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A Study on the Development of Green Finance Business at Industrial Bank from the Perspective of Sustainable Development Bonds

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Abstract: *This study takes Industrial Bank as a case to deeply analyze its practices in promoting green finance development through sustainable development bonds. First, the paper explores the fundamental concepts and current development of green finance and sustainable development bonds, elucidating the growth trends in the global green finance market. Next, by conducting a detailed analysis of the issuance process of Industrial Bank's sustainable development bonds, the paper evaluates the impact of these bonds on the bank's business, market feedback, and the development of the green economy. In addition, the paper examines Industrial Bank's measures in risk management and innovation strategies, and through a comparison of green finance practices domestically and internationally, provides insights for other commercial banks on advancing green finance. The results show that Industrial Bank has effectively expanded its green finance business through sustainable development bonds, providing strong support for China's green economic transition.*

Keywords: *Green Finance; Industrial Bank; Case Study Method; Sustainable Development Bonds*

1. Introduction

With the intensification of global climate change and environmental crises, green finance has become one of the core drivers of the global economic transition[1]. Green finance is a tool that facilitates the transition to a sustainable development model by channeling resources from capital markets into environmentally friendly, renewable energy, and low-carbon projects[2]. As a crucial component of green finance, green bonds have garnered increasing attention in recent years. According to the International Capital Market Association (ICMA), green bonds are a type of special-purpose bond whose proceeds are exclusively used to fund projects with significant environmental benefits[3].

The global green bond market has experienced rapid growth since the European Investment Bank (EIB) issued the first green bond in 2007[4]. By 2020, the global green bond market had surpassed $1 trillion, with China, the United States, and Europe dominating the market[5]. The rapid expansion of green bonds has not only fueled financing for environmental and sustainable development projects but also accelerated the greening of global capital markets[6].

The Chinese government places great emphasis on the development of green finance and regards it as a key policy tool for promoting the country’s green economic transition. Since the release of the "Green Bond Endorsed Project Catalogue" in 2016, China's green bond market has grown rapidly, becoming one of the most dynamic markets in the world[7]. Commercial banks, as an essential part of China’s financial system, have played a critical role in driving green bond issuance and the development of green finance[8]. According to academic research, commercial banks can effectively reduce financing costs through the issuance of green bonds while also gaining broader social responsibility and reputational benefits[9].

As a pioneer of green finance in China, Industrial Bank has become one of the main participants in domestic green bond issuance since adopting the Equator Principles in 2006[10]. Through the issuance of green financial bonds, Industrial Bank has provided financial support for projects in clean energy, green buildings, and pollution control[11]. Studies show that Industrial Bank’s issuance of green bonds has not only helped advance the development of green projects but also significantly enhanced its competitiveness in the financial market[12].

Despite the rapid development of China’s green bond market, it still faces several challenges,

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including the lack of uniform information disclosure standards, the absence of a green certification system, and insufficient market transparency[13]. Compared to international markets, China still has room for improvement in the standardization and regulatory framework of green bonds[14]. Additionally, the risk management challenges faced by commercial banks during green bond issuance are issues that warrant attention[15].

This paper uses Industrial Bank as a case study to explore its practices in issuing green financial bonds and developing its green finance business model. By analyzing the bond issuance mechanisms, market performance, and impact on the bank's performance, this study aims to provide insights for other commercial banks seeking to develop green finance businesses and to examine the future development trends and challenges of China's green bond market[16].

2. Overview of Green Finance and Sustainable Development Bonds

2.1. Definition and Development of Green Finance

Third-party Green finance is a financial model that integrates financial capital with environmental sustainability goals. Its primary objective is to provide financial support to promote the implementation of green projects, thereby achieving a win-win situation for economic development and environmental protection[17]. The core concept of green finance is to use financial instruments to direct capital flows toward green and low-carbon projects, including renewable energy, energy conservation and emissions reduction, pollution control, green buildings, and sustainable agriculture[18]. Specific forms of green finance include green credit, green bonds, green insurance, and environmental funds[19].

By incorporating Environmental, Social, and Governance (ESG) factors into financial decision-making processes, green finance not only supports environmental projects but also encourages companies to focus more on environmental responsibility in their business activities[20]. This approach aims to mitigate climate change, reduce the consumption of natural resources, and help achieve the United Nations' Sustainable Development Goals (SDGs) through supporting innovations in environmental technologies[21].

2.2. Concept and Characteristics of Sustainable Development Bonds

Sustainability Bonds are debt instruments issued to finance projects with both environmental and social benefits, aimed at promoting the achievement of the Sustainable Development Goals (SDGs)[22]. Unlike green bonds, the proceeds of sustainability bonds can be used not only for environmental projects (such as clean energy and pollution control) but also for social projects (such as public health, education, and social housing)[23]. The issuance of such bonds requires a clear specification of the use of funds and strict adherence to the Sustainability Bond Guidelines issued by the International Capital Market Association (ICMA), ensuring that the funds are allocated to projects that align with sustainability principles.

As investor interest in Environmental, Social, and Governance (ESG) standards has grown, the sustainability bond market has rapidly expanded. In 2020, the global issuance of sustainability bonds reached $200 billion, reflecting strong market demand for sustainable investments. The dual benefits of these bonds (environmental and social) make them a key tool for advancing green and socially responsible investments.

2.3. Issuance Mechanism of Sustainability Bonds

The issuance mechanism of sustainability bonds consists of five core components: project selection, bond design, third-party certification, fund management, and information disclosure. First, the issuer must clearly identify the specific projects to be supported, which typically cover areas such as clean energy, green infrastructure, or social welfare, and must comply with the Sustainability Bond Guidelines issued by the International Capital Market Association (ICMA). In the bond design phase, the issuer must determine key terms such as the bond's size, maturity, and interest rate to ensure that the funds meet the financing needs of the projects while also attracting investors. To ensure the environmental and social benefits of the bond, independent third-party certification agencies (such as Sustainalytics, Vigeo Eiris, etc.) evaluate and verify the projects to ensure compliance with international sustainability standards. After the bond is issued, the use of funds must be strictly managed in accordance with the designated purposes, often through the establishment of dedicated accounts for oversight. Finally, the issuer must

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regularly disclose information on the use of funds and the environmental and social impacts of the projects, ensuring transparency and compliance, thereby enhancing investor confidence and ensuring the realization of project benefits.

3. Analysis of Industrial Bank's Green Finance Practices

3.1. Strategic Layout and Development History of Industrial Bank's Green Finance

As a pioneer in China's green finance sector, Industrial Bank has gradually established a systematic green finance strategic layout since adopting the Equator Principles in 2006. This layout encompasses a variety of financial instruments, including green credit, green bonds, and green funds. By supporting projects related to clean energy, energy conservation, emissions reduction, and pollution control, the bank promotes the development of environmentally friendly industries. Industrial Bank was also one of the first in China to issue green bonds, further enhancing its influence in the green finance market. In addition, the bank actively participates in the formulation and application of international green finance standards, optimizing its green finance risk management system by incorporating international best practices.

Looking ahead, Industrial Bank will continue to deepen its green finance strategy, expand its green finance product lines, and promote the further development of green credit, green bonds, and innovative financial instruments. By strengthening international cooperation and learning from global best practices in green finance, Industrial Bank is committed to contributing to China's goals of carbon peaking and carbon neutrality, driving the economy towards a green, low-carbon, and sustainable development model.

3.2. Product Structure and Types of Green Finance Business

The product structure and types of green finance business are diverse, encompassing a range of financial instruments that support environmental protection and sustainable development. The main products include green credit, green bonds, green funds, and green insurance. Green credit is the earliest and most widely used green finance product, where banks provide loans to environmental projects, supporting clean energy, pollution control, and energy conservation initiatives. Green bonds, which have seen rapid development in recent years, are used to raise funds for specific environmental and sustainable development projects. Issuers can include governments, corporations, or financial institutions, with funds allocated to areas such as clean energy, green buildings, and wastewater treatment.

In addition, green funds gather social capital to invest in environmental projects, primarily focusing on clean energy, renewable resources, and other environmentally friendly industries, with a strong emphasis on social responsibility. Green insurance provides coverage for environmental risks, particularly in the fields of agriculture, climate change, and pollution damage compensation, helping businesses and individuals mitigate environment-related risks. Through this diversified product structure, green finance effectively supports the economic transition towards a green, low-carbon model and contributes to the achievement of sustainable development goals.

3.3. Case Study of Industrial Bank’s Issuance of Sustainability Bonds

3.3.1. Issuance Background and Objectives

The issuance background of Industrial Bank’s sustainability bonds stems from the global demand to address climate change and promote sustainable development. With the Chinese government’s commitment to achieving carbon peaking and carbon neutrality, green finance has become a crucial component of national policy. As a pioneer in China’s green finance sector, Industrial Bank actively responds to national environmental policies and aligns with global sustainability trends. By issuing sustainability bonds, the bank aims to facilitate the financing of green projects, promoting investments in environmental protection, energy conservation, emissions reduction, and clean energy. This not only aligns with China’s policy direction but also corresponds to the global Sustainable Development Goals (SDGs).

The primary objective of Industrial Bank’s sustainability bond issuance is to provide stable financial support for projects that meet Environmental, Social, and Governance (ESG) standards, contributing to the growth of green industries. Additionally, through the issuance of these bonds, Industrial Bank aims to further strengthen its market position in the green finance sector, demonstrate its corporate social responsibility, and attract more sustainability-focused investors. Moreover, the issuance of the bonds

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helps reduce financing costs, optimize capital allocation, and drive the economic transition towards green development, thereby providing financial support for China's achievement of its "dual carbon" goals.

3.3.2. Issuance Background and Objectives

Sustainability bond business is a new development in the green finance field for Industrial Bank in recent years. As early as 2014, Industrial Bank began preparing for the issuance of green bonds, and after completing the necessary preparations. As show in table1, it became the first bank in China to issue domestic green financial bonds in 2016. As of 2023, the balance of Industrial Bank's green finance financing has reached 1.7148 trillion yuan. From the initial issuance of 50 billion yuan in 2016, it has grown into a significantly large scale today, with cumulative financial bond issuances amounting to approximately 200 billion yuan.

Table 1: Overview of Industrial Bank's Green Finance Bond Issuance

Bond Name	Issuance Date	Size (Billion CNY)	Term (Years)	Interest Rate (%)
2016 First Green Finance Bond	January 2016	10	3	2.95
2016 Second Green Finance Bond	July 2016	20	3	3.2
2016 Third Green Finance Bond	November 2017	20	5	3.4
2018 First Green Finance Bond	October 2018	30	3	3.98
2018 Second Green Finance Bond	November 2018	30	3	3.99
2019 First Green Finance Bond	July 2019	20	3	3.55
2022 First Green Finance Bond	January 2022	15	5	3.01
2023 First Green Finance Bond	May 2023	27	3	2.77
2023 Second Green Finance Bond	June 2023	23	3	2.66

Source: Industrial Bank Official Website

From a pioneer to a leader in the issuance of sustainability bonds, Industrial Bank has consistently aligned its bond issuance with national policies, driving China's economic transition towards sustainability through financial bonds. In recent years, guided by the vision of ecological civilization, Industrial Bank has strategically advanced its efforts, seizing opportunities and leading innovation. It has been awarded the highest ESG rating in the domestic banking sector by MSCI for five consecutive years, contributing to the high-quality development of green finance and writing a new chapter in China's modernization. Industrial Bank is adapting to the green and low-carbon development trend in the economic structure, supporting both the green transformation and upgrading of traditional industries as well as the growth of emerging green industries. As show in table2, It provides more accessible financing channels for the transformation of traditional industries and the development of green industries, gradually building a robust green balance sheet.

Table 2: Scale of Green Credit at Domestic Equator Banks

No.	Bank Name	Green Credit Financing Balance (Billion CNY)	Green Financial Bond Issuance Size (Billion CNY)
1	Industrial Bank	1149	Approximately 30
2	Bank of Jiangsu	Nearly 100	10
3	Bank of Guizhou	21.517	5
4	Chongqing Rural Commercial Bank	More than 17	2
5	Bank of Chongqing	12.152	6
6	Huzhou Bank	8.714	1

Source: Data from public disclosures by banks and online data summary

4. Risk Management of Industrial Bank's Sustainability Bonds

4.1. Risk Identification and Assessment

Industrial Bank's sustainability bonds face several key risks during their development. First is credit risk, one of the most common risks in the bond market. For sustainability bonds, the creditworthiness of the issuer, Industrial Bank, is the critical factor determining credit risk. Any credit crisis could impact the timely repayment of the bonds. Second is market risk, which primarily stems from fluctuations in market interest rates. When interest rates rise, bond prices may fall, leading to capital losses for investors. Additionally, changes in the macroeconomic environment, such as fluctuations in economic growth and inflation rates, could adversely affect bond prices. Liquidity risk refers to the risk that investors may not be able to sell bonds quickly at a reasonable price when they need funds. Although bonds issued by large

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banks generally have good liquidity, changes in market liquidity still warrant attention.

Project-specific risk is unique to sustainability bonds, as these bonds are often tied to specific green projects. The performance of the project directly impacts the bond's ability to repay. If the project fails to generate the expected benefits on time, the bond's repayment may be affected. Additionally, legal risk should not be overlooked. As regulations on sustainability and environmental protection continue to evolve, policy changes may affect the bond's legality and profitability. Interest rate risk is closely related to changes in market interest rates. Since sustainability bonds typically have fixed interest rates, a rise in market rates could reduce their relative attractiveness, causing their market value to decline.

Lastly, Environmental, Social, and Governance (ESG) risk is directly linked to the sustainability goals of the bonds. For example, if the sustainable projects supported by Industrial Bank fail to achieve their expected environmental benefits or face social governance issues, it could impact the bond's repayment capacity and investor confidence. The fluctuation of these risk factors could directly affect the yield, price, and interest rate of Industrial Bank's sustainability bonds. Investors should carefully consider these risks and make prudent investment decisions.

4.2. Risk Management Strategies and Measures

As Industrial Bank has established a comprehensive internal control system for managing risks associated with sustainability bonds, covering credit, market, liquidity, project-specific, legal, and ESG risks. For credit risk, Industrial Bank rigorously selects bond issuers and continuously monitors their credit status to ensure their repayment capacity. In terms of market risk, the bank uses both quantitative and qualitative analyses to assess fluctuations in interest and exchange rates, developing flexible investment strategies to cope with market volatility. Liquidity risk is managed by reasonably arranging the maturity of the investment portfolio and closely monitoring market liquidity. For project-specific risks, the bank conducts due diligence and regular follow-ups to ensure that the projects proceed as planned.

Legal risk management is addressed by closely tracking changes in laws and regulations and collaborating with legal institutions to ensure the bonds' compliance. For ESG risk management, Industrial Bank incorporates environmental, social, and governance factors into its risk framework and regularly publishes ESG reports to showcase its achievements in sustainable development. The risk warning mechanism includes data analysis and credit risk assessment, with real-time monitoring of market conditions and the credit status of issuers. Based on risk alerts, the bank formulates response strategies through cross-department collaboration, external partnerships, and timely communication with investors to ensure that risks are effectively addressed. Overall, through this rigorous risk management and response mechanism, Industrial Bank has significantly enhanced the safety of its sustainability bonds and bolstered market confidence.

4.3. Innovation and Management Optimization

Industrial Bank can adopt various measures in terms of innovation for sustainability bonds. In terms of product innovation, the bank can develop a wide range of sustainability bonds, such as green bonds, social bonds, and sustainability bonds, to support projects related to environmental protection, social welfare, and governance (ESG), thereby meeting the growing demand for sustainable investments from investors. In service innovation, Industrial Bank can establish partnerships with financial institutions, government agencies, non-governmental organizations (NGOs), and international organizations to jointly promote the expansion of the sustainability bond market, enhancing its market influence and share.

For market innovation, Industrial Bank can position itself as a leader in the sustainability bond market by providing innovative, high-quality sustainable investment opportunities to attract more investors, while also providing financial support for enterprises engaged in sustainable development projects. By building a diversified bond portfolio, Industrial Bank can reduce risks and increase returns, catering to investor demand for sustainable development projects across different sectors and regions.

5. Comparative Analysis of Domestic and International Sustainability Bonds

5.1. Comparison of the Current Development of Green Finance Business Domestically and Internationally

Internationally, green finance businesses are primarily concentrated in European and American countries, where a longer development history and well-established legal and regulatory frameworks have led to the formation of mature markets. Currently, the range of green finance products in Europe and the U.S. is diverse, including green bonds, green stocks, and green funds, catering to the diversified needs of investors. Additionally, there is a high level of awareness of green finance among investors, with an increasing number of institutional and individual investors incorporating sustainability factors into their investment decisions. Financial institutions in Europe and the U.S. are also actively collaborating with other countries and international organizations to promote cross-border green investments and technology exchanges, providing crucial support for achieving global sustainability goals.

At the same time, the Chinese government places significant emphasis on promoting green finance and has introduced a series of policies and guidelines to facilitate the rapid expansion of green credit, green bonds, and other related businesses. Domestic financial institutions, in cooperation with the government, enterprises, and non-governmental organizations, have contributed to the vigorous development of China's green finance market.

5.2. Comparison of Domestic and International Practices of Sustainability Bonds

At the international level, Europe is the leader in the sustainability bond market, while the North American and Asian markets are also experiencing rapid growth, especially in large economies such as the United States and China. The international market has a high level of acceptance of sustainability bonds, with large issuance volumes and frequent multi-currency issuances. The primary issuers include multilateral development banks, international financial institutions, national and local governments, and large corporations, particularly energy and utility companies. In recent years, China has also made significant efforts to promote green finance, especially the issuance of sustainability bonds, with the government supporting market development through policy advocacy and incentives.

Although China’s green bond market occupies an important position globally, its issuance volume and diversity still have room for improvement compared to the more mature markets in Europe and the U.S. In terms of investor participation, the European and U.S. markets are mature and diversified, attracting a wide range of institutional investors, corporations, banks, insurance companies, and individual investors. In contrast, China’s market is primarily composed of institutional and financial investors, with lower public awareness, though participation is gradually increasing under policy support. In terms of regulation, the international market is guided by international standards such as the Green Bond Principles (GBP), with well-established legal frameworks, whereas the Chinese market, despite its rapid development, is still in the cultivation phase, with public awareness and market maturity needing further enhancement.

6. Conclusions

Green bonds, as debt instruments supporting environmental protection and sustainable development projects, play a key role in providing financing for environmentally related projects and industries, while attracting more investors to participate in green project investments. By issuing green bonds, corporations and governments can secure funding to actively engage in projects aimed at reducing carbon emissions, improving energy efficiency, and developing renewable energy, thereby promoting the growth of the environmental protection industry and accelerating the transition of the economy towards green and sustainable development.

Furthermore, the issuance of green bonds not only enhances a company’s brand image and sense of social responsibility but also strengthens its environmental reputation, attracting more investors who focus on Environmental, Social, and Governance (ESG) factors, thereby lowering financing costs. As more investors prioritize environmental and sustainable development, green bonds offer them a new investment channel with greater social responsibility and environmental significance. Overall, green bonds contribute to the green transformation of the economy and sustainable development by facilitating environmental project financing and encouraging more investors to participate in the green industry.

Since Industrial Bank officially launched its green finance business in 2006, it has developed a mature risk management system for green bonds. This paper takes the case of Industrial Bank’s sustainability

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bonds as the subject of study, exploring in depth the practices of commercial banks in managing risks associated with green bonds and summarizing the experiences of the banking industry in the field of green finance. By analyzing the issuance patterns and impact of Industrial Bank's green bonds, this study aims to further clarify the critical role of green bonds in driving the green transformation of the economy and provide a comprehensive understanding of the green finance bond market.

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