

Digital Transformation: The Impact of e-CNY on Securities Institutions and Financial Systems in China

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Abstract: In recent years, the rapid advancement of emerging technologies such as big data, blockchain, and artificial intelligence has accelerated the transformation of currencies, shifting from materialization towards digitization and electronization. The e-CNY stands out as a prime example of China's pioneering digital financial innovation globally. Governed by the central bank, it embodies the national agenda. As the e-CNY's application field and reach expand, its relationship with the financial market grows increasingly intimate. As a significant participant in China's financial landscape and a proactive responder to national policies, the securities industry is profoundly influenced by the e-CNY across various domains. Therefore, this paper undertakes a theoretical analysis of the e-CNY's implementation within securities institutions, concluding that it will usher in a new paradigm for the entire financial system.

Keywords: e-CNY; Securities institutions; Digital transformation

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1. Introduction of e-CNY and literature research

1.1. Definition of e-CNY

The digital yuan, also known as e-CNY, exemplifying China's leadership in global digital financial innovation, underscores that traditional and new finance can be seamlessly integrated. It stands as a prime example of the co-design, co-innovation, and co-optimization of financial and information systems at the national level in China.

The e-CNY is a legal digital currency issued by the People's Bank of China, positioned as equivalent to banknotes and coins in circulation. It possesses the characteristics of value and legal compensation and is intended to coexist with the physical renminbi (RMB) in the long term^[1]. The development and application of e-CNY aim to fulfill the public's demand for digital cash, gradually replacing a portion of banknote and coin circulation, facilitating and serving various aspects of residents' lives, and contributing to financial inclusion^[2].

1.2. e-CNY characteristics

e-CNY has a series of advantages and features that are incomparable to other physical currencies as well as digital currencies, and the advantages and features are as follows:

1.2.1. Traceability

The transaction records of e-CNY can be tracked and traded on the blockchain network, ensuring a high level of transparency in the transaction process. This transparency facilitates regulators in verifying the authenticity and reasonableness of fund flows and in combating illegal activities such as money laundering, fraud, and crime. Additionally, e-CNY employs a real-name system, where account information is matched with users' genuine personal information, enabling regulators to implement precise control measures more conveniently ^[3].

1.2.2. Security

The central bank will implement a digital certificate system, digital signatures, secure encrypted storage, and other technologies comprehensively ^[4], ensuring that e-CNY possesses characteristics such as non-repeatability. As a result, the data becomes more objective, authentic, and authoritative ^[5].

1.2.3. Legal status

Both e-CNY and physical RMB are liabilities of the central bank to the public and have the same legal status and economic value ^[6].

1.2.4. Concurrent accounts and values

The e-CNY is compatible with Account-Based, Quasi-Account-Based, and Value-Based methods, and adopts variable denomination design to realize value transfer in the form of crypto-coin strings.

1.3. Literature research

Regarding the entire financial market, Ma posited that e-CNY can enhance the technical level and management capability of the financial system, thereby realizing efficiency improvements ^[7].

Regarding the impact of e-CNY on securities institutions, Zhang and colleagues argued that e-CNY affects brokerage firms' investment banking bond business and bond investment business differently due to its controllable and anonymous tracking features ^[8], while Fan and Wang suggested that the digital encryption mechanism of the central bank's digital currency and its direct peer-to-peer transmission feature can facilitate the internationalization of the RMB in the bond market ^[9].

2. Theoretical analysis of the application of e-CNY in the securities industry

Recently, with the acceleration of the integration of e-CNY and the securities industry, the securities industry has actively embraced the development trend of the digital economy and conducted in-depth exploration into the integration of e-CNY with various aspects of its operations ^[10].

2.1. e-CNY functional analysis

2.1.1. Enhancing payment efficiency through instant clearing

Compared with traditional currency payment, e-CNY payment offers the advantageous feature of "payment is settlement," almost completing the payment instantaneously. This realization leads to the unification of transaction flow and cash flow, ensuring a high degree of consistency between the two streams. As a result, it

lowers the proportion of capital occupation and enhances cash liquidity, thereby improving the efficiency of the payment system, reducing transaction time, and mitigating transaction risks ^[11].

2.1.2. Enabling the tracking of sources and uses of funds to prevent risky behavior

Due to the traceability of e-CNY, transactions using e-CNY can be tracked and recorded to ensure data transparency, The application of the programmable characteristics of e-CNY enables institutions to carry out automated risk management through smart contracts, set risk management rules, automatically trigger risk control measures.

2.1.3. Expanding the scope of services and increasing application scenarios

At present, the e-CNY application scenarios take into account both online and offline, covering wholesale and retail, catering, culture and tourism, education and medical care, public transportation, government payment, tax collection, subsidy issuance, etc.

2.1.4. Helping sink markets

The loosely coupled account design of e-CNY can facilitate the use of e-CNY wallets by people in remote areas without holding a traditional bank account, which is conducive to increasing the coverage of financial services ^[10].

2.1.5. Convenient cross-border settlement and international trade

Traditional finance has the problems of cumbersome processes, inefficient processing, numerous intermediaries, and high service costs. By constructing a multilateral central bank digital currency bridge, e-CNY can supplement the design of the existing e-CNY technology route, facilitate the realization of precise point-to-point payment, directly establish the value chain, and improve the efficiency of international clearing ^[12].

2.1.6. Ensure ease of payment

Different from the physical currency, e-CNY has the characteristics of electronic and digitalization, which can realize transactions without physical entities. e-CNY can be paid through mobile devices ^[13].

2.1.7. Reduce transaction costs by bypassing intermediaries

Transaction clearing between users and account banks involves third-party intermediaries, e-CNY is committed to solving the problem of settlement and payment intervention by third-party institutions ^[3], e-CNY does not charge the designated operating institutions for the circulation service, e-CNY facilitates the direct skipping of intermediaries and realizes the direct conversion of funds and claims between the two.

2.1.8. Building the settlement standards

e-CNY has unlimited legal capacity and can realize fast and free circulation among all supported banks and payment tools, avoiding extra costs and convenience problems caused by different payment platforms and means and breaking the transaction barriers. In addition, the system of non-interoperability between Alipay and WeChat has brought certain problems to the daily lives of residents, and the promotion of e-CNY helps to break this transaction barrier.

3. Analysis of the securities and investment banking segment

Securities firms are part of the financial industry and provide a range of financial services involving the

buying and selling of securities, investment, financial, and asset management. The following are common job descriptions for securities firms: (1) Brokerage services; (2) Investment banking; (3) Asset management; (4) Research and analysis; (5) Risk management; (6) Settlement and clearing; (7) Compliance and regulation; (8) Technical support.

4. Scholastic reflections on theoretical frameworks

4.1. e-CNY brings up brokerage services and settlement

Brokerage services are an important part of a brokerage firm's business segment, involving the purchase and sale of securities assets such as stocks and bonds, and with the construction of the brokerage firm's digital platform, through e-CNY, users can now use the brokerage institution's own APP to conduct purchase and sale trading activities; Settlement is the finalization process of the transfer of claims, while electronic payment transactions usually use settlement methods such as "T+1," "T+2," "D+1," "D+2," and so on, There is a certain degree of risk and inefficiency in the settlement of transactions. The payment and settlement characteristics of e-CNY will bring about changes in the mobile payment platform.

The integration of e-CNY instant clearing with securities brokerage services and settlement and clearing segments is mostly reflected in the convenience of purchasing over-the-counter (OTC) financial products and the settlement and flow of funds, thus realizing the enhancement of the efficiency of capital use and the level of transaction completion. The advantage of using e-CNY to invest in over-the-counter financial products lies in the convenience of trading time and settlement of assets. The electronic trading platform ensures that orders can be placed at any time 24/7 to meet various investment needs ^[14]. At the same time, e-CNY can effectively improve the efficiency of payment and settlement, and the funds can be withdrawn one day in advance after redemption, which can effectively improve customers' investment experience and the efficiency of capital flow ^[15].

4.2. e-CNY helps security institutions achieve comprehensive and automatic risk control

The securities industry, as well as the main work content of the investment banking business, is to help enterprises complete IPOs and other activities involving large capital flows, which require strict risk control of key factors such as issuer qualifications, the financial status of the counterpart company, and the level of capital flows, thereby preventing the flight of funds and the emergence of money laundering, fraud, and other non-compliant activities ^[16], but the risk control needs to be considered by several factors, and it may be faced with difficulties such as regulatory difficulties, frequent gray areas, etc. In addition, the construction of the anti-money laundering function of e-CNY should be accelerated and the existing e-CNY management system should be improved.

e-CNY tracing funds, risk control and investment banking, risk management, compliance, and supervision services. e-CNY makes securities-related transaction records traceable, and the traceability of e-CNY realizes the query and tracing of the source and use of funds, which can be organically combined with investment banking and settlement and payment of securities business to prevent money laundering, fraud, and other illegal and criminal behaviors; e-CNY is also convenient for brokerage firms to grasp the qualification information of issuers ^[16].

The e-CNY is a legal digital currency that draws on blockchain technology, with the characteristics of traceability, openness, and transparency, which can effectively protect the immediate interests of securities institutions and investors. As the use of e-CNY is fully traceable, it can effectively prevent money laundering, terrorist financing, and other illegal activities, and protect China's financial security, and the financial technology brought by e-CNY makes risk management more convenient and comprehensive.

Investment banking business involves corporate financing, mergers and acquisitions, etc., and the qualification of the issuer and other key information should be considered in fundraising and issuance of securities, etc. The e-CNY can enhance the degree of mastery of securities firms on corporate information, data, and credit information, and with the help of the e-CNY's openness to financial information and capital flows, it is easy to conduct further audits on the qualification of the issuer and to guard against qualification deception of the issuer. At the same time, it provides a convenient solution to the regulatory system of brokerage firms' compliance process. The securities industry can use e-CNY to realize the automation of risk management and control, using the programmable features of e-CNY to set up risk patterns and risk tips in advance, improve the precision of control over irregular activities, and at the same time reduce manpower costs.

4.3. e-CNY expands application scenarios in the securities industry

In recent years, the e-CNY pilot cities in the national scope of the gradual increase in the number of good pilot effects also make the e-CNY application scene is also continuing to expand the richness of its ecosystem construction continues to improve, in the retail consumption, transportation, and travel, retail trading, financial settlement of multiple areas of the application of the scene incremental expansion of the surface and improve the quality.

The director of the Beijing Computer Society Digital Economy Professional Committee, Bu Chao, believes that according to the different application objects of the e-CNY, it can be roughly divided into three aspects, the first is the C-end personal payment field, involving life services, super retail, etc.; second is the B-end enterprise scenario, involving the payment and clearing between the enterprises, the staff payroll, etc., and finally, the cross-border transaction field, our country has reached an agreement with the Central Bank of Thailand, the Central Bank of the United Arab Emirates, the "Multilateral Central Bank Digital Currency." Lastly, in the field of cross-border transactions, China has reached an agreement with the Central Bank of Thailand and the Central Bank of the United Arab Emirates on the "Multilateral Central Banks Digital Currency Bridge" program.

e-CNY is also gradually expanding its application scenarios in the securities industry to explore the sinking market, and the universality of e-CNY has helped the securities brokerage business reach out to disadvantaged groups. The following is an analysis of the e-CNY wallet as an example:

"Innovation highlights: China's exploration of e-CNY is at the forefront of the world, and the application fields and depth have been continuously expanded in practice pilots. At the same time, China is a socialist country, which is different from capitalist countries, and we insist on people-centeredness, so we integrate the consideration of China's characteristics and national conditions into the design of the e-CNY to meet the needs of the disadvantaged groups and to realize the digital financial inclusion in the securities industry."

The popularization and application of e-CNY will further increase the scope of users and applications in the field of wealth management. Convenient types of equipment and operations will enable disadvantaged groups, such as people with disabilities, to realize wealth management and share the fruits of technological advancement in the convenience of securities trading, purchase and sale, and payment through the electronic e-CNY payment platform.

4.4. e-CNY helps the securities industry build a smart platform

The technical features of e-CNY have been integrated into the securities brokerage business and technical management services to build e-CNY-mediated OTC trading platforms and expand the application areas of e-CNY. Through the payment portal created by e-CNY, major brokerage organizations have established e-CNY settlement platforms, bringing new business opportunities.

Digital currency investment and trading have made great progress in China. It is reported that Singapore's world's first digital securities exchange iSTOX and Chongqing Financial Supervisory Bureau to start cooperating, committed to the world's first digital securities trading platform in Chongqing, for the central and western regions of China and even radiate to the national scope, the use of digital securities and other intelligent technology, to realize the investment, trading, issuance of the field of instant settlement, direct trading.

The launch of new scenarios for the application of e-CNY in the securities industry, on the one hand, enhances the efficiency of the funds of the existing users of the brokerage firms as well as the use of experience, on the other hand, it can also enhance the attractiveness to young investors, especially those who are interested in the e-CNY and digital currencies, and to feel the latest functions and services of the securities industry^[2]. On the other hand, e-CNY forces the securities industry to make technological progress and speeds up the digital transformation of brokerage firms e-CNY, which draws on blockchain technology at the bottom, is a brand-new digital financial tool that provides financial institutions with more powerful data analysis, risk control and investment research capabilities, and therefore requires a higher level of technology and an operating platform^[17], e-CNY can force brokerage firms to carry out digital transformation and help the financial industry achieve high-quality new development.

4.5. e-CNY to solve the challenges of international payment and settlement and brokerage services in the securities industry

To address the three major challenges of traditional cross-border payments, such as high cost, low efficiency, and low transparency, in October 2020, the Group of Twenty (G20) put forward an initiative to improve cross-border payments, and central bank digital currencies were identified as one of the solutions, and China's e-CNY is now at the forefront of the world.

To effectively solve the difficulties and risks of RMB international clearing, the online Cross-Border Interbank Payment System (CIPS) alleviates to a certain extent the high dependence of RMB settlement on the Society for Worldwide Interbank Financial Telecommunications (SWIFT) and brings a new mode and a new turnaround for China's outward investment and foreign investors' securities transactions. Cross-border payment has the problems of slow speed, high cost, non-transparency, and weaponization^[8].

e-CNY's cross-border payment field operation of the progress of the realization of the solution to the problem of the existence of barriers to the flow of international funds, for foreign investors, foreign currencies in China's domestic securities institutions for investment, payment, and other transactional activities to lay a solid technological foundation, at the same time, e-CNY cross-border payment of certain risks, but also need to be at the same time to improve the legal supervision, the need for stronger security^[3].

4.6. e-CNY is committed to solving the settlement and payment problems of third-party organizations in the securities industry

The e-CNY does not charge the designated operating organization for circulation services, and the designated operating structure does not charge individual customers for services, reducing service cost fees, which will promote the application of e-CNY for buying and selling in the securities industry with greater competitiveness. At the same time, it will save a large amount of cash operating costs and labor management costs as well as derive new profit growth points. In addition, the joint operation of e-CNY wallets with the traditional business of securities firms will also catalyze new business models.

Securities settlement and payment transactions are carried out through e-CNY, which reduces the cost of intermediary link services, releases profits of the industry chain, and is expected to break the duo-giant monopoly of the third-party payment system and establish a unified payment and clearing standard^[18].

Nowadays, the other payment market is monopolized by Alipay and WeChat, but there is no ecosystem between them, which causes certain problems in the flow of funds. e-CNY can be used as an official legal payment tool to intervene in the field of market-oriented payment tools and to build up a unified standard for payment and settlement.

5. Conclusions and outlook

e-CNY, as an emerging legal tender, is occupying a more and more important position in the financial field with the continuous development of digital currency technology. e-CNY is not only a simple change in the means of payment but also a leader of China's financial system in striding towards digitization and intelligence. The securities industry, as an important part of China's financial market, will usher in a new era of digital transformation and change in the wave of e-CNY ^[19].

Based on the foregoing analysis, it can be concluded that e-CNY brings countless new possibilities to the securities industry, whether it is in the integration and innovation of digital stocks, compliance regulation, smart custodianship, or future innovations and enhancements in many more areas. With its own traceability and non-replicability qualities and high technological advantages, e-CNY is a guide to the securities industry by promoting the construction of digital platforms for stock trading, emphasizing the application of programmable financial instruments, increasing the supervision of previously opaque links, setting up automatic risk identification and control procedures, and providing digital asset management and customer services.

Digitalization is an inevitable trend in the development of brokerage business, and it is only a matter of time before it enters the digital era. The prospect of e-CNY continues to be promising, and it will play a great role in promoting financial innovation, improving payment efficiency, and promoting the construction of digitization in the field of brokerage ^[14]. Securities institutions should actively seize the opportunities brought by the take-off of e-CNY, pay attention to the business work of integration with e-CNY, and accelerate the layout of e-CNY-related business. RMB-related businesses, make use of the technical characteristics and legal status of e-CNY to drive the combination of the digital comprehensive technical service capacity of securities institutions and the e-CNY scene service capacity of banks, drive the pace of their own digital transformation, and at the same time strive to meet the challenges of information security and technical problems brought about by the e-CNY ^[20], thereby reducing the potential financial risks and maintain their competitiveness in the turbulent and fierce financial market, and actively explore the role of the e-CNY in the financial markets. At the same time, we strive to meet the challenges of information security and technical problems brought about by e-CNY, reduce potential financial risks, maintain our competitiveness in the turbulent and fierce financial market, actively explore the application of e-CNY in various fields, reserve corresponding high-level technical talents, and help open up a new pattern of wealth management in China.

Disclosure statement

The author declares no conflict of interest.

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