



## THE RELATIONSHIP BETWEEN LOW-CARBON FINANCE AND SUSTAINABLE DEVELOPMENT: A CASE STUDY OF INDUSTRIAL BANK OF CHINA

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### ABSTRACT

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The action plan of China-proposed One Belt One Road initiative play a significant role of sustaining the green and steady growth of Chinese economy. Meanwhile, it also brings tremendous opportunities and challenges for low-carbon economy. Developing low-carbon finance is necessary for developing low-carbon economy in China. Commercial banks' primary objective is to maximize profits, so they inevitably pay attention to the influence of competitiveness and earnings after developing carbon finance. Industrial Bank as China's first bank joining Equator Principles is the typical example of commercial banks which develop low-carbon finance. This paper analyzes the total assets, non-performing loan ratios and net capital of the bank and concludes that if a commercial bank can do a good internal management, the development of low-carbon finance will promote its sustainable development. In other words, the sustainable development based on low-carbon finance will generate visible benefits to the bank.

**Contribution/Originality:** The paper's primary contribution is finding that commercial banks can improve its market competitiveness, decrease its operational risk, enhances its profitability and gain support from investors through developing low-carbon economy. The finding in this study sheds light on the sustainable development of Chinese commercial banks.

## 1. INTRODUCTION

### 1.1. Background and Significance

In September and October of 2013, Chinese President Xi Jinping visited Central Asia and Southeast Asia. At that time, he raised the initiative of jointly building the Silk Road Economic Belt and the 21st-Century Maritime Silk Road (hereinafter referred to as the Belt and Road), which attracted numerous attention from all over the world. The initiative to jointly build the Belt and Road is aimed at promoting the orderly and free flow of economic factors, highly efficient allocation of resources and deep integration of markets (Zhao, 2015). Also, the Belt and Road will encourage the countries to achieve economic policy coordination and carry out broader and more in-depth regional cooperation of higher standards. Open, inclusive and balanced regional economic cooperation architecture will benefit all countries. While developing economy, a series of problems arise because of the threat of climate

change, the impact of the global financial crisis and the constraint from resources and environment, making the transformation of the pattern of economic development brook no delay. As the inevitable way of China's sustainable development, low-carbon economy and low-carbon civilization are the future trend to figure out climate change and achieve scientific development concept (Li *et al.*, 2010).

Banking institutions are the main force in Chinese financial fields. They should seize the opportunity, comply with the needs of economic development and make energetic efforts to develop low-carbon finance. Meanwhile, banks, especially commercial banks, should carry out mechanism innovation and operation innovation to support low-carbon financial business. As a practitioner, commercial banks should promote the transformation of low-carbon economy and find more profit opportunities for themselves.

China, as the largest emitter of greenhouse gases and the largest developing countries, faced great pressure on the energy saving and emission reduction. Policy banks use their own advantages and energetically expand low-carbon financial business, which can bring a lot of benefits. For one thing, it has vital practical significance to promote energy saving and emission reduction, upgrade industrial structure and accelerate transformation of the model of economic development, in order to achieve resource-conserving and environment-friendly economic model. For another thing, low-carbon finance can impel the innovation ability of policy banks (Demirgüç-Kunt and Harry, 1999). Meanwhile, policy banks can fulfill more social responsibility through low-carbon financial business. It is beneficial to build a favorable social and public image. Therefore, developing low-carbon financial business of commercial banks has a practical value both for the transformation of economic development pattern and for achieving own sustainable development in China.

Industrial Bank of China is the pioneer among other commercial banks of developing carbon finance in China. In 2006, Industrial Bank as the first commitment to Equator Principle among Chinese commercial banks designed Chinese first green credit program—energy saving and emission reduction financing project. In 2008, in order to advance its management idea, Industrial bank publicly promised to adopt 'Equator principles', which became the first carbon financial institution in China. In the paper, I selected some key indicators of Industrial bank to analyze the effects of developing low-carbon finance for commercial banks, which has great typical significance.

## 1.2. Research Methods

This paper makes full use of various ways to search relevant literature of low-carbon finance, including the database of Guangdong University of Foreign Studies Library, China National Knowledge Infrastructure (CNKI) and several financial websites etc. After studying and concluding relevant academic literature, conference report and academic journals, the paper explored the low-carbon financial business in commercial banks. It takes the low-carbon financial business implementation in Industrial Bank as an example, analyzes the related data in the Annual Report of Industrial Bank, and studies the effects of Industrial Bank after developing low-carbon finance.

## 2. LITERATURE REVIEW

### 2.1. Research Status of Foreign Countries

The relevant studies of 'low-carbon finance' in foreign countries focus on environmental finance, sustainable finance and low-carbon finance, etc. In 2003, T.E. Gradel and B.R. Allenby published a co-authored book *Industrial Ecology* (2<sup>nd</sup> edition). In that book, they built the theoretical framework of finance and environmental protection, which regarded finance as a kind of service industry and embraced finance into the theory framework of finance and environmental protection from the industry and environment point of view. T.E. Gradel and B.R. Allenby pushed the finance and environmental protection study into a new stage (Allenby and Graedel, 2002). In 2003,

International Finance Corporation (IFC) <sup>1</sup>initiated 'Equator Principles' on international banking, which built standards for project financing censorship including social and environmental factors. The financial institutions which are willing to join the 'Equator principles' <sup>2</sup> should ensure that when they have a financing project they will consider both social and environment problems. These financial institutions also should fulfill their social responsibility in related to environmental management and social problems.

Low-carbon financial transaction derived from the formulation of Kyoto Protocol <sup>3</sup>in 1997. The Low-carbon financial transaction gained a strong development after Kyoto Protocol came into force in 2005. Kyoto Protocol presents three complementary market mechanisms which can reduce the costs of emission reduction for all over the world. It makes greenhouse gas emissions become intangible products which can be transacted. Kyoto Protocol laid the foundation for the development of low-carbon financial markets.

## 2.2. Domestic Research Status

Domestic scholars consider that low-carbon finance means various financial system arrangements and financial transaction activities which aim at the reduction of green gas emissions and the transition of carbon transaction risk. Low-carbon finance includes the transaction of carbon credit and its derivatives, the investment and financing of low-carbon project, carbon insurance and carbon fund etc. (Chu, 2010). All in all, as for the definition of low-carbon finance, financial institutions and scholars mainly pay attention to the aspects of carbon financing and carbon transaction. Carbon financing can be regarded as the investment and financing of environmental projects. Also, carbon transaction is business activities of carbon products and their derivatives (Chi *et al.*, 2014). When domestic scholars defined low-carbon financial business, they pay a higher attention on carbon financing which is not highlighted by foreign scholars (Wu and Lin, 2010). This is a main difference for the definition of low-carbon finance between domestic scholars and foreign scholars. Because the development of low-carbon financial business is still in initial development and many carbon products are not enough mature. Carbon financing can bring the function of 'carbon currency' into play that will solve the problem of finance shortage and promote the development of low-carbon business (Ren, 2008; Chen, 2009). Therefore, low-carbon finance is a financing solution and financial system, including low-carbon financing project, carbon credit and its derivatives and other related financial services, which aims at controlling green gas emissions and mitigating global warming.

Huang and Zhu (2017) makes a study on Chinese corporations' conception of sustainable development based on an innovative view of corpus analysis, and finds out that Chinese companies should enhance their concept of sustainable development in business transactions. Zhu *et al.* (2017) argues that students are not very much aware of green finance and thus suggests that Chinese universities should strengthen the degree of environmental protection education so that talents can be filled with the concept green development and social responsibility. Chen (2018) suggests that governments should create an ecological environment for the development of green finance by means of perfecting related norms, rules and regulations as well as implementing incentive policies and value orientations.

From the above review, it is seen that there are no direct research findings in terms of the relationship between low-carbon finance and banks' sustainable development, not saying the case study of the effect of developing low-

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<sup>1</sup> International Finance Corporation (IFC) is an international financial institution that offers investment, advisory, and asset management services to encourage private sector development in developing countries.

<sup>2</sup>Equator Principles is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in project finance. It is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

<sup>3</sup>Kyoto Protocol is the supplementary terms of *United Nations Framework Convention on Climate Change*. In 1997, *United Nations Framework Convention on Climate Change* was adopted at the Third Conference of the Parties, entered in to force in February 2005. The file had set up mandatory targets of reductions in greenhouse gases for more than 30 countries, but the United States was not involved in the legal system.

carbon financial practice, such as Industrial Bank as China's first bank joining Equator Principles. Thus, it is innovative to conduct a related research in this field.

### **3. RELATIONSHIP BETWEEN INDUSTRIAL BANK'S LOW-CARBON FINANCE AND ITS SUSTAINABLE DEVELOPMENT**

#### **3.1. Status Analysis of Low-Carbon Finance in Industrial Bank**

After years of continued exploration practice, low-carbon finance has achieved complete coverage within all branch institutions of Industrial bank currently. Meanwhile, all those branches set up low-carbon finance business which covers three fields of low-carbon economy, cyclic economy, and ecological economy. The projects involve many types including improving energy efficiency, new energy and renewable energy utilization, carbon emission reduction, sewage disposal and water treatment, sulfur dioxide emissions, and solid waste cyclic utilization, etc. Through vigorously supporting green industry and the development of low-carbon economy, Industrial bank has gradually embarked on a path of sustainable development.

Data displays that the loan balance of low-carbon loan projects is around 7510 billion yuan among 21 main banking financial institutions in China currently. Industrial bank comes out top among those banks. By the end of 2017, Industrial bank has accumulated to provide low-carbon financing for 1456 billion yuan of 14395 environmental protection enterprises. The loan balance of low-carbon financing is 680 billion yuan. The supported projects can be implemented in the country which will save standard coals around 29.12 million tons per year that are equivalent to 83.78 million tons of carbon dioxide emissions per year. In addition, those projects can realize the annual emission reduction of Chemical Oxygen Demand (COD)<sup>4</sup> 3.85 million tons, the annual integrated utilization of solid waste 44.79 million tons, and the annual saving yield of water 408.4 million tons. Industrial Bank exclusively created a carbon quota property risk management and value evaluation model. Meanwhile, the carbon quota mortgage products were initially launched in Hubei province which was the first carbon trading agent account opening system based on the banking system. The system was established connections with 7 domestic carbon emission trading pilot provinces and signed cooperative agreement with 6 of them. As for emission permits finance, Industrial bank has established connections with 9 domestic provinces which are the pilot provinces of emission permits. Industrial bank cooperates with these provinces relating to market construction, system development consulting, capital clearing, emission right mortgage loan and so on.

#### **3.2. Effect Analysis of Industrial Bank after Developing Low-Carbon Finance**

##### **3.2.1. Improving Market Competitiveness**

Whether can enhance the market competitiveness is one of the crucial factor for the sustainable development of a bank. Therefore, it is necessary to analyze the impact of market competitiveness for Industrial bank after carrying out low-carbon finance (Huang *et al.*, 2012). For banks, total assets and its growth rates can reflect the market competitiveness and variation trend of this bank to a large extent. The total asset for one commercial bank is the total figure of its resources which can gain profits. This is also the fundamental guarantee for commercial banks whether have ability to repay their debt. The total asset of one commercial bank can reflect the scale and financial strength of this bank. The more of the total asset, the corporation scale is larger. The capacity of paying the principal with interest to the customer is higher. In other words, we can judge whether a commercial bank is reliable, we can find from its total asset. The market share of a commercial bank can be measured by total asset ratio that is a commercial bank's total asset ratio of the total number of commercial bank's total assets. From this ratio, we can find the market share of one commercial bank. It also can give expression to the competitive position in one

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<sup>4</sup> Chemical Oxygen Demand (COD) determines the standard method for indirect measurement of the amount of pollution (that cannot be oxidized biologically) in a sample of water. The higher the chemical oxygen demand, the higher the amount of pollution in the test sample.

field. The increase speed of the total asset ratio is faster in one commercial bank, and the total asset ratio of this bank in that field is higher. That is to say, the increase speed of current asset is faster, so the competitive strength of this bank is higher. Industrial bank is a commercial bank which aims at profit maximization. For Industrial bank, one of the standards to make decision about whether carrying out one business is the market competitiveness of that business.

Table-3.1. Total Assets of Industrial Bank

| Year | Total Asset of Industrial Bank (Unit: Million) | Total Assets of Banking Financial Institutions (Unit: Million) | Total Assets of Joint-equity Commercial Banks (Unit: Million) |
|------|--|--|---|
| 2017 | 6,419,189                                      | 245,778,448  | 44,961,958  |
| 2016 | 6,085,895                                      | 232,253,200  | 43,473,200  |
| 2015 | 5,298,880                                      | 199,345,400  | 36,988,000  |
| 2014 | 4,406,399                                      | 172,300,000  | 31,400,000  |
| 2013 | 3,678,304                                      | 151,350,000  | 26,940,000  |
| 2012 | 3,250,975                                      | 133,622,400  | 23,527,100  |
| 2011 | 2,408,798                                      | 113,287,300  | 18,379,400  |
| 2010 | 1,849,673                                      | 94,258,460   | 14,861,690  |
| 2009 | 1,332,162                                      | 78,769,000   | 11,784,980  |
| 2008 | 1,020,899                                      | 62,391,290   | 8,813,060   |
| 2007 | 851,335  | 52,598,250   | 7,249,400   |
| 2006 | 617,704  | 43,949,970   | 7,141,900   |

(Data from: Annual Report of Industrial Bank and Website of China Banking Regulatory Commission)

Table-3.2. Total Asset Ratios of Industrial Bank

| Year | Total Asset of Industrial Bank (Unit: Million) | Annual Growth Rate of Industrial Bank Total Assets (Unit: %) | Occupied Ratio of Banking Financial Institutions' Total Assets (Unit: %) | Occupied Ratio of Joint-equity Commercial Banks' Total Assets (Unit: %) |
|------|--|--|--|---|
| 2017 | 6,416,842                                      | 5.44   | 2.61   | 14.28   |
| 2016 | 6,085,895                                      | 14.85  | 2.62   | 14.00   |
| 2015 | 5,298,880                                      | 20.25  | 2.66   | 14.33   |
| 2014 | 4,406,399                                      | 19.79  | 2.56   | 14.03   |
| 2013 | 3,678,304                                      | 13.14  | 2.43   | 13.65   |
| 2012 | 3,250,975                                      | 34.96  | 2.43   | 13.82   |
| 2011 | 2,408,798                                      | 30.23  | 2.13   | 13.11   |
| 2010 | 1,849,673                                      | 38.85  | 1.96   | 12.45   |
| 2009 | 1,332,162                                      | 30.49  | 1.69   | 11.30   |
| 2008 | 1,020,899                                      | 19.92  | 1.64   | 11.58   |
| 2007 | 851,335  | 37.82  | 1.62   | 11.74   |
| 2006 | 617,704  | 30.02  | 1.41   | 8.65  |

(Data from: Annual Report of Industrial Bank and Website of China Banking Regulatory Commission)

According to relevant data in Annual Report of Industrial bank and 'total assets and total liabilities (quarter of year)' on the website of China Banking Regulatory Commission, I sorted table 3-1 and table 3-2. From table 3-1 we can find that from 2006 (the year to carry out low-carbon finance) to 2017, the total asset of Industrial bank kept a sustained growth trend. The average annual trends kept more than 30% in most of the years. Because of increasingly strict regulation from government, the decreasing of China's economy growth rate and the concentrated risk exposure of some over-capacity industries, the whole banking industry has experienced a slow-down from the year of 2016. Although the increase speed had a slip in the year of 2016 and 2017, the annual growth rate of Industrial bank total assets in other years stayed at a growth trend, which is much better than other banks. The increase trend shows that the overall competitiveness of Industrial bank is enhanced gradually. Market competitiveness reflects more about the capacity variance of market behaviors by market entity. Meanwhile, the ratios of total asset of Industrial bank occupying of banking financial institutions' total assets experienced a stable

increase from 1.41% in 2006 to 2.61% in 2017. The ratios increased by nearly 85.11% during the 12 years. Even among the joint-equity commercial banks which have a rapid development, the ratios of total asset of Industrial bank occupying ratio of joint-equity commercial banks' total assets had a fast rise from 8.65% in the year of 2006 to 14.28% in the year of 2017. The ratios increased by 65.09% during the 12 years after Industrial bank developing low-carbon finance.

Generally speaking, a commercial which agrees to adopt 'Equator principles' will have to give up some assets projects which violate the 'Equator principles' so that the total asset of that bank will decrease. However, according to the two figures we find, the total asset of Industrial bank was not decrease after bringing 'Equator principles' into force. On the contrary, it gained a faster increase speed. No matter from the aspect of absolute value or from relative competitive capacity, the market competitiveness of Industrial bank makes a great progress. The overall competitiveness is increasing year by year.

### 3.2.2. Reducing Operating Risk

Since Industrial Bank has carried out low-carbon financial business, the total asset of Industrial bank hadn't decrease. On the contrary, it had a faster growth than other commercial banks. However, as for this kind of scale expansion, whether it will increase its operating risk. Therefore, it is necessary for us to analyze the overall asset risk level of industrial bank. As for commercial bank, bank lending practices own the most of proportion in the composition of asset. The 'bad loan ratio' is a common index to evaluate the loan risk. So, I analyzed the variation of 'bad loan ratio' of Industrial bank to reflect its variation of operational risk. If the 'bad loan ratio' of a commercial bank has a growth trend, the asset quality tends to become worse. The operational risk will increase than before; or its asset quality gradually takes a turn for better. Meanwhile, the operational risk will decrease than before.

**Table-3.3. Annual Bad Loan Rate of Industrial Bank**

| Year                         | 2017  | 2016  | 2015  | 2014  | 2013  | 2012  | 2011  | 2010   | 2009   | 2008   | 2007   | 2006   |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| Bad Loan Ratio (Unit: %)     | 1.59  | 1.65  | 1.46  | 1.10  | 0.76  | 0.43  | 0.38  | 0.42   | 0.54   | 0.83   | 1.15   | 1.53   |
| Annual Growth Rate (Unit: %) | -3.64 | 13.01 | 32.73 | 44.73 | 76.70 | 13.16 | -9.52 | -22.22 | -34.94 | -27.83 | -24.84 | -34.33 |

(Data from: Annual Report of Industrial Bank)

According to relevant data in Annual Report of Industrial bank, I sorted table 3-3. From Table 3-3 we can find that for the first five years that Industrial bank carrying out low-carbon finance since 2006, the bad loan ratio experienced a nearly 30% degree of reduction per annual, and kept a rapid decrease trend before 2012. From the year of 2010 to the year of 2012, the bad loan ratio kept at a lower level around 0.4%. Because of the slow-down of economy's growth rate and the transformation of industrial structure from the year of 2013, the operational pressure of the mineral, steel industry and the private enterprises is becoming larger and larger, which results in the increase of the credit default rate of these enterprises. Although there were increase trends of bad loan ratio from the year of 2013 to the year of 2017, it is still acceptable compared with the whole banking industry's situation. These data reflected that after Industrial bank carried out low-carbon finance, the market share of it had a growth trend. Meanwhile, the asset quality had a gradually strength, so did its operating risk which also had a decrease trend.

### 3.2.3. Increasing Profitability

We found that carrying out low-carbon finance is beneficial to improve the market share of Industrial bank, so the competitiveness will increase accordingly. However, whether this expansion behavior will harm its profitability, I analyzed the index of net profit to evaluate the profitability and management performance of Industrial bank which is calculated by subtracting a company's total expenses from total revenue. Thus net profit shows what a bank has earned (or lost) in a given period of time (usually one year). Number of net profit, the greater, and then the

profitability of the bank is better. If the net profit amount is small or even negative, then the profitability of the bank is relatively low.

**Table-3.4. Annual Net Profit of Industrial Bank**

| Year                                | 2017   | 2016   | 2015   | 2014   | 2013   | 2012   | 2011   | 2010   | 2009   | 2008   | 2007   | 2006  |
|-------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| <b>Net Profit (Unit: Million)</b>   | 57,735 | 54,327 | 50,650 | 47,530 | 41,511 | 34,718 | 25,505 | 18,521 | 13,282 | 11,385 | 8,586  | 3,798 |
| <b>Annual Growth Rate (Unit: %)</b> | 6.27   | 7.26   | 6.56   | 14.50  | 19.57  | 36.12  | 37.71  | 39.44  | 16.66  | 32.60  | 126.07 | 54.08 |

(Data from: Annual Report of Industrial Bank)

According to relevant data in Annual Report of Industrial bank, I sorted table 3-4. From table 3-4 we can find that the net profit of Industrial bank showed a high speed increase trend. In 2006 the year of beginning to develop low-carbon finance, the growth rate of net profit increased 54%. In the second year (2007), the growth rate of net profit increased 126% based on the rapid growth of 2006. After the following five years, the growth rates of net profit kept over 30%. Although from the year of 2013 to the year of 2017, there were decrease trends of annual growth rate. However, it still kept leading position compared with other large banks in China. These data explained that when the market share of Industrial bank increases after developing low-carbon finance, the capacity of profitability is gradually increasing.

#### 3.2.4. Improving the Investment Willingness of Shareholders

We can use the indicator called 'net worth' to measure the willingness change of shareholders to invest a stock-listed commercial bank. The indicator of net worth is larger; the actual investment amount of shareholders is larger. That is to say, the shareholders are willing to increase their investment scale. Otherwise, the shareholders begin to reduce their investment scale.

**Table-3.5. Annual Net Worth of Industrial Bank**

| Year | Net Worth (Unit: Million ) | Annual Growth Rate (Unit: %) |
|------|----------------------------|------------------------------|
| 2017 | 526,117                    | 15.13                        |
| 2016 | 456,958                    | 19.15                        |
| 2015 | 383,504                    | 16.65                        |
| 2014 | 328,767                    | 31.41                        |
| 2013 | 250,183                    | 18.63                        |
| 2012 | 210,890                    | 41.81                        |
| 2011 | 148,715                    | 30.70                        |
| 2010 | 113,785                    | 47.75                        |
| 2009 | 77,013                     | 33.43                        |
| 2008 | 57,717                     | 20.60                        |
| 2007 | 47,859                     | 66.17                        |
| 2006 | 28,801                     | 43.45                        |

(Data from: Annual Report of Industrial Bank)

According to relevant data in Annual Report of Industrial bank, I sorted table 3-5. From table 3-5 we can find that the net worth of Industrial bank enjoyed a rapid growth. In the first year of carrying out low-carbon finance (2006), the annual growth rate reached to 43.45% than the year of 2005. For the second year (2007), the annual growth rate rocketed to 66.17%. After the following five years, the annual growth rate still kept on over 30% per year. However, there was a decline in the year of 2013 and 2015 which are 18.63% and 16.65%. After this year, the annual growth rate of net worth rose again which was reach to 19.15%. All these data reflected that after Industrial bank developing low-carbon finance, the bank owned more supports from shareholders. And the shareholders were willing to invest more money to Industrial bank. The increase of net worth amount can help Industrial bank to

resist market risk to ensure the safety of clients' assets. This is also the important guarantee for Industrial bank to expand market share in a short period.

#### **4. REASON ANALYSIS OF POSITIVE EFFECTS FOR INDUSTRIAL BANK**

By comparing the change of total assets, bad loan rate, net profit and net worth of Industrial bank after carrying out low-carbon finance, it is concluded that improving market competitiveness, reducing operating risk, increasing profitability, and improving the investment willingness of shareholders are all positive effects. So I consider that developing low-carbon finance bring positive effects to Industrial bank. The main causes of these positive effects are as following:

##### **4.1. Announcement Effects**

Market reputation creates announcement effects and promotes the development of Industrial bank. Industrial bank took the lead in developing low-carbon finance business, and gained a lot of national and international awards, so it obtained a high market reputation which benefits to gain more assets share than other commercial banks. Other financial institutions still did not know the profits and risks of low-carbon finance, so they didn't implement and only released various regulations and policies in accordance with government requirements. However, these financial institutions which did not know low-carbon finance business were not willing to provide financing products and services for clients who conformed to 'Equator principles'. So these eligible low-carbon financing demanders generally raised financing apply to Industrial bank on their own accord, which led to the rapid increase of asset scale of Industrial bank.

With the promoting of 'One Belt and One Road' policy, Chinese government will give more support to low-carbon finance and sustainable economy. The low-carbon finance market in China will expand year by year. If Industrial bank can take the lead of low-carbon finance business in whole market, with the development of low-carbon economy and sustainable economy, it will constantly grow in a higher speed and finally enhance market competitiveness.

##### **4.2. Risk Management**

Industrial Bank enhanced its risk management and decreased the risk level. Generally speaking, the enterprises devoting to low-carbon field all own preferable sense of social responsibility, and have less subjective malicious breach of contract. So long as Industrial bank offers loans after overall evaluating clients' repaying capability, the risks of breach of contract by borrower are generally lower than other borrowers. Moreover, in recent years Chinese government greatly encourages and supports the development of low-carbon economy and sustainable economy. In accordance with 'Equator principles', Industrial bank offers loans basically has no serious policy risk. Low-carbon enterprises will not have ability to repay the loans and form bad loans because of the change of national macro-economy policies.

When carrying out low-carbon finance by Industrial bank, it introduced strategic patterns and finally went public. During this procedure, the inter-control system was completed and the inter management risk were decreased.

##### **4.3. Low Risk Market Expansion**

Industrial bank expanded market in low risk and increase the profitability of its own. Since the year of 2006 after developing low-carbon finance, the 'total profit' showed a fast growth trend. Because of scale expansion of total asset and boosting of internal business management, operation effectiveness of Industrial bank has continual improvement. Combining the data in the table 4-1, we can find that total profit had an increase trend from the year of 2006 to the year of 2017. Particularly in the year of 2007, the annual growth rate of total profit was apparently

higher than the annual growth rate of total asset, which reached to 116.21%. For the other 12 years, the total profit and total asset did not have large differences. The annual growth of total profit was closed to the annual growth rate of total asset. We can judge that the rapid growth trend of net profit of Industrial bank largely depended on the scale expansion of total asset.

**Table-4.1. Annual Growth Rate of Total Profit and Total Asset of Industrial Bank**

| Year | Total Profit (Unit: Million) | Annual Growth Rate of Total Profit (Unit: %) | Total Asset (Unit: Million) | Annual Growth Rate of Total Asset (Unit: %) |
|------|------------------------------|--|-----------------------------|---|
| 2017 | 65,046                       | 1.75   | 6,419,189                   | 5.48  |
| 2016 | 63,925                       | 1.08   | 6,085,895                   | 14.85                                       |
| 2015 | 63,244                       | 4.37   | 5,298,880                   | 20.25                                       |
| 2014 | 60,598                       | 11.68  | 4,406,399                   | 19.79                                       |
| 2013 | 54,261                       | 17.47  | 3,678,304                   | 13.14                                       |
| 2012 | 46,193                       | 37.22  | 3,250,975                   | 34.96                                       |
| 2011 | 33,664                       | 40.24  | 2,408,798                   | 30.23                                       |
| 2010 | 24,005                       | 39.33  | 1,849,673                   | 38.85                                       |
| 2009 | 17,229                       | 22.74  | 1,332,162                   | 30.49                                       |
| 2008 | 14,037                       | 28.66  | 1,020,899                   | 19.92                                       |
| 2007 | 10,910                       | 116.21                                       | 851,335                     | 37.82                                       |
| 2006 | 5,046                        | 42.34  | 617,704                     | 30.02                                       |

(Data from: Annual Report of Industrial Bank)

From the annual report of Industrial bank, I found that return on assets (ROA)<sup>5</sup> of Industrial bank in 2006 had only 0.7% (See table 4-2). However, from the year of 2007 to 2015, return on assets of Industrial bank raised to 1.17% and after that the figure of return on assets kept near 1.20%. Compared with banking industry, there were seven years that the figure of return on assets of Industrial bank exceeded the figure of banking industry. Also, we can find that return on equity of Industrial bank experienced a growth trend from the year of 2006 to the year of 2014. Meanwhile, Industrial bank was listed in 2007 which enhanced its internal business management and largely decreased the bad loan ratio. Finally, the profitability of Industrial bank had a substantially increase.

**Table 4.2. Returns on Equity and Returns on Assets of Industrial Bank and Banking Industry**

| Year | Return on Equity of Industrial Bank (Unit: %) | Return on Equity of Banking Industry (Unit: %) | Return on Assets of Industrial Bank (Unit: %) | Return on Assets of Banking Industry (Unit: %) |
|------|---|--|---|--|
| 2017 | 15.35   | 11.91  | 0.92  | 0.91   |
| 2016 | 17.28   | 13.40  | 0.95  | 1.00   |
| 2015 | 18.89   | 15.00  | 1.04  | 1.10   |
| 2014 | 21.21   | 17.59  | 1.18  | 1.23   |
| 2013 | 22.39   | 19.17  | 1.20  | 1.27   |
| 2012 | 24.36   | ————   | 1.23  | 1.22   |
| 2011 | 24.60   | 17.05  | 1.20  | 1.20   |
| 2010 | 24.44   | 17.16  | 1.16  | 1.03   |
| 2009 | 24.46   | 16.30  | 1.13  | 0.95   |
| 2008 | 25.90   | 17.63  | 1.22  | 1.01   |
| 2007 | 31.17   | 19.23  | 1.17  | 0.93   |
| 2006 | 26.21   | ————   | 0.70  | ————   |

(Data from: Annual Report of Industrial Bank and Website of China Banking Regulatory Commission)

<sup>5</sup> Return on Assets (ROA) shows the percentage of how profitable a company's assets are in generating revenue.

#### 4.4. Improvement of Operation Effectiveness

We know that when investors consider whether to invest one industry, they mainly pay attention of two indicators—risk and profit. They are more willing to add investment to Industrial bank because they find the two indicators have a good trend. From table 3-3 we found, since 2006, the bad loan rate of Industrial bank had a decrease trend and kept at a low rate in recent years. This phenomenon reflected that the investment risk of Industrial bank had a fall trend. At the same time, when I read the annual report of Industrial bank, return on equity of Industrial bank was 19.28% which is the peak from the history data. However, after Industrial bank carrying out low-carbon finance, the annual return on equity kept stable around 25%. In 2007, it even reached to 31.17%. Therefore, we found that since Industrial bank developing low-carbon financial business, the investment risk has been lower than before. The return on investment has been larger than before. So the net worth has a rapid growth trend.

#### 5. CONCLUSION

In conclusion, first of all, adopting the 'Equator Principles' does not shrink the asset scale of Industrial Bank. On the contrary, the asset scale has gained a faster growth speed so that it can obtain more market share and enhance its market competitiveness. Secondly, after developing low-carbon finance, Industrial Bank has more chances to offer loans to enterprises doing low-carbon business. Although the scales of these enterprises are relatively small, this kind of loans will not increase its bad loan risk after an overall analysis. On the contrary, based on enhancing internal management, Industrial Bank has decreased its bad loan rate after 2006, a reduction of risk level. Thirdly, during developing low-carbon finance, Industrial Bank realizes an expansion of asset scale which reduces the risk level at the same time. So the profitability had a rapid increase. Finally, because of enhancing the profitability and reducing the risk level, Industrial Bank gains more support from investors.

As the typical example in China which strives to develop low-carbon finance, Industrial Bank improves its market competitiveness, decreases its operational risk, enhances profitability and gains supports from investors in the recent ten years. With the raising of awareness level of low-carbon economy and low-carbon finance in China, low-carbon economy and low-carbon finance will gain a rapid development in China. And this increasing trend will last for a long time. Under the fast growth environment of low-carbon finance, only striving to develop low-carbon finance can one commercial bank keep expanding its market share and boosting its competitiveness. Therefore, if a commercial bank can both do internal management well and strongly develop low-carbon finance under the circumstances, it will improve its market competitiveness, decrease its operational risk, enhance its profitability and gain supports from investors. Ultimately, it will gain a better development potential.

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