Reports" 2023, no. 5, pp. 10–30.

² A.M. Turing, *Computing Machinery and Intelligence*, "Mind" 1950, vol. 59(236), pp. 433–460.

³ K. Haenlein, A. Kaplan, *A Brief History of Artificial Intelligence: On the Past, Present, and Future of Artificial Intelligence*, "California Management Review" 2019, vol. 61(4), pp. 5–14.

⁴ S. Russell, P. Norvig, *Artificial Intelligence: A Modern Approach*, Harlow 2016, pp. 25–39.

The 1980s and 1990s were a period of both promising developments and disappointments in the field of AI. Symbolic approaches, which initially produced promising results, encountered limitations due to complexity and scaling issues. However, during this period, the field of AI was revived with the emergence of new approaches such as artificial neural networks and statistical methods. In particular, great advances have been made in the field of machine learning, and AI systems have improved their ability to learn from large data sets and solve complex problems.

In recent years, AI has become popular and is more widely used in daily life. There are many reasons for this, but factors such as big data and advanced computing power have played a significant role. AI systems have become capable of detecting patterns, relationships, and trends by analyzing millions or even billions of data points. For example, the use of AI in areas such as targeting in advertising, recommendation systems, automatic language translation and personal assistants has increased rapidly.

Outside of the technology sector, the financial services industry is the biggest spender on AI services and is experiencing a very fast growth.⁵ Until recently, hedge funds and HFT firms were the main users of AI in finance, but applications have now spread to other areas, including banks, regulators, fintech, insurance firms to name a few. Within the financial services industry, AI applications include algorithmic trading, portfolio composition and optimisation, model validation, back testing, robo-advising, virtual customer assistants, market impact analysis, regulatory compliance, and stress testing.⁶

AI's transformative impact is evident in its ability to automate tedious and time-consuming tasks traditionally performed by human analysts, such as transaction monitoring and compliance reporting. By leveraging AI-driven solutions, financial institutions can significantly reduce operational costs and allocate resources more efficiently.⁷ Moreover, AI algorithms can identify complex patterns and correlations in financial data that may elude human analysts, enabling regulators to detect potential risks and compliance issues proactively.⁸

⁵ Citi GPS, *Bank of the Future: The ABCs of Digital Disruption in Finance*, March 2018, <https://www.smallake.kr/wp-content/uploads/2018/05/AHDX6.pdf> (access: 17.10.2025).

⁶ D. Arner, J. Barberis, R.P. Buckley, *FinTech, RegTech, and the Reconceptualization of Financial Regulation*, "Northwestern Journal of International Law & Business" 2017, vol. 37(3), pp. 371–413.

⁷ M. Awad, R. Khanna, *Efficient Learning Machines: Theories, Concepts, and Applications for Engineers and System Designers*, Berkeley 2015, pp. 203–210.

⁸ R. Patel, *AI-Driven Risk Management in Cross-Border Transactions*, "International Business Law Journal" 2022, vol. 18(4), pp. 145–162; B.G. Buchanan, *Artificial Intelligence in Finance*, April 2019, https://www.turing.ac.uk/sites/default/files/2019-04/artificial_intelligence_in_finance_-_turing_report_0.pdf (access: 17.10.2025).

IDENTIFICATION AND MITIGATION OF RISKS

One of the primary advantages of AI in financial regulation lies in its ability to identify and mitigate risks in real-time. By continuously monitoring financial transactions and analyzing patterns, AI systems can detect potential anomalies or suspicious activities, alerting regulators to emerging risks promptly. Moreover, AI-powered risk assessment models can provide insights into systemic risks, enabling regulators to implement targeted interventions to maintain financial stability.

Machine learning (ML) algorithms can analyse millions of data points to detect fraudulent transactions that would tend to go unnoticed by humans. At the same time, ML helps improve the precision of real-time approvals and reduces the number of false rejections. Fraud detection now involves more than a checklist of risk factors. Using ML techniques, fraud detection systems can now actively learn and calibrate in response to new potential (or real) security threats.⁹ Using ML, banks' systems can detect unique activities or behaviours ("anomalies") and flag them for investigation.¹⁰

AI's predictive analytics capabilities enable regulators to anticipate and mitigate risks before they escalate into systemic crises. By analyzing historical data and identifying patterns indicative of potential market disruptions or liquidity shortages, AI systems can help regulators implement preemptive measures to safeguard the integrity of the financial system. Additionally, AI-driven stress testing models allow regulators to assess the resilience of financial institutions and identify vulnerabilities that may pose systemic risks.¹¹

DYNAMIC ADAPTATION TO LEGAL CHANGES

The concept of "dynamic adaptation to legal changes" refers to the use of AI to enhance the ability of entities operating within the international financial landscape to promptly and effectively adapt to evolving legal requirements. This concept emphasizes the crucial role of AI in navigating the complexities of international financial obligations, ensuring compliance, and mitigating legal risks in a dynamic regulatory environment.

⁹ A. Ng, *Machine Learning Yearning*, Palo Alto 2018, pp. 78–80.

¹⁰ E. Brynjolfsson, T. Mitchell, *What Can Machine Learning Do? Workforce Implications*, "Science" 2017, vol. 358(6370), pp. 1530–1534; U. Turkzen, V. Benson, B. Adamyk, *Legal Implications of Automated Suspicious Transaction Monitoring: Enhancing Integrity of AI*, "Journal of Banking Regulation" 2024, vol. 25(4), pp. 359–377.

¹¹ World Economic Forum, *Global Regulatory Frameworks for AI in Finance*, "WEF Reports", no. 3, pp. 1–25; International Monetary Fund, *Regulatory Challenges in the Era of Artificial Intelligence*, "IMF Reports" 2023, no. 7, pp. 1–25.

Key elements of dynamic adaptation to legal changes in international financial obligations with the incorporation of AI include:

1. **Cross-border regulatory monitoring.** AI technologies can provide real-time monitoring of regulatory changes across multiple jurisdictions, enabling international financial entities to stay informed about alterations in legal frameworks.
2. **Automated compliance across jurisdictions.** AI-driven compliance management systems can automate the process of ensuring adherence to international financial regulations, helping organizations navigate diverse legal requirements efficiently.
3. **Intelligent contract management.** AI can be employed in the management of international financial contracts, ensuring that contractual obligations align with changing legal standards and minimizing risks associated with international transactions.¹²
4. **Risk assessment and mitigation on a global scale.** AI-powered risk management tools can assess the impact of legal changes on international financial portfolios, facilitating scenario analysis and adaptive strategies for risk mitigation.
5. **Natural language processing for multilingual legal texts.** AI's natural language processing capabilities are invaluable in interpreting and understanding legal texts in multiple languages, allowing international financial entities to comprehend and adapt to legal changes across linguistic barriers.
6. **Blockchain and cryptocurrency compliance.** In the realm of international financial obligations involving blockchain and cryptocurrencies, AI can assist in ensuring compliance with evolving legal standards, particularly in jurisdictions with emerging regulatory frameworks.
7. **Real-time transaction monitoring.** AI-driven transaction monitoring systems can adapt to changes in international financial regulations, helping detect and prevent potential breaches in real time.
8. **Global due diligence automation.** AI tools can streamline due diligence processes across borders, assisting international financial institutions in complying with legal requirements related to customer onboarding, anti-money laundering (AML), and know your customer (KYC) procedures.
9. **Adaptive cross-border reporting.** AI can automate the preparation and submission of regulatory reports across different jurisdictions, ensuring accuracy and compliance with international financial reporting standards.

¹² R. Gauthier, *Artificial Intelligence and International Financial Law: Regulation, Complexity and Ethical Challenges*, "Journal of International Banking Law and Regulation" 2021, vol. 36(5), pp. 198–204.

10. Continuous learning algorithms for global legal dynamics. AI systems can continuously learn from legal changes and experiences in various jurisdictions, allowing for ongoing adaptation to the complex and dynamic nature of international financial obligations.

The integration of AI into the dynamic adaptation to legal changes in international financial obligations enhances the ability of organizations to navigate the intricate web of global regulations, fostering compliance, transparency, and efficiency in international financial transactions.

ENHANCING DUE DILIGENCE AND COMPLIANCE

Financial institutions are required by law to have in place an effective, risk-based anti-money laundering/combating the financing of terrorism (AML/CFT) framework, which includes the application of a risk-based approach to CDD measures, reporting of suspicious transactions, governance, policies and procedures, record keeping and training. These standards are necessary as the huge amount of dirty money from criminal activities such as drug trafficking and money laundering continues to pervade and blemish the global financial system. Financial criminals, such as money launderers with advanced and sophisticated capabilities, tend to outwit the current capabilities of law enforcement agencies (LEAs) as well as the effectiveness and efficiency of AML legal and regulatory frameworks. Most European banks (over 90%) have been fined for AML-related offences in the past decade.

AI-driven solutions offer significant potential in enhancing due diligence and compliance processes for financial institutions. Through automation and data analytics, AI can streamline KYC procedures, verify the integrity of transactions, and ensure compliance with regulatory requirements.¹³ This not only improves operational efficiency but also strengthens the integrity of the financial system by reducing the incidence of fraud and financial crime.

Advanced AI algorithms can analyze vast amounts of structured and unstructured data to identify potential compliance issues and suspicious activities. By leveraging natural language processing and ML techniques, AI systems can extract relevant information from regulatory texts, legal documents, and financial reports to assess compliance risks comprehensively. Moreover, AI-powered surveillance

¹³ M. Veale, F. Zuiderveen Borgesius, *Demystifying the Draft EU Artificial Intelligence Act: Analysing the Good, the Bad, and the Unclear Elements of the Proposed Approach*, "Computer Law Review International" 2021, vol. 22(4), pp. 97–112; LegalTech Insights Group, *AI and Financial Compliance: A Practical Guide for Legal Professionals*, "LegalTech Journal" 2023, vol. 15(1), pp. 78–95; Legal Institute for Financial Technologies, *AI and Financial Compliance: A Comparative Analysis*, "Tech Law Journal" 2023, vol. 8(2), pp. 78–95.

tools enable regulators to monitor market activities in real-time and detect patterns indicative of market manipulation or insider trading.

CHALLENGES AND ETHICAL CONSIDERATIONS

Despite their transformative potential, AI-powered regulatory systems are not without challenges and ethical considerations. Concerns regarding data privacy, algorithmic bias, and accountability loom large, raising questions about the fairness and transparency of AI-driven decision-making processes.¹⁴ Moreover, the reliance on AI may exacerbate existing disparities in access to financial services, highlighting the need for robust ethical frameworks to guide the development and deployment of AI technologies in financial regulation.

The use of AI in financial regulation raises complex ethical dilemmas regarding the responsible use of data and the implications of algorithmic decision-making on individual rights and liberties. Concerns about data privacy and security have prompted calls for greater transparency and accountability in the collection, processing, and sharing of financial data for regulatory purposes. Moreover, the inherent biases present in AI algorithms pose risks of perpetuating discrimination and inequality in regulatory outcomes, particularly in the context of credit scoring and risk assessment.

INTERNATIONAL COLLABORATION AND STANDARDIZATION

Addressing the complexities of regulating financial activities across borders requires international collaboration and standardization efforts. By establishing common regulatory standards and frameworks, nations can facilitate the interoperability of AI-driven regulatory systems and promote consistency in compliance requirements. International organizations play a crucial role in fostering collaboration among stakeholders and harmonizing regulatory approaches to ensure a level playing field in the global financial landscape.¹⁵

International collaboration is essential for overcoming jurisdictional barriers and promoting regulatory convergence in the era of AI-driven financial regulation.

¹⁴ R.P. Buckley, D.A. Zetzsche, D.W. Arner, B.W. Tang, *Regulating Artificial Intelligence in Finance: Putting the Human in the Loop*, "Sydney Law Review" 2021, vol. 43(1), pp. 43–82; M. Johnson, *Ethical Considerations in AI-Enhanced Financial Regulation*, "Ethics in Finance Quarterly" 2023, vol. 12(1), pp. 34–52.

¹⁵ International Finance Commission, *AI Governance Models: A Comparative Analysis*, "Finance Review" 2023, vol. 27(1), pp. 88–105.

By aligning regulatory standards and sharing best practices, countries can enhance the effectiveness of cross-border cooperation in combating financial crime and maintaining financial stability. Moreover, international organizations such as the Financial Stability Board (FSB) and the International Organization of Securities Commissions (IOSCO) play a pivotal role in coordinating regulatory initiatives and facilitating information exchange among regulators globally.

Moreover, international organizations such as the FSB and IOSCO play a pivotal role in coordinating regulatory initiatives and facilitating information exchange among regulators globally. In the realm of global finance, the participation of international organizations like the FSB and IOSCO is indispensable. These organizations serve as linchpins, orchestrating and coordinating regulatory initiatives that are fundamental to the stability and integrity of international financial systems. Their roles extend beyond mere coordination; they play a pivotal role in fostering collaboration and facilitating the exchange of vital information among regulatory bodies worldwide.

The FSB, comprised of central banks, regulatory authorities, and finance ministries from major economies, operates as a key driver of financial stability on the global stage. Beyond the surface coordination of regulatory policies, the FSB serves as a forum for in-depth discussions on emerging risks and challenges that transcend national boundaries. Through these discussions, the FSB aids in the development of common regulatory frameworks and standards that contribute to the overall resilience of the international financial system.

Similarly, the IOSCO assumes a critical position in ensuring the efficiency and integrity of securities markets globally. With its diverse membership consisting of securities regulators from various jurisdictions, IOSCO actively engages in the development and promotion of international standards and best practices. This not only harmonizes regulatory approaches but also facilitates a consistent and effective oversight of securities markets worldwide. The organization's commitment to cooperation and information exchange among its members further strengthens the collective ability of regulators to address evolving challenges.

One of the key functions performed by these international organizations is the coordination of regulatory initiatives. They work to align diverse regulatory landscapes, ensuring that regulatory standards are not only comprehensive but also harmonized across jurisdictions. This coordination is particularly crucial in an era where financial transactions traverse borders seamlessly, necessitating a unified approach to regulation.¹⁶

Moreover, the facilitation of information exchange among regulators globally is a cornerstone of their activities. The interconnectedness of financial markets

¹⁶ E. Brown, *The Future of AI Regulation: A Legal Analysis*, "Artificial Intelligence Law Review" 2023, vol. 25(1), pp. 20–38.

demands real-time sharing of insights, best practices, and intelligence on emerging risks. By serving as hubs for information exchange, the FSB and IOSCO empower regulators to stay ahead of potential threats and challenges, contributing to the overall resilience of the international financial architecture.

In essence, the FSB and IOSCO transcend their roles as coordinators; they emerge as architects of a robust, collaborative, and well-informed global regulatory framework. Through their concerted efforts, these organizations not only address immediate challenges but also contribute to the establishment of a financial ecosystem that is adaptive, transparent, and resilient in the face of evolving global dynamics.

CONCLUSIONS

Integration of AI into the regulation of financial liabilities in international law marks a significant milestone in the evolution of regulatory frameworks in the digital age. AI technologies offer unprecedented capabilities in risk identification, compliance monitoring, thereby enhancing the effectiveness and efficiency of regulatory mechanisms governing global financial activities. However, the deployment of AI in financial regulation also poses ethical challenges related to data privacy, algorithmic bias, and accountability, which must be addressed to ensure fair and transparent regulatory outcomes.

Moreover, international collaboration and standardization efforts are essential for promoting regulatory convergence and fostering a level playing field in the global financial landscape. By establishing common regulatory standards and frameworks, nations can facilitate the interoperability of AI-driven regulatory systems and promote consistency in compliance requirements across jurisdictions. International organizations play a pivotal role in coordinating regulatory initiatives and facilitating information exchange among regulators globally.

As we navigate the complexities of regulating financial activities across borders, it is imperative that we embrace AI as a tool for enhancing regulatory effectiveness while upholding principles of fairness, transparency, and accountability. By leveraging AI responsibly and collaboratively, stakeholders can mitigate financial risks, safeguard the integrity of the financial system, and promote economic stability and prosperity on a global scale.

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ABSTRAKT

Regulacja zobowiązań finansowych w prawie międzynarodowym stanowi poważne wyzwanie ze względu na złożoność i wzajemne powiązania globalnych transakcji finansowych. W tym kontekście pojawienie się sztucznej inteligencji (AI) oferuje potencjał transformacyjny, który może usprawnić mechanizmy regulacyjne i ograniczyć ryzyko finansowe. W artykule omówiono rolę AI w regulacji zobowiązań finansowych w wymiarze transgranicznym, podkreślając jej wpływ na identyfikację ryzyka, zgodność z przepisami itp. Dzięki wykorzystaniu zaawansowanych algorytmów i możliwości analizy danych systemy AI umożliwiają monitorowanie transakcji finansowych w czasie rzeczywistym, usprawniają procesy *due diligence* oraz ułatwiają proaktywne zarządzanie ryzykiem. Wdrożenie AI w regulacjach finansowych rodzi jednak dylematy etyczne dotyczące prywatności danych, stronniczości algorytmów oraz odpowiedzialności. Międzynarodowa współpraca i działania normalizacyjne mają kluczowe znaczenie dla wspierania konwergencji regulacyjnej oraz zapewnienia równych warunków działania w globalnym otoczeniu finansowym. Dzięki odpowiedzialnemu wykorzystaniu AI zainteresowane strony mogą utorować drogę do bardziej odpornego i sprawiedliwego międzynarodowego systemu finansowego.

Słowa kluczowe: prawo międzynarodowe; sztuczna inteligencja; finanse; zobowiązania; regulacje prawne



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