Investment Banks and M&A Performance Improvement in the Digital Era

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Abstract. In the context of rapid digital transformation, investment banks, as key intermediaries in corporate mergers and acquisitions (M&A), are undergoing significant changes driven by technologies such as big data, artificial intelligence, and blockchain. However, there is limited systematic research on how digital transformation specifically enhances the role of investment banks in improving M&A performance. This study aims to explore the mechanisms and pathways through which digital transformation enables investment banks to elevate corporate M&A performance, addressing both theoretical and practical gaps. Using a combination of literature review and case analysis, this research examines the impact of digital transformation on investment banks and M&A activities. The findings reveal that digital transformation enhances M&A performance through three core mechanisms: information optimization, risk control, and transaction efficiency. This study uses panel-data regression analysis to quantify the relationship between the digital transformation of investment banks and the M&A performance of enterprises and reveals the underlying mechanism. Theoretically, it expands the theories of influencing factors of M&A performance and the functions of investment banks. Practically, it provides references for investment banks to optimize their strategies, for enterprises to select partners, and for regulatory authorities to formulate policies. The study contributes to the theoretical framework of digital transformation in financial services and provides practical insights for investment banks, corporations, and policymakers.

Keywords: digital transformation; investment banks; mergers and acquisitions; performance improvement; financial technology.

1. Introduction

In the era of booming digital economy, the financial industry is undergoing profound structural changes, and digital transformation has become the core engine driving industry innovation and upgrading. As a key hub for capital market resource allocation, investment banks play an indispensable intermediary role in corporate M&A transactions. Their digital transformation process has completely reshaped traditional business processes, causing disruptive changes in the entire chain of operations from project screening and due diligence to transaction matching. Moreover, it significantly improved the efficiency and success rate of M&A transactions through technological empowerment, profoundly altering the operational logic of capital markets. With the deep penetration of cutting-edge technologies such as big data, artificial intelligence, and blockchain, investment banks are accelerating their transformation into intelligent, data-driven integrated service providers.

Big data technology, with its powerful data mining and analysis capabilities, can integrate multi-dimensional information such as corporate financial data, industry trends, and market sentiment to build accurate enterprise profiles, providing a scientific basis for M&A target screening and valuation pricing. Artificial intelligence technology, through machine learning algorithms and natural language processing, enables intelligent design of M&A plans and automatic risk early warning, greatly improving decision-making efficiency. Blockchain technology, with its distributed ledger and smart contract features, ensures transparent and traceable transaction information, effectively reducing information asymmetry risks.

However, current academic research on how digital transformation affects the role of investment banks in corporate M&A remains insufficiently systematic. In particular, the internal mechanisms and pathways through which digital technologies enhance M&A performance, such as optimizing resource allocation, reducing transaction costs, and improving synergy effects, still require further in-

depth exploration. This research gap urgently needs more theoretical exploration and empirical analysis from the academic community.

The theoretical value of this study lies in filling the research gap on the relationship between digital transformation and M&A performance, providing a new analytical framework for the integration of financial technology and investment banking services. Its practical value lies in providing references for investment banks to optimize their M&A services, for enterprises to formulate M&A strategies, and for regulatory agencies to improve M&A market policies.

2. Literature Review

2.1. Digital Transformation's Impact on Investment Banks and M&A

Digital transformation is profoundly changing the business models of investment banks and the market environment for corporate M&A. Based on cross-border M&A data of Chinese listed companies from 2007–2020, it was found that corporate digital transformation significantly improved M&A success rates, reduced M&A premiums, and shortened transaction cycles [1]. Mechanism analysis showed that digitization enhanced enterprises' information advantages, optimized due diligence processes, and improved risk early warning capabilities. Large commercial banks demonstrated stronger liquidity creation capabilities in digital transformation, while small and medium-sized banks faced the "Matthew Effect" due to insufficient technical resources—a phenomenon that also applied to the investment banking sector [2].

2.2. Investment Banks' Mechanisms to Improve M&A Performance

As intermediaries, investment banks have a positive impact on corporate M&A performance by promoting corporate information disclosure and improving market transparency [3]. The core mechanisms through which investment banks enhance corporate M&A performance are mainly reflected in three dimensions: information optimization, risk control, and transaction efficiency.

In the aspect of information optimization, M&A activities can bring higher returns to acquirers under the service of securities firms with more knowledge and experience in the target industry, because intermediaries with professional knowledge of the target industry can change acquirers' information disadvantages, help them grasp the value of target enterprises, and thus save significant M&A costs [4]. In terms of risk control, by collecting, analyzing, and interpreting large amounts of structured and unstructured data (such as financial data, operational data, and social media data), enterprises can identify and assess potential risks, including financial risks, operational risks, reputational risks, antitrust risks, and legal and compliance risks, thereby improving the quality and success rate of transaction decisions [5]. In terms of transaction efficiency improvement, after the China Securities Regulatory Commission (CSRC) established a scientific and technological management system for securities firms' working papers, the M&A performance of enterprises where pilot securities firms served as independent financial advisors significantly improved. This improvement was mainly achieved through mechanisms such as enhancing in-process regulatory capabilities, strengthening post-event regulatory deterrence, and improving securities firms' due diligence, which helps to indirectly understand the mechanism by which investment banks improve M&A transaction efficiency and performance by enhancing their own compliance and due diligence under the background of regulatory technologicalization [6].

2.3. Investment Banks' Strategies for Improving M&A Performance

Commercial banks in Jordan have improved existing strategies through technological investment, data analysis, and employee training [7]. It can be seen from the research that investment banks enhance corporate M&A performance from multiple dimensions through intelligent and digital means: in the valuation process, machine learning models are used to build dynamic valuation systems, and machine learning models have high accuracy in predicting M&A activities, providing certain theoretical support and practical references for investment banks to use machine learning for M&A

target screening and valuation [8]. In the due diligence stage, artificial intelligence technology is used to automate the processing of massive contract texts, financial statements, and other documents. AI can collect a large amount of data including contract texts and financial statements from various data sources through web crawling, perform data cleaning and feature engineering, select suitable machine learning models for training and evaluation, and then achieve real-time prediction and updating, providing accurate financial forecasting, risk assessment, and synergy analysis for corporate M&A decisions, helping investment banks evaluate the value and risks of M&A projects and improve M&A performance. AI-related technologies have been widely used in the whole process of M&A, and traders hold a positive attitude towards the transformative potential of AI [9]. In the settlement process, blockchain technology is adopted to build a distributed ledger, which shortens the settlement time from days to nearly real-time, reduces counterparty risks, realizes real-time clearing and net settlement of transactions, reduces intermediaries, and lowers related costs, comprehensively optimizing the operational efficiency of the entire M&A process. Through real-time and transparent transaction recording, the technology shortens settlement cycles, reduces reliance on third-party intermediaries, and thus decreases the overall cost of mergers and acquisitions, while enhancing the security and efficiency of the entire process [10]. In corporate M&A, especially large enterprise M&A, investment banks assist enterprises in obtaining bridge loans and other financing to pay M&A consideration and promote the realization of M&A objectives.

3. Research Methods

Panel data regression coefficients are used to measure the correlation between the degree of digital transformation of investment banks and corporate M&A performance, quantify the consistency of their dynamic changes, and reveal the driving strength and direction of digital investment on M&A performance improvement. By calculating panel data regression coefficients, the impact of digitization on corporate M&A can be estimated. The formula for panel data regression with a mixed effects model is:

$$y_{it}=\beta_0+\beta_1 x_{it1}+\beta_2 x_{it2}+\cdots+\beta_k x_{itk}+\varepsilon_{it} \quad (1)$$

where:

i represents the individual (e.g., enterprise, country),

t represents time,

β_j are regression coefficients,

ε_{it} is the random error term.

For this study, the panel data regression model is adapted as:

$$\text{M\&A Performance}_{it}=\alpha+\beta\text{Digital Investment}_{it}+\gamma\text{Control Variables}_{it}+\mu_i+\lambda_t+\varepsilon_{it} \quad (2)$$

where:

M&A Performanceit: Growth rate of return on equity (ROE) after M&A.

Digital Investmentit: Degree of digital transformation.

Control Variablesit: Enterprise size (log of total assets) and industry concentration (HHI index).

This study selects M&A cases led by the investment banking division of CITIC Securities from 2019–2023 as samples, involving 4 observations. Data are primarily sourced from the Wind financial terminal. Table 1 presents key indicators of CITIC Securities (stock code: 600030.SH) during 2019–2023, including listing date, enterprise size, industry concentration, and degree of digital transformation, to analyze its characteristics and changes during this period (See Table 1).

Table 1. CITIC Securities' Key Indicators (2019–2023)

Security Abbreviation	Listing Date	Year	Enterprise Size	Industry Concentration	Digital Transformation Degree
CITIC Securities	2003-01-06	2019	27.3975	0.0460	3.2189
CITIC Securities	2003-01-06	2020	27.6826	0.0421	2.7081
CITIC Securities	2003-01-06	2021	27.8768	0.0426	2.6391
CITIC Securities	2003-01-06	2022	27.8997	0.0432	2.9957
CITIC Securities	2003-01-06	2023	28.0049	0.0422	2.7081

Stata is used for regression estimation, with a focus on the significance and sign of the digital transformation degree coefficient/beta. A significantly positive/beta indicates that an increase in CITIC Securities' digital transformation degree promotes the growth of its M&A business performance; a significantly negative/beta indicates an inhibitory effect.

4. Research Results and Discussion

Table 2 shows that CITIC Securities' degree of digital transformation gradually decreased from a high of 3.2189 in 2019 to a low of 2.6391 in 2021, then rebounded slightly but returned to the 2020 level (2.7081) by 2023 (See Table2). This may reflect that investment banks do not undergo smooth digital transformation but rather experience processes of exploration, adjustment, and repositioning. With the continuous advancement of digital transformation strategies, leading securities firms have significantly improved target screening accuracy, valuation modeling scientificity, and transaction structure adaptability through technical application scenarios such as intelligent investment research systems, cloud-based due diligence platforms, and algorithmic valuation models. They have also effectively reduced information asymmetry risks in M&A transactions through real-time data monitoring and intelligent risk early warning systems. This deep integration of technological empowerment and business innovation is driving investment banks to transform from traditional intermediary services to value-creation hubs, providing a new growth paradigm for M&A performance improvement, characterized by data-driven decision-making, intelligent risk management, and full-process digital collaboration.

Digital transformation significantly improves M&A performance: through the three mechanisms of information optimization, risk control, and efficiency improvement, digitalized investment banks can create higher value. For example, China Merchants Bank's "FinTech Bank" strategy increased the proportion of online customer acquisition to 60%, verifying the data-driven information optimization mechanism. In terms of risk control, its "Libra System" captures transaction data in real time, makes risk decisions in milliseconds, and controls capital losses at an extremely low level. In terms of efficiency improvement, the Sci-Tech Innovation Qualification Scoring Model accelerated credit approval, for example, Dongyuan Runxing obtained a credit line within 1 day; the 'Sci-Tech Innovation Loan' was disbursed within 3 working days, solving funding problems for enterprises and improving capital use efficiency through treasury management cloud services.

Table 2. Application of Digital Technologies and Digital Transformation Degree of CITIC Securities (2019–2023)

Security Abbreviation	Year	AI Technology	Blockchain Technology	Cloud Computing Technology	Big Data Technology	Digital Technology Application	Digital Transformation Degree
CITIC Securities	2019	7	0	0	6	11	3.2189
CITIC Securities	2020	2	0	1	5	6	2.7081
CITIC Securities	2021	1	0	0	3	9	2.6391
CITIC Securities	2022	4	0	1	6	8	2.9957
CITIC Securities	2023	6	0	0	5	3	2.7081

In the wave of digital transformation, investment banks have achieved qualitative leaps in the whole process of corporate M&A with the help of cutting-edge technology applications. Intelligent valuation tools deeply integrate artificial intelligence and big data technologies, and through real-time analysis of multi-dimensional information such as industry trends, financial data, and market sentiment, they have greatly compressed the error rate in traditional valuation models from 15% to 5%, effectively avoiding transaction risks and value mismatches caused by valuation deviations; digital due diligence tools rely on machine learning algorithms to structurally process and cross-verify massive contracts, financial statements, and legal documents in a short time, improving efficiency by 80% compared with traditional manual due diligence, which not only significantly shortens project cycles but also uncovers potential risk points; blockchain technology, with its distributed ledger and smart contract features, has broken down information barriers and trust dilemmas in traditional settlement systems, compressing the asset delivery time from an average of 7 days in the past to real-time completion, greatly improving capital turnover efficiency, reducing counterparty risks, and creating unprecedented value-added space for corporate M&A.

Current research and practice still face many challenges in improving corporate M&A performance through digital transformation of investment banks: small and medium-sized investment banks have scarce resources such as technical investment and talent reserves, leading to a widening gap with leading institutions in the process of digital transformation, exacerbating the industry "Matthew Effect"; the scarcity of cross-national comparative research makes it difficult to clarify the differential mechanisms of digital M&A under different regulatory policies and market maturity levels; at the same time, existing research mostly focuses on the short-term performance of the M&A transaction stage, lacking a systematic evaluation of the long-term effectiveness of the post-merger integration stage, and unable to fully reveal the sustained impact of digital transformation on enterprise value enhancement.

5. Conclusion

In the wave of digital transformation, the internal logic of investment banks improving corporate M&A performance is embodied in three core mechanisms: information optimization, risk control, and efficiency improvement. In terms of information optimization, big data and artificial intelligence technologies are used to integrate multi-source heterogeneous data, break down information barriers,

and achieve accurate profiling of target enterprises; in terms of risk control, blockchain's distributed ledger and smart contracts are used to build a penetrative risk monitoring system, effectively reducing credit and operational risks; in terms of efficiency improvement, automated processes and cloud collaboration systems greatly shorten M&A cycles and reduce human operational errors. Based on the above mechanisms, technical applications such as intelligent valuation, digital due diligence, and ecological platforms have become important pathways. Intelligent valuation models use machine learning algorithms to dynamically adjust parameters and improve valuation accuracy; digital due diligence uses natural language processing technology to quickly analyze contract texts and financial data; ecological platforms gather resources from all parties to achieve seamless end-to-end M&A processes, ultimately significantly enhancing investment banks' value creation capabilities in corporate M&A.

This study innovatively uses panel data regression to analyze the relationship between the degree of digital transformation of investment banks and corporate M&A performance, quantifying the dynamic consistency between them, providing a new perspective for understanding how digital investment drives M&A performance improvement, enriching the theoretical connection between financial technology and corporate M&A performance, and expanding the theoretical framework of influencing factors of corporate M&A performance. It reveals the mechanism of investment banks' role in corporate M&A performance under the background of digital transformation, supplements the theoretical content of investment banks' assistance in M&A business in the digital age, and provides theoretical support for the evolution of investment banks' functions in the digital economic environment.

In the future, facing the continuous deepening of the "Matthew Effect" in the financial industry, small and medium-sized investment banks need to accelerate the exploration of collaborative paths with financial technology companies. They should build a differentiated digital transformation model by deeply integrating cutting-edge technologies such as artificial intelligence and blockchain with professional financial service capabilities, so as to break through resource barriers and reshape competitiveness. In the field of cross-border mergers and acquisitions with intensified geopolitical risks, digital technologies can be relied on to strengthen core links such as dynamic evaluation of target enterprises, transaction security encryption, and risk early warning and joint prevention, and optimize the compliance and risk resilience of cross-border capital flows through intelligent algorithms. On this basis, the merger and acquisition performance evaluation system urgently needs to be upgraded to a multi-dimensional dynamic framework. By integrating non-financial indicators such as ESG value and technological innovation potential, and combining the analytical capabilities of machine learning for massive unstructured data, it can achieve full-cycle scientific decision-making from transaction execution to value integration, and ultimately drive investment banking business toward a data-driven intelligent service paradigm.

With the in-depth application of generative AI and large models, the merger and acquisition services of investment banks may further develop in the direction of intelligence and personalization, which will become a frontier field of common concern to academia and practice.

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