

Research on Commercial Banks Helping to Realize 'Carbon Neutralization' under the Background of Digital Transformation

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Abstract

In recent years, digital technology has brought new opportunities in many areas, and it also plays a key role in accelerating commercial banks to achieve 'carbon neutrality' goals. Based on the SCP model, this paper first discusses the difficulties and influencing factors of Low-carbon transformation of commercial banks under data empowerment from the perspectives of market structure, market behavior and market performance. Secondly, it summarizes and refines the basic model of Low-carbon transformation of commercial banks, and on this basis, puts forward the effective implementation path of Low-carbon transformation of banks with 'digital technology' as the carrier, which can effectively help 'carbon neutralization' and create 'green banks', so as to form a new pattern of green financial development of the banking industry.

Keywords

Carbon Neutralization; Commercial Banks; Digital Transformation; Green Development; Low Carbon Transformation.

1. Introduction

In September 2020, President Xi Jinping proposed at the seventy-fifth United Nations General Assembly that carbon dioxide emissions strive to reach a peak by 2030 and strive to achieve carbon neutrality by 2060[1]. The proposal of 'carbon peak and neutrality targets' indicates that China's green development has entered a new stage, and also puts forward new challenges to the green development of China's financial industry. In recent years, with the rapid rise of digital technology, commercial banks should take the lead in order to achieve 'carbon neutrality'. In addition, affected by the early stage of the COVID-19, the financial industry has been greatly impacted. It is of more practical significance to study how to improve the digital transformation of commercial banks, improve the efficiency of Low-carbon transformation of commercial banks, and achieve the goal of 'carbon neutrality' in non-contact environment.

2. SCP Paradigm Analysis of Low Carbon Transformation Dilemma of Commercial Banks under Data Empowerment

2.1. Analysis on the Structure of Commercial Banks in the Field of Low Carbon Transformation under Data Empowerment

At present, the products in the green finance field of commercial banks are mainly concentrated in loans and bonds, and the degree of product differentiation is small. Although commercial banks have actively used digital technologies such as big data and cloud computing to achieve in-depth analysis of user needs, which has improved the homogenization of financial green products to a certain extent, it is still in the exploratory stage. In practice, there are problems such as insufficient issuance subjects of green products, fewer types of green products and fewer investment institutions of green products. In addition, the market concentration of green product investment in commercial banks is high, which cannot meet the personalized

requirements of customers. The application scenarios in the field of green finance need to be expanded. The leading commercial banks in the field of early financial science and technology have become service providers in the field of green finance relying on their own technical advantages or customer advantages. They continue to tap the blank and pain areas of financial services, and have certain monopoly characteristics. However, most commercial banks are limited to the reasons such as the evaluation of green products by relevant digital technologies, and the coverage of green credit is not wide enough [2]. In addition, the development of green stock, green trust, green fund, green insurance, green leasing, green supply chain financing and other financial products is slow, which is limited to the coordination between banks and departments, the creation of products, investors' recognition and other reasons. It cannot be solved in time, and needs to be expanded or developed.

2.2. Analysis of Commercial Banks' Behavior in the Field of Low Carbon Transformation under Data Empowerment

In the field of Low-carbon transformation, blockchain technology adopted by commercial banks has important advantages and innovations in distributed accounts and preventing information tampering. However, at present, blockchain technology is limited by computing power, cost and so on. In addition, huge amount of data leads to block synchronization work time-consuming and low system throughput. Those defects still need technical progress to bring qualitative changes. In addition, password algorithm design if there are some loopholes, investment and financing transactions may exist some security risks, while leading to computer and Internet technology costs and hardware barriers and other issues. In the early stage of low carbon transformation and development of commercial banks under data empowerment, technical risks cannot be ignored. At the same time, the credit risk pricing ability of commercial banks needs to be improved. Big data technology has strong technical barriers, and the core barrier is credit risk pricing ability. Credit pricing is the key to measure the development strength of a commercial bank in the field of green low carbon. Commercial banks can obtain and analyze the behavior characteristics of customers through big data technology for differentiated pricing, but cannot carry out accurate risk assessment. Carbon emission reduction project funds and returns often exist period mismatch, and commercial bank credit funds timely recovery is facing greater uncertainty. The continuity of carbon market policy makes commercial banks face greater risk of policy uncertainty. Therefore, in view of risk control, most commercial banks are too conservative and cautious in the process of developing green finance, and dare not intervene in it, which hinders the sustainable development of green finance of commercial banks[3].

2.3. Performance Analysis of Commercial Banks in the Field of Low Carbon Transformation under Data Empowerment

Due to the existence of digital technology barriers, China's commercial banks failed to take full advantage of big data, cloud computing, blockchain and other emerging technologies, and resource allocation efficiency remains to be improved. Taking the carbon emission trading market as an example, although China's commercial banks actively cooperate with the government, enterprises and financial institutions, there is still a lag in obtaining data and information such as carbon emissions and environmental information. The lack of intelligence, refinement and efficiency in investment decision-making, post-investment management and information disclosure is not conducive to sustainable investment and financing development. In addition, the flexibility of climate investment and financing of commercial banks is still insufficient, among which the climate investment and financing innovation tools suitable for small and micro enterprises, community families and individuals are relatively lacking, and financial non-systematic risks are not conducive to dispersion. At the same time, China's commercial banks green product business efficiency remains to be improved. Commercial

banks have not yet formed a complete, effective and systematic framework and index system for the evaluation and screening of green financial products. The efficiency of using digital technology to provide certification, labeling, evaluation and other services for green financial products is low, and the guarantee for green technology innovation enterprises and other types of risk compensation functions have not been fully played. These factors will lead to obstacles for commercial banks in the development of green finance[4].

3. Basic Mode of 'Low Carbon Transformation' of Commercial Banks

3.1. Peripheral Service Mode

The peripheral services of commercial banks in the field of Low-carbon finance mainly include product design, intermediary service and credit guidance. Commercial banks under data empowerment can design related financial products to obtain benefits in line with the development trend of Low-carbon transformation, mainly including the design of financial instruments to hedge carbon trading risks, the design of financial products linked to carbon emission rights, and the shareholding of enterprises and the development of related financial products. In addition, the intermediary service mode of commercial banks mainly includes the following four aspects: providing intermediary services for the development of green bonds, providing guarantee and credit enhancement services for carbon transactions, providing hosting operations for green funds, and providing advisory services for green finance projects. At the same time, the credit guidance mode of commercial banks' 'low carbon transformation' originates from the 'equator principle', which can guide the low carbonization of market behavior from the following four ways: First, commercial banks tend to invest credit. Second, commercial banks carry out industry-differentiated credit. Third, the regional differentiation of commercial bank credit. Fourth, issue green bonds[5].

3.2. Participation Transaction Mode

In the field of Low-carbon transformation, commercial banks have the following two ways to participate in the transaction: First, commercial banks actively act as 'market makers' in the international carbon emissions trading market. By trading carbon emission reduction rights, 'market maker' not only alleviates the problem of information asymmetry in the carbon emission trading market, activates the carbon emission trading market, but also obtains huge spreads. Second, commercial banks set up special carbon emission trading departments to engage in trading activities related to carbon emission reduction. As an emerging financial product, its risks are huge. In order to control risks, commercial banks can set up special carbon emission trading departments to engage in activities, and use digital technology to control risks at an affordable level. At the same time, China's commercial banks can take advantage of its advantages from 'market makers' to participate in carbon trading actively. Due to the uncertainty of carbon emissions trading itself, it is necessary to make corresponding risk control strategies in advance in response to risks.

3.3. Low-carbon Business Model

Commercial banks in Low-carbon transition, their own operations to achieve carbon neutrality is a key link to achieve national carbon neutrality goals. Commercial bank physical network operation, business processing, office also consumes a lot of resources, occupies a higher cost. Compared with other industries, the banking industry is an industry with low carbon intensity. By transforming green buildings, using renewable energy, reducing resource waste, and purchasing carbon credits, it is fully capable of achieving its own operational carbon neutralization by 2030. In recent years, commercial banks have used blockchain, artificial intelligence and other digital technologies to develop electronic banking business vigorously. In 2020, the proportion of electronic banking transactions of the four major commercial banks

is more than 90 %. In order to realize green operation, commercial banks also actively carry out electronic internal management. For example, the Agricultural Bank of China online 'intelligent space conference system', to create a mobile, paperless, sharing, scene of the new office mode, and continue to promote the use of mobile banking, intelligent self-service equipment, etc. To a certain extent, it reduces the comprehensive carbon emission rate of daily business activities[6].

4. Suggestions on Accelerating Commercial Banks to Achieve 'Carbon Neutralization'

4.1. Strengthening the Top-level Design of Green Financial Policy Framework and Optimizing Resource Allocation

First, improve external policy incentives and coordination mechanisms. Commercial banks should explore the use of financial discounts, risk compensation, tax incentives and other policy tools to guide all kinds of institutions to carry out green investment, enhance the enthusiasm and innovation of financial institutions to develop green finance. The second is to continuously improve and dynamically build a green development guidance mechanism, accelerate the Top-level design of the national carbon market construction, and establish a mandatory environmental information disclosure system. Mainly in the assessment and incentive, the green finance as an important strategic transformation index is included in the comprehensive evaluation system of commercial banks at all levels of business institutions, and further strengthen the assessment and restraint measures, increase financial support for green economy, low carbon economy and circular economy, and serve the high quality development of green business. Third, commercial banks need to play an important role in the design and planning of green financial policies and asset allocation and layout in advance according to national strategies. In order to speed up the establishment of a carbon account system, including the carbon accounts of individuals and enterprises, digital technology should be used to strengthen the management of carbon footprints in all aspects of the entire industrial chain, so that banks can more accurately identify and quantify green enterprises or projects supported by finance. Besides, it can prevent the risk of green financial standards and improve the efficiency of resource allocation. Fourth, innovative talent training mechanism, strengthen the professional ability of green financing services and professional talent training. Under the background of digital transformation, there is a technical threshold for Low-carbon transformation and upgrading of commercial banks. It is necessary to strengthen the training of relevant personnel and introduce professional talents. At the same time, commercial banks can carry out strategic cooperation with science and technology companies to make up for technical shortcomings and provide diversified support for green Low-carbon enterprises and technologies[7].

4.2. Actively Promote Financial Product Innovation to Meet Carbon Neutralization Financial Demand

First, innovative financing model, and actively build a green financial business system. Commercial banks should actively try to develop innovative tools for investment and financing of financial products suitable for small and micro enterprises, community families and individuals, expand the application of green finance, and improve the flexibility of investment and financing of financial products. Second, relying on digital management, strengthen science and technology empowerment. Make full use of artificial intelligence, big data, cloud computing, blockchain and other financial technology means to provide support for solving investment decision-making and post-investment management, information asymmetry, and improve customer experience and service efficiency. Third, commercial banks should combine advanced

technology with traditional green finance business, accelerate the construction of the national carbon market, explore the development of carbon insurance, carbon bonds, carbon funds, carbon repurchase and other trading or financing tools. In addition, banks should actively develop new green credit products to meet the development of green industry or industry, and constantly improve the flexibility and efficiency of carbon trading market. Fourthly, relying on the national carbon market and local pilot carbon market, participating in or supporting the underwriting and issuance of innovative financial products such as carbon neutrality thematic green financial bonds and funds, and encouraging the development of green financial products such as financing linked to carbon emission rights, and continuously improving the innovation ability of commercial banks' financial products to meet the financial needs of carbon neutrality.

4.3. Building a Complete Climate and Environmental Risk Management System to Help the Goal of Carbon Neutrality

First, build enterprise carbon emissions, climate, and environmental information data platform. Using new digital technology and methods, the government, enterprises and financial institutions work together to build carbon emissions and environmental information data platform, improve the level of risk pricing, and effectively support the intelligent early warning of investment and financing environmental risks. The second is to improve the environmental benefit evaluation system of green digital technology with emphasis on green financial policy guidance and digital technology support. Using digital technology to provide evaluation certification and rating services for customers' green products, green technology and green assets, and provide guarantee or risk compensation for green technology innovation enterprises to enhance the confidence and ability of financial institutions to deal with risks. Third, strengthen the risk prevention and control of green transformation of commercial banks, do a good job in risk assessment of climate change, and actively carry out climate and environmental stress testing and scenario risk analysis, quantitative assessment of asset risks caused by climate change. Fourth, make full use of digital technology to improve the credit risk of intelligent risk management system, and gradually establish and improve the green project investment risk compensation system and management process. Through the big data platform, climate and environmental risk management is included in the overall business strategy decision-making, risk-pricing model is innovated, and financial risks are dispersed. At the same time, it is necessary to clarify the amount of green and Low-carbon financing, improve the financial service innovation and product system, including green credit, green bonds, green insurance, green funds, climate funds, climate bonds and other financial instruments that are conducive to the realization of Low-carbon and green goals. And commercial banks should use 'Fintech + green financial innovation' to provide sustainable investment and financing paths for green and Low-carbon development, continuously improve the management ability of bank climate and environmental risks, and help commercial banks to achieve the goal of 'carbon neutrality'[8].

4.4. Speeding up the Low Carbon Transformation of 'New Infrastructure' Empowering Commercial Banks to Achieve Carbon Neutralization Goals

The underlying support of new infrastructure is an important guarantee for Low-carbon transformation of banks. The 'new infrastructure' represented by 5G, artificial intelligence and blockchain will promote the Low-carbon transformation of the banking industry and accelerate the construction of a Low-carbon industrial ecosystem with digital services. The first is the Low-carbon transformation of digital powered commercial banks from the origin. We should actively promote the construction of digital banking system engineering, take the value of green financial business as the center, apply modern science and technology such as artificial intelligence, mobile Internet and biometrics, integrate all kinds of data inside and outside the bank, online and offline, and comprehensively grasp customer behavior and green financial

product demand. Through in-depth mining and intelligent analysis, we can continuously iteratively upgrade customer green financial business service mode, and promote the in-depth integration of digital technology and green financial business. Second, the use of 'new infrastructure' to create a full-scene green financial ecosystem to reduce carbon emissions generated by their own operations. Relying on the landing application of new infrastructure, the banking business is integrated into the business scenarios of clothing, food, housing and banking, so that various living scenarios and customized services are accessible. The green ecological system of open innovation, 'online + offline', 'financial cloud + industry cloud' and 'integration into the scene + finance' is constructed, and the replacement rate of electronic bank transactions and credit card electronic bills are continuously improved[9]. Third, all-round empowerment of commercial bank green finance sustainable development. Using '5G + Internet of Things' to establish a connection with green industry and green industry, to overcome the previous problems such as geographical, time and information asymmetry. Moreover, the bank information contact angle is extended from a single green enterprise to the whole industrial chain from point to surface, so as to realize the integration of data and information in the upper, middle and lower reaches of the industrial chain. Besides, Commercial Banks should do a good job in risk assessment and management, build an open, intelligent and Low-carbon digital inclusive finance good ecology, and help the goal of 'carbon neutrality'.

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