

Research Report on Commercial Banks' Data Element-Based Financial Products and Services



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I Background and Significance

1.1 Brief Description of the Current Status of Development of the Data Elements Market

The CPC Central Committee and the State Council attach great importance to the reform of data elements and their market-oriented allocation, and have strategically proposed "accelerating the cultivation and development of the data elements market"; the digital economy, in which data is a key element, has been developing in depth, and the overall direction, implementation path and target tasks of the reform of the marketization of data elements have been clearly defined.

In 2019, the Fourth Plenary Session of the 19th CPC Central Committee listed data as one of the production factors for the first time, marking a major shift from data resources to data factors. Since then, the state has intensively issued policies to systematically promote the cultivation of the data factor market. In December 2022, the Central Committee of the Communist Party of China and the State Council issued the "Opinions on Building a Data Base System to Better Play the Role of Data Factors" ("Twty Articles on Data"), which establishes the four basic systems of data property rights, circulation, distribution, and governance, and lays the foundation for the marketization and valorization of data. In February 2023, the "Overall Layout Plan for the Construction of Digital China" put forward the "five-in-one" layout, drawing a long-term blueprint for the cultivation of the data factor market and pointing out the direction for commercial banks' financial innovation in data factors. In 2024, the NDA issued the "Guiding Opinions on Promoting High-Quality Development of the Data Industry" and the "Guiding Opinions on Promoting High-Quality Development of the Data Industry" and "Action Plan for the Development of Trustworthy Data Space (2024-2028)" and a series of other policy documents, playing a "combined punch" to promote the reform of the market allocation of data elements and activate the enterprise data value, helping commercial banks to expand the depth and

breadth of cooperation with enterprises at the data level. In October 2024, the General Office of the Central Committee of the Communist Party of China (CPC) and the General Office of the State Council issued the Opinions on Accelerating the Development and Utilization of Public Data Resources, which provided a systematic deployment of the development and utilization of public data resources, expanding the supply of public data resources and providing commercial banks with the possibility of acquiring high-quality, multi-dimensional public data.

As of June 2024, 31 provinces and the Xinjiang Production and Construction Corps have established data management organizations, and some prefectural-level cities and some counties that are in a position to do so have also set up relevant government agencies. Initial results have been achieved by actively implementing the deployment of the Central Committee of the CPC, consolidating the basic system of data elements, and innovating in the authorization and operation of public data.

1.2 Significance and Practical Exploration of Financial Services for Data Elements

As a fundamental strategic resource in the era of digital economy, the release of data value is of great significance to strengthening and optimizing China's digital economy and enhancing the new momentum of economic development. Financial services have become an important engine to promote the release of data value by financializing and monetizing data elements. First, financial services provide new kinetic energy for the development of data productivity, optimize resource allocation by integrating with capital, labor and other factors, give rise to new industries and new business forms, and empower the high-quality integration of the digital economy and the real economy. Secondly, financial services add "lubricant" for data factors to promote the change of production relations, promote the integration of all factors and the integration of the whole industry, improve the production efficiency, and help the innovation of governmental governance mode and the sharing of digital dividends by all people. Finally, financial services are a "booster"

for promoting the flow and trading of data elements, solving the problem of data silos, promoting the efficient and compliant circulation of data across regions and industries, and facilitating the transformation of industrial digitalization into the development of all-factor integration.

In practice, new models of financial services using data as an asset are emerging. Internationally, Gulp Data, a financial technology company, has used data as a guarantee to help finance enterprises, and airlines have used customer loyalty program data valuation to obtain financing. Domestically, various places are actively exploring innovative businesses such as data asset financing and data asset securitization, such as Beijing and Shanghai, which are promoting the construction of data asset registration and assessment mechanisms and promoting data assetization innovation. These practices have demonstrated the potential of the application of data elements in financial innovation and provided important lessons for the high-quality development of the data elements market.

1.3 Exploration of Paths for Commercial Banks to Develop Financial Services for Data Elements

1.3.1 Utilize financial advantages, promote the integration and development of data elements and financial services

Commercial banks have diversified high-value data resources, complete technical support systems, systematic risk management systems and capabilities, diversified customer groups and application scenarios, and systematic compliance and regulatory mechanisms. In the process of industrial digitization through the in-depth integration of data elements and traditional elements, commercial banks can give full play to the unique advantages of commercial banks, actively expand the access to data assets, promote the integration of data and business through data governance and data value mining, promote the extension of traditional financial business to data element financial business, and establish an

ecosystem in which data empowers business and business feeds data.

1.3.2 Activate the value of data, Explore financial products and services based on data assets

Custody, credit, securitization and comprehensive financial services based on data assets will become an important direction for the banking industry to explore. First, exploring the data asset custodian business. Commercial banks sign custody contracts with principals, administrators or trustees, keep data assets according to the contract, fulfill the rights and obligations agreed in the custody contract, and provide custody services. The second is to explore data asset credit business. Based on multi-dimensional data such as real capital flow, information flow, commodity flow and logistics of business entities, explore data asset credit financing mode. Third, explore data asset securitization business. Commercial banks can revitalize data assets by issuing asset-supported securities to realize loans out of the table and support the development of asset business. Fourth, explore the development of comprehensive financial services. By providing one-stop integrated financial solutions, including credit, investment, insurance and other financial services, commercial banks can not only improve service efficiency and customer satisfaction, but also bring new business growth models.

1.3.3 Build an innovation ecosystem, actively participate in the construction of data factor market.

Under the premise of fully protecting customers' information security, adhering to the principle of compliance with the law, exploring the participation in the construction of the data factor market in the mode of data vendors and third-party professional service organizations is an important entry point for commercial banks to integrate into the construction of the national data factor market. Commercial banks should give full play to their advantages in data management and business collaboration and innovation, expand new businesses, new scenarios and new modes of commercial banking operations, and seize the roles and

functions of data vendors and third-party professional service providers to ensure the "quality gate" and "value gate" of data assetization. "The role and function of data vendors and third-party professional service providers will be enhanced to ensure the quality and value of data assetization.

II Data Hosting and Management

2.1 Analysis of the Current Status of Data Hosting and Management

As a new type of production factor, data has been rapidly integrated into all aspects of production, distribution, circulation, consumption and social service management, profoundly changing the mode of production, lifestyle and social governance in various industries. With the accelerated evolution of the digitalization process, all kinds of enterprises and institutions have more and more prominent needs for data asset management, and are eager to inject new momentum into digital transformation and build their core competitiveness by strengthening data asset management.

Early data hosting originated from data centers (IDC), when the hosting party was mostly operators, the business was mainly hosting, and the data was not adjusted by special rules. Nowadays, the new model of data asset hosting is aimed at guaranteeing security while enhancing the value of data assets, which is closely linked to assetization, operation management and revenue distribution. To do a good job of data asset hosting, first, to protect data security, the use of logical and physical isolation and the latest security technology, to ensure the safe transmission, processing and application of data; second, to provide multi-scenario hosting services, fully consider the differences in the industry and unit data management, the design of a flexible "service package"; third, to create enterprise value as the core for enterprise sustained growth boost, which is where the business vitality lies.

2.2 Exploration of Business Models for Data Hosting, Management and Operation

2.2.1 Bank asset custody business model

At present, the definition and content of data asset custody have not

yet been explicitly stipulated, and the data custody business has certain similarities with the fund custody business in terms of model. Banks have been operating the asset custody business for many years, and have rich experience in the business, which can provide reference for the concept of data asset custody business. Asset custody business covers the whole process of providing services for asset management products, including but not limited to asset custody, fund clearing, valuation accounting, investment supervision, information disclosure and performance evaluation, etc., which form the basis of asset custody business.

In traditional asset custody business, a custody license is used as the core threshold. While investors entrust an independent third party to invest in securities, equity and other investments in entrusted funds, they entrust an independent third party, i.e., financial institutions such as custodian banks, to help investors keep custody of their funds/securities and play the role of fund transfer and supervision of the investing institutions. The fund custody industry takes the custody license as the core barrier, and the market participants are mainly commercial banks, also including brokerage firms, China Debt Registration / CITIC Registration / CSRC Registration, and the industry has a high concentration of market share.

2.2.2 Data hosting business model

After hosting a large amount of data, the ability to secure the data is the primary concern of the data custodian, followed by the ability to manage and apply the data assets. Data asset hosting is divided into two modes according to whether the data is used or not: one is the encrypted custodian of data assets, i.e., the core task of the data custodian is to safeguard the security of the data assets of the data owner, which requires sufficient capital, technology and trust thresholds, and an independent, third-party organization with regulatory licenses should be used to safeguard the security and privacy of the data, as well as to prevent data misuse, and this type of data hosting mode should be supported with Strong external regulatory protection; the second type is the data

management technology and operation solution provider, because the whole process of data hosting needs the all-round support of data processing technology, data management capability, big data application and data operation capability, etc., which gives rise to the second type of function of the data hosting business, i.e., realizing value-addedness of the data assets through the output of data management and operation capability.

2.3 Exploration of Data Management and Operational Models

2.3.1 Data management business model

Based on the different levels of data asset content processing, different management granularity, and different judgments on the value of the future development of the business, data asset depository can be divided into the following models:

First, data element storage services. Banks provide physical data centers and cloud storage services for principals based on their mature data storage construction experience. With this service, the client can save the construction cycle and cost and improve the storage capacity. Second, data element capability service. The bank has accumulated rich experience in data governance and can provide consulting services to the outside world. At the same time, it assists the client in building a management system to improve its data management capability. Third, data element platform and tools. By continuously optimizing its own data management platform, the bank can provide a variety of platform output services according to different needs. It supports local deployment, provides a cloud-based platform, and customizes personalized modules for the client to fit its actual management situation.

2.3.2 Data operation business model

The data assets within the data custodian can not only assist in their own business development and operational decision-making, but also participate in the data factor market circulation and trading, generating

new business value.

In terms of data element product development, enterprises may entrust the work to data trustees. The trustee should analyze the market demand for data services and products of the trustee, sort out and review the list of data demand parties and their qualifications. Investigate the types of valuable data products and design and develop them, and carry out cooperation intention matching and program design. May deal directly with the demand side, or on the platform, complete the delivery and distribution of revenue. In the operation of data element products, data trustees are able to integrate multi-industry data to develop convergent products. The trustee needs to research valuable data sources, sort out and audit data providers, reach cooperation intentions and sign agreements.

2.4 Advantages and Challenges for Commercial Banks in Data Asset Custody Business

2.4.1 Analysis of the advantages of commercial banks in data asset custody business

With the rapid development of the data factor market, data management organizations, big data exchanges and data vendors are emerging. Research shows that most data service-related enterprises are "specialized, special and new" enterprises or state-owned enterprises authorized by local governments, which are relatively weak in data management system construction, human resources and financial support, and are in urgent need of full-process data asset hosting services. Commercial banks, especially large banks, have significant advantages in carrying out data hosting business:

First, capital strength and risk tolerance. Large commercial banks are well capitalized and have strong risk tolerance, which can support the high cost investment and short-term loss of data hosting business. Second, data analysis capability. Banks have accumulated strong data governance and mining capabilities by handling massive customer, business and

transaction information, which can provide technical support for data hosting business. Third, data application capability. Banks can export their own data application experience, help enterprises lower the threshold of data application, develop data analysis tools, and assist enterprises in establishing standardized data processing processes. Fourth, organizational structure and platform support. Banks have a mature organizational structure and technical team that can build data platforms and ensure data security, and their data classification and management platforms are highly compatible with data hosting business needs. Fifth, comprehensive financial service support. Banks can analyze the hosting data to understand the business operation and investment and financing needs of enterprises and provide customized comprehensive financial solutions to release the value of data assets.

2.4.2 Challenges for commercial banks in data asset custody business

First, the supporting legal norms for the hosting of data assets have yet to be finalized. Trusteeship has not yet formed a unified and stable concept in China's legislation. Although data governance laws such as the Digital Security Law and the E-Commerce Law deal with data security requirements, they do not clarify the space for their application in data hosting, and at the same time, there is a lack of legal or institutional regulation of data ownership. There are no clear official definitions or boundaries for the division of personal and corporate data ownership, or for the distinction between the right to operate and the right to use data, and there are no laws or regulations to refer to in case of ownership disputes at the practical level of data hosting.

Secondly, the supporting institutional mechanism for data asset trusteeship has yet to be established. "Some Views on Data Base System" issued by the Department of Innovation and High Technology Development of the National Development and Reform Commission (NDRC) in March 2022 and "Opinions on Building a Data Base System to Better Utilize the Role of Data Elements" adopted by the 26th Meeting of

the Central Committee for Comprehensively Deepening the Reform in June 2022, and other relevant documents, are all principled opinions and recommendations, but there are no specific guiding initiatives. Specific guidance initiatives, the distribution mechanism of data asset revenues, data asset tax and other supporting mechanisms for data asset trusteeship still need to be established and improved.

Third, there is a lack of a mechanism for approving and regulating the licenses of data custodians. Regulators will also pay increasing attention to data security and privacy protection. On the one hand, data management and use need to rely on privacy computing technology, trusted execution environment and other technical means to safeguard data security and not to be circulated and traded again; on the other hand, data management needs to implement strict authorization for the use of data; and secondly, for the opening of accounts for the proceeds of data asset trusteeship and operation, fund allocation and fund supervision are similar to the business of bank fund custodianship.

III Data Asset Credit

Credit business is the core asset business of commercial banks, but with the slowdown in credit demand and increased difficulty in loan placement, banks urgently need to broaden financing channels and increase support for key areas and scientific and technological innovation. The landing of data assets on the table provides a new perspective for exploring data asset credit business. As an emerging investment and financing tool, data assets can promote data flow and sharing and maximize the value of data assets through the integration of rights identification, pricing, circulation and financial services.

3.1 Overview of Data Asset Credit Operations

The business process of traditional bank loans involves the bank, the enterprise applying for the loan and the third-party participant, and its business operation process mainly includes: pre-credit investigation, in-credit examination and post-credit management. The specific pre-credit, credit and post-credit operation modes are as follows:

The first is pre-credit investigation. The account manager is responsible for collecting and organizing the information of credit-granting business to ensure its legality, authenticity, completeness and validity. Credit examiners comprehensively review the legality, reasonableness and accuracy of the credit application, conduct risk assessment and put forward review opinions. Credit approval personnel analyze the risks and benefits of credit-granting business according to laws and regulations, industrial policies and banking systems, and put forward approval opinions.

Secondly, there is the mid-credit review. Prior to loan disbursement, banks continuously monitor and assess the compliance, authenticity and completeness of an enterprise's credit information, financial data and investigation reports. This process requires banks to have good risk control capabilities and an in-depth understanding of the enterprise's operations in order to ensure loan security and reduce credit risk.

Finally, post-credit management. It includes interest collection and loan collection management, post-credit inspection, risk early warning monitoring, risk resolution, and reassessment of the value of pledges and collaterals. The core task is to track and analyze the risk factors affecting credit repayment, detect hidden dangers and take countermeasures in a timely manner to prevent the occurrence of non-performing assets.

3.2 Key Issues in Data Asset Credit Operations

3.2.1 Identification and review of data asset ownership

The identification and analysis of data asset ownership is crucial in pre-credit investigations. Unlike traditional physical assets, the non-physical nature of data assets makes the identification of their ownership more complex. These assets often exist in the form of digital or information that can be easily copied and distributed without compromising their original value. As a result, clarifying and reviewing the ownership of data assets becomes particularly critical. Banks and other financial institutions need to ensure that the data assets pledged or leveraged have a clear and legal chain of ownership when making loan approvals. This includes a rigorous review of the legality of data collection, storage and use. At the same time, emphasis must be placed on compliance with privacy policies and data protection regulations to ensure that the collection and use of data does not violate the relevant legal provisions, especially when it comes to sensitive information such as customers' personal data or trade secrets. A clear definition of the ownership of data assets and related responsibilities is an indispensable part of pre-credit investigation.

3.2.2 Valuation of data assets

In the value assessment of data assets, banks should cooperate with third-party professional assessment organizations to assess the quality and value of data assets provided by enterprises in an objective manner. In this process, the appraisal organization will not only assess the market

value and potential earnings of the data assets, but also focus on reviewing the ownership of the data assets. This includes the legal source of the data, compliance of its use and processing, and the complete control of the enterprise over the data assets. In addition, the valuation process should take into account the uniqueness and irreplaceability of the data assets, all of which will have an impact on the final value of the data assets. Finally, the assessment results will be combined with the bank's internal assessment to form a comprehensive data asset value assessment report, which will provide an important basis for the bank's decision-making in the data asset credit business.

3.2.3 Development of special post-loan management measures for data asset

The post-credit management of loans issued by commercial banks to enterprises is an important part of ensuring loan security, reducing risks and safeguarding the interests of the bank, which involves continuous supervision and management of the loans, including strict monitoring of the operating conditions of the lending enterprises and disposing of the early warning signals in accordance with the relevant internal regulations of the bank on time until the loans are fully repaid. Based on the traditional post-loan management mode of banks, Data Asset mainly adds the supervision and management of "the whole life cycle of data assets" of enterprises in the post-loan inspection process. The whole life cycle of data assets includes data asset collection, preservation, application and destruction, etc. Banks can continuously monitor and manage the quality, completeness, application value and ownership conversion of data assets of lending enterprises through data exchanges, affiliates of the lending enterprises, and the Bureau of Political and Mathematical Affairs.

3.3 Further Development and Promotion of Data Asset Credit Operations

The data asset credit business covers a wide range of industries in practice, focusing on the segments of data supply chain, industry supply

chain and basic data resources. Meanwhile, business implementation faces a series of challenges, such as difficulties in confirming data asset ownership and the lack of uniform value assessment standards, which need to be carefully addressed in practice. In addition, business promotion suggests in-depth cooperation with exchanges and other platforms, accelerating the construction of business processes and automation, and strengthening risk-sharing mechanisms.

3.3.1 Achieving scale through business process automation

A large number of small, medium and micro digital enterprises born under the wave of economic digital transformation are the main force of digital technology innovation, digital talent training and digital industry upgrading. The financial resource constraints of small and medium-sized digital enterprises is a bottleneck that restricts the development of "Digital China", and the fundamental way to solve this problem is to increase the credit supply of small and medium-sized digital enterprises relying on the strategy of "inclusive finance", and to guide the formation of a benign cycle of financial resources in the digital industry. The fundamental way to solve this problem is to increase the supply of credit to small and medium-sized digital enterprises based on the strategy of "inclusive finance" and guide financial resources to form a virtuous circle within the digital industry. Therefore, whether or not it is possible to reduce the comprehensive cost of credit, shorten the credit approval process and accelerate the speed of credit disbursement is the key issue for "inclusive finance" to help "digital China".

Reducing the cost of credit, shortening the approval process and speeding up the disbursement of funds are key to increasing the supply of credit based on the strategy of "financial inclusion". Automated credit approval leverages technology and data analytics to improve efficiency, reduce risk, optimize customer experience, and reduce bank costs. By building automated decision-making models, banks can quickly assess the credit quality of borrowers and formulate loan conditions, while using data analysis to identify market opportunities, develop innovative credit

products, and expand the scope of services so that more small and micro digital enterprises can benefit from inclusive finance policies.

3.3.2 Exploring risk-sharing mechanisms for sound business development

At this stage of the data asset credit financing business in the process of carrying out, there are still certain risks and challenges, need to formulate special risk mitigation measures to cope with, mainly manifested in the following points:

First, it is difficult to recognize the ownership of data assets. Data assets involve intellectual property, ownership and privacy issues and lack clear legal support. The risk of disputes over ownership can be reduced by introducing legal organizations to review data asset ownership and control agreements. Second, value assessment standards are not uniform. There is a lack of uniform standards and authoritative organizations for data asset assessment. It is recommended to introduce multi-party organizations to jointly assess the data assets to provide comprehensive reference for credit approval and reduce assessment uncertainty. Third, insufficient financial statement data asset information. Data assets have not been entered into the table, and the value of enterprise data assets is not reflected in the financial statements. Fourth, it is difficult to dispose of after credit. The data element trading market is still immature, and it is difficult to predict the disposal method and income of data assets in case of default. The construction of data infrastructure and the cultivation of the trading market need to be strengthened.

Therefore, when commercial banks carry out data asset credit financing business at this stage, they need to control the risk from the source, establish a set of perfect special risk buffer mechanism, and at the same time, actively cooperate with all kinds of data element market entities to ensure the integrity of the process and reduce all kinds of risks.

IV Securitization of Data Elements

4.1 Background to the Development of the Securitization Business

Since the Fourth Plenary Session of the 19th Central Committee of the Communist Party of China in 2019 listed data as a new factor of production, how to maximize the value of data assets with the help of financial tools has become an important research topic. In addition to traditional data asset credit business, data asset securitization is an important way to realize its commercialization and maximize its value.

The securitization business, a financial instrument that enables risk diversification, improves liquidity and reduces the cost of financing, originated in the 1950s and emerged and developed significantly in the 1980s. Its development has been driven by innovations in financial markets, changes in corporate financing structures, technological advances and globalization trends. According to the latest data from the China Securities Investment Funds Association, as of January 2025, the number of private securities investment fund managers in China reached 7,904, with a management scale of RMB 5.234 trillion. The commercial real estate trust market is gradually developing, and policy relaxation is helping its healthy development. Non-performing asset securitization also plays an important role, with financial institutions securitizing non-performing assets to promote asset liquidation and healthy market development.

4.2 Models of Data Asset Securitization

4.2.1 Data asset-backed note model

Data Asset-Backed Note (DABN) refers to a securitized financing instrument that is issued in the interbank bond market in a structured manner through an issuance vehicle for the purpose of realizing financing for a non-financial enterprise, with the repayment support of the cash flows generated from the enterprise's data assets, and with an agreement

to repay the principal and pay the interest within a certain period of time. The future cash flows of the enterprise data assets, or the enterprise data assets themselves, are the underlying assets of the data asset-backed note business. Compared to traditional credit products, its most significant feature is that it does not rely on physical assets to be pledged, but rather taps the value of data assets.

4.2.2 Data Asset-Backed Securities Model

Data Asset-Backed Securities (DABS) are financial instruments that are structured to be repaid by future cash flows generated by the data underlying assets, and by which data asset-backed securities are issued. The main role of data asset-backed securities is to enhance the liquidity of data assets. Potential investors are mainly banks, insurance companies, money market funds, mutual funds, pension funds and hedge funds.

Depending on the underlying assets, the data asset-backed securities business model includes the following types: Type I, issuance and listing of securities based on an enterprise's data asset intellectual property rights, data infrastructure, data assets and future income rights of data assets. Type II, based on credit assets or debt assets in enterprise data assets. Type III, issuance of securities based on cash flows generated or variables related to cash flows, i.e., the process of re-securitization of data asset securities, using data asset-related securities or portfolios of securities as underlying assets.

4.2.3 Data asset investment trust model

Drawing on the model of REITs and the successful experience of asset securitization in intellectual property and infrastructure, this report proposes a more feasible method of securitizing data elements, i.e., through the establishment of Data Asset Investment Trusts (DAITs) that package data assets and sell trust shares to investors. This report proposes a more feasible method of securitizing data elements, namely, through the establishment of Data Asset Investment Trusts (DAITs), which package data assets and sell trust shares to investors.

On the production side, the pricing of the shares of the data asset pool is assessed by introducing professional intermediaries to issue them to investors on the basis of the future returns of the data assets or projects. After the first successful issue, investors are allowed to transfer the shares to form a secondary market and promote the realization of data value. In terms of collateralization, the equity structure between the data subject and the controller is reset through the form of "data trust", and the income arrangement is clarified so as to reasonably distribute the income among the stakeholders in accordance with the contract. In terms of income, DAITs invest in diversified data assets and reduce the risk of a single asset through diversification. By purchasing shares of DAITs, investors obtain data asset returns and realize the efficient circulation and realization of data asset value.

4.3 Reflections on the Development of Securitization of Data Elements

At present, the development of data asset securitization in China's commercial banks is characterized by problems such as single product type, inaccurate value assessment and insufficient risk identification capability. Data asset-backed notes dominate the market, and the imperfect data trading market leads to difficulties in valuation and trading, as well as the lack of quantitative risk assessment indicators and systems. In the future, commercial banks can deepen their data asset securitization business from various aspects:

First, it plays to the advantages of traditional asset securitization. As the original equity holders, commercial banks securitize their own data assets, which can enhance their liquidity and provide diversified choices for investors, as well as obtain funds at low cost and optimize their capital structure. Secondly, it enhances the ability of value assessment. Using rich data processing and analysis capabilities to accurately assess the value of data assets and design reasonable securities products not only strongly supports the securitization business, but also increases revenue through valuation services. Third, strengthen risk management and

information disclosure. Carry out exhaustive due diligence, comprehensively assess the quality, authenticity and potential value of data assets, fully disclose information and risks to investors, and strengthen investor education to enhance their knowledge of relevant products. Fourth, focus on institutional investors. Before the data trading market matures, it will not be open to individual investors for the time being, while strengthening market supervision and building a perfect regulatory system to protect the healthy development of the market and investors' rights and interests. Fifth, explore diversified asset securitization. Priority should be given to the development of bonds, and when the market and regulatory environment are mature, it should be gradually expanded to stocks, investment trusts, options and other forms, and the design of equity securities should reasonably allocate the right to use, manage and operate data assets, so as to balance security and capital operation.

V Financial Ecology of Data Elements

5.1 Financial Ecology on the Industry Chain Scenario of Data Elements

As an important player in the financial market, commercial banks have significant advantages in the areas of comprehensive financial services and data asset management, and are able to provide professional support for the data element market and promote its rapid expansion. Traditional banking services cover deposits, loans, wealth management, payments and other businesses, laying the foundation for the expansion of data factor services. In the operation of the data factor market, commercial banks play the core functions of credit intermediary and payment intermediary, and with their profound data accumulation and high-quality data processing capability, they provide professional and secure data services for diversified subjects, especially helping small and medium-sized micro-enterprises lacking in data governance capability to stimulate market vitality. In addition, commercial banks promote data transactions and circulation by defining data ownership and assessing data value, and provide guarantees for data transactions through their credit intermediary function to ensure the safe circulation of data elements.

In order to integrate into the construction of the data factor market, commercial banks should actively cooperate with market players to provide one-stop comprehensive financial services. In terms of traditional services, they can provide products such as loans, guarantees and wealth management to meet investment and financing needs; in terms of data asset management, they can provide services such as data valuation, storage and hosting, management consulting, assist in customer profiling, risk rating and other research, and customize their products to expand their application scenarios. At the same time, commercial banks can explore innovative services such as credit financing, insurance and securitization of data assets, especially for "specialized, special and new" enterprises to provide comprehensive credit to help their development. By

integrating traditional and innovative services, commercial banks play a key role in the data factor industry chain and promote the high-quality development of the market.

5.2 Financial Ecology on Authorization Operating Scenarios of Public Data

This section deepens the perspective from the exploration of theories and cases to the analysis of specific scenarios, examines how commercial banks can carry out the whole chain of integrated financial services for data elements in data operation scenarios, and inspires commercial banks to explore the formation of a service model for public data as well as other data element markets.

Through a market-based mechanism, the authorized operation of public data supports state-owned companies to carry out data operation business, enhance the added value of data and generate revenue, which is ultimately paid to the local treasury. This model empowers the government to make smart decisions, increase revenue, optimize debt, and promote the development of the local digital economy. The industry chain covers upstream data providers (e.g., municipal governments), midstream operators (e.g., big data groups), and downstream demanders (e.g., finance, healthcare, etc.), with technical support for data collection, storage, processing, and trading.

Commercial banks can provide credit and financial support, and utilize their technical and service advantages to assist the main industrial chain players to play a role in data collection, storage and processing, to promote the integration and application of public and social data, and to promote the prosperity and innovation of the data factor market.

5.2.1 Typical banking service model on data authorization operation scenario

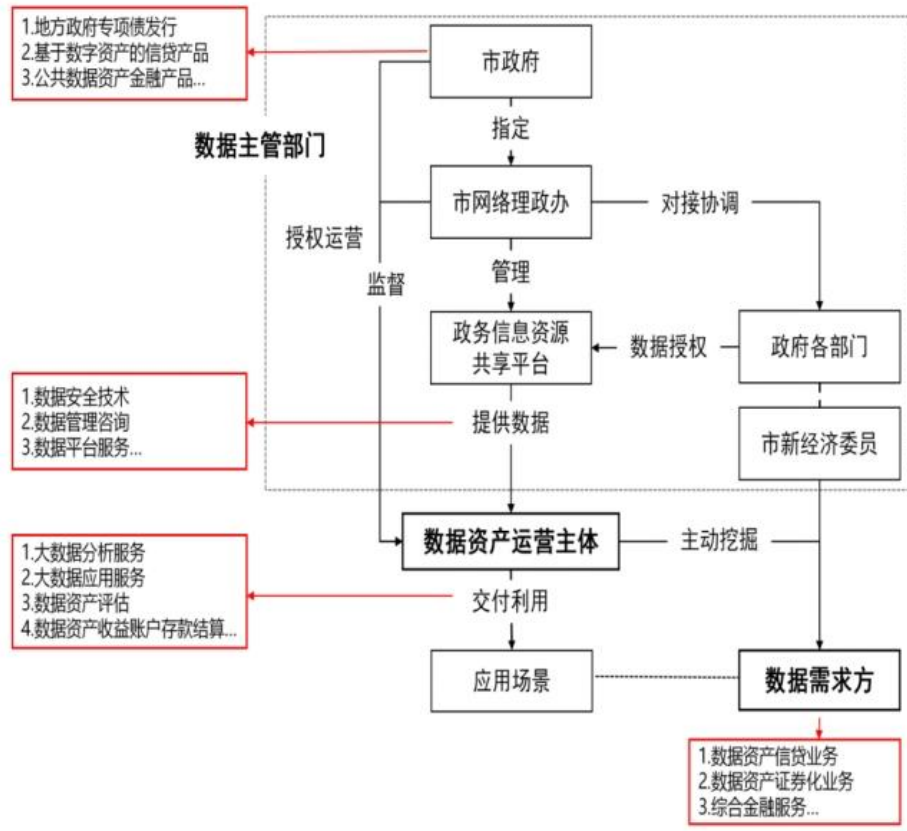


Figure 1 Public Data License Operation Industry Chain

(1) Bank service model of data authority

Upstream of the public data authorization and operation industry chain: data authorities. Government departments have the ownership of public data and are the data authorities, which can authorize or support subordinate state-owned companies to carry out centralized operation of government data in order to enhance the effectiveness and value of data assets. For the upstream main body of the public data authorization and operation industry chain, banks should actively expand market opportunities, provide financial services including local government special debt issuance, credit products based on data assets, etc., and inject credit funds into the public data authorization and operation industry chain to support the "blood".

(2) Bank service model of data asset operating entity

The middle reaches of the public data authorization and operation

industry chain: the main body of data asset operation. Local big data groups, big data exchanges, and data merchants are important main bodies in the development of the data factor market, and with the expansion of public data authorization and operation business, this type of enterprise will usher in a rapid development stage. Banks should actively promote cooperation with local data asset operating bodies to expand opportunities in data asset security, data asset management consulting, big data analysis and application, and capital settlement, so as to help the development of local digital industries.

(3) Banking services model of data demand-side

Downstream of the public data authorization and operation industry chain: data demand side. Public data are analyzed and processed and provided to systems and users with different data needs, bringing decision-making value and paying data fees. Banks should actively explore the financial needs of the data demand side of public data authorization and operation, and provide support in credit, securitization, distribution, payment and settlement.

5.3 Typical Scenarios and Banking Service Models for Data Factor Markets of Large Model

5.3.1 Introduction to typical scenarios of large model data element markets

The big model data industry, which is a key area for the development of the data factor market, may become a new engine of development in the intelligent era. The big model makes the production and acquisition cost of information shift from marginal cost to fixed cost, making the marginal cost of each use of the big model extremely low. Unlike previous technological means, this change triggered by big models is fundamental, bringing the power of industrial revolution to the data factor market.

As a data-intensive industry, the data required for big models can be divided into three categories: first, large-scale basic text corpus data,

which is produced by public collection, private collection and private transactions; second, large-scale industry-specialized domain corpus data, which is produced by private collection and private transactions; and third, small-scale fine-tuned data , which is mainly personalized, The third is small-scale fine-tuned data , which is mainly produced in a personalized and customized way. The big model needs new data for training, and also makes some old data have new value, accordingly giving rise to new service demands in the data factor market, providing a strong driving force for the development and prosperity of the data factor market. Commercial banks should gain insight into the huge commercial value and development space contained in the big model data industry, do a good job in market analysis, supporting policies and services, and seize the development opportunities of the emerging industry.

5.3.2 Typical banking service model on Large model data element scenario

In the big model data industry, the operation direction and development status of market players are different, then the data production methods they rely on are different, and the service demand for banks is also different, banks should provide more matching service models in a targeted manner to comply with the development of the big model data industry.

(1) Innovative asset securitization services

Banks can innovate financial services based on data assets and intellectual property rights: first, data asset intellectual property rights support notes. Design securitization products based on the intellectual property rights of data assets, such as support notes or secondary licensing model notes, to improve the liquidity of data assets and broaden financing channels. The second is "digital loan integration" credit services.

(2) Development of emerging data services

The supply and demand market of the big model data industry has problems such as data asset management and evaluation, which require

the services of third-party professional organizations. Banks can expand their roles to provide the following services: First, data asset management services. Relying on technology and data asset management capabilities, it provides services such as grading, categorization, and evaluation for AI datasets, and builds data asset full life cycle management capabilities. Second, data asset quality assessment services. Utilizing data analysis tools, we help both parties to the transaction identify data quality, gain insight into data value, and provide professional assessment services.

(3) Expansion of traditional financial services

Some data-factor enterprises are not satisfied with the scale of data available from public collection, but also do not have the ability and conditions for private collection, so private trading has become an important way for them to acquire data, and their trading behavior cannot be separated from financial support.

Such enterprises are potential new customers for banks, for which banks should actively explore the scope of traditional comprehensive services: First, credit services. Through data hosting and enterprise data analysis, banks can provide customized credit products for data-factor enterprises to meet their specific needs and risk tolerance. The second is bill services. Banks can provide bill services with exchange, payment, settlement, circulation and financing functions to improve the convenience of data transactions and capital financing.

VI Prospects and Suggestions

6.1 Policy Suggestions for Commercial Banks to Better Utilize the Value of Data Elements

First, the system should be improved to strengthen the foundation of financial services for data elements. Accelerate the implementation of the "Twenty Data Articles", build a "1+N" system, and promote the standardization of the data factor market. Improve the system of laws, regulations and standards, and clarify the legal provisions and operational norms for key aspects such as property rights attribution, trading and evaluation of data assets. Explore the establishment of a pricing mechanism that conforms to the characteristics of data elements, establish a revenue distribution system that reflects efficiency and promotes fairness, give full play to the market's decisive role in resource allocation, and ensure that market players participate in revenue distribution according to their contributions.

Second, mechanisms should be rationalized to promote the synergistic development of data in the financial sector. Open up internal data sharing and expand data resources of public services, e-commerce and operators. Promote the authorized operation of public data in the financial industry to realize that financial institutions "have data available". Accelerate the supply-side reform of the circulation and integration of data elements in the financial industry, and promote special actions, pilot demonstrations and policy synergies in the use of public data in the financial sector. Explore the mature model of data circulation and trading in the financial industry, build a linkage mechanism between financial institutions and data trading venues, and promote compliance, transparency and fairness in the circulation of financial data.

Once again, it is important to realize scenario linkage and release the new value of cross-domain data elements. Promote the integration and development of data elements and financial services, and encourage financial institutions to participate in the construction of data element

markets. Construct an interoperability mechanism between public data and commercial bank data, promote cooperation between the public sector and financial institutions in data sharing and transactions, and establish cross-industry and cross-domain data application demonstration projects. Financial institutions are encouraged to join hands with data vendors and third-party service organizations to carry out pilot demonstrations focusing on such areas as financial inclusion, anti-electronic fraud, agricultural assistance and intelligent risk control, and to promote innovation in the application of data elements in the financial industry and the release of value.

Lastly, integration and innovation should be carried out to expand the data asset financing service system. Enrich the multiple participation mechanism of the data factor market and give full play to the advantages of finance in leading the new era of data factors. Accelerate the breaking down of institutional and institutional barriers to the development of the data element market, encourage financial institutions to actively participate in the construction of the data element market, strengthen modern financial supervision, construct financial data security defenses, promote the compliant and efficient circulation and use of financial data, promote the application innovation and value release of data elements in the financial industry, and boost the integration of digital reality and the "Strengthening Reality with Data". "The company has been working on this project for a long time.

6.2 Prospects for Future Development Trends

6.2.1 Promoting the compliant and efficient flow and use of data

With the continuous improvement of data elements and the laws, regulations and regulatory systems in the financial sector, the institutional foundation for data circulation and deepened application will be more consolidated. Through industry-level data registration, trading and sharing platforms, data circulation in the financial industry will be promoted to be more standardized, professionalized and systematized.

Innovative applications of authorized operation of public data in the financial sector will gradually be put into practice, solving the problems of small scale, narrow scope and fewer scenarios of data supply in the financial industry. Commercial banks will promote the innovation of financial products and business of data elements, improve the technology of data asset identification and evaluation, develop data banking business, and explore new modes of data deposit and loan, value evaluation, securitization, etc., so as to help the development of science and technology finance, green finance, inclusive finance, pension finance, and digital finance.

6.2.2 Enabling high-quality development of the real economy

Financial institutions should continue to increase the supply of innovative products and provide more comprehensive financial solutions for science and technology innovation and industrial transformation and upgrading: "Asset management institutions also need to continue to increase product innovation, continuously broaden the scope of underlying assets of products such as science and technology innovation intellectual property ABS and science and technology innovation park REITs, and create more science and technology through the cooperation among brokerage firms, insurance and asset management institutions. insurance products, build a science and technology innovation financial system with the participation of multiple subjects and supply through multiple channels, and promote the formation of a virtuous cycle between science and technology, industry and capital." Leading the comprehensive leap of industries with scientific and technological innovation and driving the emergence of new economic growth points. We will empower industrial development with collaborative innovation, give full play to the "multiplier" and "multiplication" effects of data elements, and cultivate new momentum for economic development.

6.2.3 Exploring new paths to the realization of common wealth

From the perspective of common wealth and modernization, the

regulatory framework and policy environment will be gradually improved. With the gradual deepening of the regulators' knowledge of data assets and data factor financial business, it is expected that more policies and regulatory rules conducive to data factor financial innovation will be introduced in the future. At the same time, commercial banks can, through their own practice, on the basis of the separation of data rights, improve the redistribution adjustment mechanism of data factor income by carrying out data factor-related services, explore the new road of data factor "right to income", pay attention to the universality of digital factor income sharing, and pull reforms by the data dividend. The data dividend will lead to reforms, and the people's enthusiasm to participate in building wealth together will be further stimulated by reasonable distribution and sharing; the public data authorization mechanism will be further improved, and the people will be able to reasonably share the open benefits of public data resources under the guidance of the government, and the enterprises will be able to provide high-quality public welfare services relying on public data to realize the value of data elements for sharing and common construction; the data elements and the superposition of financial services can accelerate the empowerment of new quality productivity and drive China's modernization with digitalization.