STATUS, SHORTAGE AND SUGGESTIONS OF FINANCIAL DATA FACTOR MANAGEMENT IN CHINA

Deng Haoming[1], Huang Rui[1], Mo Di[1], Huang Jiamin[1]

[1]Faculty of Business Innovation and Technology,
Universiti Melaka, Batu 28, 78200 Kuala Sungai Baru, Melaka, Malaysia.

Corresponding author's email: 1054314558@qq.com

Article History:
Received : 10 September 2023
Accepted : 20 November 2023
Published : 22 November 2023

ABSTRACT

China's financial industry is facing the challenges of rapid development and digital transformation. The status, influencing factors and suggestions of financial data factor management are crucial to ensure the data quality and security of financial institutions. This paper reviews the status quo of financial data factor management in China, including challenges and opportunities in data integration, data standardization, and data security. At the same time, factors that affect the management of China's financial data factors, such as regulatory requirements, technological innovation, and market competition, are also proposed and analyzed in this paper. Finally, after comparing with more mature data management solutions and data trading markets in United Kingdom, some suggestions are provided to help Chinese financial institutions improve their data factor management level, including the introduction of relevant policies, Suggestions on strengthening data rights verification, improving data factor pricing, and data desensitization.

Keywords: *Data Factors, Financial Data Factors, Chinese Status on Data Management*

INTRODUCTION

Recent years, the global digital economy has developed vigorously, and the digital economy accounts for an increasing proportion of the national economy (Kolesnikov et al., 2020), he also mentioned that in 2021, the digital economy of the United States and Germany accounted for more than 30% of GDP. Currently, the global COVID-19 pandemic, which is wreaking havoc worldwide, has brought unprecedented pressure and disruption to traditional industries and traditional models, compelling traditional industries to undergo transformation and upgrade (Z. fei Li et al., 2021). Amid the crisis, there is opportunity. The digital economy and digital governance have surged with tremendous vitality, becoming a stabilizing anchor, and driving force for China's economy and society (Xia et al., 2023). The digital economy's vitality and motivation stem from its fundamentally distinct nature compared to traditional agricultural and industrial economies (Tu et al., 2022), data has become a crucial production factor driving the economy. In the development process of the digital economy, data plays a central and crucial role, profoundly affecting traditional production factors (Cheng et al., 2023). Furthermore, in the financial industry, the digital revolution has heightened the importance of financial data, making organizations to navigate complex financial environments effectively, provide high-quality services, and thrive in an era of supreme efficiency (Murugan & T, 2023) including enhanced customer risk assessment, asset pricing and comprehensive risk alerts.

LITERATURE REVIEW

Data and Data Factors

Data factors play a foundational and core role in the development of the digital economy in China. Data represents digital records of objective events (Krotov & Johnson, 2023), which is also the unprocessed raw material. In order to make it useful, it needs to be collected, collated, aggregated, and analyzed to form data resources. When data resources participate in economic activities and bring economic benefits, they become data factors (Kissel, 2011). For the first time in China, data was added to the production factors, that is, the production formula Y=F (L, K, H, N) was developed into Y= F (L, K, H, N, Data factors) Y=F (L, K, H, N) was developed into Y=F (L, K, H, N, Data factors) (Rong, 2022), placing data on par with traditional production factors, such as labor, capital, natural resources, and technical knowledge, underscores its importance in various Chinese industries. Additionally, data analysis plays a vital role in AI technology applications, like ChatGPT, where extensive experimental data is crucial for model training. The accuracy and efficiency of models depend on the quality and quantity of this data, and big data analysis and processing allow rapid information acquisition from experimental data (Ray, 2023). This accelerates and enhances AI development. The connection between AI and big data hinges on whether data quantity and quality improve AI effectiveness. AI's progress relies on big data as a critical resource, while AI enhances big data analysis, elevating its level and efficiency. These two domains mutually support each other, underscoring the importance of proper data management. But for financial data, the focus is on ownership, security, and transactions (Xu et al., 2023).

Financial Data Factors

Financial data factors are key attributes within financial datasets, representing various financial information. These elements encompass a wide range, including market data, economic indicators, credit risk factors, regulatory information, and real-time data. They serve as essential building blocks for financial insights and decision-making for investors, analysts, regulators, and businesses. The diverse sources of these data elements can lead to demand for comprehensive data management. When traded among different data custodians, there is substantial market potential but also significant challenges in managing these financial data elements. Accurate and high-quality data are crucial for financial decision-making, impacting credit assessments, and more (Q. He & He, 2022). Accurate data elements are essential for complex financial decisions and are instrumental in enhancing customer experiences. In the age of personalization, financial institutions use these elements to analyze individual customer preferences, enabling tailored financial products, advice, and services. Moreover, financial data elements are vital for a country's financial system, with big data technology

improving data processing capabilities and potentially reducing the risk of financial crises (Venkateswarlu et al., 2022), effective management of financial data elements can help small and medium-sized enterprises respond swiftly to economic shocks, preventing the ripple effects of capital chain disruptions.

Elements influencing the management of financial data factors in China:

1. Laws, regulations, and policies

Laws and regulations are vital for managing data elements, ensuring compliance in areas like data protection and permissions through relevant regulatory documents (Varadi et al., 2012). China's financial data management is tightly regulated, encompassing data privacy, cybersecurity, financial regulations, and cross-border data flow. The response to the digital wave of data protection in 2021 led to the enactment of the Personal Information Protection Law (Z. He, 2022). Regulations define financial institutions' duties in ensuring legal, compliant, and private data handling. Government policies encourage digital innovation and data sharing, prioritizing national security and financial stability. These laws provide essential guidance for financial institutions to secure, legalize, and improve the quality of financial data, meeting regulatory and compliance standards.

2. Innovation in the financial industry

Innovation in the financial sector has had a profound impact on the management of financial data elements in China. The financial sector, amidst this wave of innovation, is experiencing a profound shift towards digitization and intelligence, redefining how financial data is handled. One of the key drivers of this transformation is the advent of financial technology. Fintech solutions have revolutionized traditional financial services, offering cutting-edge tools and platforms that streamline transactions, enhance security, and provide customers with more personalized and efficient experiences (Ren et al., 2023), this shift has transformed financial data element management. New products like mobile payments depend on thorough data analysis, expediting transactions and producing valuable data. Blockchain ensures secure transactions, AI utilizes machine learning for intelligent data management, and IoT adds real-time data to financial transactions. Fintech innovation presents challenges and opportunities for enhanced data value and efficiency in the financial industry.

3. Globalization and international cooperation

Globalization and international cooperation will have profound impacts on the management of financial data elements in China, especially with the launch of the Belt and Road Initiative by China. As financial markets become more internationalized, cross-border transactions and data flows by financial institutions are becoming increasingly frequent, necessitating higher standards and compliance in financial data element management. International cooperation and data-sharing agreements, such as Society for Worldwide Interbank Financial Telecommunication, have been established. However, it's worth noting that SWIFT has faced issues related to customer privacy protection in the past, with concerns that information controllers in the United States may have accessed financial transaction information from participating countries through vulnerabilities in the agreement (Fuster et al., 2008). As a significant participant in SWIFT, China must enhance its global financial data transmission systems while adhering to international standards. International regulatory cooperation is crucial to addressing cross-border financial crimes and data leaks. However, China's commitment to information sovereignty has led to restrictions on the free flow of cross-border information. To maintain stability and security in the international financial system, China needs to make its financial data management more open, transparent, and compliant (G. Zheng, 2021), which is also the aspect for which China has been consistently criticized. Therefore, China should actively participate in international cooperation to promote global standards and regulations for financial data management to ensure the security and legality of globalized financial data management.

4. Technological Infrastructure

Technological infrastructure stands as the cornerstone in shaping the landscape of financial data management within China. Its significance becomes evident in its ability to underpin the storage and processing of the colossal volumes of financial data, thereby facilitating efficient data management

practices (Ng et al., 2017). This robust infrastructure is at the forefront of cybersecurity, employing encryption and intrusion detection to protect financial data. It ensures data accessibility, integrating diverse sources for advanced analytics, facilitating quick decision-making, and compliance with regulations. Real-time data processing, disaster recovery, and scalability rely on this technological foundation. Emerging technologies like blockchain, AI, and machine learning leverage this infrastructure for enhanced data management. As China's financial sector evolves, investing in modern, adaptable infrastructure becomes crucial, securing data and meeting industry demands.

The Trend of Financial Data Factors Management in China

1. The core of the enterprise

The application level of data factors is becoming the core factor of the competitiveness of financial companies (Dong & Yu, 2023), In today's dynamic financial landscape, data has become the primary driver of competitiveness for financial enterprises, transforming from an auxiliary asset to the lifeblood of innovation, informed decision-making, and customer experiences. Success in this data-driven environment hinges on the effective utilization of data, with industry leaders distinguished by their ability to extract actionable insights. It's not just about data collection; it's about interpreting hidden stories, predicting trends, spotting opportunities, and managing risks. This approach empowers organizations to offer personalized services, make data-informed decisions, and optimize operations. Beyond individual companies, data fosters collaborations between traditional financial institutions and agile fintech startups, facilitating cross-border transactions and democratizing access to financial services. Data stands as the cornerstone of the future of finance, with those recognizing its significance and investing in technology, talent, and strategies leading the way in shaping the financial industry's future in an increasingly data-centric world.

2. Data share

Data integration, sharing, and openness are a prevailing global trend in the financial industry, amplifying data's value and significance. This shift transcends boundaries and is embraced by governments and businesses worldwide. Collaboration in the realm of big data is key, necessitating the harmonization of personal, corporate, and government data to transform private big data into a public resource. Leading regions like the U.S. and Europe exemplify data sharing practices, recognizing data as a shared asset that drives innovation, economic growth, and improved public services. This global shift towards data openness departs from traditional siloed data management approaches. As the financial sector evolves, adopting this ethos of data integration and sharing becomes a means to foster creativity, catalyze insights, and drive advancements benefiting not only organizations but entire economies and societies. The momentum of data openness is poised to drive collaborative innovation, cross-sector partnerships, and unlock unprecedented value in the financial industry and beyond. The Chinese government is also working hard to promote data openness after the incident "prove your mother really is your mother"(Zhou et al., 2020). Hence, the government should lead in government data transparency and enhances data sources via big data service platforms.

3. Collaboration across fields

The integration and application of data and other cross-domain data has been continuously strengthened (Susha et al., 2023), designed to further create and capture value from information. Before 2015, financial institutions primarily relied on internal data for analysis. However, after 2016, advancements in big data technology led to the collection of extensive external data sources through technologies like image and speech recognition. This included government public data, corporate websites, and social data, offering a more profound understanding of customers' dynamic data. Looking ahead, the data circulation market is expected to strengthen, allowing financial institutions to access data from various industries. Integrating financial and cross-industry data will enhance the accuracy of marketing and risk control models, fostering cross-industry applications and the creation of scenario-based financial products with deeper integration into other industries.

4. High emphasis on data security

Fourth, more and more attention has been paid to the security of financial data. Based on existing research findings, data-related policies can have important economic impacts, that is, protecting customer privacy can also be very positively fed back into the economic benefits of data (Jones & Tonetti, 2020). Big data offers valuable insights but also challenges data security. Financial institutions face increased cyberattacks and data breaches, demanding stronger data security management. Big data centralizes vast amounts of valuable information but poses a substantial risk in the event of a breach. Breaches can escalate into data manipulation and sophisticated fraud, leading to financial losses, reputational damage, and regulatory scrutiny. Robust data security management is imperative. To address these challenges, financial institutions need advanced cybersecurity measures, including intrusion detection, encryption, and access controls. They should prioritize cybersecurity awareness and invest in cybersecurity professional training.

STATUS OF FINANCIAL DATA FACTOR MANAGEMENT IN CHINA

With the widespread adoption and maturity of big data technologies, the application of financial data factors has become a hot trend in the industry (Yang et al., 2020), but their application faces constraints like inadequate data asset management, technological transformation challenges, the absence of industry standards, security and control pressures, and incomplete policy supervision (Eckert, 2023). Additionally, individuals sharing their financial data with institutions for accessing services often grant permission for data usage, but some institutions excessively and forcibly request permissions through apps, unlawfully collecting sensitive personal data. This not only infringes on data subjects' rights but also raises public concerns about data management in the financial industry. Then is inactive data factors market. Data elements derive their value from their attributes. To gauge the state of data element management in China, one can look at the China Data Element Exchange, a marketplace for data elements. Since 2015, various data trading centers have been established across regions, with policies encouraging data trading. Guiyang Global Big Data Exchange, the first national big data exchange, was approved in April 2015, and other cities like Wuhan, Guangzhou, Shanghai, and Zhejiang have established similar exchanges. However, challenges persist. For instance, Guiyang Global Big Data Exchange, as of March 7, 2023, has completed only 373 transactions with a total transaction amount of approximately 91 million US dollars (Ye et al., 2022), which is far from the goal of reaching 10 billion transaction volume in 3-5 years as envisioned at the beginning of its establishment. The last one is considered to be data silos. Data is a key production factor in the digital age, and the financial industry is one of the most data-rich sectors. With the continuous expansion of financial business systems and the ever-increasing volume of data, the challenge of breaking through "data silos", where data is not shared and collaborative efforts are hindered (Carruthers, 2022), has become more pressing. Achieving efficient data processing and in-depth analysis for financial institutions has also become a critical topic within the industry. Many underdeveloped regions in China are still following traditional financial development models, characterized by opaque and non-shared information (Y. Li, 2021). Ironically, these areas possess a significant amount of rural financial data elements, exacerbating China's problem of data isolation.

OBJECTIVE, FRAMEWORK AND METHODOLOGY

This analysis compares China's financial data management with other countries and offers recommendations. Emphasizing the pivotal role of data in the industry, it explores governance, integration, security, and technology innovation to uncover insights and best practices that can transform financial processes. In a landscape of evolving customer expectations and strict regulations, the capacity to leverage and secure data elements is not merely an advantage but a competitive necessity (Hartmann et al., 2023). This paper aims to provide financial professionals, policymakers, and stakeholders with a comprehensive understanding of how proper data element management is both operational and strategic, transforming financial institutions into agile, efficient, and forward-looking entities in the digital world. The research method involves a case analysis of the United Kingdom, a leader in financial data element management, to provide insights for China's

management focus.

FINANCIAL DATA ELEMENTS MANAGEMENT COMPARED WITH U.K.

Case analysis is a valuable methodology for providing recommendations by comparing cases (Eisenhardt, 1989). Currently, the strategic value of big data has gained attention from governments of developed countries, leading to the introduction of big data plans and regulations to foster its application and development. There's a significant gap in services. The choice of the UK is due to its pioneering role in data collection and application in the European region (Ozga, 2009), with an approach that limits government regulation, highlighting a defect in China compared to the UK. Lack of coordinated governance among regulatory entities is a significant problem, in an increasingly open financial market, the complexity and dynamics of cross-border personal financial data risks require a multi-layered risk management approach (Ruijer, 2021). China's current regulatory approach to cross-border personal financial data is government-centric and lacks coordination, both horizontally and vertically, among different regulatory departments, industry sectors, and societal entities (D. Zheng, 2022).

Chinese financial industry associations, relying on administrative oversight, face limitations and a lack of independent regulations, risking control by large financial institutions. To address this, mechanisms should facilitate active industry engagement in collaborative governance, establishing a regulatory partnership with government oversight. Another challenge is poor liquidity in data assets, as institutions hesitate to share personal financial data swiftly. They view accumulated data as proprietary, resulting in closed data storage. The Chinese government, adopting a cautious stance on financial liberalization, aims to prevent market volatility from foreign portfolio investors (H. Xu et al., 2023). This has led to strict entry and exit requirements for financial data elements. For instance, the removal of apps from cross-border securities companies like Futu and Tiger by the China Securities Regulatory Commission in 2023 will change how small and medium retail investors participate in US and Hong Kong stocks in the short term. Moreover, a crucial outflow channel for financial capital is missing.

SUGGESTIONS FOR THE MANAGEMENT OF FINANCIAL DATA ELEMENTS IN CHINA

In the era of data-driven technologies, China should adopt comprehensive data protection legislation similar to Europe's GDPR. Such laws would create a strong legal framework to safeguard personal and financial data, emphasizing informed consent, transparency, and strict penalties for data breaches. This move would offer numerous advantages, including enhanced data security, trust-building for a thriving digital economy, global compatibility, legal clarity, and greater accountability among data handlers. Secondly, strengthening the confirmation of financial data elements can make management easier. Data property rights are of great significance in the basic system of data, and data right confirmation is an indispensable prerequisite for realizing the safe and orderly flow of data and the capitalization of data (Zhang et al., 2023). Which subject belongs to the data rights, what rights are enjoyed to the data, and the data is reproducible. Therefore, only by clarifying the basic attributes of these data rights can a basic data system be established. What's more, although the process may be very long, the data right confirmation legislation is a good way to ensure the right confirmation of data elements. The legislation of data rights confirmation is a complex systematic project.

The current laws of various countries have not yet regulated the legislation of data rights confirmation. Courts are generally used to deal with individual cases, with the help of different legal mechanisms including privacy protection laws, intellectual property laws, and contract laws to judge (Wachter & Mittelstadt, 2019), ensuring the legislation of rights confirmation can also optimize the management of financial data elements from the side. Moreover, enhancing the pricing mechanisms for financial data factors has the potential to promote the marketization of these elements and invigorate data markets. Precise data pricing involves setting both a cost-based floor and a customer-oriented ceiling, while also considering market dynamics and economic theories to optimize profitability and consumer welfare. In practice, when dealing with the complexities of big data, it's

essential to recognize its inherent value, which goes beyond raw data and includes its potential to generate insights, fuel innovation, and streamline decision-making. Therefore, apart from cost and customer-centric factors, a comprehensive data pricing framework should draw insights from data economics, product pricing strategies, and asset valuation theories. One approach to this task is a multi-faceted strategy that encompasses query-based, market-based, and model-based approaches. Query-based pricing determines prices based on specific data requests or queries. Market-based pricing aligns prices with supply and demand dynamics in data markets. Model-based pricing uses predictive models and algorithms to forecast data's future value and price it accordingly (J. Xu et al., 2023), the integration of these pricing methods ensures a scientific and objective approach to data pricing. Unlike static methods, dynamic data pricing considers characteristics, market conditions, and forecasting models for accuracy. In financial contexts, data desensitization, transforming sensitive information, is crucial to safeguarding personal details like cash flow. Governments and businesses are developing data masking tools to secure data usage without storing raw information, providing benefits such as safeguarding financial information, preserving privacy, and ensuring regulatory compliance.

CONCLUSION

In conclusion, there indeed exist inactive markets, a lack of interactive data, and regulatory systems that lag those of more mature data management nations in China. However, data element management is consistently regarded as crucial globally, especially with substantial support from domestic and international policies. Data element management is the driving force behind China's fintech revolution to enhance customer experience, risk management, innovation, security, and compliance in the financial sector, and as China aims to become a global financial powerhouse, effective data element management remains critical to industry growth and global influence. This article has proposed to improve the status of data by establishing relevant protection laws, and improve the way data rights, pricing and desensitization, so that data is traded like a normal commodity. Through these methods, the chaos and shortcomings of Chinese financial data management mentioned above will be solved. When these existing problems are solved, Digital China will bring China's financial industry development into a new and healthier growth.

AUTHOR CONTRIBUTIONS

All authors played a role in conceptualizing the research and drafting the manuscript. In simple words, all team members provided support in various aspects of this paper.

CONFLICTS OF INTEREST

The manuscript has not been published elsewhere and is not under consideration by other journals. All authors have approved the review, agree with its submission and declare no conflict of interest on the manuscript. This paper published as part of 1st International Conference On Business & Management (1ST ICBM) 2023.

REFERENCES

Carruthers, A. (2022). Breaking Data Silos. In *Building the Snowflake Data Cloud: Monetizing and Democratizing Your Data* (pp. 29–50). Springer.

Cheng, S., Ma, W., Luo, L., & Li, Y. (2023). Can The Development of Digital Economy Improve the Quality of Regional Investment? — Empirical Evidence from Chinese Cities. *Economic Analysis and Policy*. https://doi.org/10.1016/J.EAP.2023.08.006

Dong, X., & Yu, M. (2023). Does Fintech Development Facilitate Firms' Innovation? Evidence from China. *International Review of Financial Analysis*, *89*, 102805. https://doi.org/10.1016/J.IRFA.2023.102805

Eckert, C. (2023). Beyond the Spreadsheet: Data Management for Physicians in the Era of Big Data. *Surgical Clinics of North America*, *103*(2), 335–346. https://doi.org/10.1016/J.SUC.2022.11.007

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *Academy of Management Review*, *14*(4), 532–550.

Fuster, G. G., De Hert, P., & Gutwirth, S. (2008). SWIFT and The Vulnerability of Transatlantic Data Transfers. *International Review of Law, Computers & Technology*, *22*(1–2), 191–202. https://doi.org/10.1080/13600860801925185

Hartmann, B., Reuter, C., & Strauss, E. (2023). Controlling big data? Unfolding The Organisational Quest for IT-Enabled Competitive Advantage. *Scandinavian Journal of Management*, *39*(3), 101282. https://doi.org/10.1016/J.SCAMAN.2023.101282

He, Q., & He, J. (2022). Analysis of The Path to Solve the Rural Financing Problem Based On "Agricultural Big Data + Financial Technology." *Optik*, 170340. https://doi.org/10.1016/J.IJLEO.2022.170340

He, Z. (2022). When Data Protection Norms Meet Digital Health Technology: China's Regulatory Approaches to Health Data Protection. *Computer Law & Security Review*, *47*, 105758. https://doi.org/10.1016/J.CLSR.2022.105758

Kissel, R. (2011). Glossary of Key Information Security Terms. Diane Publishing.

Kolesnikov, A. V, Zernova, L. E., Degtyareva, V. V, Panko, I. V, & Sigidov, Y. I. (2020). Global Trends of the Digital Economy Development. *Opción: Revista de Ciencias Humanas y Sociales*, *26*, 523–540.

Krotov, V., & Johnson, L. (2023). Big Web Data: Challenges Related to Data, Technology, Legality, And Ethics. *Business Horizons*, *66*(4), 481–491. https://doi.org/10.1016/J.BUSHOR.2022.10.001

Li, Y. (2021). Research on Internet Financial Regulatory Innovation in China. *E3S Web of Conferences*, *275*, 01037.

Li, Z. fei, Zhou, Q., Chen, M., & Liu, Q. (2021). The Impact Of COVID-19 On Industry-Related Characteristics And Risk Contagion. *Finance Research Letters*, *39*, 101931. https://doi.org/10.1016/J.FRL.2021.101931

Murugan, M. S., & T, S. K. (2023). Large-Scale Data-Driven Financial Risk Management & Analysis Using Machine Learning Strategies. *Measurement: Sensors*, *27*, 100756. https://doi.org/10.1016/J.MEASEN.2023.100756

Ng, S. T., Xu, F. J., Yang, Y., & Lu, M. (2017). A Master Data Management Solution to Unlock the Value of Big Infrastructure Data for Smart, Sustainable and Resilient City Planning. *Procedia Engineering*, *196*, 939–947. https://doi.org/10.1016/J.PROENG.2017.08.034

Ozga, J. (2009). Governing Education Through Data In England: From Regulation To Self-Evaluation. *Journal of Education Policy*, *24*(2), 149–162. https://doi.org/10.1080/02680930902733121

Ray, P. P. (2023). ChatGPT: A Comprehensive Review On Background, Applications, Key Challenges, Bias, Ethics, Limitations and Future Scope. *Internet of Things and Cyber-Physical Systems*, *3*, 121–154. https://doi.org/10.1016/J.IOTCPS.2023.04.003

Ren, Y. S., Ma, C. Q., Chen, X. Q., Lei, Y. T., & Wang, Y. R. (2023). Sustainable Finance and Blockchain: A Systematic Review and Research Agenda. *Research in International Business and Finance*, *64*, 101871. https://doi.org/10.1016/J.RIBAF.2022.101871

Rong, K. (2022). Research Agenda for The Digital Economy. *Journal of Digital Economy*, *1*(1), 20–31. https://doi.org/10.1016/J.JDEC.2022.08.004

Ruijer, E. (2021). Designing and Implementing Data Collaboratives: A Governance Perspective. *Government Information Quarterly*, *38*(4), 101612. https://doi.org/10.1016/J.GIQ.2021.101612

Susha, I., Rukanova, B., Zuiderwijk, A., Gil-Garcia, J. R., & Gasco Hernandez, M. (2023). Achieving Voluntary Data Sharing in Cross Sector Partnerships: Three Partnership Models. *Information and Organization*, *33*(1), 100448. https://doi.org/10.1016/J.INFOANDORG.2023.100448

Tu, Y., Liu, R., & Li, H. (2022). The Development of Digital Economy and the Future of the Trade Union Law of the People's Republic of China. *Journal of Chinese Human Resource Management*, *13*(2), 76–85. https://doi.org/10.47297/wspchrmWSP2040-800507.20221302

Varadi, S., Kertesz, A., & Parkin, M. (2012). The Necessity of Legally Compliant Data Management In European Cloud Architectures. *Computer Law & Security Review*, *28*(5), 577–586. https://doi.org/10.1016/J.CLSR.2012.05.006

Venkateswarlu, Y., Baskar, K., Wongchai, A., Gauri Shankar, V., Paolo Martel Carranza, C., Gonzáles, J. L. A., & Murali Dharan, A. R. (2022). An Efficient Outlier Detection with Deep Learning-Based Financial Crisis Prediction Model in Big Data Environment. *Computational Intelligence and Neuroscience*, *2022*.

Wachter, S., & Mittelstadt, B. (2019). A Right to Reasonable Inferences: Re-Thinking Data Protection Law in the Age of Big Data and AI. *Columbia Business Law Review*, *2019*(2), 494–620.

Xia, L., Baghaie, S., & Mohammad Sajadi, S. (2023). The Digital Economy: Challenges and Opportunities in The New Era of Technology and Electronic Communications. *Ain Shams Engineering Journal*, 102411. https://doi.org/10.1016/J.ASEJ.2023.102411

Xu, H., Li, S., & Tian, Z. (2023). Does Foreign Equity Investment Impact the Spillover Effect of Industries in China? *The North American Journal of Economics and Finance*, *68*, 101955. https://doi.org/10.1016/J.NAJEF.2023.101955

Xu, J., Hong, N., Xu, Z., Zhao, Z., Wu, C., Kuang, K., Wang, J., Zhu, M., Zhou, J., Ren, K., Yang, X., Lu, C., Pei, J., & Shum, H. (2023). Data-Driven Learning for Data Rights, Data Pricing, and Privacy Computing. *Engineering*. https://doi.org/10.1016/J.ENG.2022.12.008

Yang, R., Yu, L., Zhao, Y., Yu, H., Xu, G., Wu, Y., & Liu, Z. (2020). Big Data Analytics for Financial Market Volatility Forecast Based On Support Vector Machine. *International Journal of Information Management*, *50*, 452–462. https://doi.org/10.1016/J.IJINFOMGT.2019.05.027

Ye, Y., Zhou, A., Shi, X., & Huang, C. (2022). A SEED Model for Constructing the Data Factor Market: Evidence from Guiyang Global Big Data Exchange (GBDEx) in China. *Journal of Digital Economy*, *1*(3), 273–283. https://doi.org/10.1016/J.JDEC.2023.03.002

Zhang, L., Chen, Y., Luo, Y., He, Z., & Li, T. (2023). Data Rights Confirmation Scheme Based on Auditable Ciphertext CP-ABE in the Cloud Storage Environment. *Applied Sciences*, *13*(7). https://doi.org/10.3390/app13074355

Zheng, D. (2022). On the Collaborative Governance of China's Financial Data. *Economist*, *12*, 76–85. http://jjxj.swufe.edu.cn/CN/article/downloadArticleFile.do?attachType=PDF&id=4761

Zheng, G. (2021). Trilemma and Tripartition: The Regulatory Paradigms of Cross-Border Personal Data Transfer in the EU, the U.S. and China. *Computer Law & Security Review*, *43*, 105610. https://doi.org/10.1016/J.CLSR.2021.105610

Zhou, L., Huang, R., & Li, B. (2020). "What Is Mine Is Not Thine": Understanding Barriers to China's Interagency Government Data Sharing from Existing Literature. *Library & Information Science Research*, *42*(3), 101031. https://doi.org/10.1016/J.LISR.2020.101031