

Research on the Impact of Fintech and Mathematization Transformation of Listed Companies on Market Value Management

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Abstract: Along with the unprecedented opportunities and challenges faced by listed companies, financial technology is developing rapidly and digital transformation is being promoted deeply. Therefore, this study explores the mechanism of financial technology and digital transformation in influencing the market value management of listed companies through the direct and indirect effects of financial technology application and digital process reengineering on the market value of listed companies. The empirical analysis finds that the application of financial technology can significantly and positively affect the market value of listed companies by improving their market efficiency and reducing their transaction costs. Digital transformation indirectly affects the company's market competitiveness and investor confidence by improving operational efficiency and user experience. This paper not only supplements the theoretical aspects of market value management, but also provides suggestions for the feasibility of market value management for listed companies under the wave of fintech and digital transformation at this stage.

1. Introduction

Fintech has been developing at a high speed since 2019, profoundly changing the mode of operation of the financial services industry. The reform of the financial regulatory system pushes the fintech industry into the transition of the super-regulation era, and the data element capability and fintech scenario construction have become the main concerns of the fintech industry. Fintech can be roughly divided into two categories: one is the new type of financial activities birthed by the promotion of new technologies, such as mobile payment and blockchain-based smart contracts; the other is the change in production and management (operational change) brought by traditional financial institutions based on the reality of the development of high technology, such as the use of cloud computing, Internet of Things and machine learning technology to implement supply chain management, customer service and product development.

The concept of market value management has been developed in China for more than 10 years, but the definition and meaning of market value management is not yet fully harmonized, resulting in ambiguity of some securities violations, such as violation of information disclosure, securities

manipulation, misrepresentation, and insider trading. Early warning of market capitalization risks can be provided through technological means. In the 2024 China Fintech Enterprise Chief Insight Report, it is shown that there is more optimism about the prospects for the application of big model finance. More than half of the surveyed companies already have layouts involving big data technologies and products. It shows that fintech and digitalization are bringing more and more influence to the market value management of various listed companies.

This study focuses on the issues of data security, privacy protection, laws and regulations of enterprises based on the background of FinTech and digital economy and the issues and market value management brought about within the enterprises. As stated in Fintech: Research Status and Prospects, Fintech has shortened the distance between financial services and applications through digitalization, intelligence, security and other technological measures, which makes it easier for financial service providers to achieve the goals of service provision such as liquidity, profitability, and security, etc. At many points, Fintech and the concept of market capitalization management are highly compatible with each other, and provide new perspectives and strategies for market capitalization management, which helps enterprises to more reasonably adjust and plan for market value management in the era of digital economy. It provides new perspectives and strategies for market capitalization management, and helps enterprises to adjust and plan their market capitalization management strategies more rationally in the era of digital economy.

2. Literature review

2.1. Theoretical development of financial technology

Fintech is a product of the combination of the financial industry and science and technology. In recent years, fintech has been all the rage globally, and has become an important force driving the upgrading of financial services and the development of the real economy.

Feng Yongqi and Lin Huangfeng (2024) point out that digital finance significantly promotes the high-quality development of enterprises by reducing transaction costs, expanding the scale of financing, and improving the timeliness of access to capital. They empirically examined the mechanism and realization path of digital finance on enterprise high-quality development by constructing a digital finance development index at the prefecture-level city level and a high-quality development index at the enterprise level^[1]. Su Guihong (2024) discusses the impact of fintech on enterprise digital innovation, emphasizing the role of fintech in reducing market transaction costs, expanding the scale of financing for digital innovation activities, and improving the timeliness of access to capital, thus easing the financing constraints of enterprises and helping to improve the level of enterprise digital innovation^[2]. Fintech improves corporate ESG performance by promoting internal growth through technological progress and agency cost reduction, and optimizes the external environment to improve ESG performance by reducing external transaction costs and easing financing constraints. Based on the data of 230 Shanghai and Shenzhen A-share listed digital enterprises in China from 2007 to 2022, Chu, X. W. and Wang, J. B. (2024) analyze the effect of science and technology financial policies on the rise of digital enterprises in the global value chain and the internal mechanism of the effects of the policies using a multi-temporal double-difference method^[3]. Zhao Wenju et al. (2024) explore the relationship between fintech, regulatory strategies and regional financial risk. The study finds that fintech suppresses regional financial risks and works through three paths: "stabilizing the economy", "stabilizing finance" and "preventing proliferation"^[4].

Research on fintech's impact on high-quality development of enterprises, ESG and global value chains, and financial risks has a positive effect, and such research is not only conducive to the enrichment of the theoretical content of fintech, but also to the formulation of relevant policies and the production and operation of relevant enterprises. Further research could focus on the long-term

impact of fintech on enterprises and its cross-regional effects, as well as the relationship between fintech and the realization of sustainable development goals.

2.2. Theoretical development of mathematized transformations

According to Wu Fei et al. (2021), digital transformation can improve the capital market performance of enterprises, and digital transformation increases the market-based liquidity index of enterprises and improves the investment efficiency index^[5]. Yuan Chun et al. (2021) studied the impact of digital transformation on state-owned economy-dominated economy, and found that digital transformation can help to increase the specialization and higher vertical integration of the division of labor of enterprises, and improve the innovation efficiency and market competitiveness of enterprises^[6]. Dai Xiang et al. (2023) found that digital transformation helps enterprises break through the low markup rate trap, improves their output performance, and enables them to expand their exports^[7]. Fang Mingyue et al.(2022) explored the association between digital transformation and intra-enterprise sharing performance, and the impact of digital transformation on intra-enterprise income distribution is mainly through resource allocation, enterprise labor cost and productivity technological advancement, which can further affect or then directly affect the intra-enterprise income gap^[8]. Zhang Hongchang and Ding Rui(2024) found that digital transformation strengthens the dynamic capabilities of firms and enhances their recovery and intrinsic capabilities when coping with external shocks^[9]. Cheng Ao(2024) studied the impact of enterprise digital capability on ESG performance and found that enterprise digital capability is positively correlated with ESG performance, and digital capability improves enterprise ESG performance by promoting green technology innovation and improving operational efficiency in decision-making and management operations^[10]. According to Du Chuanzhong and Xue Yuzhe (2024), digital transformation helps enterprises realize core technological innovation, and open innovation has a mediating effect on it^[11].

Digital transformation has become an effective way to promote corporate innovation and development, business optimization and upgrading and performance improvement, resilient growth and development of sustainable, with the help of core technology to carry out business innovation, optimize and improve the operation and management capacity and level of the enterprise, and enhance the core competitiveness of the enterprise. At the same time, there is a significant correlation between the Company's digital transformation and its ESG performance, application of core technologies, etc., which can promote the fulfillment of the Company's social responsibility and sustainable development. However, there are challenges in the implementation process of digital transformation, digital transformation still has a low degree of matching the technological needs of enterprises in China, high labor costs and difficult to recruit, the amount of investment is very small, etc., we need the relevant departments, enterprises, universities and scientific research institutions to seriously explore the advantages and disadvantages associated with digital transformation, dig each other to play a synergistic advantage of more and more effective methods and means, to better achieve the digital transformation of the enterprise.

2.3. Theoretical development of market value management

Lu Xueyan et al. (2024) investigated the spatial cohort effect of enterprise digital transformation, and the digital transformation contributes to the high-quality development of enterprises, which also provides a new idea of enterprise market value management from the root, and can improve the long-term market value of the enterprise by means of transformation^[12]. Du Chuanzhong and Xue Yuzhe(2024) analyzed the impact of digital transformation and "dual innovation" on the core technology breakthrough of China's enterprises, and proposed that "dual innovation" has an important role to play in enhancing the innovation ability and market competitiveness of China's enterprises, as

well as in the management of China's enterprise market value. It is suggested that "dual-creation" is important for enhancing the innovation ability and market competitiveness of Chinese enterprises, and also for the market value management of Chinese enterprises^[11]. Yuan Weihai and Zhou Jianpeng(2024) studied the impact of digital transformation of Chinese enterprises on new factors of production, and found that digital transformation significantly improves the new productivity of Chinese enterprises, which also points out the idea for the market value management of Chinese enterprises from the root, i.e., we can rely on the new factors of production to fundamentally improve the value of Chinese enterprises^[13]. Zhang Hongchang and Ding Rui (2024) studied how digital transformation affects the toughness of high-tech manufacturing enterprises through dynamic capabilities, and proposed that the stronger the dynamic capabilities of high-tech manufacturing enterprises, the smaller the impact of institutional pressure on their market value maintenance, and enhance the toughness of their market value maintenance^[9].

Enterprises should pay attention to the role of digital transformation and open innovation in market capitalization management, and improve their competitive advantages and investor confidence through upgrading capabilities and new quality productivity, so as to enhance and stabilize their market capitalization. In addition, future research can further explore the market value management paths and effects of the two paths of digital transformation and open innovation in different industries and company sizes, and also analyze the effects of the combination of digital transformation and open innovation with other management paths.

2.4. Synthesis of comments

It can be seen from the above literature that fintech significantly reduces the cost of enterprise financing, develops financing channels and improves the speed of financing, which vigorously promotes the high-quality development of enterprises, and improves their ESG performance, the status of global value chains and the ability to cope with regional financial crises. Digital transformation, on the other hand, has significantly enhanced the core competitiveness of enterprises through the introduction of new technologies, optimization of business processes and improvement of management efficiency. Digital transformation is closely related to the improvement of ESG performance as well as innovation and breakthrough technologies of enterprises, and is an important driving force to drive the development of enterprise innovation, improve enterprise performance, enhance resilience and achieve sustainable development. In terms of market capitalization management, digital transformation and open innovation are considered to have a positive impact on the enhancement of long-term corporate value.

3. Analysis of the Current Situation of Listed Companies in Financial Technology, Mathematization Transformation and Market Value Management

3.1. Analysis of the current status of financial technology

With the rapid development of fintech, the financial services of different industries have undergone great changes, especially in these leading regions, the listing of fintech enterprises also fully reflects the different characteristics and uneven innovation capacity of different parts of China. In addition, most of these regions have relatively strong innovation ability, human resources dividend and government support.

With the continuous development and progress of fintech technology, there is an increasing demand for talents, but the shortage of talents has become a bottleneck for the development of fintech enterprises. Therefore, financial institutions must formulate corresponding talent strategies, cultivate and introduce fintech talents, and establish scientific and reasonable incentive and retention

mechanisms. In addition, fintech enterprises also use technologies such as big data, artificial intelligence and blockchain to provide personalized and differentiated financial services to improve the efficiency and quality of financial services. Fintech companies present a situation of a hundred flowers competing for attention, and your company has innovated a new product or service, which will inevitably cause other companies to follow suit and promote the development of the entire fintech industry. And the support of the policies issued by the state is also a factor in the development of a business, the introduction of a series of policies can make fintech enterprises in a more friendly environment for rapid and healthy development.

3.2. Analysis of the current status of digital transformation

Digital transformation has become an important way to enhance the corporate value of listed companies and increase the expected return to investors. The importance of digital transformation is not only in improving financial operations, but also in enhancing brand image and using digital tools to communicate more effectively in the marketplace. Digital transformation promotes the company's business processes, such as upgrading the supply chain, efficient production, cost savings and increased efficiency, which will eventually be reflected in the financial indicators, which will provide strong support for the company's valuation.

Second, digitization can also help companies develop new products and launch new services, enhancing their market competitiveness and innovation, which can affect company value. In addition, digital tools such as CRM systems and personalized recommendation engines can enhance the experience of sellers of products, such as customers, thereby increasing the company's brand impact and market impact, which has a positive effect on company value. In addition, risk management systems, early warning models, etc. can help the company identify risks in advance and carry out risk control, reducing the company's operational risks and uncertainties and enhancing investors' trust and peace of mind in the company.

3.3. Analysis of the current status of market value management

Market value management refers to a kind of enterprise operation and management activities in order to improve the market value of enterprises and protect the immediate interests of investors. In the new era, market value management is no longer only carried out from financial management and operation management, but comprehensive management of corporate image and market value with the content of corporate image construction and market communication. The digitalization of market value management is mainly reflected in the online investor relations platform built by listed companies through social media platforms, using big data and other resources to intelligently interact with investors and promote or disseminate corporate brand, corporate image and market value. This shows that the application of market value management of listed companies in the context of digitization has begun to play a value.

Therefore, listed companies use digital technology such as XBRL and artificial intelligence-assisted analysis tools to improve the depth of financial report disclosure and analysis efficiency, and the transparency of financial information rises, which helps investors to understand the true value of the disclosing company and increase market value. Data-driven decision-making based on big data and artificial intelligence algorithms can better help companies predict the market, predict the future, and make more scientific and rational market decisions. Market capitalization management is a dynamic, multi-dimensional process. Listed companies should embrace market capitalization and, with the help of digital technology, continue to truly identify it as well as their own competitiveness.

4. Mechanisms and Implementation Strategies of the Impact of Fintech and Mathematization Transformation of Listed Companies on Market Value Management

4.1. The deep impact of financial technology

With the rapid development of fintech, it has become an important force in reshaping the landscape of the financial industry and promoting innovation in financial services. Fintech is not only a simple application of technology, but also involves the innovation of financial service concepts, the transformation of business models and the change of market participants' behavior.

Fintech-related listed companies have clustered in the capital market in recent years, and most of them are generally facing challenges in the context of digital transformation, as shown in Table 1.

Table 1: Fintech's Impact on Market Capitalization and Implementation Strategies

corporations	Fintech's Impact on Market Capitalization and Implementation Strategies
Ant Group	In November 2020, Ant Group's IPO was suspended by Chinese regulators, primarily due to changes in the regulatory environment and regulatory compliance issues that could lead to volatility in market capitalization and a decline in investor confidence, affecting the company's reputation in the marketplace and future growth
	Strengthen communication with regulators, adjust business structure to meet regulatory requirements, and enhance transparency and compliance
Lu Jinshi (Chinese company)	In March 2022, Lufthansa faced challenges from PCAOB audit regulation in the United States, affecting its cross-border business, and increased compliance risk in cross-border business, which may affect international market expansion and global strategic layout
	Establishing a global compliance framework, working with international partners to address regulatory challenges, and optimizing cross-border business processes
China Merchants Bank	In July 2023, China Merchants Bank faced difficulties in adapting its traditional banking business model to the demands of digital transformation
	Explore new business models such as platformization and servitization, utilize fintech to improve efficiency, and strengthen digital talent training
Ping'an One Account	January 2024 Ping An OnePay faces shortage and competition for highly skilled fintech talent
	Establishment of talent development programs, provision of competitive compensation and benefits, creation of a favorable working environment, and strengthening of cooperation with colleges and universities
Microcentral Bank	In May 2024, MSB found that insufficient user awareness of fintech products and services affects market acceptance and promotion of new products, and customer loyalty and market share
	Strengthen user education and market promotion, increase user awareness and trust in fintech, and enhance brand influence through online and offline activities

Source: Author's compilation based on public information of each enterprise

Fintech technology services have the ability to provide innovative services, which can form an innovative atmosphere, motivate employees to continue to apply new technologies to their work and production, and further enhance the company's innovation ability and core competitiveness. Service innovation helps the company produce differentiated products and services, helps the company have differentiated features in homogenized competition, and has differentiated advantages, which can retain the advantages of the company's existing customers' knowledge and perception of the company, and help the company generate market value premiums. Fintech empowerment helps the company to be able to be based on the global market and not be limited to the local market, the company has the ability to look for opportunities in the global market and optimize the allocation of the company's factors of production. This optimized allocation helps the company avoid the market risks associated with being constrained by accounting in its home market, which helps to enhance the company's viability and has a stabilizing effect on its market value.

4.2. The full impact of digital transformation

Digital transformation can reduce costs through the optimization of business processes by eliminating unnecessary expenditures, and it can also improve the efficiency of human and material resources through the refinement of business operations. Reduced costs can be directly reflected in the financial statements in the cost and total cost ratio, thereby improving the company's profitability, which also has a positive impact on the company's market value. Improved customer perception is not only a higher credibility of the company's products, but also a qualitative improvement in the company's market response time, the rapid changes in the market environment, the ability to respond quickly to the company is more likely to be recognized by the market, which will have a positive impact on the company's market capitalization. Being able to make decisions based on readily analyzable data can provide adequate assurance that decisions will be made with less uncertainty, and the success rate of decisions will be greatly improved, thus directly improving market capitalization.

Digital transformation affects multiple levels of business operations, such as a company's supply chain operations, customer communication and relationships, and marketing methods, resulting in improved operational efficiency and customer experience. It can help companies adjust their operations faster, better understand customer needs through data analysis, match and personalize their marketing and services, and increase customer loyalty. In turn, it can optimize the operation process, improve the operation efficiency from the inside, reduce the cost, increase the revenue and further increase the market value of the company.

Digital transformation can improve the efficiency of the company's internal management, reduce operating costs and enhance its management transparency; improve the company's customer experience, encouraging more consumers to pay attention to the company's brand products and can enhance the market channel customer anti-fraud defender; data analysis will help companies to analyze the market demand for a more accurate, often to help the company to operate more scientifically.

4.3. Comprehensive strategy for market value management

First, listed companies entering the fintech ecosystem must open up and pull together cross-departmental working mechanisms to realize fintech full business connectivity with technology full connectivity. All three departments of the company are required to recognize that the intrinsic and fundamental purpose of the company's business and products is to improve the user experience and expand the competitive advantage in the market, which are the two prescribed goals that are not separated from each other, and the overlap of the roles of the three departments and fintech makes the three "intertwined" together. On this premise, the company can effectively utilize fintech to balance its own products with the level of user satisfaction and competitive advantage in the marketplace, and it can rationally apply the three roles of facilitating cooperation, knowledge export and technology supply by means of fintech-enabled real enterprises.

Second, digital talent as the core driver of digital transformation. It is important to improve the ability of listed companies to cultivate and attract digital talents, especially in the digitalization of cloud computing, big data, IoT and artificial intelligence. These talents need to be composite talents who should understand the dynamics of digitization, know how to apply technology in practice, and have the ability to innovate business models and management concepts. In addition, listed companies should also create learning organizations and equip their existing employees with broader digital knowledge to adapt to the dynamics of the digital space due to changes in business models.

Third, strengthening communication with investors is an important strategy to enhance market capitalization. In addition to requiring listed companies to fully utilize different forms of collective communication, such as information disclosure, performance briefing and other ways to regularly

announce information to investors, listed companies can also actively utilize the public platform for listed companies' network information disclosure and other ways to communicate with investors. Favorable communication platforms help investors fully understand the company's business plan, accounting and financial information, valuation basis, etc., improve investor expectations and preferences, increase investor loyalty, and thus enhance the company's market value.

Through the implementation of these strategies, listed companies can make full use of the advantages of financial technology and digital transformation. They can better manage market capitalization. They can thereby achieve longer-term sustainable market capitalization growth. They can also gain more favorable market competitiveness. This enables listed companies to respond quickly and flexibly to adjustments. This happens when they face changing market conditions. It allows them to continue leading. It also allows them to face fierce market competition from a more advantageous position.

The company will also be able to make adjustments quickly and flexibly in the face of changing market conditions, so that it can continue to lead and be in a more advantageous position to continue to face fierce market competition.

4.4. Implementation Strategies

Having explored the far-reaching impact of FinTech and digital transformation on market capitalization management, listed companies should take concrete actions to capture the opportunities these changes present and address the corresponding challenges.

First, build a digital management system for market value. A digital platform can be built to grasp market value information in real time, analyze the market situation, predict market value trends, and provide a basis for researchers to make decisions. Enterprises can anticipate market value changes in real time on the digital platform, adjust the financing structure, optimize the financing plan, and implement effective market communication.

Second, strengthen data security protection. With the deepening of digital transformation, companies rely on more and more "advanced" IT technology, and the requirements for data security are also higher. Listed companies can focus on capital investment, improve the level of data encryption and decryption technology, and improve the internal data access control system. These measures can strengthen data security protection and protect the listed company's own data as well as customer data. They can also reduce the impact of external data leakage on the company's market value.

Third, enhance transparency and compliance. In the era of big data, listed companies should improve the transparency of operational and financial information. Listed companies can regularly disclose financial statements, timely disclose significant events, and maintain compliance with relevant regulations and legal systems. They can actively communicate with regulators and pass on information. They can display operational information to the market and promote the development of the capital market.

Fourth, strengthen investor relations management. Investor relations management can be carried out with the help of information technology means, such as online meetings, virtual roadshows, social media, etc., to communicate in a timely and effective manner, deliver accurate information, provide a platform for convenient exchanges, manage investor expectations, optimize the investor structure, and thus achieve a positive enhancement of the stock price.

Fifth, implement a differentiated branding strategy. Companies can enhance corporate brand value and awareness through digital marketing and branding. They can analyze consumers' shopping characteristics through big data, artificial intelligence and other technologies, and provide customized

digital branding services for different consumers. This can attract consumers, increase brand loyalty, and boost traffic.

Through the implementation of these strategies and recommendations, enterprises can better uphold the concept of combining financial technology and digital transformation for market capitalization management, in order to continue to obtain the sustainability and longevity of market competition. At the same time, it will help enterprises improve their ability to adapt to changes in the general environment, gain better insight into market dynamics and seize market opportunities.

5. Conclusions

Fintech and digital transformation can significantly enhance the efficiency of market value management of listed companies. Listed companies use fintech and other new technologies to optimize the efficiency of capital allocation, lead the market transparency, improve the efficiency of operation and management, and also provide customers with convenient services, and at the same time, it also derives compliance and other issues. Listed companies, in addition to the pursuit of innovation in fintech+digital transformation, need to carry out the relevant risk compliance work; At the same time, listed companies should formulate corresponding market capitalization management strategies in conjunction with market changes and the development of science and technology informationization. This study can, against the backdrop of current financial technology and big data, provide certain theoretical guidance and reference for listed companies on how to formulate market capitalization management strategy objectives. It can further clarify how to grasp the balance of risk compliance in the sound operation and development of market capitalization.

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