ESG Green Rating and Green Index

ICBC Green Finance Research Group

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TRUCOST
S&P Dow Jones Indices
ESG Analysis

Abstract

As the world faces increasingly acute challenges in pursuing sustainable development, enterprises, investors and financial institutions across the globe are looking to identify, assess, manage and mitigate environmental and social risks while conducting environmentally and socially responsible economic activities. Based on the experiences of international rating agencies and China's experience in running green credit and risk management endeavors, we established an environmental, social and governance (ESG)-based green ratings system based on China's national conditions and domestic enterprises. This is the first ESG-based ratings of its kind aimed at China's commercial banks. ICBC's ESG-based ratings utilizes internal customer data and authoritative third party data. After conducting a trial run with the 180 enterprises listed on the Shanghai Stock Exchange, we created a green development index and green investment index, both of which can be used by commercial banks to identify risks and encourage sustainable investment.

Key words

Environmental Factors, Risk Quantification, ESG Rating, Commercial Banks

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The group is grateful to Liu Shuang, program director of low carbon economic growth at Energy Foundation for great contribution to the English version.

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1 Introduction

Modern production and technological progress in the 21st century has awarded humanity with great benefits but they have also consumed huge amounts of energy and resources, and caused ecological/environmental threats and social problems. Today, many people are now concerned with how we can achieve sustainable development. Businesses, investors and financial institutions across the globe are looking to identify, assess, manage and mitigate environmental and social risks while conducting environmentally and socially responsible economic activities. In 1992, the United Nations Environment Program Finance Initiative (UNEP FI) said financial institutions should include Environmental, Social and Governance ("ESG") factors into decision-making processes. Since then ESG has gradually become a key measure for the international community to evaluate the capacity of economic entities to reach sustainable development. Rating agencies worldwide have also started using ESG to assess company performance and guide sustainable investment.

After more than 30 years of rapid economic development, China is now facing serious resource depletion rates, acute environmental problems and deteriorated living conditions that threaten health and safety. With the traditional growth model now unsustainable, it is imperative that China upgrade its socio-economic growth model. "Greenization" is now the fifth objective in its economic restructuring, after the "four modernizations". In August 2016, seven ministries and commissions jointly issued Guiding Opinions on Building a Green Financial System and said the construction of a green financial system was an integral part of China's strategy. Increasingly more investors now realize that in addition to the traditional ways of evaluating enterprises by their financial returns, environmental, social and corporate governance and other non-financial factors are now commonly being included in decisions involving investment and assessment as part of a move to practice more responsible investment and to guide and encourage enterprises to reach sustainable development.

As ESG-based investments become more popular, financial institutions are becoming increasingly interested in ESG-based rated products. In the international arena, financial institutions have largely been relying on third party rating agencies for ESG assessments; very few financial institutions conduct their own ESG ratings. With such a huge difference in economic development between China and developed countries, Chinese companies tend to perform poorly in areas of ESG information disclosure. This means it is difficult to directly use current ESG-based ratings systems in the China context. Therefore, Chinese financial institutions must explore ways to set up their own ESG-based ratings systems that would work in China to encourage the transformation to a green economy while reducing environmental and social risks.

ICBC, which is dedicated to building a world-class green financial institution, has been conducting research on green finance. In order to better identify ESG-related risks, ICBC's green finance task force initiated the "ESG Green Ratings and Green Index" project at the end of 2015. This came as the bank was working on pioneering research to quantify environmental risk in a study called: "Credit Risk Stress Testing on the Impact of Stricter Environmental Protection Requirements on the Steel Industry for Commercial Banks". For this study we cooperated with the China Index Academy and Trucost, part of S&P DJI, a leading index institute and environmental data provider, to guarantee the quality and credibility of the ESG-based ratings system. The system will not only help banks identify promising corporate customers with strong sustainable development capability and reduce environmental and social risks, but it will also play an essential role in guiding green investment, improving green financial systems and supporting green and sustainable development.

ICBC'S ESG green ratings system has the following innovative characteristics:
First, the ESG framework was based on the experiences of international rating agencies and the practice of green credit and risk management in China. This ensures the ratings system is reliable and targeted. It covers three levels; the first is based on the concept framework used worldwide, that is, Environmental (E), Social (S) and Governance (G) factors. The second and the third levels have 17 dimensions and 32 key indicators related to green credit and risk identification.

Second, data sources were both diverse and reliable, improving the rating system's accuracy and effectiveness. We used ICBC customer data, environmental data provided by Trucost, and data publicly disclosed from customers. This solved the problem of enterprises' insufficient disclosure of ESG information.

Third, the framework weighted environmental factors heavily in the assessment. Because China is faced with severe environmental protection challenges, we weighted more heavily pollution emissions, disclosure of environmental protection information, fines for environmental protection violations and accidents making the rating more sensitive to environmental performance.

Fourth, the index operation management system and the data source system were developed at the same time. ICBC developed an "Index Management System" and an "Industry-specific Credit Risk Management System" to collect key operational data from major industries, including environmental and energy efficiency data. This was used to generate an ESG-based rating for all customers, which will improve the accuracy and availability of environmental data.

Fifth, banks can use ratings to identify promising customers and guide sustainable investment. As a complement to traditional credit ratings, ESG-based ratings are an important tool for banks to help reduce environmental and social risks, and support the "greenization" of the balance sheet. The task force also created a green investment index and green development index based on the ESG-based ratings. The green investment index supports green investment by helping to locate opportunities that show good sustainable development capability. The green development index can provide reference for regulators to determine changes in the sustainable development practices of a particular industry and to help with industry-specific policy making.

This report aims to provide a comprehensive introduction to ICBC's ESG framework. It explains the indicators used and ratings methodology in our ESG-based ratings system. After calculating the ESG ratings of companies listed on the 180 stock index on the Shanghai Stock Exchange, we also discuss the prospects for developing capital market tools, like a green index. This remainder of this report is organized as follows: Section II covers the theoretical basis and international experiences in making ESG-based ratings; Section III introduces the guidelines and methodology used in ICBC's ESG-based ratings system; Section IV analyzes the results for sampled enterprises on the Shanghai Stock Exchange 180 Index; while Section Vincludes both a conclusion and policy suggestions.

2 The Necessity for, and Current Status of, ESG-based Ratings

i. Theoretical Background

As the environment begins to play a bigger role in the operations and management of firms, investors are now paying more attention to environmental performance and how it affects the financial performance of enterprises. Research indicates that this also impacts social performance and corporate governance. We have divided literature on this area into three main streams:

Sustainable development theory argues that sustainable development should meet the needs of the present generation without compromising benefits for future generations. Social sustainability relies on economic sustainability and companies are the micro units of economic development, so we can only reach sustainable development in terms of the environment and society as a whole if we can balance immediate with future benefits.

Stakeholder theory argues that the operation and management of companies are affected not only by shareholders and creditors but also their employees, upstream and downstream customers and the natural environment. Environmental pollution, a lack of social corporate responsibility, and unsound governance compromises the interests of employees, local communities and society at large, and will eventually affect company performance and depress their valuation.

The theory of enterprise competitiveness argues that a firm's competitiveness is not only a function of profits but also its governance structure and its ability to respond to risks, including environmental risk and its corporate social responsibility record.

Research indicates that a company's performance is not only about reaching profit objectives and raising shareholder value; more importantly, it now also depends on whether it is having a negative impact on society or the environment. The traditional way of assessing company performance focused mainly on financial factors; it paid little or no attention to environmental, social and corporate governance factors so it could not accurately assess sustainable development capability. That is why ESG-based ratings are now being used to assess environmental, social and corporate governance performance.

ii. Practical Demands for ESG-based Ratings

ESG-based ratings are a practical way to support investment decisions. Recent research has shown that investment returns improve when ESG factors are considered. For example, the United Nations Environment Program Financial Initiative (UNEP FI) found that ESG-based ratings had a positive impact on investment performance in a 2007 study. Morgan Stanley Huaxin Fund Management Company Limited also demonstrated an obvious positive impact from ESG-based ratings on investment strategy in emerging markets. MSCI also built two ESG investment strategies whose returns were much higher compared with the MSCI All Country World Index over a period of eight years. The global ESG investment fund accumulated assets of about USD23 trillion in 2016, about 26.3% of total assets under management with a compound annual growth rate of 15%. ESG investment has transformed from a marginal investment strategy into a mainstream one. So research in this area is extremely important in the design of future investment strategies.

ESG-based ratings are also effective in dealing with increasingly stringent information disclosure requirements. As early as the 1990s, international organizations began to appeal to enterprises and financial institutions to incorporate environmental, social and governance factors (ESG) into decision-making and to publicly disclose relevant information to support establishing green financial markets characterized by information transparency, openness and fairness. As green and sustainable development spread around the world, ESG information disclosure requirements are becoming increasingly rigorous. Some countries and regions have now introduced a mandatory information disclosure policy. For example, the European Union revised its auditing regulations in December 2001 to rule that public enterprises with more than 500 employees should disclose ESG information in audits. In December 2015, the HKEX officially released the Environmental, Social and Governance Reporting Guide (Revised Edition) that elevated ESG disclosure requirements to the half-mandatory level of “comply or explain”. China is now studying ways to support the mandatory disclosure of ESG-related information from listed companies. ESG information disclosure requirements are expected to become more stringent going forward. So companies and financial institutions must prepare themselves in advance and establish an effective ESG evaluation system as soon as possible. Commercial banks, in addition to preparing for their own ESG information disclosure preparation, should also be able to evaluate the ESG performance of their customers and create an index to describe their client list’s sustainable development performance. This would alleviate the problem of insufficient disclosure of company ESG data.

iii. Global Development of ESG-based Ratings

As green investment grows more popular, increasingly more institutions are developing their own ratings products based on ESG information. The most influential among them are from MSCI, Bloomberg, Italy's ECPI and Standard & Poor's. MSCI publishes more than 100 ESG-based indices annually covering more than 5,500 listed companies around the world; Stoxx, an ESG research and service provider is working with Sustainalytics to develop a series of indices based on ESG ratings. In addition to ESG ratings for enterprises, these institutions have also developed ratings products for countries and industries, providing a foundation for the assessment of regional and industrial sustainability.

However, ESG ratings, as a global phenomenon, is still at a primary stage. There are differences between green ratings-based indexes because of varying definitions of sustainability. The quality of ESG-based ratings is subject to enterprise information disclosure. And, different institutions use their own ways to calculate ESG-based ratings and that makes them difficult to compare.

3 ICBC's ESG-based Ratings System

i. General Idea

ICBC's ESG-based ratings system is divided into two parts: an ESG rating specific to enterprises and an index based on the ESG rating. The ESG rating is subdivided into an index and methodology. Its main purpose is to help evaluate companies' sustainable development capabilities and underpin the green transformation of credit and loans.

ii. Principles behind the Indicators

It should be noted that, even in developed countries, the definition of a firm's sustainable development capability is still evolving. So we believe that ESG assessment in China should be in line with the country's development stage, the particular company, and society's awareness of sustainable development.

Using internationally-accepted procedures, ICBC's ESG-based ratings is divided into three levels. The first are the three dimensions of sustainability -- that is, environmental performance (E), social responsibility (S) and corporate governance (G) factors. The second are the corresponding specific aspects of each dimension, while the third level comprises key performance indicators from various databases. The main differences between this and other institutions' ESG-based ratings are in the definitions used at the second level and the selection of key performance indicators at the third level.

1. Environment

In recent years, environmental risk has become an important dimension in risk management. According to research in China and overseas, environmental risk can affect company operations in three ways: first, more restrictive standards of environmental protection and policy tightening will dent cash flow, assets and liabilities[1] ; second, because investors may also come under fire for lending to a polluting enterprise, for example, financial institutions and investors may enact higher costs on environmentally-sensitive industries and enterprises; third, companies may see their reputation eroded if they cause environmental damage or are seen

1.Since the implementation of the new environmental law in 2015, legislation and judicial practice have all improved the environmental protection requirements for enterprises. Penalties due to the violation of the environmental law has become a major issue for enterprises to be reckoned with.

as having poor environmental governance.

Thus, the main considerations under the environmental dimension include: classifying the environmentally-friendliness of a firm and the emission intensity of different pollutants emitted during the production process. Any assessment should consider the atmosphere, soil and water resources. It should also include indirect pollution emissions upstream and downstream in the supply chain. Environment should also include environmental penalties imposed by governments and environmental accidents that could harm a company's reputation and environmental policy and information disclosure, both of which demonstrate environmental risk management capability.

2. Social Responsibility

Corporate social responsibility refers to responsibilities enterprises should bear because of the impact of their operations on society and in terms of their legal responsibility to shareholders. This includes both the rights and interests of their employees, but also work they do outside the company, for example with charities and local communities.

In China, protection of employees' rights and interests is the main factor at this stage. However, in the future, as more and more companies contribute to public goods, corporate social responsibility will also be a major factor. Awareness of corporate social responsibility in society and among investors is also a key factor affecting company reputation that should be assessed. ICBC's ESG-based rating has six aspects of corporate social responsibility: labor protections, labor unions and training, public welfare, emergencies and social information disclosure.

3. Corporate Governance

Corporate governance refers to a set of institutional arrangements to supervise and control a company's operations, management and performance. In the context of a modern corporation, governance structure is the most important factor in long-term profitability. Corporate governance determines whether managers are behaving in the company's interests and is the institutional guarantee for sound operation.

Keeping the situation for China's listed companies in mind, the following aspects emerge as important: first, a comprehensive assessment of the financial situation and capital management should be conducted; this is called "the operating footprint" and it should be used to judge operating capacity; second, compliance and ethical issues should be included to help evaluate potential operational risks; third, as we did in the other two dimensions, the quality of disclosed information should also be included (this is a measure of the degree of transparency in the governance system); fourth, the market awareness of companies' governance capacity is another factor. This gives us seven aspects under the governance dimension: comprehensive assessment of corporate governance, corporate operating footprint, anti-corruption, tax transparency, business ethics, compliance and corporate governance information disclosure.

4. Selection of Key Performance Indicators

The third level of the ESG-based ratings system is composed of key performance indicators (KPIs) that represent each aspect at the second level. The task force proposes that the following principles should be considered in the selection process.

First, the degree of quantization of KPIs should be a primary consideration. To improve the ESG-based rating, priority should be given to indicators with higher degree of quantization. China has released a number of financial products in green finance that look at company performance on social responsibility and governance factors. However, the credibility of these has been undermined because of a lack of qualitative indicators. ICBC's ESG-based ratings has made a breakthrough in data sourcing. By collaborating with the China Index Academy and Trucost, and S&P DJI, the task force had access to a number of useful quantitative indicators on environmental pollution and emissions and social responsibility, significantly improving the accuracy of the rating.

Second, the availability and reliability of data should be given priority. The accuracy of the ratings system is closely tied with whether the KPIs used reflect reality. ICBC has built a comprehensive internal data system, with strict rules and regulations on the reporting and collection of data. The task force has fully utilized this data to supplement publicly-available data.

Third, attention should also be paid to data update frequency. To make the ESG-based ratings more effective, indicators should be updated frequently. Although financial statements and social responsibility reports are important sources, they are usually only published quarterly or every half year, meaning they do not reflect real-time changes in company ESG performance. ICBC's database is updated in real-time, offering timely and accurate ESG data.

Using these principles, the task force conducted three rounds of KPI selection. In the first round, we explored 308 related indicators (112 from the ICBC database, 130 from the public database and 66 from third-party data companies); in the second round, we analyzed and classified the indicators to determine the secondary dimensions; in the third round, we further refined indicators based on their quality, effectiveness and quantification, before drawing up the final index.

iii. Rating Methodology

It is important to make the ESG-based ratings accessible and to that endeavor we created an ESG score to represent overall ESG performance. The ESG score is a number that represents the key information of the KPIs in the different dimensions. Drawing on international experience, the task force utilized used a scorecard to calculate ESG score. For comparison purposes, the weights of KPIs were normalized so that the final ESG score and scores under the three dimensions were real numbers in the [0,1] interval. To reflect the rating's effectiveness, the task force gave greater weight to quantitative indicators and emergencies. The final ESG score is then comparable across different industries.

iv. Indexes Based on ESG Ratings

The task force also developed a green investment index and a green development index based on ESG scores. The green investment index is a passive index investment product based on the ESG rating of a listed company. Adjusting investment amounts in different stock samples was made according to ESG scores to guide investors to boost green investment and explore the earnings of green sustainable development[2] ; The purpose of the green development index is to reflect how rated companies are performing in sustainable development in a given period. Based on the ESG ratings, all ESG scores can be weighted and summarized by reference to the capital scale or operating performance of the rated enterprises.

v. Summary

As the first ESG-based ratings by a Chinese commercial bank, ICBC's ESG-based ratings has made breakthroughs in a number of areas. First, in terms of the principles we used in making the ESG-based ratings; second, in terms of progress made in data mining. KPIs were culled from public data, third-party institutional data and ICBC's own internal data. And third, we also made progress in terms of methodology; expert reviews and model predictions will be necessary additions.

As China continues to make progress in the field of sustainable development, ICBC's data system, the dimensions of the second level of the ESG ratings and the KPIs of the third level will continue to expand and grow richer. Although this ESG ratings may undergo changes in the future, we believe that the principles highlighted in this report are important for the future development of ESG ratings.

2. The approach is to first follow the principle of industry neutrality, i.e., to take the ESG score as the basis for weighting the stock price within the industry while keeping the inter-industry weight of the generating indices unchanged. The advantage is that green development is brought into the new index while remaining consistent with the practice of generating indices for reducing risk in investment portfolios. The SSE 180 Carbon Efficient Index follows this approach. Second, use the company ESG score as the basis for the new weighted stock index. This has the advantage of meeting the needs of institutions and investors involved in green investment.

4 Applying the ESG-based Ratings: An Analysis of SSE 180 Enterprises

The task force rated companies listed on the Shanghai Constituent Index (hereinafter referred to as the "SSE 180 Index"). These companies included those in all sectors under national economic industries [3], and so their information disclosure is relatively sound, making the ratings reasonably effective.

By June 1, 2017, the highest weighted industries in the SSE 180 Index were financial and insurance industries (45.13%) and manufacturing (23.84%), followed by construction, real estate and extractive industries (see Figure 4.1)

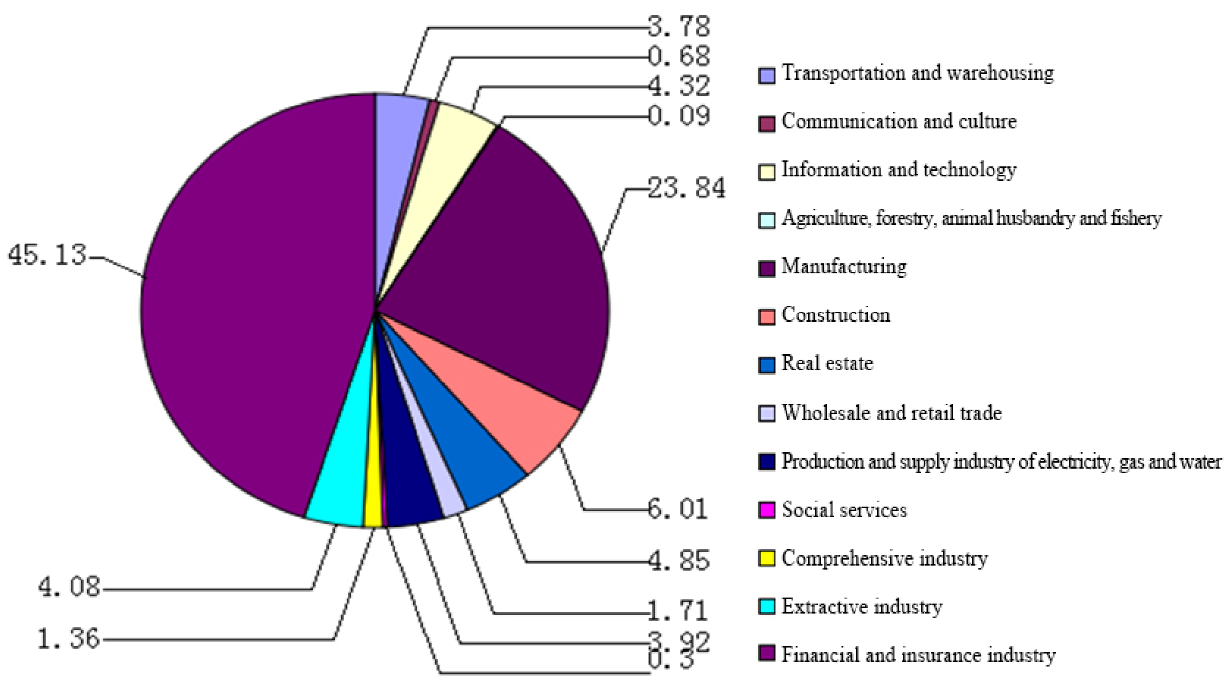


Figure 4.1 Sectoral Weights of the Constituents of the SSE 180 Index

3. As of June 1, 2017, the SSE 180 Index has covered 54 enterprises in the manufacturing, 35 in the finance and insurance, 22 in the real estate, 14 in information and technology, 10 in transportation and warehousing, nine in the extractive industry, seven in wholesale and retail trade industry, seven in electric power, gas and water production and supply, three in communication and culture, one in agriculture, forestry, animal husbandry and fishing, and six in the comprehensive industry.

i. Analysis

The task force conducted four trial ratings from June 15, 2015 to June 9, 2017. During this period, the sample stocks on the SSE 180 Index were adjusted three times [4]. ESG scores were re-calculated after each adjustment and thus four rounds of ratings were made[5] . The following analysis is based on the final round.

1. Results

First, companies scored better on average on environmental and governance indicators than on social responsibility. The mean environmental (E) score of the 180 enterprises was 0.574, social responsibility (S), 0.235 and corporate governance (G), 0.588. Companies scored highest on corporate governance, largely related to the fact that listed companies scored well in this area on information disclosure. Social responsibility scores were generally lower because corporate social responsibility information disclosure is non-mandatory. Coverage and quantization of all indicators should be improved in public data. Most companies only provide the names of social welfare projects but do not supply statistics or adequate follow up reports.

Second, enterprises varied greatly in ESG performance, mostly related to the quality of information disclosure and environmental performance. The variance in corporate governance scores for the 180 companies was 0.165, environment, 0.159 and social responsibility, 0.09. Although most of the 180 companies had published corporate social responsibility reports, the quality of information disclosure within them differed widely. There are also big gaps in terms of information available on worker protections and community spending.

Social responsibility variance was low because of the lack of company information disclosure on corporate social responsibility, this factor showed a "convergence" to a common low value.

Third, although there was a positive correlation between ICBC's ESG-based rating scores and ESG-based rating scores by other institutions [6], certain differences remained. Variance analysis showed that data provided by ICBC and third-party institutions contributed more than 50% to the final ESG score. We know our own data source is of a high quality and so we are more confident of our ratings results.

2. ESG Performance by Industry

In general, the electricity and public utilities

4. The change in each sample stock could not exceed 10%

5. According to regulations, re-adjustment takes place at the next trading day after the close of trade on the second Friday of June and December of each year. June 15, 2015 corresponded to the first trading day after the adjustment made in June, and June 9, 2017 corresponded to the last trading day before the re-adjustment.

6. When we used ESG-based ratings models on the Bloomberg data platform the correlation coefficient was 0.19.

7. Electricity and utilities in this report include electricity, heat, gas and hydropower.

industries [7], the extractive industry and manufacturing tend to have lowest average ESG scores while finance, real estate and services had the best.

For companies in the financial and insurance industry, the ESG score varied between 0.49 to 0.72. The mean ESG score was 0.564, the highest of all sectors. Financial firms perform well in environmental (E) and governance (G) dimensions, and topped all other industries, showing that listed financial companies have built a sound corporate governance structure following shareholding system reform and years of standardized management. In addition, listed financial companies tend to cause less environmental pollution in their daily operations and interaction with upstream and downstream enterprises in the supply chain.

The mean ESG score for the real estate industry was 0.51. The scores ranged from 0.39 to 0.62, the variance was minimal. On average, real estate companies performed well in environmental protection and pollution control and thus their overall performance in the environment dimension (E) ranked second of all industries. However, governance (G) and social responsibility (S) scores were low, indicating that they need to improve in terms of standardized operations and related risk management.

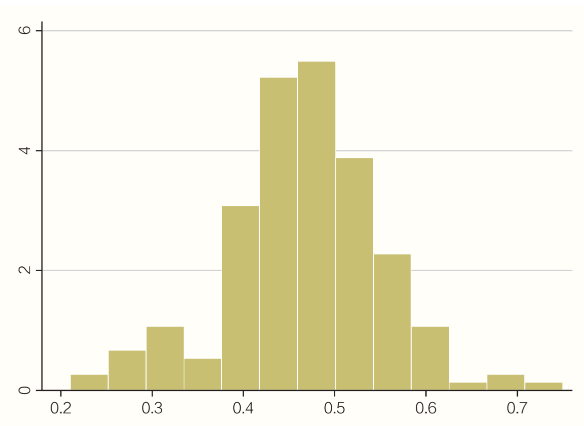
The mean ESG score for the manufacturing industry was 0.455 and the variance, 0.10. Scores ranged between 0.2 and 0.67. Overall environmental performance was better than that of the extractive and energy supply industries, but they scored lower in corporate governance and social responsibility. The task force also analyzed the many sub-sectors under manufacturing. The brown metal smelting and processing industry as well as the chemical manufacturing industry had the lowest ESG scores, while automobile manufacturing and electrical machinery and equipment manufacturing scored the highest.

The extractive industry recorded a mean ESG score of 0.405, with a variance of 0.122. Scores ranged from 0.257 to 0.59. The average environmental performance was the second worst of all six industries, only ahead of the electric energy supply industry. However, governance and social responsibility scores were relatively high because many of them are state-owned enterprises with advanced levels of financial management. Also, because they are in an environmentally-sensitive sector, companies in the extractive industry are more inclined to disclose information on social responsibility than the environment.

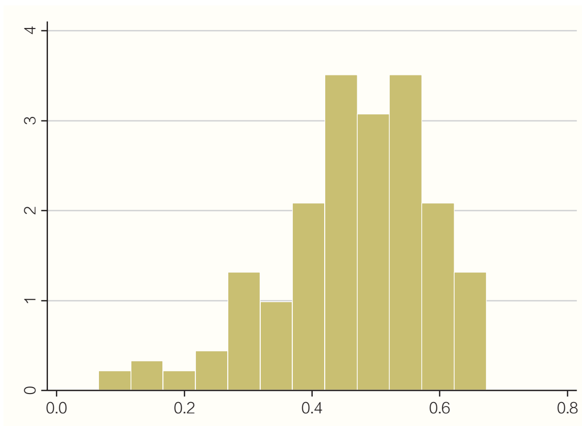
The electricity and utilities industry recorded the lowest mean ESG score at 0.31. Even when we remove emissions from the upstream energy industry, its environmental protection and pollution control performance was still poor (the average score in the environmental dimension (E) was 0.22, the lowest of all industries). Social responsibility (S) and corporate governance (G) scored high, a sign of the outstanding performance of listed companies in the power industry in terms of corporate standardized operations, workers protections, and training, etc.

ii. Stability of ESG-based Ratings

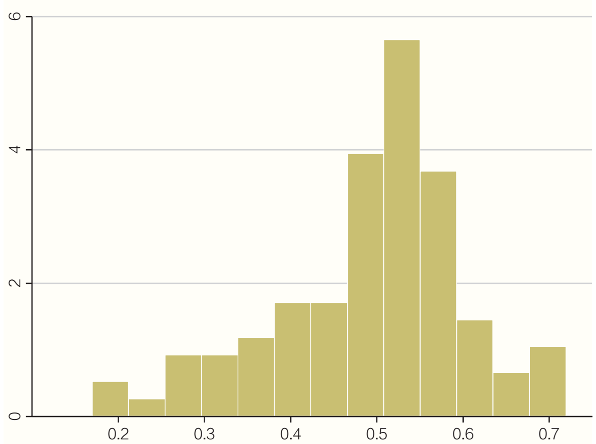
Whether a ratings is accepted by the market or not, not only depends on its accuracy, but also on its stability over time. Figure 4.2 shows the four rounds of ESG ratings on 180 listed companies. Although the mean and variance change over time, ESG scores exhibited a normal distribution and no company moved its position more than 10 points in any adjacent round.



June 15, 2015



December 14, 2015



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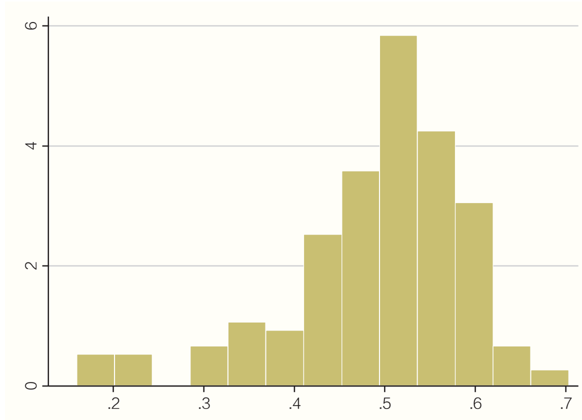

December 12, 2016

Figure 4.2 Histogram of the previous ESG score

iii. ESG Index

Using our ESG ratings, we also generated a green investment index and a green development index for the 180 enterprises.

The dotted line in Figure 4.3 shows the new index obtained by summing up daily stock prices for the SSE 180, weighted by ESG score. For comparison purposes, June 15, 2015 is used as the base (100) and we compared it with the SSE 180 Index (solid line). Over the two-year period, the new index performed better than the SSE 180 Index and showed less volatility, showing that, to an extent, ESG ratings show great potential in helping to develop financial products.

The green development index is shown in Figure 4.4. It was calculated by summing ESG scores of companies according to their weight in the SSE 180 Index. For the sake of comparison, we took June 2015 as the base month (100), and reported the results of four rounds of ratings[8] . In the two-year period, the index followed an upward trend, in line with the development of green finance in China. The rise may also be related to a scale-up of ESG information disclosure requirements and social concerns as well as increasing concerns for managing ESG risks in the listed companies.

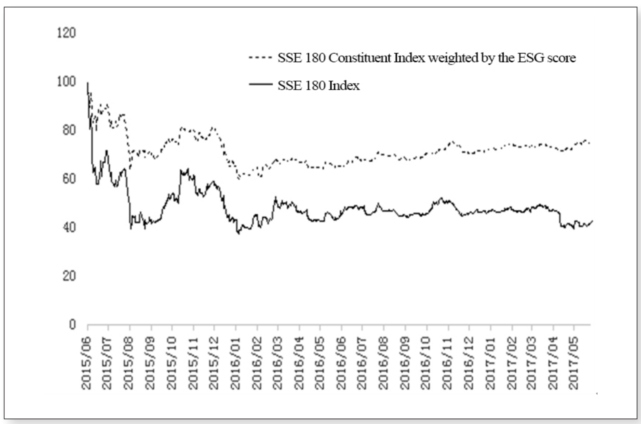

Figure 4.3 180-ESG Investment Index

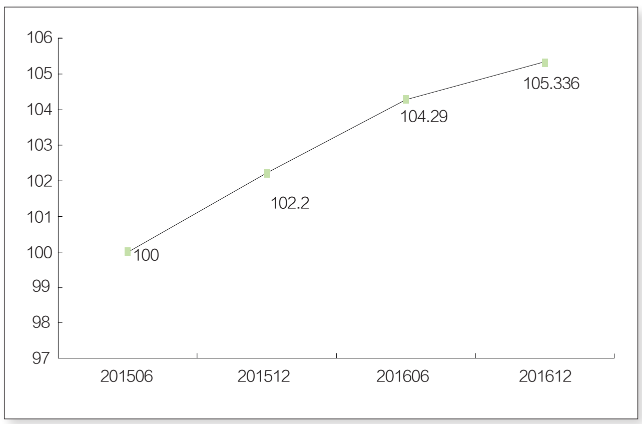

Figure 4.4 Changes in the ESG Development Index

8. The aggregated weight is that of each stock in the SSE 180 Index.

5 Conclusions and Policy Recommendations

This first study of a bank-oriented ESG-based green ratings now offers a discussion of the results and some policy recommendations.

i. Major Conclusions

Overall, the ESG performance of the 180 enterprises was characterized as "good but with significant variations". First, ICBC' ESG-based green ratings enjoyed better data quality and a different methodology, making it stand out amongst the other ESG ratings on the market. Second, the ESG scores were highly consistent with conclusions from sustainable development research, evidence of its accuracy. Third, of the three dimensions, environment was the most important; governance scores were generally high, indicating that listed companies are doing well in terms of governance structures, compliance operations and business information disclosure; social responsibility scores were relatively low, showing that this is an area that needs to be improved.

For indices based on ESG scores, the green investment index for the 180 stocks performed significantly better than the SSE 180 Index over the sample period. Its continued climb showed the growth of green development and green investment.

ii. The future

We believe that, as a new initiative, there is much scope for further development of the ESG ratings and the ESG index. First, buoyed by interest in the green economy, enlarging the ESG ratings we could widen the scope of its evaluation in terms of business operations; second, as investors and regulators are growing more concerned about ESG information, ESG ratings market potential will gradually increase; third, with its extensive use in both stocks and bonds market, ESG ratings will play an important role in financial products.

ICBC will continue this study in the following areas: first, we will continue to promote the management of the index so that we can release the ICBC index on a regular basis. Second, we will expand the scope of the ratings to the 300 enterprises listed in the Shanghai and Shenzhen stock markets. Third, we will continue to promote the "industrial credit risk management system". With stable and reliable data covering relevant industry, environment, energy efficiency and other fields, ICBC will further improve the ratings' indicators and ratings methodology, launch more trial ratings for all of ICBC's large-scale corporate customers (listed companies) and finally expand it to non-listed corporate customers. Fourth, we will promote the application of the green ratings in daily operations, including customers' choice, credit rating, risk control and other business; also, we will explore establishing green index investment targets and guiding social funds flowing to green enterprises. Fifth, we will shares our experiences with other commercial banks.

iii. Application Prospects

As improvements are made to the ESG-based ratings system, applications for the ICBC ESG ratings and the ESG index will continue to expand. First, they can complement internal ratings systems already adopted by commercial banks. As the first domestic ratings developed by a commercial bank to quantitatively evaluate company sustainable development, this project establishes a system to rate customer sustainability from customer credit ratings, filling in gaps in green ratings for commercial banks. Second, commercial banks can refer to them in deciding customer pricing. Thus, while providing financial products and services, commercial banks can give more support to projects that are environmentally beneficial, and guiding the financial industry and green enterprises in carrying out green investment and financing. Third, the ICBC ESG-based ratings and the ESG index can help to establish an industrial benchmark. The ICBC ESG green index will likely become an important investment target for institutional investors to help with the early stages of development of China's green assessment and green index. Companies that perform very well on green ratings may be rewarded with more investment opportunities, thus further promoting green development. Fourth, they can help guide funding, helping investors better understand a company's economic, social and environmental performance and sustainable development capacity, thus further supporting China's green investment and financing and the transformation of the economy into a green economy.

iv. Policy Recommendations

We suggest regulatory authorities and other institutions focus on the following:

1. Establish a mandatory disclosure system for ESG information. At present, although the Shanghai Stock Exchange and the Shenzhen Stock Exchange have issued notices or guidance documents on ESG information disclosure, most listed companies only disclose information on a voluntary basis. As a result, only about 20% of listed companies disclose their environmental information. We recommend the following: First, domestic exchanges should gradually establish mandatory ESG information disclosure systems to properly guide market expectations. While giving certain incentives to listed companies that voluntarily disclose, tougher penalties should be imposed on those who fake environmental information. Second, environmental protection departments and related functional departments should improve how they share and use data on companies' environmental information. Third, regulatory agencies or social third-party institutions should create an atmosphere of good environmental information disclosure to encourage third-party institutions to actively participate in the collection and release of environmental information.

2. Improve policy support for green enterprises and projects. Measures should be taken to support local governments in reducing the costs borne by green enterprises with specialized guarantees and credit enhancement mechanisms and other measures. This could include improving the approvals (filing) process to reduce administrative costs for the issuance of products from green enterprises and related indices or encouraging social capital to participate in the construction of green projects launched by enterprises with good green ratings through the PPP model.

3. Policy support should be given to enterprises and projects that perform well on ESG factors. First, green credit assets reaching a certain ESG ratings standard should qualify under the central bank's monetary policy; this would encourage banks to issue green credit; second, capital fund standards for green credit asset invested in enterprises with outstanding ESG performance should be revised down in a targeted way to reduce capital occupation of commercial banks; third, negative lists and standards should be established, based on green ratings results, to guide commercial banks into cutting loans for enterprises with poor ESG performance.

4. Cultivate responsible investors. Efforts should be made to guide long-term institutional investors, such as social security funds, insurance companies and pension funds to pay more attention to corporate social responsibility and green indices when choosing investment products so as to support green industries. This can be done through a variety of index products. Companies should be given sustained encouragement to continually improve environmental

performance and information disclosure.

5. Improve academic exchanges both at home and abroad. China's green ratings and green indexes can be improved by increasing high-level exchanges between international and domestic scholars and banking industries under the framework of the G20 Green Finance Study Group (GFSG). The priorities for discussion should be the development of indicators, model calculations, and theoretical framework.

ICBC

Urban Finance Research Institute of ICBC

Urban Finance Research Institute of ICBC, which was established in 1993, is the strategy research and planning department of ICBC Head Office. As well as providing intellectual support for top decision-making of ICBC, the Institute sets up the development vision of building "The Think-Tank for Chinese Financial Industry", devoting itself to make contribution to healthy and sustainable development of Chinese financial system. The major responsibilities of the Institute are as follows: formulating medium-to-long term development planning and strategies; analyzing the macro-economic situations & outlooks, development of banking industry and business tactics; focusing on prospective study on green finance as well as international and domestic cooperation, exploring the methodology of environmental risk quantification, conducting environmental factors stress-testing and ESG rating; editing and publishing two journals named CHINA URBAN FINANCE and FINANCE FORUM respectively; taking charge of daily operation and organization of China Urban Finance Society; taking charge of daily operation of ICBC Post-Doctoral Research Center; compiling the history of ICBC.

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