Sustainable Finance & China's Green Credit Reforms: A Test Case for Bank Monitoring of Environmental Risk

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In the past few years, the focus of international organizations on sustainable finance—the integration of environmental, social, and governance ("ESG") considerations into global financial systems—has intensified because of its potential to promote financial stability, better risk assessment, and more efficient allocation of capital. The success of these efforts depends in part on whether banks and other financial institutions can manage, price, and monitor environmental risk.

This Article offers new answers to this question from China—one of the most important global test sites for sustainable finance. Corporate governance theory suggests that creditor monitoring can promote managerial accountability and lower agency costs, a role that is critical in economies like China, Europe, and much of the developing world, where companies depend heavily on bank financing. China's recent green credit reforms offer an opportunity to re-examine these theories and assess banks' potential to drive sustainable finance across global capital markets.

To examine banks' monitoring potential, this Article uses data for 2012–2017 from the annual reports and sustainability reports of the twenty-one Chinese banks that are at the forefront of China's green finance initiatives, as well as insights from fieldwork conducted in 2016 and 2017. This investigation shows that leading Chinese banks are strengthening their ability to integrate environmental criteria into credit risk assessment in response to regulatory priorities but that barriers to efficient pricing and monitoring of environmental credit risk remain. This Article identifies key lessons from the Chinese context for sustainable finance reform elsewhere.

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Introduction

International organizations from the United Nations' Environmental Programme (UNEP) and the World Bank[1] to the Organisation for Eco-

1. In January 2014, the United Nations Environment Programme (UNEP) began its initiative to facilitate and promote sustainable finance policies. UNITED NATIONS ENVIRONMENT PROGRAMME & THE WORLD BANK GROUP, ROADMAP FOR A SUSTAINABLE FINANCIAL SYSTEM 2 (2017), http://unepinquiry.org/publication/roadmap-for-a-sustainable-financial-system/ [https://perma.cc/E36Q-5UUS] (presenting an annual review of sustainable finance policy instruments and their implementation) [hereinafter UNEP & WORLD BANK].

nomic Co-operation and Development (OECD)[2] and the G20[3] are now working to promote sustainable finance—the integration of environmental, social, and governance ("ESG") considerations into global financial systems in order to promote financial stability, asset pricing, risk assessment, and more efficient allocation of capital toward investments that promote sustainable and resource-efficient development.[4] The success of these policies depends in no small part on whether financial institutions can manage and price environmental and social sources of financial risk and how well corporations' access to capital can be linked to their environmental performance.

This Article offers new answers to these questions from China—one of the most important global test sites for sustainable finance. For over a decade, China has been building policy frameworks for sustainable finance that incentivize environmental sustainability, "green development," and its transition toward a "green economy."[5] Since 2015, the Chinese government has introduced next-generation green finance policies that require financial institutions and capital markets to play an even bigger role in funding China's green development agenda.[6] China also initiated strategic initiatives on green finance in 2016 as part of its presidency of the G20 and

2. The OECD has numerous finance initiatives related to sustainable development. *See Financing for Sustainable Development*, OECD, http://www.oecd.org/dac/financing-sustainable-development/ [https://perma.cc/H2XR-7GF8].

3. *See, e.g.*, G20 Green Finance Study Group, G20 Green Finance Synthesis Report 2017 (2017), http://www.unepinquiry.org/wp-content/uploads/2017/07/2017_GFSG_Synthesis_Report_EN.pdf [https://perma.cc/CSQ7-V9QF] (presenting the findings of the G20 Green Finance Study Group). In 2017, the Task Force on Climate-Related Financial Disclosure (TCFD) of the G20's Financial Stability Board produced its final report on the financial effects of climate risk and its framework for disclosure of climate-related risk by financial institutions and other corporations. *See generally* TCFD, *Publications*, G20 Fin. Stability Board (June 29, 2017), https://www.fsb-tcfd.org/publications/ [https://perma.cc/4NMB-CVDJ] (identifying links between climate risk, financial performance, and systemic risk).

4. This definition draws on several leading formulations: UNEP Inquiry, The Financial System We Need: Aligning the Financial System with Sustainable Development 13 (2015), http://unepinquiry.org/publication/inquiry-global-report-the-financial-system-we-need/ [https://perma.cc/A3E6-RYTF]; *Sustainable Finance*, Eur. Comm'n, https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance_en [https://perma.cc/D6K2-TGJV] (defining sustainable finance as "the provision of finance to investments taking into account environmental, social[,] and governance considerations"); UNEP & World Bank, *supra* note 1, at 9, 83–84 (surveying definitions adopted by the United Nations, the European Union, and governments in Switzerland and Indonesia).

5. *See infra* Part II (explaining the evolution of China's sustainable finance policies).

6. Guiding Opinions on Establishing the Green Financial System (关于构建金融体系的指导意见) (promulgated by the People's Bank of China (PBOC), China Ministry of Fin. (MOF), Nat'l Dev. & Reform Comm'n (NDRC), China Ministry of Envtl. Prot. (MEP), China Banking Reg. Comm'n (CBRC), China Sec. Reg. Comm'n (CSRC), and China Ins. Reg. Comm'n (CIRC), Aug. 31, 2016, effective Aug. 31, 2016; Green Finance Task Force, Establishing China's Green Financial System: Report of the Green Finance Task Force 3–4 (2015), http://www.unepfi.org/fileadmin/communications/EstablishingChinasGreenFinancialSystem.pdf [https://perma.cc/7E84-GA7N].

continues to promote green finance innovation.[7]

By 2017, twenty-one leading Chinese banks had issued over USD 1.3 trillion (RMB 8.3 trillion) in green credit, accounting for nearly 10% of all corporate loans.[8] One such project involved a fund formed by a Chinese bank, Huaxia Bank, in cooperation with a syndicate of three international organizations that was used to build a photovoltaic power plant.[9] Another project, financed by one of China's leading green credit lenders, the China Industrial Bank Co. Ltd. (CIB), involved a RMB 100 million loan to help a company acquire energy efficient rental vehicles.[10] As in these cases, green credit funds can support green technology and renewable energy innovation,[11] but green credit also includes measures to reduce capital flows to uses that harm the environment.[12] In recent years, central government policies have pushed banks to extend less financing to highly polluting sectors or to industries designated as experiencing serious overcapacity.[13] According to official estimates, green credit financing extended in the first half of 2017 will save 715 million tons of water and 215 million tons of

7. G20 Green Finance Study Group, *supra* note 3, at 3.

8. CBRC, Statistics on Green Credit of 21 Major Banks (21家主要银行绿色信贷情况统计表) (2017), http://www.cbrc.gov.cn/chinese/files/2018/8E392703618F4CB283AACB07A391FBDE.pdf [https://perma.cc/9QLZ-JCH3] [hereinafter CBRC Statistics]; CBRC, 2016 Annual Report 63–64 (2017), http://www.cbrc.gov.cn/chinese/files/2018/529E627CE8324461BD37CE152929E9BE.pdf [https://perma.cc/2QNR-AP5P] [hereinafter CBRC 2016 Report] (reporting a 2016 year-end green credit loan volume of RMB 7.51 trillion); UNEP & Int'l Inst. Green Finance, Cent. U. Fin. & Econ., Establishing China's Green Financial System: Progress Report 2017 17 (2017), https://wedocs.unep.org/bitstream/handle/20.500.11822/22285/China_Green_Finance_ProgressRep_ES_EN.pdf?sequence=1&isAllowed=Y [https://perma.cc/W8JY-MURR] [hereinafter UNEP & IIGF]. This is a marked increase from the mid-2000s. *See* Bing Zhang et al., *Tracking the Implementation of Green Credit Policy in China: Top-Down Perspective and Bottom-Up Reform*, 92 J. Envtl. Mgmt. 1321, 1322 (2011) (citing CBRC data from 2008 reporting green credit volume of RMB 10.6 billion for the top five commercial banks in 2007, which amounts to less than 1% of the total loan volume for that year, RMB 2.6 trillion).

9. CBRC, 2015 Annual Report 77 (2016), http://www.cbrc.gov.cn/chinese/files/2018/AF549A3E49BA45548422CDD9D54DE11E.pdf [https://perma.cc/87QZ-E3MB] [hereinafter CBRC 2015 Report].

10. Jiang Xueqing, *Banking Sector Takes Greener Approach,* ChinaDaily Asia (June 30, 2016), https://www.chinadailyasia.com/business/2016-06/30/content_15456266.html [https://perma.cc/82DA-UWYK].

11. CBRC, Notes on the Green Credit Statistics Information Disclosure (绿色信贷统计信息披露说明) 1, http://www.cbrc.gov.cn/chinese/files/2018/DD114DBE72084577BBB4392A38E65FFE.pdf [https://perma.cc/BW7M-28G6] [hereinafter CBRC Notes] (summarizing standards set under China's Green Credit Statistics System (GCSS)). *See, e.g.*, Shanghai Pudong Development Bank, 2014 Corporate Social Responsibility Report 109–11 (2014) (reporting on credit volumes supporting renewable energy, green construction, and resource conservation projects, among others).

12. *See infra* Part II (discussing mandatory restrictions on financing to heavily polluting or overcapacity sectors).

13. CBRC 2015 Report, *supra* note 9, at 75 (reporting on the level of lending to highly polluting firms, those with high resource consumption, and those in sectors with overcapacity known collectively as the "two high, one overcapacity" (两高一剩) firms); PricewaterhouseCoopers, Exploring Green Finance Incentives in China: Final Report 4 (2013), https://www.pwccn.com/en/migration/pdf/green-finance-incentives-oct2013-eng.pdf [https://perma.cc/P8ZL-8K2X].

coal, and reduce greenhouse gas emissions by nearly 500 million tons.[14]

This Article focuses on green credit, a core pillar of China's recent green finance reforms, in order to explore the role banks may play in monitoring environmental risk and implementing sustainable finance policies more broadly. As the above examples show, green credit is debt financing provided by a bank or bank syndicate to firms or projects that offer environmental benefits.[15] It works by relying on lenders to limit polluting firms' access to credit and to direct capital to projects that promote environmental conservation, sustainability, and remediation.[16] China's green credit reforms, therefore, offer a unique opportunity to consider the potential for bank monitoring to drive better environmental risk management by corporate borrowers.

Corporate governance theories developed largely in Western contexts suggest that creditor monitoring plays an important role in driving managerial accountability and lowering agency costs,[17] and the mechanisms of creditor monitoring are well-known.[18] Banks and other private lenders rely on a range of contractual tools to constrain management, including loan covenants that constrain the borrower's ability to take on new debt or to make investments that increase its credit risk. Lenders have access to information on the borrower's financial condition and its compliance with the financial and technical covenants throughout the life of the loan.[19] Creditors also enjoy strong contractual enforcement rights, such as the ability to seize collateral or to accelerate the debt in the event of default.[20] Lenders issuing green credit can use these same contractual tools to monitor

14. CBRC STATISTICS, *supra* note 8 (reporting aggregate savings from green credit issued in the first half of 2017). According to China's GCSS, instituted in 2013, banks should calculate the environmental benefits of green loans using third-party verifications, feasibility studies, and related data on an annualized basis. CBRC NOTES, *supra* note 11, at 3. The CBRC provides formulas and calculation tools banks may use for projects where this information is not already provided to the lender. *Id.*

15. The terms "green" or "sustainable" finance often include other nonfinancial dimensions of financial risk and return, including labor and employment (i.e. social) aspects of corporate operations. *See, e.g.*, CBRC, NOTICE OF THE CHINA BANKING REGULATORY COMMISSION ON ISSUING GREEN CREDIT GUIDELINES (中国银监会关于印发绿色信贷指引的通知) (Feb. 24, 2012), http://www.cbrc.gov.cn/EngdocView.do?docID=3CE646AB629B46B9B533B1D8D9FF8C4A [https://perma.cc/RMT9-VEJH] (China) [hereinafter GREEN CREDIT GUIDELINES] (addressing both social and environmental risk).

16. *See infra* Section I.C (describing these mechanisms).

17. Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 4 J. FIN. ECON. 305, 344–45 (1976) (highlighting the effect of capital structure on agency costs). *See also* Frederick Tung, *Leverage in the Board Room: The Unsung Influence of Private Lenders in Corporate Governance,* 57 UCLA L. REV. 115, 144–48 (2009) (discussing private lenders' role in reducing agency costs). *See generally* Douglas G. Baird & Robert K. Rasmussen, *Private Debt and the Missing Lever of Corporate Governance*, 154 U. PA. L. REV. 1209 (2006) (same).

18. *See* George G. Triantis & Ronald J. Daniels, *The Role of Debt in Interactive Corporate Governance*, 83 CAL. L. REV. 1073, 1081–90 (1995) (discussing these mechanisms); Tung, *supra* note 17, at 135–39 (same). *See generally* Baird & Rasmussen, *supra* note 17 (same).

19. Tung, *supra* note 17, at 131–39; Triantis & Daniels, *supra* note 18, at 1082–84; Baird & Rasmussen, *supra* note 17, at 1232.

20. Tung, *supra* note 17, at 131–35. *See* Triantis & Daniels, *supra* note 18, at 1093.

aspects of the borrower's credit risk that are tied to environmental impacts and risk management.[21] As discussed below,[22] Chinese commercial banks use similar strategies and are also subject to regulations and governance standards modelled on international best practices.

This Article examines the extent to which China's top banks serve as external monitors of corporate environmental credit risk.[23] Its analysis relies primarily on data from 2012 to 2017 drawn from the annual reports and sustainability reports of the 21 leading Chinese banks that account for China's officially reported green credit volume.[24] Because information on how banks manage and price credit risk is generally not publicly reported, this study explores key aspects of bank green credit implementation through interviews conducted in 2016 and 2017 in Beijing, Hong Kong, and Shanghai.[25] As detailed in Appendix E, these interviews were conducted with bank managers and employees at a sample of the banks included in this study, as well as with central-level regulators, lawyers, accountants, consultants, academics, and other professionals engaged in implementing or shaping various aspects of China's green credit policies.[26] Although these sources do not permit quantitative analysis of the extent of creditor monitoring or its ultimate effect on borrowers' environmental risk management, they do shed light on many aspects of financial institutions' ability to monitor environmental credit risk and their incentives to do so, expanding the limited literature on international bank practice in Western jurisdictions.[27]

These findings also contribute to the emerging literature on sustainable finance policies. Over sixty governments worldwide have adopted green credit policies to varying degrees, including the United Kingdom, Brazil, Canada, Australia, India, and Brazil.[28] Although the European

21. *See infra* Section I.C (discussing environmental credit risk management).

22. *See infra* Section II.A (discussing China's banking reforms).

23. Leading studies that predate the most recent reforms include Motoko Aizawa & Chaofei Yang, *Green Credit, Green Stimulus, Green Revolution? China's Mobilization of Banks for Environmental Cleanup*, 19 J. ENV'T. & DEV. 119 (2010) and Zhang et al., *supra* note 8. *See generally* PRICEWATERHOUSECOOPERS, *supra* note 13 (surveying implementation of pre-2013 policies). The UNEP-FI works with Chinese policymakers and advisors and regularly assesses China's green finance strategy. *See generally* UNEP & IIGF, *supra* note 8 (identifying implementation successes and challenges).

24. Much of the analysis focuses on the eighteen commercial banks in this sample, since China's three policy banks provide funding based on more explicit policy goals.

25. Except where indicated on Appendix E, interviews were conducted on condition of anonymity with respect to both the individual's identity and their employer's.

26. The methodology of this study is discussed in more detail *infra* Section III.A.

27. These studies include: Olaf Weber, *Environmental Credit Risk Management in Banks and Financial Service Institutions*, 21 BUS. STRAT. & ENVT. 248 (2012) (examining practices at the six Canadian commercial banks); Olaf Weber et al., *Incorporating Sustainability Criteria into Credit Risk Management,* 19 BUS. STRAT. & ENV'T. 39 (2010); Paul Thompson, *Bank Lending and the Environment: Policies and Opportunities*, 16 INT'L. J. BANK MARKETING 243 (1998) (examining environmental policies at twelve banks from eight jurisdictions, including the United Kingdom).

28. According to the 2017 annual report of the UNEP-FI, over 300 policy and regulatory measures to promote sustainable finance have now been adopted in over sixty countries. UNEP, UN ENVIRONMENT INQUIRY ANNUAL OVERVIEW 2017 5 (2018), http://

Union and other governments are now considering broader programs,[29] most national green finance policies focus on specific types of projects, such as large-scale infrastructure projects or conservation efforts, or on certain types of risks, such as climate change.[30] China is the first to adopt a comprehensive green finance strategy, and its green credit policies are the first to apply broadly to all commercial lending.[31] China's experience, therefore, offers useful lessons for regulators and private sector initiatives in other jurisdictions that are considering new directions for sustainable finance reforms.

This Article begins by explaining the basic tools of creditor monitoring and how a client or project's environmental risk can affect credit risk. Part II provides a brief introduction to banking reform in China and the evolution of China's green credit reforms. Part III presents an analysis of current green credit practice among Chinese commercial banks, and, to a lesser extent, China's policy banks. This analysis shows that leading Chinese banks are strengthening their ability to integrate environmental criteria into credit risk assessment in response to regulatory priorities but that barriers to efficient pricing and monitoring of environmental credit risk remain. The Article concludes by identifying areas for future research and key lessons that can be drawn from China's experience for sustainable finance reform elsewhere.

I. Creditor Monitoring & Environmental Risk

Current efforts to promote sustainable finance rest on a two-fold premise. The first is that the cost of corporate financing does not yet reflect the environmental and social risks of corporate operations. The second is that financial systems should integrate environmental and social factors, either because of their financial impact on firms or investors, or because of the need to align financial markets with sustainable development policy goals. For reasons discussed below, these assumptions are gaining widespread acceptance among financial regulators in many jurisdictions. But sustainable finance will only work if financial institutions can (i) accurately distinguish "green" and "non-green" investments; (ii) differentiate among investments in each of these categories based on their relative level

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unepinquiry.org/wp-content/uploads/2018/01/UN_Environment_Inquiry_Annual_Overview_2017.pdf [https://perma.cc/G9HQ-B7Y2]. Brazil's central bank, for example, has required all banks to establish environmental and social risk management systems. UNEP & WORLD BANK, *supra* note 1, at 55 (surveying national policies adopted by central banks and bank regulators). *See also* PBOC ET AL., ESTABLISHING CHINA'S GREEN FINANCIAL SYSTEM 9 (2015) (referencing green credit programs by Canadian and Australian banks for low-emission auto finance); Aizawa & Yang, *supra* note 23, at 120 (citing studies on green credit in Brazil and India).

29. *See, e.g.*, EUR. COMM'N, *supra* note 4, at 6–9, 13; UNEP & WORLD BANK, *supra* note 1, at 54 (observing a "major increase in system-level" sustainable finance measures since 2016).

30. *See supra* note 28 and sources cited therein.

31. *See infra* Section II.C (discussing the scope of the CBRC's 2012 Green Credit Guidelines and related measures).

of environmental and social risk; (iii) make financing decisions and price risk accordingly; and (iv) make sure that funds earmarked for "green" (or "more green") uses are not diverted to projects that have a different environmental and social risk profile.

Even though sustainability issues are relatively new considerations for financial institutions, banks and other lenders are well-positioned to make these kinds of determinations.[32] Banks are also the dominant source of corporate finance not only in China, but also in Europe and much of the developing world.[33] Even in the United States, where a focus on shareholders overshadows creditors' role in corporate governance,[34] banks are an important source of capital and wield real influence over corporations.[35] This Part explains how creditor risk assessment and monitoring work, why ESG factors may be material to bank lenders, and how lenders can use the standard mechanisms of creditor monitoring to monitor environmental and social risk.

A. The Rationale for Creditor Monitoring

The literature on the governance effects of debt financing emphasizes the important role of creditors as a check on firm management that can reduce agency costs.[36] Creditor monitoring complements other external managerial constraints from, for example, product markets, managerial labor markets, and the market for corporate control, as well as internal corporate governance constraints from board oversight, corporate officer fiduciary duties, and shareholder voting rights.[37]

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32. The role of banks is central in many multilateral sustainable finance initiatives, such as the "Sustainable Banking Network," whose members include bank regulators in twenty countries, including developing countries in Africa and Asia. UNEP, GREEN FINANCE FOR DEVELOPING COUNTRIES: NEEDS, CONCERNS AND INNOVATIONS 29–32 (2016), http://unepinquiry.org/wp-content/uploads/2016/08/Green_Finance_for_Developing_Countries.pdf [https://perma.cc/26DM-GBHG].

33. Martin Èihák et al., *Benchmarking Financial Systems Around the World* 22–23 (The World Bank, Policy Research Working Paper No. 6175, 2012) (noting that developing economies rely heavily on bank financing even when stock markets develop to supply alternatives). *European Financial Stability and Integration Review 2017*, at 23–26, SWD (2017) 171 final (May 19, 2017) (reporting that bank lending has historically been the major source of corporate finance for companies in Europe and is increasing post-financial crisis). *See also* Thomas Schmid, *Control Considerations, Creditor Monitoring, and the Capital Structure of Family Firms*, 37 J. BANKING & FIN. 257, 258, 262 (2013) (discussing bank-centric financing in Germany).

34. The mainstreaming of ESG-related shareholder activism has been a focus of my own prior work. *See* Virginia Harper Ho, *Risk-Related Activism: The Business Case for Monitoring Nonfinancial Risk,* 41 J. CORP. L. 647, 658–62 (2016). *See also* Johanna M. Shepherd et al., *What Else Matters for Corporate Governance? The Case of Bank Monitoring*, 88 B.U. L. REV. 991, 993 (2008) (noting a "yawning gap" in the corporate governance literature regarding creditor governance).

35. *See* Shepherd et al., *supra* note 34, at 992 (noting the "pervasiveness of bank debt among public companies"). *See also supra* note 18 and sources cited therein.

36. *See generally* Tung, *supra* note 17 (describing lenders as a routine influence on management decision making in the U.S.); Triantis & Daniels, *supra* note 18 (describing an interactive corporate governance model that reduces managerial slack).

37. Triantis & Daniels, *supra* note 18, at 1075–77.

Banks and other private lenders protect their claims on corporate assets through a range of mechanisms that facilitate monitoring of the borrower and reduce risk. These include financial covenants that limit the borrower's ability to take on new debt, and investment covenants designed to prevent the borrower from substituting risky investments for more secure ones or from transferring assets out of the firm.[38] Secured lenders have particular incentives to monitor risk that may reduce the value of their collateral. Most important for present purposes, debt agreements also give banks the right to receive information on the borrower's financial position and its compliance with other covenants. These information rights give lenders a means of identifying financial difficulties and renegotiating or enforcing the terms of the debt contract, and the disclosure obligations may themselves lower agency costs and discourage management from taking actions that may be excessively risky to the lender.[39] Banks also typically enjoy contractual rights to vote on mergers and other fundamental changes and the right to intervene and exercise remedies in the event of a breach.[40]

These contractual tools are quite flexible and, in fact, give banks real power in the governance of the firm over time.[41] Importantly, banks can adjust the level of monitoring they employ if the borrower breaches some of the technical covenants of the loan agreement, and they can "ratchet up" the level of control they exert over a borrower as the risk of financial default rises.[42] In some cases, banks reserve the right to intervene directly when the borrower encounters financial difficulties, for example, by forcing changes in top management.[43] Breach of these covenants may entitle lenders to exercise standard remedies, such as placing new limits on future borrowing, but more typically, breach gives the lender an opportunity to renegotiate the terms of the debt contract.[44]

Multiple creditors of the same debtor may agree to delegate monitoring responsibility to the creditor who can do so most efficiently.[45] Unsecured creditors, for example, may prefer to free-ride and let secured creditors or guarantors bear the cost of monitoring.[46] Triantis and Daniels observe

38. *Id.* at 1078. Tung, *supra* note 17, at 135–38.

39. Triantis & Daniels, *supra* note 18, at 1093 (describing loan covenants as "trip wires" that offer early alerts of the borrower's condition).

40. *See id.* at 1082–89 (describing how banks exercise "voice" or "exit" strategies). *See also* Tung, *supra* note 17, at 135–39 (describing these tools).

41. *See generally* Tung, *supra* note 17.

42. *See id.* at 135–38.

43. *Id.* at 156–58.

44. Douglas W. Diamond, *Financial Intermediation and Delegated Monitoring,* 51 REV. FIN. STUD. 393, 394–95 (1984) (discussing the function of technical loan covenants). *See also* Tung, *supra* note 17, at 141–44 (discussing the "certainty of renegotiation" as a key lever of bank influence).

45. Raghuram Rajan & Andrew Winton, *Covenants and Collateral as Incentives to Monitor,* 1 J. FIN. 1113, 1113 (1985). The focus here is primarily on creditor monitoring by commercial lenders, as banks have a number of advantages over trustees and dispersed investors in publicly traded bonds. *See* Triantis & Daniels, *supra* note 18, at 1089–90.

46. *See* Triantis & Daniels, *supra* note 18, at 1094.

that other creditors often rely on banks as designated monitors because banks often have stronger incentives to monitor the borrower and can do so more efficiently.[47] One reason is that banks often have a direct client relationship with the borrower that gives them access to information about the borrower's cash management at lower relative cost, allowing them to identify red flags earlier than other creditors.[48] If a bank identifies problems, it can send distress signals to other corporate stakeholders and to the market indirectly by refusing to extend new debt or to renew existing debt, or by exercising enforcement rights.[49] By serving as delegated monitors, banks can lower monitoring costs for shareholders and other stakeholders of the firm and can improve firm value.[50] At the same time, lenders' ability and incentives to monitor are reduced if they face higher competition from other lenders or if they can transfer risk to other creditors, shareholders, or to third parties through securitization, guarantees, insurance, or other means.[51]

Ultimately, banks will set interest rates based on the borrower's creditworthiness and on the bank's ability to manage or shift risk. Borrowers who hope to reduce the cost of debt capital may need to agree to more burdensome covenants, greater transparency, and tighter lender monitoring, and banks may use contractual pricing mechanisms that adjust interest rates based on the borrower's performance.[52] Banks' ability to charge higher interest rates may motivate borrowers to reduce the risk of the funded project or to secure a guarantor, insurer, or other third-party who will bear part of the risk associated with the project or transaction. The power to price risk, therefore, gives banks direct and indirect influence over the risk profile of the projects and borrowers they fund.

B. Understanding Environmental Credit Risk

Although banks have not traditionally incorporated environmental and social risk into lending decisions or post-loan monitoring, evidence of the potential materiality of these risks is increasingly motivating regulators and financial institutions themselves to evaluate whether sustainability factors are material and should therefore be part of lenders' standard risk

47. *Id.* at 1083–88. Baird & Rasmussen, *supra* note 17, at 1244 (noting that the lead bank in a syndicate typically bears the primary monitoring responsibility). *See also* Diamond, *supra* note 44 (developing a theory of delegated monitoring by banks and other financial intermediaries).

48. *See* Tung, *supra* note 17, at 139.

49. *See* Triantis & Daniels, *supra* note 18, at 1084–87 (discussing the signaling effect of bank "voice" and "exit" from a lending arrangement).

50. *See* Rajan & Winton, *supra* note 45, at 1113; Triantis & Daniels, *supra* note 18, at 1089–90 (explaining delegated monitoring to banks as lower-cost monitors than bond indenture trustees). *See also* Shepherd et al., *supra* note 34, at 1003–06 (finding that bank monitoring improves firm value).

51. *See* Tung, *supra* note 17, at 161–69.

52. *See id.* at 147–50, 152 (discussing performance-based pricing and the relationship between interest rates and contract stringency).

assessment.[53] Prior studies have explained the ways in which environmental and social risk affects lenders' financial risk in terms of direct, indirect, and reputational impacts.[54] Comparative studies on the extent to which banks conduct environmental examinations of credit, loans, and mortgages find wide variation among jurisdictions, but note that banks in some jurisdictions, including the United Kingdom and Canada, are beginning to do so more systematically.[55]

First, environmental and social risks may be a source of direct liability for lenders if they bear legal responsibility to clean up contamination caused by an insolvent borrower.[56] For example, in the United States, lenders historically had a strong motivation to monitor borrowers engaged in projects with high environmental impacts because of the prospect of direct liability under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).[57] In its present form, CERCLA provides a safe harbor for lenders that discourages banks from undertaking direct oversight of borrowers' environmental practices.[58] While it permits lenders to advise clients on risk mitigation and monitoring, or to enforce the terms of credit or security agreements, lenders who finance projects that produce environmental harm may still be held liable if they engage in management functions.[59] Potential legal liability, or protection from it, in other jurisdictions will obviously have equally important impacts on lenders' incentives to pre-screen or monitor corporate borrowers.

More commonly, environmental risk associated with borrowers' environmental practices affects the market risk, credit risk, underwriting risk, and business risk financial institutions bear.[60] For example, a corporate borrower's efficiency in managing energy, water, and other natural resources, and the extent to which its operations impair those resources may translate into higher costs or reduced revenues; legal liability or

53. *See supra* notes 27–30 and accompanying text. *See also* Thompson, *supra* note 27, at 247–48 (concluding that banks in the United Kingdom believe that environmental issues materially affect corporate lending); G20 GREEN FINANCE STUDY GROUP, *supra* note 3, at 12–13.

54. *See* Thompson, *supra* note 27, at 244–45.

55. *See* Weber, *supra* note 27, at 257–59 (reporting that as of 2011, 53.5% of banks from a global sample of sixty-one banks conducted environmental risk management as part of the lending process, and that all six of Canada's commercial banks do so).

56. *See* Thompson, *supra* note 27, at 244–45.

57. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), § 107(a)(2), provides for liability for any defendant who "directs the workings of, manages, or conducts the affairs of a [polluting] facility." CERCLA, 42 U.S.C. § 9607(a)(2) (2011); United States v. Bestfoods, 524 U.S. 51, 66 (1998) (interpreting the language in CERCLA § 107(a)(2) subjecting to liability any "person" who "operated any facility at which . . . hazardous substances were disposed of").

58. 42 U.S.C. § 9601(E)–(F); CERCLA, Pub. L. No. 109-591, § 101(20)(E), (20)(F) (2005).

59. *Id.* § 101(20)(E)(iii)–(iv) (defining "participate in management").

60. *See* G20 GREEN FINANCE STUDY GROUP, *supra* note 3, at 8 (explaining these relationships).

reputational harm can also impair its future profitability.[61] In recent years, a number of leading firms, including BP, have experienced credit downgrades following high-profile environmental disasters, since serious environmental penalties or cleanup costs increased their risk of default.[62] Poor management of environmental risk may also reduce borrowers' profitability, competitive advantage, and growth, and ultimately could impair the value of assets that serve as collateral for the debt.[63] All of these factors may motivate banks to develop effective environmental credit risk management systems to quantify, track, and price environmental risk. Even when the bank is not exposed to credit risk related to its customer's activities, it may still bear reputational risk if the public sees the bank as backing companies that cause environmental harm, which, in turn, may hurt its ability to attract clients.[64]

Empirical work among firms in the U.S. and Europe testing these effects shows that better ESG risk management reduces credit risk—as reflected by credit ratings—the likelihood of covenant breach, the price volatility of public debt, bond yields, the rate of default, and spreads on credit default swaps (CDS).[65] Lending to firms with lower environmental risks or better risk management practices may also reduce lenders' transaction costs by alleviating the need for lenders to engage in extensive negotiations, demand more complex covenants, or undertake more extensive ongoing monitoring.[66] Some credit rating agencies are responding to this evidence by integrating environmental and social indicators into their rating criteria, in addition to standard corporate governance measures.[67] Studies specifically testing the economic effects of bank monitoring also show that it increases firm value.[68]

Government policies can also encourage banks to view environmental and social risk as a material element of credit risk assessment. Following the Paris Climate Accords, many governments have begun tightening regulatory controls on high-polluting sectors, which increase corporate borrowers' liability risk and therefore the risk of default to their lenders. The G20's 2017 recommendations on climate-related disclosure also call attention to the need for financial institutions to measure and disclose their

61. *See* Omer M. Elaskit & Andrew C. Worthington, *Using Environmental and Social Information in Lending Decisions,* 5 INT'L. J. ECON. & FIN. 112, 113–14 (2013) (citations omitted).

62. *See* S&P GLOBAL RATINGS, RATINGS DIRECT: PROPOSAL FOR ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) ASSESSMENTS 2 (2016).

63. *See* UNPRI, CORPORATE BONDS: SPOTLIGHT ON ESG RISKS fig. 1 (2013) (mapping the relationship between ESG indicators, factors affecting creditworthiness, and credit risk indicators).

64. *See* Thompson, *supra* note 27, at 245.

65. *See, e.g.*, UNPRI, *supra* note 63, at 8–10 (citing these studies).

66. *See* Elaskit & Worthington, *supra* note 61, at 113 (2013) (citations omitted).

67. *See* UNPRI, STATEMENT ON ESG IN CREDIT RATINGS (2016), https://www.unpri.org/credit-ratings/statement-on-esg-in-credit-ratings/77.article [https://perma.cc/WC56-Z3LX].

68. *See generally* Shepherd et al., *supra* note 34.

exposure to climate-related risk more consistently.[69] These pressures could strengthen bank demand for better information on environmental credit risk and borrower risk management practices.

Beyond risk management, preferential incentives and other public policies favoring green-tech, renewable energy, and the like may also encourage banks to extend capital to "green" borrowers or to do so on preferential terms. Although these policies may not motivate environmental risk monitoring, the prospect of new business opportunities is already driving some financial institutions to engage in green lending or to develop financial products that are defined in terms of the positive environmental outcomes they may produce.[70] Innovating in these areas will require banks to develop their capacity to measure and price environmental outcomes, which may have spillover effects on other areas of their business.

Although banks' incentives will not always align with environmental risk monitoring, banks may nonetheless have stronger incentives than shareholders or corporate boards to influence corporate practice.[71] The long-term nature of many environmental risks makes them more likely to be financially material to banks than to equity investors who may have a more short-term perspective. In addition, traditional agency theory predicts that shareholder pressure is likely to incentivize managerial risk-taking,[72] which may be more likely to push firms to externalize environmental costs rather than manage environmental risk.

C. Environmental Credit Risk Management

As the prior discussion shows, the potential financial impact of environmental risk, as well as the opportunities green finance offers, explains why banks may incorporate environmental factors into lending decisions. To do this, banks must first seek reliable information on the nature of environmental risk and then attempt to manage that risk. Alternatively, as discussed above, borrowers may need corporate guarantees, risk insurance, or some other form of bonding to reduce their exposure, or they can structure the investment in a way that transfers risk to a third party. If they are

69. *See* TCFD, ANNEX: IMPLEMENTING THE RECOMMENDATIONS OF THE TCFD (June 2017), https://www.fsb-tcfd.org/publications/final-implementing-tcfd-recommendations/ [https://perma.cc/Q8W7-4MTZ] (providing specific performance indicators for the financial sector). In 2011, the Global Reporting Initiative released its Sustainability Reporting Guidelines for the Financial Sector to encourage ESG disclosure. *See* GLOBAL REPORTING INITIATIVE, SUSTAINABILITY REPORTING GUIDELINES & FINANCIAL SERVICES SECTOR SUPPLEMENT (2011), https://www.globalreporting.org/resourcelibrary/G3-English-Financial-Services-Sector-Supplement.pdf [https://perma.cc/JQ4J-KL8F].

70. *See generally* UNEP-FI, GREEN FINANCIAL PRODUCTS AND SERVICES (2007) (surveying green finance products developed by North American financial institutions).

71. *See* Tung, *supra* note 17, at 131, 133 (discussing the unique qualities of banks that facilitate monitoring, as compared to corporate boards). Although jurisdictions vary, as a matter of corporate law in the United States, the mechanisms of shareholder influence on corporate boards and management is indirect. For an overview of these mechanisms, see Harper Ho, *supra* note 34, at 658–62.

72. *See generally* Jensen & Meckling, *supra* note 17.

unable to transfer or eliminate credit risk, lenders can ultimately charge a higher interest rate to compensate for the added risk exposure.

The United Nations' Environmental Programme Finance Initiative (UNEP-FI) has developed a framework for conceptualizing this environmental credit risk management (ECRM) process.[73] The UNEP-FI framework has six stages: identification, analysis, categorization, mitigation, monitoring, and in some circumstances, reporting.[74] These stages span the entire period from the start of the lender's due diligence before the loan is issued through the life of the loan, and potentially through to renegotiation or enforcement of the bank's rights under the terms of the debt.[75]

The core of credit risk management begins with pre-issuance due diligence to identify credit risks that may derive from the environmental risks and impacts of the project, in addition to analysis of the projects' expected cash flows or the borrower's risk profile. The International Finance Corporation (IFC) and multilateral development banks have developed due diligence standards, procedures, and measures for assessing environmental and social risk, and these institutions were among the first to use them in connection with large-scale project finance investments.[76] These standards are now familiar to international financial institutions, since they informed the development of the "Equator Principles," which are voluntary commitments now endorsed by most leading financial institutions globally. The Equator Principles commit signatories to conduct ongoing environmental and social risk monitoring for certain project finance-related investments.[77] As Part III discusses in the Chinese context, banks who are not engaged in project finance or who have not adopted the Equator Principles also widely reference the IFC standards, and the standards are the basis of IFC initiatives to develop client banks' capacity to evaluate environmental risk.

Once banks obtain the necessary information, they apply internal policies, applicable regulations, and information from the client to assess and categorize the risk associated with the borrower or the project. Just as creditors can condition financing on firms' commitment to abide by contractual covenants, so, too, banks extending green credit can negotiate covenants requiring ongoing environmental compliance, lender consent for new investments, and reporting of specific ESG information periodically to

73. *See generally* UNEP-FI, UNEP FI GUIDE TO BANKING AND SUSTAINABILITY (2011), https://europa.eu/capacity4dev/file/11476/download?token=A56RslOv [https://perma.cc/VB4M-45DN] [hereinafter UNEP FI GUIDE, 1st ed.]. *See also* UNEP-FI, UNEP FI GUIDE TO BANKING AND SUSTAINABILITY (2d ed., 2016), http://www.unepfi.org/fileadmin/documents/guide_banking_statements.pdf [https://perma.cc/LW3V-PNBV].

74. *See* UNEP FI GUIDE, 1st ed., *supra* note 73, at 20–22.

75. *See id.* at 19–22.

76. For the core standards of the IFC, see INTERNATIONAL FINANCE CORPORATION [IFC], E&S PERFORMANCE STANDARDS i–9 (2012), https://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS_English_2012_Full-Document.pdf?MOD=AJPERES [https://perma.cc/MFU4-7F9J] (outlining these standards).

77. *See* EQUATOR PRINCIPLES, *The Equator Principles*, http://equator-principles.com/about/ [https://perma.cc/X5TQ-3XY5] (last visited Dec. 20, 2018) (defining their scope).

the lender. Lenders considering extending credit to projects with high environmental credit risk can also require a borrower commitment to mitigate that risk during the life of the loan or to obtain insurance to limit the lender's exposure. Standard loan covenants may also cover obligations to monitor, mitigate, or disclose environmental impacts, requiring compliance with applicable law. Breach of these covenants then entitles lenders to exercise standard remedies, and again, even if not directly enforced, covenant breach can allow the lender to renegotiate the terms of the debt contract and possibly demand further assurances or a higher interest rate.[78]

But banks' ability and incentives to monitor environmental credit risk are subject to many of the same limits as creditor monitoring of other risks. Prior studies have found that banks' credit risk evaluations primarily focus on the initial credit assessment phase and that the costs of renegotiation and enforcement may limit ongoing monitoring.[79] Even with respect to financial covenants, banks often focus on enforcing repayment obligations rather than monitoring technical defaults of the loan covenants, and the potential costs of enforcement may similarly dissuade lenders from actively monitoring covenants addressing environmental credit risk.[80] And again, financing may be structured to shift the financial risk of noncompliance to another creditor, even if the terms of the debt give the initial lender the power to monitor environmental risk.[81]

Beyond these constraints, another widely recognized limit on bank monitoring of environmental risk is lender access to reliable information.[82] The borrower itself may provide information on environmental risk or compliance, but banks typically rely on public data from regulators, such as environmental enforcement authorities, because of concerns about the reliability of self-reported data.[83] Direct environmental due diligence can be more costly than traditional creditworthiness assessments because of the diffuse nature of the information and the need to obtain outside expertise if the bank lacks the capacity to assess environmental credit risk internally.[84] China's recent reforms provide an opportunity to assess the potential for lender monitoring in light of these challenges.

78. *See also* Tung, *supra* note 17, at 141–44, 151–52. *See also supra* note 43 and accompanying text.

79. *See* Tung, *supra* note 17, at 133–34, 144, 150–51.

80. A report by the UNPRI observes that "defaults resulting purely from environmental and social issues are virtually unheard of." UNPRI, *supra* note 62, at 10.

81. Tung, *supra* note 17, at 162–67 (discussing risk transfer and credit derivatives).

82. *See* G20 Green Finance Study Group, *supra* note 3, at 14–15 (noting the difficulty of using public environmental data for financial analysis).

83. *See id.* at 12. To be sure, much of the information obtainable by regulators, such as emissions data, is also based on self-reporting.

84. For example, data from regulatory agencies is often disaggregated by agency and by indicators; environmental information is often reported on a facility rather than company-wide basis, making financial analysis difficult. *See id.* at 14–15 (noting the high search costs of obtaining public data and aggregating it for financial analysis). *See also* Michael Viscuso, Note, *Scrubbing the Books Green: A Temporal Evaluation of Corporate Environmental Disclosure Requirements,* 32 Del. J. Corp. L. 879, 890–91 (2007) (noting that this kind of data incompatibility has stymied inter-agency cooperation between the EPA and the SEC).

II. China's Green Credit Reforms

Over the past decade, the Chinese government has introduced an array of top-down mechanisms to more clearly define "green" investments, to encourage the development of green financial products, and to create an oversight framework for financial institutions in order to enforce the new policies. These reforms are aligned and driven by the central government's economic development goals, as reflected in China's Twelfth (2011–2015) and Thirteenth (2016–2020) Five-Year Plans, which promote green and low-carbon development.[85] China's international commitments to address climate change are also spurring on these initiatives.[86] In contrast to earlier periods, China's central government is now looking to banks themselves rather than to state agencies to redirect capital to green investments and reduce corporate environmental impacts.[87]

These policies impose tighter regulatory oversight of financial institutions and specifically direct them to undertake environmental due diligence and monitoring of their clients' and prospective clients' environmental risk. China's bank regulator, the China Banking and Insurance Regulatory Commission (CBIRC) (prior to 2018, the China Banking Regulatory Commission (CBRC)), and China's central bank, the People's Bank of China (PBOC), are the two primary regulators with authority to establish green finance standards for financial institutions. Until 2018, China's National Development and Reform Commission (NDRC) was responsible for implementing national development policy and China's response to climate change.[88] It adopted standards for energy efficiency credit and for green bonds, and partnered with the CBRC, China's Ministry of Environmental Protection (MEP), and other agencies in issuing green finance guidance.[89] The MEP's successor, the Ministry of Ecology and Environment (MEE), assumed responsibility for China's climate change policies from the NDRC in 2018.[90] Guidance and voluntary standards cre-

85. *See generally* COMMUNIST PARTY OF CHINA, THE THIRTEENTH FIVE-YEAR PLAN FOR ECONOMIC & SOCIAL DEVELOPMENT OF THE PEOPLE'S REPUBLIC CHINA: 2016–2020 (中华人民共和国经济和社会发展第十三个五年规划纲要) (Compilation & Translation Bureau, Cent. Comm. of the Communist Party of China trans., 2016), http://en.ndrc.gov.cn/newsrelease/201612/P020161207645765233498.pdf [https://perma.cc/CT64-YEGZ].

86. *See generally* NDRC, CHINA'S POLICIES AND ACTIONS FOR ADDRESSING CLIMATE CHANGE (2017).

87. All of the banks in this study that report green credit loan volumes are also required to quantify the environmental benefits associated with these loans. *See* CBRC 2015 REPORT, *supra* note 9, at 76 and accompanying text.

88. Under reforms of administrative agencies under the State Council introduced in 2018, the NDRC's climate response functions have been merged under the new Ministry of Ecology and Environment, formerly the MEP. Xu Lingui, Lyu Qiuping & Chen Yongrong, *China Unveils Restructuring Plan*, XINHUA (Mar. 13, 2018), http://www.xinhuanet.com/english/2018-03/13/c_137036855.htm [https://perma.cc/FZB9-5VB7].

89. *See, e.g.*, CBRC & NDRC, NOTICE ON ISSUING THE ENERGY EFFICIENCY CREDIT GUIDELINES (关于印发能效信贷指引的通知), No. 2, Jan. 13, 2015; NDRC, GUIDANCE ON GREEN BOND ISSUANCE (绿色债发行指引), No. 3504, Dec. 31, 2015.

90. *See* Xu et al, *supra* note 88.

ated by international and domestic organizations—including the China Banking Association, other trade associations, and NGOs—also influence green credit standards and practice.[91] The following discussion introduces the context of Chinese bank reform and basic green credit policy framework.

A. Banking Reform & Creditor Power

Until relatively recently, Chinese banks were not well-motivated to undertake market-based credit risk assessments of their borrowers or to engage in ongoing monitoring. Chinese banks were entirely state-owned, as were many of their clients.[92] Because the state itself ultimately bore the risk of default and would support banks that held bad debt, there was little reason for banks to develop the ability to evaluate credit risk independently.[93] Historically, the state also imposed strict constraints on interest rates, so banks had little ability to raise interest rates for riskier borrowers.[94]

Over the past decade, however, the central government has initiated sweeping reforms of bank regulation to enable Chinese banks to compete globally, to expand access to capital domestically, and to transition banks to a market-based model. In the early 2000s, the Chinese government began to encourage banks to attract foreign investment and to improve their risk management and corporate governance by listing their shares.[95] As Appendix A indicates, nearly all of the banks included in this study are now publicly traded in mainland China and on the Hong Kong Stock Exchange, and retain international accounting firms as their auditors. As a result, they are now increasingly subject to external market pressure from investors and stock exchange regulation. As of 2016, banks listed in Hong Kong must also publish ESG reports that include disclosures on their environmental practices, and are encouraged to adopt international reporting

91. Corporate social responsibility guidelines for the banking sector have been introduced by the CBRC and the China Banking Association. *See* CBRC, OPINION ON STRENGTHENING THE SOCIAL RESPONSIBILITY OF THE BANKING SECTOR AND FINANCIAL INSTITUTIONS (中国银行监督会关于加强银行业金融机构社会责任的意见), No. 252, Dec. 5, 2017; CHINA BANKING ASS'N, CORPORATE SOCIAL RESPONSIBILITY GUIDANCE FOR FINANCIAL INSTITUTIONS (中国银行业金融机构企业社会责任指引), Jan. 12, 2009. NGOs who monitor the environmental impact of financial institutions include BankTrack and the World Wildlife Federation. See examples in Yunwen Bai, et al., *The Role of China's Banking Sector in Providing Green Finance,* 90 DUKE ENVTL. L. & POL'Y F. 89, 125–37 (2013).

92. *See* JAMES STENT, CHINA'S BANKING TRANSFORMATION: THE UNTOLD STORY 6–10, 66–93 (2017) (tracing the evolution of the Chinese banking sector). China's "Big Four" state banks first listed as publicly traded companies between 2003 and 2008. *Id.* at 87.

93. *See id.* at 72–73, 76–78 (describing Chinese banks in the 1990s as bursars of the state).

94. *See* YONG TAN, PERFORMANCE, RISK AND COMPETITION IN THE CHINESE BANKING INDUSTRY 7–36 (2014) (discussing this history). *See also* Yuyang Tan et al., *Completing China's Interest Rate Liberalization,* 24 CHINA & WORLD ECON. 1, 10–11 (2016) (identifying primary reforms between 2012 and 2015).

95. *See* TAN, *supra* note 94, at 16–17.

standards for these disclosures.[96]

Since the mid-2000s, banks have also been required to establish internal controls, risk management functions, and other corporate governance reforms, and to meet capital adequacy requirements.[97] In addition, banks must now regularly report to the CBIRC on their efforts to restructure nonperforming loans (NPLs), their implementation of these internal governance and risk management requirements, and other aspects of financial performance.[98] All of these requirements are modeled after international standards.[99]

Other reforms in the mid-2000s modernized the legal framework of commercial law in China, refining rules for secured lending and shoring up creditor remedies. Most notably, China's Property Law[100] and its Enterprise Bankruptcy Law[101] came into force in 2007, around the time China's earliest green finance policies took shape. These key reforms put in place new rules for secured lending, bankruptcy, and foreclosure that were informed by international best practice, improving creditor protections and streamlining procedures for filing and enforcing liens, accessing debtor credit records, and the like.[102] With this foundation, the contrac-

96. *See generally* HONG KONG STOCK EXCH., *Main Board Listing Rules*, app. 27; *GEM Board Listing Rules*, app. 20.

97. *See* Nicholas C. Howson, *China's Restructured Commercial Banks: Nomenklatura Accountability Serving Corporate Governance Reform?*, *in* CHINA'S EMERGING FINANCIAL MARKETS: CHALLENGES AND GLOBAL IMPACT 123, 123–30 (Zhu Min et al., eds., 2009) (surveying reforms in the early- to mid-2000s). *See also infra* Section II.B (describing these requirements).

98. *See, e.g.*, CBRC 2016 REPORT, *supra* note 8, at 138, 145 (reporting on bank transparency policies).

99. *See* STENT, *supra* note 92, at 20–21, 125–49 (explaining how Chinese banks adopted their technical capacity and internal structures based on Western models and with the assistance of international financial institutions and foreign investors). *See also* IMF, PEOPLE'S REPUBLIC OF CHINA: DETAILED ASSESSMENT OF OBSERVANCE OF BASEL CORE PRINCIPLES FOR EFFECTIVE BANKING SUPERVISION, REPORT NO. 17/403 10–11 (2017) (assessing the state of risk management, accounting, and oversight of the Chinese banking sector against international standards as of 2017).

100. ZHONGHUA RENMIN GONGHEGUO WUQUAN FA (中华人民共和国物权法) [PEOPLE'S REPUBLIC OF CHINA, PROPERTY LAW] (promulgated by the Nat'l People's Cong., Mar. 16, 2007, effective Oct. 1, 2007) (incorporating provisions of China's 1995 Security Law governing secured lending).

101. ZHONGHUA RENMIN GONGHEGUO QIYE POCHAN FA (中华人民共和国企业破产法) [PEOPLE'S REPUBLIC OF CHINA, ENTERPRISE BANKRUPTCY LAW] (promulgated by the Standing Comm. Nat'l People's Cong., Aug. 27, 2006, effective June 1, 2007).

102. *See* IMF, PEOPLE'S REPUBLIC OF CHINA: DETAILED ASSESSMENT REPORT: BASEL CORE PRINCIPLES FOR EFFECTIVE BANKING SUPERVISION, NO. 12/78 8–9 (2012) (providing an overview of the legal and regulatory framework of the banking sector). *See also* IFC, SECURED TRANSACTIONS ADVISORY PROJECT IN CHINA (2012), https://www.ifc.org/wps/wcm/connect/5a98b5804aebf045904cfa888d4159f8/Secured+Transactions+Project+n+China+Notes.pdf?MOD=AJPERES [https://perma.cc/V4U6-4WHG] (discussing the IFC's contribution to these reforms). For an overview of secured lending practices, creditor remedies, and the availability of judicial enforcement under the PRC Property Law, the PRC Bankruptcy Law, and related regulations, see Jack Wang & Stanley Zhou, *Lending & Secured Finance – China*, *in* INTERNATIONAL COMPARATIVE LEGAL GUIDES [ICLG], THE ICLG TO LENDING & SECURED FINANCE 2018 (6th ed. 2018), https://iclg.com/prac-

tual tools outlined above that empower creditors to monitor corporate borrowers are available to Chinese banks.

None of these important reforms have substantially altered the state's controlling position or influence in the corporate governance of most Chinese banks. The state remains the controlling shareholder for all of China's "Big Five" banks—the Bank of China (BOC), the Construction Bank of China (CBC), the Agricultural Bank of China (ABC), the Industrial and Commercial Bank of China (ICBC), and the Bank of Communications (BOC)—and is the largest shareholder of all but three of the top-tier joint-stock commercial banks through the Ministry of Finance and its holding company, Central Huijin Company.[103] The Chinese Communist Party's internal appointment system governs key personnel appointments.[104] State-owned enterprises (SOEs) are also the core clients for China's largest banks,[105] and the full extent of state support or distressed SOE borrowers is not transparent. The embedded institutional position of Chinese banks and their largest clients reduces banks' ability and incentives to monitor and price risk even as it increases their responsiveness to state policy priorities.

Another important part of the context for green finance reform is that Chinese banks also find themselves in a climate of increased competition and economic pressure, amid concerns about rising levels of NPLs and the overall stability of the Chinese banking system. In order to increase access to capital, China has expanded the number of commercial banks and other financial institutions, including, by authorizing the entry of foreign financial institutions and, since 2015, by establishing private banks.[106] In 2013, China also took initial steps to liberalize interest rates, which, as commentators observe, has pushed banks to "sharpen their ability to price loans commensurate with risk."[107] With interest rate liberalization and heightened competition, banks' interest rate margins and other key measures of profitability have declined from 2013 levels.[108] On balance, tighter competition reduces banks' ability to charge higher interest rates for investments with higher environmental risk and their willingness to

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tice-areas/lending-and-secured-finance-laws-and-regulations/china [https://perma.cc/5Y8E-HVL6].

103. Minsheng Bank, PingAn Bank, and Zheshang Bank are the three exceptions. STENT, *supra* note 92, at 156. *See also* Curtis Milhaupt & Li-Wen Lin, *We Are the (National) Champions*, 65 STAN. L. REV. 697 (2013) (exploring the state's pervasive influence within and beyond the state sector).

104. *See generally* Howson, *supra* note 97.

105. NICHOLAS R. LARDY, MARKETS OVER MAO: THE RISE OF PRIVATE BUSINESSES IN CHINA 103–12 (2014) (citing evidence that as of 2012, state-sector credit accounted for about half of all commercial lending and credit to the private sector at 30–44%).

106. *See* CBRC 2015 REPORT, *supra* note 9, at 25–26, 43–44 (highlighting a private bank pilot program and related policies).

107. TAN, *supra* note 94, at 180–81; STENT, *supra* note 92, at 57–58, 233–35 (discussing the impact of interest rate liberalization). Interest rate liberalization was also intended to increase bank liquidity and expand access to capital. *See* IMF, THE PEOPLE'S REPUBLIC OF CHINA: SELECTED ISSUES, COUNTRY REP., NO. 16/271 14 (2016).

108. KPMG, MAINLAND CHINA BANKING SURVEY 5–6 (2017) (reporting a decline in average net interest margins for five commercial banks from 2.6% in 2012 to 2.1% in 2016).

expend resources on due diligence and post-loan monitoring.[109] Tougher regulations and enforcement policies rolled out by the CBRC in 2017 suggest that banks have responded to the competitive environment by taking on more risk rather than less.[110] In addition, poor corporate governance practices, the proliferation of complex financial products, and greater financial intermediation—all of which are practices targeted by the CBRC's 2017 crackdown—also weaken banks' ability to play a monitoring role.[111] Evidence of how banks included in this study are implementing green credit reform and responding to these pressures is discussed in Part III below.

B. Green Finance 1.0

Although China's green finance reforms have their roots in administrative guidance issued in the 1990s,[112] current initiatives trace most directly to the mid-2000s, which saw the introduction of policies to promote a "harmonious society" and to address the environmental impact of China's breakneck development. Core policies which the State Environmental Protection Agency (SEPA)—predecessor to the MEE—introduced in 2006 and 2007, in cooperation with the CBRC and the PBOC, represent the first phase of China's green finance reforms. During this period, a number of Chinese commercial banks, including China Industrial Bank (CIB) and Shanghai Pudong Development Bank (SPDB), received financial backing and technical assistance on green finance from the IFC and other international financial institutions.[113]

In 2007, SEPA, the CBRC, and the PBOC jointly issued the first green credit policies directed at improving the environmental oversight of banks.[114] The 2007 guidance on environmental protection and credit risk directed banks to incorporate environmental due diligence into credit management to ensure projects' compliance with environmental regulations

109. *See* Tung, *supra* note 17, at 161–69 (discussing the effect of competition on lender monitoring).

110. *See* Chen Yun et al., *CBRC's New Supervisory Storm Is Here– Implications for Foreign Banks in China*, China Law Insight (Apr. 13, 2017), https://www.chinalawinsight.com/2017/04/articles/finance/cbrcs-new-supervisory-storm-is-here-implications-for-foreign-banks-in-china/(detailing the goals of eight notices released in July 2017).

111. *See id.* (describing the targeted practices).

112. *See* Aizawa & Yang, *supra* note 23, at 126 (discussing the PBOC's initial *Notice on Implementing Credit Policies and Enhancing Environmental Protection,* issued in 1995). This notice urged banks to "implement national environmental protection policy in credit activities." Zhang et al., *supra* note 8, at 1321.

113. *See also infra* Part III.B.6 (discussing international influence on green credit implementation).

114. SEPA, CBRC & PBOC, Opinions on Implementing Environmental Protection Policies and Rules and Preventing Credit Risks (关于落实环保政策法规防范信贷风险的意见), No. 108, July 12, 2007. *See also* Hu Mengze & Li Wei, *A Comparative Study on Environment Credit Risk Management of Commercial Banks in the Asia-Pacific Region*, 24 Bus. Strat. Env't. 159, 171 (2015) (noting that the measures require banks "to adhere to the 'one ticket veto' principle for clients who fail to fulfil environmental requirements or standards); Aizawa & Yang, *supra* note 23, at 125 (describing the purpose of the measures).

and industrial policies and to redirect financing away from polluting sectors and toward those with better environmental performance. They also imposed responsibility on financial institutions for violations of the guidance.[115] In order to facilitate legal compliance review as contemplated by the 2007 measures, the MEP established a database on companies' environmental violations and introduced a process for information sharing between local environmental authorities and banks.[116] And in 2008, the Shenzhen and Shanghai stock exchanges introduced guidance and, in the case of Shanghai, requirements for environmental disclosure by listed companies.[117]

One of the challenges in implementing green credit reforms is that they were introduced at a time when the basic infrastructure for credit risk assessment by financial institutions was still not fully formed.[118] The PBOC first established a credit reference center to serve as the source of consumer and commercial credit reporting for Chinese companies and individuals only in 2006.[119] In 2007, the CBRC adopted standard requirements for the content of information disclosure in commercial banks' annual financial reports, including disclosure on risk management policies and procedures.[120] Between 2006 and 2009, the CBRC also introduced the first guidance for commercial banks on basic risk management.[121] Together, these measures require the development of risk assessment and risk management policies and procedures, internal controls and audit systems, external disclosure to the CBRC of major risk events, and CBRC oversight of financial institutions' implementation and reporting. They also urge the integration of reputational risk—which could include risk related to environmental impacts—into corporate governance and the bank's com-

115. SEPA et al., *supra* note 114.

116. Mengze & Wei, *supra* note 114, at 171. This system is still evolving. *See id.* at 167.

117. MEP & CSRC, GREEN SECURITIES POLICY (国家环境保护总局关于加强上市公司环境保护监督管理工作的指导意见), No. 24, Feb. 25, 2008. *See generally* Hua Wang & David Bernell, *Environmental Disclosure in China: An Examination of the Green Securities Policy,* 22 J. ENV'T. & DEV. 339 (2013) (reviewing these disclosure requirements and assessing their effectiveness).

118. *See* STENT, *supra* note 92, at 93–95 (discussing the author's experience at Minsheng Bank and Everbright Bank in the mid-2000s).

119. *See* CREDIT REFERENCE CENTER, PBOC, *"Overview,"* http://www.pbccrc.org.cn/crc/zxgk/index_list_list.shtml [https://perma.cc/CGW4-KEF3].

120. CBRC, MEASURES FOR THE INFORMATION DISCLOSURE OF COMMERCIAL BANKS (商业银行信息披绿办法), No. 7, July 3, 2007.

121. *See* CBRC, GUIDELINES FOR THE COMPLIANCE RISK MANAGEMENT OF COMMERCIAL BANKS (商业银行规风险管理指引), No. 76, Oct. 25, 2006, art. 10, 29 (requiring the board to establish risk management and audit committees under its supervision for compliance management); CBRC, NOTICE OF THE CHINA BANKING REGULATORY COMMISSION ON ISSUING THE GUIDELINES ON THE OPERATIONAL RISK MANAGEMENT OF COMMERCIAL BANKS (中国银监会关于印发《商业银行操作风险管理指引》), No. 42, May 14, 2007; CBRC, NOTICE OF THE CHINA BANKING REGULATORY COMMISSION ON ISSUING THE GUIDELINES ON THE REPUTATIONAL RISK MANAGEMENT OF COMMERCIAL BANKS (中国银监会关于印发《商业银行声誉风险管理指引》), No. 82, Aug. 25, 2009.

prehensive risk management system.[122] The internal processes these rules envision are an essential foundation for any effective credit risk management system, but the fact that they are of a relatively recent vintage limits the potential pace of environmental credit risk management and green credit implementation.

A number of studies have already explored the implementation of this first phase of China's green credit reforms. One study, published in 2011 by Zhang et al., looked at commercial banks' self-reported incentives to implement green credit policy.[123] The study found that market incentives mattered more than state directives—banks that saw green credit as an opportunity to expand their customer base or improve their brand recognition or reputation embraced green credit more enthusiastically than banks who simply responded to the new guidance.[124] According to a report by the IFC, which has advised many Chinese banks on implementation of the 2007 policies, the guidance did motivate banks to begin to develop environmental and social risk management systems and "to integrate [these] considerations into credit decision-making and management."[125] However, because the 2007 measures were issued as administrative guidance, which has a relatively low degree of authority, many banks did not feel compelled to implement them.[126] The IFC report also notes that "[l]ack of environmental information, incomplete supporting policies and laws, unclear implementation standards for different industries, and local protectionism [were among] the major barriers in the promotion of green credit policy" during this period.[127]

C. 2012 Green Credit Guidelines

The foundation of green credit bank practice at present is the Green Credit Guidelines issued by the CBRC in 2012, which build on the earlier green finance measures and are designed specifically to aid banks in allocating capital toward firms and projects with better environmental and social risk management.[128] The Guidelines urge lending institutions to promote green credit in order to improve resource efficiency and serve the real economy.[129] They also encourage financial institutions to adopt risk

122. *See generally* CBRC, Reputational Risk Management Notice (中国银监会关于)印发《商业银行声誉风险管理指引》的通知), No. 82, Aug. 25, 2009.

123. *See* Zhang et al., *supra* note 8 (surveying 500 branches of 12 banks in Jiangsu Province).

124. *See id.* at 1324, 1326.

125. *See* IFC, IFC's Role in China's Financial Sector Transformation 34 (2012). Because of the IFC's role as an investor or consultant to CIB, SPDB, and other Chinese banks, the IFC's Environmental and Social Standards, which underpin the Equator Principles, have informed these banks' development of the environmental and social risk management systems required under the 2007 green credit policies. *See id.* at 33–34.

126. *See* Zhang et al., *supra* note 8, at 1323, 1326.

127. *See id.* at 1322 (identifying similar challenges). *See also* IFC, *supra* note 125, at 33–34, and sources cited therein.

128. *See* Green Credit Guidelines, *supra* note 15, art. 19.

129. *Id.* at pmbl. *See also* CBRC, Guiding Opinions on Banking Industry Serving the Real Economy (2013).

management across all stages of the lending process and to comprehensively "identify, measure, monitor and control environmental and social risks."[130] The Guidelines were developed in consultation with the IFC and with some of the banks who are considered leaders in green finance, developed the Guidelines, incorporating the experience they have accumulated since the mid-2000s.[131]

An important contribution of the Guidelines is that they help to define green credit more consistently. Under the Guidelines, green credit is the extension of credit by financial institutions to firms based on a creditworthiness assessment that incorporates an evaluation of the environmental and social risk associated with the borrower.[132] Lenders may also establish environmental and social criteria for the use of the loan proceeds.[133] In contrast to definitions of environmental and social risk that focus only on the financial risks to the firm and its shareholders,[134] the Guidelines define environmental (and social) risks in terms of the negative impacts of bank clients and their affiliates on a range of stakeholders.[135]

The Guidelines urge financial institutions to adopt sound governance and internal management, and to ensure that capital allocation is based on environmental and social credit risk assessments.[136] They also contemplate a monitoring role for financial institutions. Under the Guidelines, banks must take steps to identify clients "with major environmental and social risks" and to establish separate credit approval guidelines "for restricted industries under state regulation and industries with major environmental and social risks."[137] Most critically, the Guidelines prohibit issuing credit to clients that "fail to comply with the relevant regulations on environmental and social performance."[138] Under the Guidelines, each bank has the flexibility to set its own strategies, policies, and internal oversight standards, including its own environmental and social risk appraisal

130. *See* GREEN CREDIT GUIDELINES, *supra* note 15, art. 4.

131. Interview with branch Chief Executive Officer, Bank C, in Hong Kong (July 4, 2016); interview with green finance consultant, IFC, in Beijing (July 2017).

132. The Guidelines apply to "banking financial institutions," which includes "policy banks, commercial banks, rural cooperative banks, and rural credit cooperatives." GREEN CREDIT GUIDELINES, *supra* note 15, art. 2.

133. *Id.* art. 3–4.

134. For example, the U.S. Securities and Exchange Commission (SEC)'s 2010 guidance on climate-related risk defines it only in terms of the potential financial impact on the company. Commission Guidance Regarding Disclosure Related to Climate Change, Exchange Act Release No. 33-9106, 75 Fed. Reg. 6290 (Feb. 8, 2010).

135. GREEN CREDIT GUIDELINES, *supra* note 15, art. 4 ("[E]nvironmental and social risks . . . means the possible harm and relevant risks that may be caused to the environment and society in the construction, production, and business operations of [bank clients] and the important affiliates of such clients (重要关联方), including environmental and social issues relating to energy consumption, pollution, land, health, safety, migrant relocation, ecological protection, and climate change.").

136. *Id.* art. 19 (urging financial institutions to "regard a client's management of environmental and social risks as an important basis for determining the allocation of credit funds").

137. *Id.* art. 10–11. The CBRC provided additional guidance in its 2014 Audit Standards, discussed *infra* note 148 and accompanying text, which identifies these sectors.

138. GREEN CREDIT GUIDELINES, *supra* note 15, art. 17.

standards.[139]

The Guidelines contemplate that lenders will also incorporate environmental and social analysis into post-loan monitoring and due diligence, at least for projects that present a major environmental and social risk.[140] Article 18 of the Guidelines explicitly directs banks to utilize contractual covenants to "strengthen [clients'] environmental and social risk management" and to require borrowers that present significant risks "to submit environmental and social risk reports," and to make representations and warranties regarding their environmental and social risk management and improvement. Because financial institutions may lack the capacity to effectively assess and monitor these risks, the Guidelines give banks the option to outsource client environmental and social risk auditing to third parties.[141] At the same time, the Guidelines encourage banks to identify guarantors and other third parties who can share the environmental and social risk associated with a project.[142]

Finally, the Guidelines empower banks to impose explicit remedies for breach of environmental risk management and to require additional risk mitigation measures for clients the banks identify as presenting "major environmental and social risks."[143] They also encourage greater transparency from lenders themselves regarding their own environmental and social risk, their implementation of the Green Credit Guidelines,[144] and "the impact of credit granting involving major environmental and social risks."[145] Although not formally required in the Guidelines, a Green Credit Statistical System (GCSS) established in 2013[146] and green credit audit standards, discussed below, require all twenty-one banks in this study to report annually to the CBIRC on their implementation of the Guidelines and the level of green credit lending they provide.[147]

D. Green Finance 2.0

Between 2014 and 2016, financial regulators introduced a new second-generation green finance framework that reinforced the 2012 Guidelines and signaled the central government's strong policy support for green credit. These policies were spurred on by China's Thirteenth Five-Year Plan (2016–2020)—which explicitly requires the establishment of a green

139. *Id.* art. 11. Article 15 also permits financial institutions to define the scope of their own due diligence and credit risk assessments and determine whether third-party expertise is necessary to help evaluate environmental and social risk. *Id.* art. 15.

140. *Id.* art. 20.

141. *Id.* art. 14.

142. *See id.* art. 15.

143. *Id.* art. 10–11 (requiring banks to "classify . . . environmental and social risks," use them as the basis for credit ratings, loan pricing, lending determinations, and risk management, and to require high-risk clients to undertake risk mitigation measures).

144. *See id.* ch. V (on internal control management and information disclosure); *id.* art. 25–28 (on implementation).

145. *Id.* art. 24.

146. *See supra* note 12 and sources cited therein.

147. CBRC 2016 REPORT, *supra* note 8, at 59; *see also supra* note 11 and sources cited therein including notes on the Green Credit Statistics System.

financial system and includes proposals to develop a green bond market, green credit policies, and green development funds.[148]

While the contours of the framework itself did not emerge until 2015 and 2016, an important foundational component with respect to green credit appeared in 2014, when the then-CBRC introduced its 2014 Green Credit Implementation Key Audit Standards to guide banks in applying the 2012 Green Credit Guidelines and to establish key performance indicators for green credit.[149] As departmental guidance, the regulatory authority of the 2012 Guidelines, like earlier sustainable finance policies, is relatively low—they are soft standards rather than clear mandates. However, the 2014 Audit Standards allow the CBIRC to assess bank compliance with the Guidelines and are expected to ground more formal evaluation of bank implementation in the near future.[150] The 2014 Audit Standards apply to all CBIRC offices and to policy banks, state-owned commercial banks (SOCBs), joint-stock commercial banks, and the Postal Savings Bank. All of these institutions must conduct annual self-audits and submit an annual audit report to the CBIRC, indicating the degree to which they comply with each of the standards.[151]

The Audit Standards are extremely detailed, with over eighty indicators ranging from the role of the bank's board of directors in setting green credit targets and overseeing green credit implementation, to measures for how well the bank assesses its client's legal compliance and environmental and social risk in the initial credit assessment and post-issuance.[152] Other indicators measure how well the bank monitors covenants in the loan agreement pertaining to borrowers' environmental and social risk management, and rate the bank's own transparency and self-audit practices. Banks must indicate their level of compliance on a four-point scale. Nine additional quantitative indicators ask banks to report their total green credit loan volume and what I refer to here as "black credit"—loans to firms in nineteen sectors with either high pollution, high resource consumption, or overcapacity (i.e. "two high, one overcapacity" sectors), such as petrochemicals, heavy industry, and certain processing facilities.[153] Because banks are expected to use contractual covenants as the basis of environ-

148. THIRTEENTH FIVE-YEAR PLAN, *supra* note 85, ch. 48 § 1.

149. CBRC, GREEN CREDIT IMPLEMENTATION KEY AUDIT STANDARDS (绿色信贷实施情况关键评价指标) No. 186, June 27, 2014 [hereinafter AUDIT STANDARDS]. The Audit Standards cover sixty-three industry sectors. *Id.* at app. I.

150. Interview with senior official, CBRC, in Beijing (July 2017). *See also* Maggie Zhang, "*Green" Financing to be Included in Chinese Banks' Performance Ratings*, S. CHINA MORN. POST, Apr. 8, 2017, at B3 (indicating plans to include green finance measures in the PBOC's macroprudential assessment framework).

151. Interview with senior official, CBRC, *supra* note 150.

152. *See* AUDIT STANDARDS, *supra* note 149, ch. 2-6.

153. *See id.* at app. II-IV (providing a list of the nineteen sectors and their industry code). The list includes, for example, smelting, concrete production, leatherworks and dyed goods, and wood product manufacturing. Appendix II to the Audit Standards includes a list of high-risk project categories that are subject to special rules, and Appendix III includes a basic rating system for banks to use in assessing their level of satisfaction with borrowers' environmental and social risk management practices.

mental credit risk assessments and responses, an appendix to the Audit Standards includes a list of recommended terms that banks are encouraged—though not required—to include in green credit loan agreements or in separate risk management contracts with the borrower.[154] These are reproduced in part in Appendix D to this Article. The recommended terms include various covenants on environmental and social risk management and reporting, as well as provisions that define events of default with regard to those covenants and spell out specific remedies.

Under the Audit Standards, banks must also disclose their green credit policies and strategies, report the loan volume associated with borrowers who have environmental or labor-related compliance breaches, and disclose environmental or social risk incidents if required under any other regulations.[155] Finally, the Audit Standards include optional indicators on which the bank may report, including average carbon emissions and average electricity consumption per employee, gender diversity in management, number of disabled employees, hours of green credit training, and level of engagement with environmental NGOs and other stakeholders.[156] Many of the banks in this study already use these indicators in their 2015 and later sustainability reports.

At the end of 2015, the PBOC, in cooperation with the UNEP-FI, rolled out an initial broad template for green finance policy in a report titled "Establishing China's Green Financial System."[157] It expands on the green finance programs introduced in 2007 to cover fourteen different initiatives: green credit, green listing, carbon trading, and mandatory green insurance programs, as well as plans to develop or expand green ratings, green indices, and mandatory environmental disclosures for listed firms and bond issuers. The report also considers the possibility of new incentives, such as preferential interest rates and eligibility requirements for green credit, to be administered through government finance departments, policy banks, and commercial banks.[158]

The 2015 framework contemplates the possibility of introducing joint and several liability of financial institutions for environmental pollution and other harms caused by projects they fund, in addition to administrative, civil, and even criminal penalties that may apply.[159] The joint and several liability model, which the PBOC patterned in part on the owner-operator liability provisions under CERCLA, is bolstered by the 2015 revisions to the Law on Commercial Banks, which tighten banks' environmental due diligence requirements and require financial institutions to closely monitor environmentally risky projects.[160]

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154. *Id.* at app. V.
155. *Id.* art. 24.
156. *Id.* pt. 2, items 10–17.
157. *See generally* PBOC ET AL., *supra* note 28.
158. *Id.* at 20–21.
159. *See id.* at 34–35.
160. *See* ZHONGHUA RENMIN GONGHEGUO SHANGYE YINHANG FA (中华人民共和国商业银行法) [LAW OF THE PEOPLE'S REPUBLIC OF CHINA ON COMMERCIAL BANKS] (promulgated by the Standing Comm. Nat'l People's Cong., Aug. 29, 2015), art. 1. *See* PBOC ET AL.,

Also in 2015, the NDRC issued "Energy Efficiency Credit Guidelines" to encourage lending for energy efficient projects that establish risk control requirements and are subject to environmental credit risk monitoring.[161] The NDRC Guidelines aim to promote low-carbon development and reduce energy consumption through credit financing.[162] The Guidelines instruct banks to directly monitor funded projects through regular audits of legal compliance and environmental and social risk management of the borrowers, the projects, and any related energy service providers. The Guidelines also expect financial institutions to conduct initial environmental due diligence and appraisal of the "technical risks" and potential savings a project will generate, and to retain third-party auditors for that purpose.[163] Furthermore, the Guidelines contemplate that banks will impose remedies for breach, including requiring additional collateral or remedial action, suspending or terminating the loan, or accelerating the debt.[164] Banks have issued only a limited amount of credit under the NDRC Guidelines to date.[165]

The official roll-out of a definitive next-generation green finance framework came in August 2016, when seven agencies jointly issued new "Guiding Opinions for Establishing the Green Financial System," sending a unified message of backing for green finance policy.[166] The framework outlines central government plans to promote green credit and other elements of the PBOC's 2015 template, including measures to expand the green bond market, promote green development funds, and expand green insurance.[167] The purpose of these measures, like that of their predecessors, is to stimulate China's green development transition by directing capital toward green operations.

The 2016 Guiding Opinions are noteworthy for their policy focus on

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supra note 28, at 34 (proposing amendments to the PRC Commercial Banking Law). Under the proposed measures, plaintiffs would not have a private right of action, but local Environmental Protection Bureaus (EPBs) or the MEE itself would have the right to sue commercial banks for harming the environment.

161. *See* CBRC & NDRC, *supra* note 89, art. 1 (establishing eligibility standards for energy efficient projects, related risk control requirements, and environmental credit risk management). By their terms, the EEC Guidelines apply to all banking institutions approved by the CBRC that conduct "energy efficiency credit business." *Id.* art. 2.

162. *Id.* art. 3–4. The Guidelines make clear that green credit financing for such projects is typically collateralized and repaid from the cash flows generated by the funded project, which may reflect the net cost savings realized from energy efficiency. *See id.* art. 9 (requiring that funded projects generate such funds on a stable and continuous basis).

163. *Id.* art. 8–15 (describing project structure and risk management obligations).

164. *Id.* art. 12, 14.

165. Interview with senior official, NDRC (July 2017).

166. Guiding Opinions of the PBOC, the MOF, the NDRC, and Other Departments on Establishing a Green Financial System (中国人民银行、财政部、发展改革委等关于构建绿色金融体系的指导意见) (promulgated by the Standing Comm. Nat'l People's Cong., Aug. 31, 2016) [hereinafter Green Financial System Guiding Opinions].

167. *Id.* art. 2, 19, 22.

some of the key challenges to green finance.[168] The first is the challenge of effective cross-agency collaboration between environmental and financial regulators at all levels.[169] The 2016 Guiding Opinions also emphasize the need to harness capital markets to serve the real economy,[170] to facilitate efficient market pricing of negative externalities, and to create trading markets to stimulate conservation of water and other natural resources.[171] In recognition of the technical challenges that have limited green credit reforms to date, the 2016 Guiding Opinions acknowledge the weak comparability of the information sources available to financial institutions and reemphasize the need for quantitative environmental and social risk indicators to incorporate into credit risk assessment.[172] Some of these challenges were also the focus of policy experiments in five pilot zones for green finance that China's State Council established in four provinces and in the Xinjiang Uyghur Autonomous Region in June 2017.[173]

Other basic mechanisms that are essential to environmental credit risk assessment, such as environmental cost accounting systems and rating systems for green credit products, are still being developed.[174] For example, although banks may develop their own tools for assessing environmental credit risk, green ratings could facilitate credit risk evaluations for issuers and projects based on "the impact of environmental pollution, the impact to the ecological system, and the sustainable utilization of natural resources."[175] Green ratings could also be used to ground fiscal subsidies or penalties to borrowers, bank interest rate discounts or adjustments to credit and bond financing costs, and eligibility criteria for a range of regulatory incentives.[176] Two Chinese credit rating agencies are working to develop these tools,[177] and both are signatories of the U.N. Principles for

168. Many of these limits have been highlighted in prior surveys by the PBOC and various reports of the Green Finance Working Group. They also emerge from the sources consulted in this study. *See infra* Part III.

169. *See* GREEN FINANCIAL SYSTEM GUIDING OPINIONS, *supra* note 166, art. 19, 26 (emphasizing cross-departmental collaboration throughout, as well as the need for public-private partnerships).

170. *Id.* at pmbl.

171. *Id.* art. 9, 26.

172. *Id.* art. 4, 9–11, 32–33.

173. *See China to Set up Pilot Zones for Green Finance, Cut Red Tape for Industries*, XINHUA (June 14, 2017), http://www.xinhuanet.com/english/2017-06/14/c_136366005.htm [https://perma.cc/7ZPJ-3FCR]. The four provinces are Guangdong, Guizhou, Jiangxi, and Zhejiang. *See id.*

174. *See* PBOC ET AL., ESTABLISHING CHINA'S GREEN FINANCIAL SYSTEM: DETAILED RECOMMENDATIONS 10: DEVELOP ENVIRONMENTAL COST ANALYSIS 2, 4 (2015), https://drive.google.com/file/d/0B1GFkVHt5UUeSWZEZTMybk1zb1E/view (recommending development of environmental cost accounting systems to facilitate comparability of reporting and disclosure).

175. PBOC ET AL., ESTABLISHING CHINA'S GREEN FINANCIAL SYSTEM: DETAILED RECOMMENDATIONS 8: ESTABLISH A GREEN RATING SYSTEM 2 (2015), https://drive.google.com/file/d/0B1GFkVHt5UUeMmlrajNxS3hyYlE/view (identifying sub-indicators).

176. *Id.* at 2, 4. Green credit ratings could also be made available to NGOs and other public stakeholders. *Id.* at 4.

177. *Id.* (designating Dagong Global Credit Rating Co. and China Cheng Xin International Rating Co (CCXI) as the first credit rating agencies to take the lead).

Responsible Investment's voluntary statement on ESG Credit Ratings.[178]

E. Green Bonds & Green Credit

Although a full discussion of publicly traded "green" debt instruments is beyond the scope of this Article, a key part of China's green finance reforms—its emerging green bond market—is also directly impacting standards for green credit, as well as the Chinese banking system's capacity for green finance. Green bonds are "any type of bond instruments where the proceeds will be exclusively applied to finance or re-finance . . . projects and activities that will promote progress on environmental[ ] sustainab[ility]."[179]

Initially issued largely by international financial institutions, such as the World Bank and the Asian Development Bank (ADB), as well as by sovereign wealth funds, the volume of global green bonds is rapidly rising, and China is now one of the world's leaders in volume of green bonds issued.[180] Green bonds issued by Chinese financial institutions have met high demand from investors.[181] Seven of the banks in this study, including the CIB, ICBC, and SPDB, have issued green bonds since 2015, when the ABC issued the first RMB-denominated green bond on the London Stock Exchange.[182] Commercial banks, such as the BOC and ICBC, account for most of China's green bond volume, and the policy banks' corporate bonds and offerings make up the balance.[183]

Green bonds are an important emerging source of capital for corporate green credit lending. Like most other corporate loans, banks currently extend green credit primarily from deposited funds.[184] However, bank representatives, officials, and green bond certification providers interviewed for this study expect that green bonds will become an increasingly

178. *See* UNPRI, *Statement on ESG in Credit Ratings*, https://www.unpri.org/credit-ratings/statement-on-esg-in-credit-ratings/77.article [https://perma.cc/AM34-GZCS] (last visited Dec. 20, 2018).

179. INTERNATIONAL CAPITAL MARKET ASSOCIATION, GREEN BOND PRINCIPLES 2015—VOLUNTARY GUIDELINES FOR ISSUING GREEN BONDS 2 (2015), https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/GBP_2015_27-March.pdf [https://perma.cc/F6A7-VP6E]. This definition is adopted in the International Capital Market Association's Green Bond Principles (2015), which are the leading international green bond framework. They establish voluntary project selection, management, and reporting guidelines for green bond markets.

180. CLIMATE BONDS INITIATIVE & CHINA CENT. DEP. CLEARING CO., CHINA GREEN BONDS MARKET 2017 2, 4 (2018) [hereinafter CHINA GREEN BONDS] (indicating that China is second only to the United States in all green bonds issued worldwide).

181. As early as January of 2016, the SPDB and the CIB had issued green bonds that were oversubscribed. *See* KPMG, MAINLAND CHINA BANKING SURVEY 2016 59, https://assets.kpmg.com/content/dam/kpmg/cn/pdf/en/2016/09/mainland-china-banking-survey-2016.pdf [https://perma.cc/XFK5-JMUV].

182. CBRC 2015 REPORT, *supra* note 9, at 77. The proceeds were required to be invested in green projects in accordance with the Green Bond Principle, and the offering was oversubscribed. *See id.*

183. CHINA GREEN BONDS, *supra* note 180, at 5.

184. Interview with senior official, CBRC, *supra* note 150.

prominent source of green credit funding.[185]

Of particular relevance to the argument here, green bonds not only generate new sources of capital, but also introduce an additional monitoring mechanism, since qualification as a "green bond" means that the proceeds must be applied to designated "green" uses.[186] Although not formally required under current guidelines for Chinese green bond issuers, China's stock exchanges and over-the-counter debt markets all require as a matter of practice that green bond issuers obtain third-party certification pre-issuance that the bond proceeds will qualify as "green."[187]

In 2015, the PBOC and the NDRC introduced separate rules for green bond issuance that define green bonds and provide a process for tracking how bond proceeds are used.[188] The NDRC approves green bond offerings by state-sector firms and large private companies, and the PBOC authorizes green bond offerings by financial institutions. In addition to encouraging government agencies to promote green bond issuance and investment, the rules of both the NDRC and the PBOC encourage the use of third-party review and certification attesting to the use of bond proceeds, the validity of the issuer's environmental policies, and the reliability of the issuer's internal processes for managing allocation of loan proceeds.[189]

In December 2015, the PBOC issued a "Green Bond Endorsed Project Catalogue," which was developed in consultation with four other central-level agencies, domestic and international organizations, including the IFC, and leading financial institutions.[190] The Catalogue, which China's stock exchanges rely on to identify green-eligible projects, directly references leading international standards, including the Green Bond Principles (GBP) and the Climate Bonds Initiative Taxonomy.[191] It provides detailed criteria for six project categories appropriate for funding through the issuance of green bonds, ranging from energy conservation to clean transporta-

185. *Id.* Interview with green bond assurance consultant, Syntao Green Finance, in Beijing (July 2017) [hereinafter Interview with Syntao green bond consultant].

186. Stephen Park, *Investors as Regulators: Green Bonds and the Governance Challenges of the Sustainable Finance Revolution*, 54 STAN. J. INT'L L. 1, 13 (2018).

187. Interview with Syntao green bond consultant, *supra* note 185 (discussing NAFMII's rules). China's National Association of Financial Market Institutional Investors (NAFMII) is a self-regulatory organization that develops rules for the interbank bond market and has established an over-the-counter debt exchange for the interbank market. *See* NAFMII, *About us*, http://www.nafmii.org.cn/english/ [https://perma.cc/RR64-WRMH].

188. *See* PBOC, Announcement of the Administrative Measures for the Issuance of Financial Bonds in the National Inter-Bank Bond Market & Green Bond Endorsed Project Catalogue, No. 39, Dec. 12, 2015; NDRC, *supra* note 89.

189. NDRC, *supra* note 89, at para. 3. KPMG, *supra* note 181, at 62. Green bond issuances typically require a third-party certification as to the green attributes of the bonds, in addition to standard third-party auditor assurances. CLIMATE BONDS INITIATIVE & CHINA CENT. DEP. CLEARING CO., CHINA GREEN BOND MARKET 2016 11 (2017). At present, NDRC approval is based entirely on information provided by the issuer. Interview with senior official, NDRC, *supra* note 89 (citing concerns about the cost of third-party verification).

190. *See* PBOC, *supra* note 188.

191. *Id.*

tion and renewable energy.[192]

Standardization of terms and the emergence of market standards for green bond issuances with the implementation of the 2016 Green Finance Guidelines are already spurring capacity-building within financial institutions and third-party organizations who can provide certifications of green bond use of proceeds. To obtain certification, the assurance provider, typically an international consultant or accounting firm, must confirm that the projects to which bond proceeds will be applied are in accordance with the Green Bond Endorsed Project Catalogue and that they are subject to an appropriate process for management of proceeds, selection of green projects, and transparency requirements. In practice, the assurance provider also assesses whether the projects comply with relevant environmental regulations, have obtained regulatory approval, and are supported by evidence of the environmental benefit they will produce.[193] Issuers may obtain optional post-issuance third-party assurance that the funds have been allocated to their intended purpose and do not present any major environmental risks.[194] To the extent bond proceeds flow through to commercial lending, third-party assurance requirements will continue to inform bank oversight and monitoring practice.

III. Green Credit Implementation

The central government's policy emphasis on expanding green credit raises important questions about whether it will succeed and the extent to which other markets can or should replicate aspects of the Chinese approach. This study sheds light on these questions by looking at trends in green credit lending from the period immediately before the most recent wave of reforms and continuing through the present.

Using a combination of interview data and content analysis of the public disclosures of commercial banks who currently report on green credit lending to the CBIRC, I examine the extent to which China's largest banks have instituted mechanisms to monitor borrowers' environmental credit risk. In some cases, interview data also permits a preliminary look at how banks are actually using these mechanisms and what obstacles they encounter in implementing current green credit policies. Section A introduces the specific research questions posed and describes the study's methodology. Section B presents the findings and analysis, and Section C

192. *Id.* The PBOC and the NDRC's standards are broader than these international green bond standards. They define "green" to include some types of projects, such as clean coal and upgrades to fossil fuel plants that international standards exclude.

193. Interview with Syntao green bond consultant, *supra* note 185. Two types of external review are common for new green bond issues: the first relies on an external organization with environmental expertise, hired by the issuer, to develop an assessment standard to evaluate the green credentials of the debt and then to render an opinion on whether the issue complies with that standard. The second is a third-party verification of the green credentials of the debt based on the Climate Bonds Standard or another model. *See* CHINA GREEN BONDS, *supra* note 180, at 6–7 (describing these two types of assessments).

194. *See id.*

addresses its limitations. Part IV then draws on these findings to make a preliminary assessment and suggests lessons for sustainable finance reform more broadly.

A. Research Questions & Methodology

China's banking sector includes one national development bank, two policy banks, five state-owned commercial banks (SOCBs), twelve joint stock commercial banks, 134 municipal commercial banks, and over 4,000 other financial institutions.[195] Of these, the SOCBs and the joint stock commercial banks, which are listed in Appendix A, account for nearly 60% of all financial assets in the Chinese banking system.[196] Since 2013, the CBRC (as of 2018, the CBIRC) has obtained data on green credit financing and on financing to high polluting and overcapacity sectors from twenty-one banks, which together account for over 80% of all green credit financing.[197] These include seventeen commercial banks (the SOCBs and joint stock commercial banks), China Development Bank (CDB), the two policy banks, and the Postal Savings Bank of China.[198] It should be noted that the CBIRC figures potentially underreport the level of green credit finance, since these twenty-one banks are the only banks that are currently required to report on green credit lending volume to the CBIRC.[199]

This study incorporates all twenty-one banks included in the CBIRC's assessment, which contribute to the total reported green credit volume. These banks represent the top tier of the Chinese banking system. However, because the focus of this analysis is on commercial bank corporate lending, the three policy banks are excluded from much of the analysis since they do not engage in commercial lending, and therefore, do not directly finance commercial green credit. This leaves eighteen banks remaining in the primary sample. Because environmental and social risk management is also an integral part of policy banks' role in development finance, information regarding the policy banks is discussed separately where relevant below.

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195. CBRC 2016 REPORT, *supra* note 8, at 25. On the history of these institutions, see TAN, *supra* note 94, at 17–26.

196. CBRC 2015 REPORT, *supra* note 9, at 26. *See also* Wen Ya (温雅), *China's Banking Industry Green Credit Exceeds 8 Trillion Yuan* (我国银行业绿色信贷余额超8万亿元, XINHUA (June 24, 2016), http://www.xinhuanet.com/fortune/2016-06/24/c_11191081 17.htm [https://perma.cc/M7KR-GFY4] (reporting updated statistics from the CBRC for 2015).

197. CBRC 2016 REPORT, *supra* note 8, at 30. *See also* CBRC NOTES, *supra* note 11, at 115 (listing these banks). The Green Credit Statistics System (GCSS) requires banks to categorize banks to report and categorize green credit loans, and to quantify the environmental benefits they produce. *See id.* (citing two administrative notices of the CBRC from 2013 and 2014 that are the basis of this system).

198. The Postal Savings Bank is a joint stock company that, as of 2016, is publicly traded on the Hong Kong Stock Exchange. Its focus is on serving small and medium commercial clients, rural clients, and those in the agricultural sector. POSTAL SAVINGS BANK, 2016 ANNUAL REPORT 2 (2017).

199. Others are required to report to the CBRC's regional offices. *See* CBRC NOTES, *supra* note 11, at 1.

The particular research questions addressed in this study are as follows:

(i) What is the level of green credit the top Chinese banks issue, and what observations can be made from recent trends?;
(ii) Do banks view green credit and environmental risk assessment as part of their core business model, or do they engage in green credit primarily in support of the government's current development policies?;
(iii) What environmental credit risk policies and practices have banks implemented, and what capacity constraints or other factors impact their ability to monitor borrowers' environmental practices and assess credit risk?;
(iv) To what extent are banks able to spread or shift environmental credit risk?; and
(v) To what extent do international standards influence green credit implementation by Chinese banks?

To answer these questions, this study relies first on a content analysis of the annual reports and sustainability reports of the eighteen banks (i.e. seventeen commercial banks and the Postal Savings Bank) that reported green credit data to the CBRC for fiscal years 2012–2016, other than the policy banks. Annual reports and sustainability reports for earlier years were also obtained, but most banks produced limited and inconsistent data prior to 2012.[200] Data from the 2012–2016 reports were coded and analyzed based on multiple indicators, identified in Section B below, that relate to each of the research questions. Appendix B shows the results of this analysis, together with the number of banks reporting each indicator for the three most recent years (2014–2016).[201] All of the banks included in this sample produce annual financial reports, and sixteen of the banks also produce sustainability reports; Hengfeng Bank is one of the two banks that do not produce a sustainability report, but it includes some information on green credit in its annual report. Banks generally report quantitative data on green finance and descriptions of ECRM processes almost entirely in their sustainability reports.

Investigating how banks assess and price risk of any kind is challenging because financial institutions' client relationships, the details of internal credit assessment policies and models, and data on enforcement of loan covenants are proprietary and not a matter of public record. The content, implementation, and outcomes of risk management policies, credit evaluations, and lending decisions are similarly within the black box of an institution's internal operations. Banks discuss the existence and scope of ECRM systems and offer indications of the priority of environmental risk

200. Two banks in this study—Zheshang Bank and Hengfeng Bank—do not produce sustainability reports, although Hengfeng includes sustainability information in its annual report. Reported results are, therefore, more limited for these banks.

201. The CBRC has encouraged Chinese financial institutions to adopt CSR indicators and to produce regular sustainability reports. *See supra* note 91 and sources cited therein. The China Banking Association (CBA) and the China Trustee Association (CTA) have also adopted their own guidelines for CSR reporting by their membership. *See* CBRC 2015 REPORT, *supra* note 9, at 163–64.

management in their annual reports. But their annual reports do not include detailed information on how the banks implement ECRM policies, nor do banks disclose any information regarding implementation challenges in their public disclosures.

This study fills some of these gaps with insights gleaned from interviews with CBRC and NDRC officials, bank representatives, lawyers, academics, consultants, and representatives of the IFC who have been involved in developing, implementing, or advising on the implementation of China's green finance policies. As indicated in Appendix E, all interviews were conducted between 2016 and 2017 in Hong Kong, Beijing, and Shanghai; bank representatives included managers from four branches and one bank headquarters. The interviewees' areas of responsibility ranged from senior management (including one branch president), to mid-level managers responsible for bank strategy, environmental risk assessment, and direct client relationships. Although most interviewees worked with the SOEs and other large clients typical of top-tier Chinese banks, two worked in departments serving primarily small- and medium-sized enterprise (SME) clients. I also interviewed bank personnel at international banks not included in this study who were familiar with the Chinese context. As is typical in research of this sort, interviewees were identified primarily through personal contacts and so are not intended to reflect a representative sample of similar professionals or banks.

B. Analysis

This Section presents the findings with regard to the research questions identified above. The results of the content analysis of the banks' public reports provide evidence of green credit volume, the priority banks place on green credit and ECRM specifically, and the extent of implementation. Interviews and further documentary research suggest answers to the remaining research questions regarding banks' capacity constraints, limitations, and ability to shift environmental credit risk, as well as the extent to which Chinese banks have adopted international standards.

1. Green Credit Volume

To determine whether Chinese banks are able to implement green credit policies, a basic starting point is the volume of green credit they issue. Green credit is a subset of the corporate loan volume for commercial banks and is measured as a ratio of the total corporate loan balance.[202] Since 2012, the total green credit lending for all Chinese banks has hovered at nearly 10% of their commercial lending volume, as illustrated in Table 1 below. These figures represent an exponential increase over the past dec-

202. The CBRC's annual report appears to report green credit volume as a percentage of total loans, but CBRC officials confirm that these figures are in fact a ratio of green credit corporate loans. Interview with senior official, CBRC, *supra* note 150. These figures are based on the reported green credit balance for a given year rather than the total green credit loan volume (cumulatively) of each bank, which most banks also report.

ade and an average annual increase of over 12% since 2012.[203] As of 2016, the total green credit loan volume for banks in the sample averaged 8.9% of their total corporate loan balance, which is a subset of the banks' total loan volume.[204] In the aggregate, green credit for the commercial banks reporting this data stands at over RMB 3.7 trillion (over USD 530 billion) and accounts for over half of all green credit financed by Chinese banks.[205] China's policy banks and CDB together issue the remainder of reported green credit volume.[206]

The range of variation annually is quite high: at China Construction Bank, green credit accounted for 15% of its total corporate loan volume in 2016, the highest in the sample, as compared to China Minsheng Bank, where green credit was less than 1% of its corporate loan balance in 2015 and 2016.[207] As Table 2 below and Table C-1 in Appendix C indicate, most of the banks whose multi-year data is available reported modest increases in their level of green credit lending over the past three years.

Leaving aside the policy banks, three-quarters (13) of the banks in this study also quantify their level of lending to highly polluting firms or firms in industries identified by the CBIRC as "overcapacity" sectors—in other words, the "two high, one overcapacity" (*lianggao yisheng* 两高一剩") sectors, which I refer to here as "black" loans—during at least one of the reporting years.[208] In 2016, black loans accounted for 3.8% of all corporate loans on average for the banks in this sample. A higher percentage of the banks (58% in 2016) report that they have recalled or denied funding to projects in these sectors in response to recent state policies urging banks to restrict lending to these sectors. According to the CBIRC, credit restrictions to the "two high, one overcapacity" sectors have resulted in restricting RMB 1.8 trillion in financing, with some banks reporting no financing to

203. CBRC Statistics, *supra* note 8 (2013–2017). *See also* CBRC, Annual Reports (various years). In 2007, the total amount of green credit loans was approximately RMB 10.6 billion, as compared to over RMB 7 trillion at the end of 2016. *See* Zhang et al., *supra* note 8, at 1322. Part of this increase may be attributable to a higher rate of reporting or changing definitions of green credit during the period, in addition to increases in green loans disbursed. Banks participating in a syndicated lending arrangement may only count their own contribution to the financing as part of their green credit volume. *See* Interview with senior official, CBRC, *supra* note 150.

204. Although the limited number of banks included in this sample is too small to confirm statistical significance, green credit lending volume does not appear to be correlated with the size of the bank (measured either in terms of total loan volume or total assets). *See* CBRC Statistics, *supra* note 8 (various years).

205. This figure is as compared to the 2016 year-end of approximately RMB 7.5 trillion, which includes green loans by the policy banks. *See* CBRC 2015 Report, *supra* note 9, at 63. Zheshang Bank and Hengfeng Bank do not report their green credit volume.

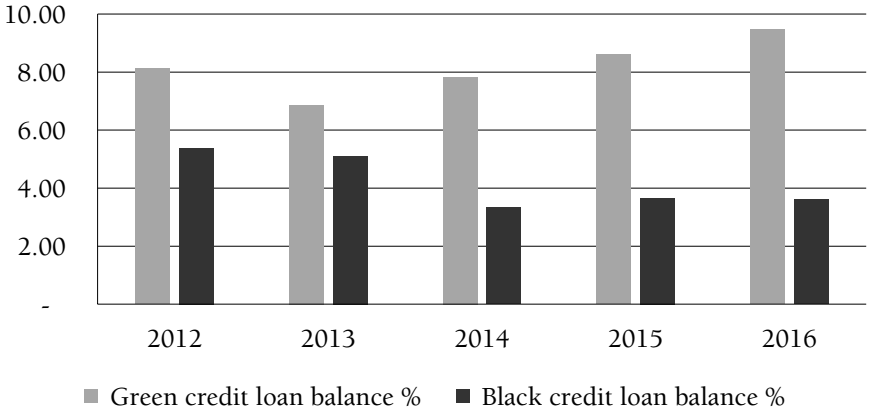
206. In 2016, nearly RMB 1.6 trillion in green credit was issued by China Development Bank (CDB) alone. CDB, 2016 Sustainability Report 53 (2017).

207. China Industrial Bank (CIB) reports on its aggregate green finance volume, a broader category not limited to green credit; green finance for CIB accounted for nearly 40% of its corporate loan volume in 2016. *Compare* CIB, 2016 Annual Sustainability Report 57 (2017), *with* China Construction Bank (CCB), 2016 Annual Report 38, 74 (2017), *and* CDB, *supra* note 206, at 48, 201.

208. *See* Audit Standards, *supra* note 149, at app. IV (listing these 29 sectors).

these sectors in 2015, the most recent year for which this data is available.[209] Table 3 below and Table C-2 in Appendix C report the balance of "black credit" as a percentage of total corporate loan volume for the banks that provide this data. Although some banks report increases in the volume of black credit in certain years between 2012 and 2016, black credit loan volumes as a percentage of corporate lending declined over this period.[210] Table 1 shows the average green credit loan balance and black credit loan balance as a percentage of corporate loan volume.[211]

Table 1: Average Green Credit & Black Credit as Percentage of Corporate Loans (2012–2016)



209. Wen, *supra* note 196, at 1–2. The CBRC's 2015 Annual Report puts the figure at RMB 1.6 trillion. *See* CBRC 2015 REPORT, *supra* note 9, at 75.

210. Tbl. 1. *Compare* CBRC, 2013 ANNUAL REPORT 35–36 (2014), *with* CBRC 2015 REPORT, *supra* note 9, at 75. Accurate assessments of loan volumes to polluting sectors are difficult because of the inclusion of "overcapacity" sectors in the reported figures.

211. Some banks report a "black credit loan ratio" (i.e. percentage) or black credit loan volume but do not clarify whether it is determined as a percentage of the corporate loan balance or of total lending. The black credit loan percentage would be smaller if reported relative to total lending.

Table 2: Green Credit as Percentage of Corporate Loans — Commercial Banks & Postal Bank (2014–2016)

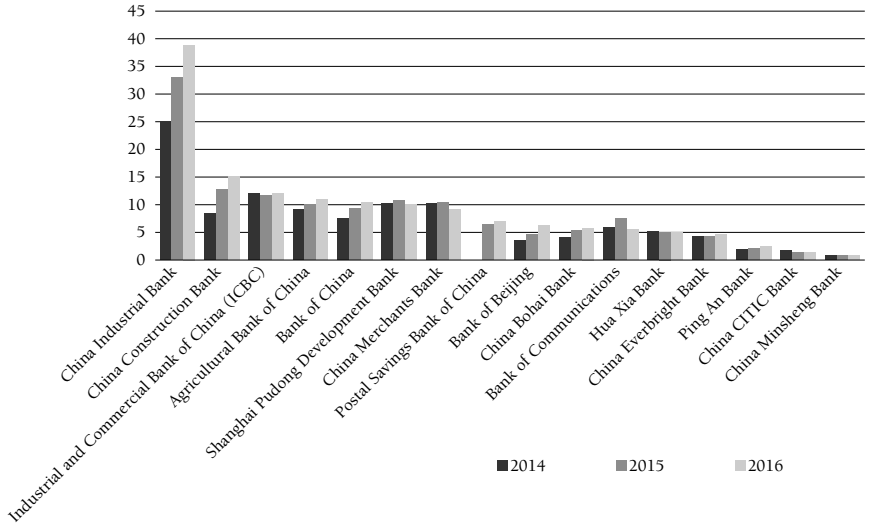
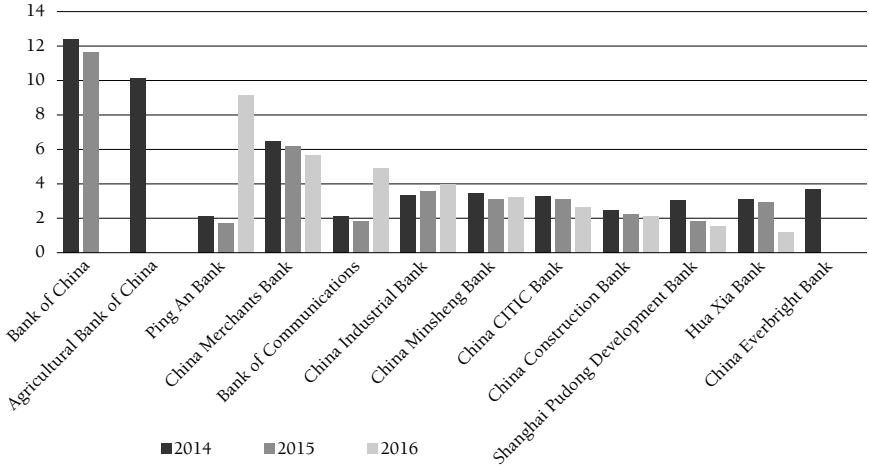


Table 3: Black Credit as Percentage of Corporate Loans — Commercial Banks (2014–2016)



According to bank representatives and advisors interviewed for this study, most banks base their determinations on the 2012 Green Credit Guidelines; some banks also confirm this in their most recent sustainability reports.[212] All of the banks in this study should also be identifying "green" loans and quantifying the reported environmental benefits of

212. Per the 2012 Guidelines, green credit loan volume is debt capital used to finance firms and projects that produce environmental benefits, including emissions reduction or pollution remediation. *See* GREEN CREDIT GUIDELINES, *supra* note 15, at 1. Prior to 2016, no banks in the sample indicated in their reports how they determined green credit volume.

those loans, such as reduced carbon emissions, in line with the CBIRC's Green Credit Statistics System. However, prior to 2016, few of the reports, contain any footnotes or other explanation confirming that this was the case, and reporting practices between 2012 and 2014 exhibit some degree of variability. Moreover, because green credit policies are currently non-binding, each bank must set its own internal policies to determine which investments to designate as green credit, albeit with reference to the CBIRC's guidance.

Another important caution is that the volume of green credit is only a rough proxy for the extent of environmental credit risk assessment. Nearly all banks in the study have implemented basic environmental compliance thresholds for issuing commercial loans, but the CBIRC encourages banks to conduct differentiated environmental credit risk screening so that investments in high-polluting or overcapacity sectors are subject to more extensive monitoring than those in "green" sectors.[213] As a result, not all loans that are subject to stricter ECRM standards are "green," and some green loans may not be subject to post-issuance environmental monitoring at all.[214]

2. *Green Credit Priority & Materiality*

Although Chinese banks must respond to state policy priorities, they may be less willing to monitor borrowers' environmental and social risk over the long term if they are implementing green credit solely in support of national development policy or under the auspices of general corporate social responsibility than if their own economic interests align with these policies. While all of the banks in this sample are pursuing green finance for policy reasons to some extent,[215] many are also beginning to integrate green credit and environmental risk assessment into their core business models, trends that are particularly evident in how banks report on green credit implementation in 2016, even as compared to 2014 and 2015. Key indicators of banks' own view of the financial materiality of environmental factors are the level of board oversight of ECRM functions, banks' own environmental practice, and whether banks link green credit or ECRM to financial performance.

a. Corporate Governance

Per the CBRC's 2014 Audit Standards, banks that place a higher priority on green credit should integrate environmental and social risk management or sustainability functions into standard corporate governance structures, for example by designating a committee or the full board to

213. *See* AUDIT STANDARDS, *supra* note 149, at 7 (directing banks to distinguish investments across three categories based on environmental risk).

214. As discussed below, untested "green" projects require banks to focus more heavily on whether the project is profitable than on its environmental impact. *See* text accompanying notes 262–65, *infra*.

215. Interview with green finance consultant, IFC, *supra* note 131 (reporting that this is the case for most banks involved in IFC green finance capacity building programs).

exercise environmental and social risk oversight.[216] The commercial banks in this sample all indicated that they have implemented the basic corporate governance, risk management, and formal internal controls structures that are required by law and that serve as the foundation for environmental and social credit risk monitoring.

However, few banks in this study assign responsibility for green credit to specific governance units. Only six of the banks in the sample (33%) charge either the full board or a board committee with responsibility for environmental and social risk oversight.[217] This confirms the findings of earlier studies showing that mainland banks exhibit a "lack of board leadership on environmental and social issues."[218]

b. Financial Materiality

Another indicator of the extent to which banks view environmental credit risk as material is the degree to which green credit or environmental risk management appears in the annual reports, and whether they appear in the social responsibility or policy sections of the report, or instead in the annual report's sections discussing risk management, corporate governance, or financial performance. For all banks, the primary data source on green credit implementation is the environmental section of the bank's sustainability report, alongside other parts of the report showcasing support for other central government priorities such as poverty alleviation, regional economic development, and China's massive global investment initiative, the "Belt and Road." Sustainability reports also highlight bank efforts to reduce their own environmental impacts, promote e-banking, contribute to charity, or finance SMEs and rural agriculture.

Although detailed discussion of green credit programs is almost universally reserved for the sustainability reports, 12 of the 18 banks (67%) directly reference green credit or corporate responsibility in their annual reports. Some of these also include environmental key performance indicators in the annual report.[219] However, prior to 2015, references in the annual reports were limited to brief mention of green credit and "black credit" volume. Narrative discussion, if any, was limited to the parts of the annual report devoted to corporate social responsibility or public policy issues. However, between 2015 and 2016, several banks began to reference green credit and environmental credit risk more directly in their standard

216. AUDIT STANDARDS, *supra* note 149, art. 7–9.

217. One of these banks is China Construction Bank (CCB), which has established a multi-departmental green credit committee, which reports to its board's corporate social responsibility committee. *See* CCB, *supra* note 207, at 102. Bank of Communications (BOC) has tasked its CSR board committee with green credit policy oversight. *See* BOC, ANNUAL REPORT 146 (2016). As of 2015, only China Industrial Bank (CIB) had placed environmental and social risk oversight functionally under the direct supervision of the full Board of Directors rather than a separate committee. *See* CIB, 2015 SUSTAINABILITY REPORT 57 (2016).

218. *See* PRICEWATERHOUSECOOPERS, *supra* note 13, at 11.

219. Many banks include core financial ratios and economic indicators in their sustainability reports as indicators of their responsibility to shareholders.

disclosures on corporate lending, risk management, credit risk, and other core aspects of the directors' report contained in the annual report.[220] These developments are noteworthy since financial institutions worldwide generally include only limited environmental disclosure in their annual reports, if at all.[221]

c. Market Opportunities & Stakeholder Orientation

Research on Chinese bank practice from the mid-2000s indicates that market opportunities also motivate banks to improve their risk management systems and expand their investment in green sectors.[222] References in the banks' public reports to stakeholder engagement are therefore an indication that banks place a higher priority on environmental and social concerns, since environmental and social issues impact the banks' customers, local communities, and other external stakeholders. Banks that seek to reduce their own environmental impacts and that publicly report on their own sustainability records may also be better positioned to monitor borrowers' environmental risks.

Banks in this sample rank relatively high on measures related to their own environmental footprints and disclosure practices, which the 2014 Green Credit Audit Standards encourage. Every bank in this study monitors and reports on its own environmental performance and stakeholder impact in its sustainability report, many with quantitative three-year lagged data on resource conservation and their carbon footprints. As Appendix B indicates, half of the banks currently report on their "social contribution[s] per share," a metric developed by the Shanghai Stock Exchange as a way to distill in a single number companies' contributions to both shareholders and external stakeholders.[223] Bank monitoring of their own environmental impact is not equivalent to effective environmental credit risk management, but it does indicate an understanding of how to assess operational environmental risks and impacts.

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220. *See, e.g.*, HENGFENG BANK, ANNUAL REPORT 51 (2016) (discussing green credit within the report's standard credit risk section).

221. *See* TCFD, PHASE I REPORT 13 (2017), https://www.fsb-tcfd.org/publications/phase-i/ [https://perma.cc/L6LA-DYVF] (finding that few existing voluntary and mandatory reporting regimes apply to the financial sector, beyond those that may apply under stock exchange listing rules).

222. *See, e.g.*, Yong Liu & Zhongguo Lin, *Understanding the External Pressure and Behavior of Commercial Banks' Environmental Risk Management: An Empirical Study Undertaken in the Yangtze River Delta of China*, 43 ROYAL SWED. ACAD. SCI. REPORT 395, 400–01, 403 (2014).

223. According to the Shanghai Stock Exchange (SSE), social contribution value per share = earnings per share + value increase per share; value increase per share = (annual taxes payable + staff remuneration + interest paid to creditors + corporate donations – other social costs)/total shares. In 2016, this number was highest (RMB 12.12/share) for CIB, which may suggest that banks with a higher proportion of their loan business in green credit may be overall sustainability leaders. CIB, 2016 ANNUAL SUSTAINABILITY REPORT, *supra* note 207, at 16. However, those with a green credit loan ratio nearer the average, such as Merchants' Bank, also had a high social contribution measure (RMB 7.98/share). MERCHANTS' BANK 2016 SOCIAL RESPONSIBILITY REPORT 13 (2017). Other factors may explain this result.

3. *Environmental Credit Risk Management & Risk Pricing*

The level of ECRM implementation reported by leading banks varies widely and appears to relate to size and, therefore, to overall capacity.[224] Despite intense policy emphasis on green credit in recent years, ECRM is in its early stages at even the largest banks. According to a number of consultants who advise banks on green credit practice, smaller municipal commercial banks do not yet have the capacity, and in some cases even lack basic policies, to implement green credit lending.[225] At the same time, the findings here confirm that many of the largest banks are working to develop more sophisticated ECRM processes.[226] China Development Bank and China Export-Import Bank also report instituting internal environmental and social risk review processes.[227]

To assess banks' level of ECRM implementation, I apply here the indicators developed by the UNEP-FI to the policies and practices reported in the banks' annual and sustainability reports and to those reported in direct interviews with bank personnel.[228] These indicators include whether the bank has established green credit policies; whether its credit risk assessment includes environmental and social factors; and whether it adopts contractual or other tools to monitor borrowers' environmental risks. At present, the emphasis for most banks' green credit programs is on meeting green credit targets set by bank management, showing declines in the level of "black" credit finance, and demonstrating banks' commitment to financing green sectors. Banks often limit ECRM to clients or projects in environmentally high-risk sectors.

a. ECRM Policies & Implementation

As indicated in Appendix B, all but one of the surveyed banks report adoption of green credit policies as of 2016.[229] However, with limited exceptions, the surveyed banks' annual or sustainability reports do not detail the nature and scope of these green credit policies or the process for environmental risk monitoring. Sustainability reports tend to emphasize case studies and basic trends in green credit volume and do not disclose barriers that might limit the banks' ability to issue green credit or to monitor borrowers.

Eleven banks (61%) report that they incorporate environmental or social risk factors into credit risk assessment in some form, whether by

224. An IFC internal assessment of its banks clients' due diligence processes found similarly wide variability. Interview with green finance consultant, IFC, *supra* note 131.

225. Interview with Syntao green bond consultant, *supra* note 185.

226. *See* PRICEWATERHOUSECOOPERS, *supra* note 13, at 61 (noting that banks have historically relied largely on EIAs but are moving to more robust risk identification and risk management).

227. China Export-Import Bank's processes are based on the IFC's Performance Standards. *See* IFC, *supra* note 125, at 36.

228. These stages are discussed in Jensen & Meckling, *supra* note 71, at 308, 312–13; UNEP-FI GUIDE, 1st ed., *supra* note 73, at 19, 21–22 and accompanying text.

229. This finding is consistent with earlier studies. *See* Zhang et al. *supra* note 8, at 1324 (reporting that as of 2008, most banks had adopted a green credit policy).

ranking clients in terms of these measures or by directly integrating these factors into the due diligence process. Over one-third report that they engage in environmental risk monitoring. These findings represent a significant change since 2010, when prior research found that most banks did not have specific units that focused on green credit and that most lacked environmental credit risk management systems.[230] However, IFC personnel who routinely advise Chinese banks on ECRM implementation still report that most of their clients "feel [ECRM] is too demanding."[231]

In general, ECRM is currently limited to pre-issuance compliance screening, which includes confirming that an environmental impact assessment (EIA) has been approved and that all relevant permits have been granted; that the project is otherwise in compliance with environmental regulations; and that the borrower is not on a blacklist for prior environmental violations.[232] Half of the banks report that they deny or discontinue financing to companies or projects that are penalized for environmental violations, a policy that the CBRC originally introduced in 2007 known as "one vote veto."[233] For example, the Agricultural Bank of China's 2016 Annual Report states:

> As for those who failed to pass the certification of the environment authority, the Bank resolutely refused to do business with them. As for those who were highly exposed to the environmental and social risks, such as relating to environmental protection litigations, administrative penalties and negative press reports, the Bank would timely lower the customers' classification and actively cut their credit exposure.[234]

To conduct pre-issuance and ongoing due diligence, banks rely to some extent on self-reporting by the corporate borrower.[235] For example, the EIA and evidence of compliance with project-related permitting rules

230. *Id.* at 1325. The study did note that, as of 2010, at least two commercial banks had already established a "nationwide system for identification, supervision, feedback, and disposal of environmental protection information" on corporate clients, relying largely on information obtained from local EPBs. *Id.* at 1325–26 (citing examples from ICBC and ABC, and finding based on a survey in Jiangsu Province that "environmental authorities are only willing to provide limited public information about most environmental laws. Information is either not available or is not timely provided. Moreover, information on the business environment is not updated.").

231. Interview with green finance consultant, IFC, *supra* note 131.

232. Interview with sustainable finance consultants, Syntao Green Finance, in Beijing (July 2017) [hereinafter Interview with Syntao Sustainable Finance Consultants]. In 2016, Minsheng Bank reported that it requires EIAs for *all* corporate lending. *See* MINSHENG BANK, ANNUAL REPORT 200 (2016). China Development Bank has adopted the same requirement since 2013. *See* CDB, SUSTAINABILITY REPORT 92 (2015).

233. SEPA et al., *supra* note 114.

234. AGRICULTURAL BANK OF CHINA, ANNUAL REPORT 58 (2016).

235. In 2016, the NDRC issued an amended Clean Production Audit Notice for firms in resource-intensive, hazardous, or highly polluting sectors that requires them to institute a self-audit and reporting framework for certain environmental impacts, in addition to environmental audits by environmental authorities. Measures for Clean Production Review (清洁生产审核办法), Order No. 38 (promulgated by the NDRC, May 16, 2016, effective July 1, 2016). This framework is encouraged for other industries and creates an online report that financial institutions can use to assess environmental and social credit risk. *See id.* art. 7–8. Other information on environmental risk and performance

are generally provided by the client. In addition, some banks conduct online searches pre-issuance to look for evidence of environmental incidents involving the borrower.[236] This is consistent with international practice, where environmental risk analysis depends heavily on publicly available environmental data.[237]

However, banks measure environmental risk largely based on information about the prospective borrower's environmental violations obtained directly from local environmental protection bureaus (EPBs)[238] or from China's Ministry of Ecology and Environment, which aggregates information reported by the EPBs.[239] Because the MEE's own data is inconsistent, some banks rely on information from the Institute of Public and Environmental Affairs (IPE), a domestic NGO which consolidates data from local EPBs on borrowers' environmental compliance.[240] More useful sources in the future may be rating systems like those Jiangsu Province has developed, which the provincial-level EPBs administer. Under this system, the EPBs assign a color to companies based on their environmental risks, and those with "red" or "black" status are not allowed to obtain credit from banks.[241] A growing number of Chinese companies also include some form of environmental disclosures within environmental, sustainability, or CSR reports, but neither prior studies nor interviewees in this study indicate that they rely on these reports in assessing credit risk.

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that may be obtained publicly or from the client include receipt of an environmental award, or certification of an environmental management system under ISO 14000.

236. Interview with branch managers, Bank A, in Shanghai (July 2017).

237. G20 Green Finance Study Group, *supra* note 3, at 4, 12–13 (defining this data as all environmental data provided by non-corporate sources).

238. EPBs maintain databases of penalties levied against companies for environmental violations, as well as online portals for citizens to report environmental violations. *See* Ministry of Ecology and Environment (MEE), *Administrative Penalties*, http://www.mee.gov.cn/home/pgt/xzcf/(last visited Oct. 15, 2018). This data includes imposition of administrative penalties, evidence of a clean production audit, records on sewage or pollutant emissions, and the incidence of events with significant environmental impact. Zhang et al., *supra* note 8, at 1325. China's amended Environmental Protection Law and earlier environmental regulations require environmental disclosure, although some reporting requirements apply broadly and others are limited to large polluters and companies involved in major environmental incidents. *See* PBOC et al., Establishing China's Green Financial System: Detailed Recommendations 14: Make Environmental Disclosure Mandatory 2–3, 5 (2015), http://unepinquiry.org/wp-content/uploads/2015/04/ECGFS_Detailed_Recommendation_14_Mandatory_Disclosure.pdf [https://perma.cc/T32D-V5PJ] (summarizing these requirements).

239. Zhang et al., *supra* note 8, at 1325. Publicly traded companies are required to disclose the potential impact of environmental regulations on their operations and to report material information regarding environmental investigations and any administrative or criminal penalties, but this type of information is not granular enough nor timely enough to inform lending decisions for a particular borrower.

240. Interview with Syntao Sustainable Finance Consultants, *supra* note 232 (reporting that ICBC, SPDB, and CIB reference IPE data). Some banks use blacklists created by NGOs to screen clients for environmental violations. *See, e.g.*, CIB, *supra* note 217, at 57 (reporting reliance on data from an NGO in Fujian).

241. One study of twelve commercial banks in Jiangsu Province found that banks relied heavily on this system. *See* Zhang et al. *supra* note 8, at 1324–25 (reporting that in 2009 about 4% of the approximately 16,000 companies rated in the system had a red or black rating under the Jiangsu system).

In addition to environmental due diligence, some of the banks in this study indicate that they have adopted monitoring practices that span the life of the loan and track the UNEP-FI framework phases. For example, Huaxia Bank and CIB sustainability reports include schematic drawings of how environmental risk assessment is integrated within the bank's management structure and how it applies throughout the lending cycle.[242] Another example is Minsheng Bank, which describes its process as follows:

> [For] industries with high pollution, the Bank clarifies environmental and social risk assessment standards and compliance examination lists, carrying on full process examination in the aspects of due diligence investigation, compliance examination, credit line approval, contract management, fund appropriation, and post-loan management. . . . Minsheng Bank enhances risk management and control in the aspects of policy orientation, customer access, risk limits, loan origination, and post-loan management.[243]

CIB, a green finance leader, has instituted an environmental credit risk monitoring process that includes 300 qualitative key performance indicators (KPIs) on its clients' risk management.[244] Internal staff review nearly all corporate lending against the Equator Principles' environmental and social standards.[245] CIB also retains external consultants to conduct pre-issuance environmental audits and site visits on most of its corporate loans, since its clients generally fall within the sectors deemed high or moderately high risk under the CBRC Audit Standards.[246] CIB branches conduct their own post-issuance review, which resulted in over 3,000 risk warnings to the bank's clients in 2016.[247]

Bank disclosures and interviews with bank personnel confirm that many banks now rank projects or borrowers according to their potential environmental impacts following the CBRC Audit Standards, and that they use contractual monitoring provisions for environmental risk, at least for projects designated as higher risk.[248] These contractual provisions, which are based on the CBRC's recommended contract terms excerpted in Appendix D, include covenants to provide ongoing disclosure regarding the funded projects' environmental and social risk, as well as post-issuance creditor monitoring rights and remedies. The CBIRC also uses data from

242. *See* HUAXIA BANK, SUSTAINABILITY REPORT 36–37 (2015); CIB, *supra* note 207, at 20, 29, 54–55.

243. MINSHENG BANK, CORPORATE RESPONSIBILITY REPORT 34 (2015).

244. CIB, *supra* note 207, at 56.

245. Interview with headquarters manager, Bank C, in Beijing (July 2017). According to CIB's sustainability reports, the bank applied the Equator Principles to forty-nine projects in 2016, totaling over RMB 581 billion in investment. CIB, *supra* note 207, at 84.

246. Interview with headquarters manager, Bank C, *supra* note 245.

247. *Id.* CIB, *supra* note 207, at 56 (reporting post-loan risk rectification by twenty-four companies).

248. Interview with branch division managers, Bank B, in Shanghai (July 2017). This bank's form contract for high-risk sectors includes several covenants on environmental risk and compliance. *See, e.g.*, HUAXIA BANK, *supra* note 242, at 36–37 (discussing the bank's use of contractual covenants to require information disclosure of high-risk clients' environmental and social risk management).

the MEE to maintain a quarterly credit blacklist of companies with outstanding environmental violations; this list may trigger some banks to conduct a risk inspection of a current borrower and to potentially withhold future funding.[249]

Part of the impetus for banks to implement ECRM practices comes from the government's recent efforts to control pollution and tighten funding to sectors with "high overcapacity." As a number of interviewees noted, these policies increase the direct risk of default on outstanding loans when firms are shut down or face regulatory penalties.[250] Indeed, the 2014 amendments to China's Environmental Protection Law increased potential sanctions against polluting firms and expanded the space for environmental litigation.[251] Although the CBRC's earliest rules required lenders to restrict credit for companies with environmental violations, it is only with tightened enforcement that these standards become relevant to commercial lending.[252] Lending to firms in polluting or "overcapacity" sectors also involves a form of political risk, because of the unpredictability of how and when the government decides to penalize polluting firms.[253] Market changes have an impact as well, as lenders are also responding to the reality that certain sectors, such as steel production and other heavy industries, face worsening prospects in a changing economy.[254]

b. Obstacles to Implementation & Risk Pricing

Despite commercial banks' progress in establishing ECRM processes, they nonetheless confront a number of obstacles to implementing ECRM and setting interest rates to reflect environmental risk. The primary barriers are limited capacity to undertake ECRM analysis, especially at the branch level,[255] and the lack of reliable information that can be readily integrated into a credit risk assessment. Even if these constraints were to

249. *See, e.g.*, BOC, *supra* note 217, at 129, 163, 220 (describing its internal green credit rating process and post-disbursement enforcement). *See also* CHINA CITIC BANK, SUSTAINABILITY REPORT 70 (2015) (discussing its use of the list for new clients).

250. Interview with Syntao Sustainable Finance Consultants, *supra* note 232. For example, one study notes that even in the 1990s, "the Agricultural Bank of China lent a considerable amount of money to SMEs [but that] the government forced closure on many SMEs [for environmental pollution]" which caused serious losses to the bank. Liu & Lin, *supra* note 222, at 395 n.1.

251. ZHONGHUA RENMIN GONGHEGUO HUANJING BAOHU FA (中华人民共和国环境保护法) [ENVIRONMENTAL PROTECTION LAW OF THE PEOPLE'S REPUBLIC OF CHINA] (promulgated by the Standing Comm. Nat'l People's Cong., Apr. 24, 2014, effective Jan. 1, 2015), art. 58, 59 (authorizing public interest litigation brought by certain social organizations and daily accrual of fines and penalties, respectively).

252. *See* SEPA et al., *supra* note 114.

253. These concerns were raised by multiple respondents interviewed in this study.

254. Some banks report that their NPLs, not surprisingly, are concentrated in such sectors. *See, e.g.*, MINSHENG BANK, *supra* note 232, at 53.

255. The credit review for high-risk or high-value projects is typically done at both the branch and headquarters level, but not all banks have yet integrated their risk assessment processes. This was reported to be the practice by most of the bank representatives interviewed for this study.

be addressed, banks' competitive environment and client base also limit their ability to price environmental risk.

The lack of high-quality, comparable data is one of the most critical challenges to a market-driven green credit model.[256] EIAs are not designed for credit risk analysis, and local EPBs do not always provide information to either lenders or the MEE on a timely or comprehensive basis.[257] Local protectionism in favor of companies who are significant to the local economy contributes to gaps in the information the MEE itself obtains from local EPBs.[258] The IPE's data may be more comprehensive, but not all banks include this data in their due diligence. Banks must expend resources to obtain and integrate information from EPBs and third parties, and without it, banks' ability to effectively price risk pre-issuance or monitor it post-issuance is limited.

Another fundamental challenge to greening corporate loans is that the green credit model depends heavily on lending to relatively high-risk borrowers.[259] On the one hand are the more promising clients—the greentech companies and energy-efficient projects that green credit is expected to favor. Many of these investments may be considered "green credit" simply because of the industry sector the company is in, regardless of whether any environmental credit risk assessment is conducted.[260] More critically, these are often companies that have uncertain long-term profitability, a limited credit history, unpredictable cash flows, and few assets that can collateralize the loan.[261] In these cases, banks will prefer to lend to estab-

256. The reasons for the variable reliability and accessibility of information related to environmental impact and compliance are complex. *See generally* Alex Wang, *Explaining Environmental Information Disclosure in China,* 44 ECOLOGY L.Q. 865 (2018) (explaining these challenges). Understandably, banks' sustainability reports offer limited information on the availability or quality of the information on which they base their credit determinations. Zhang et al., *supra* note 8 (based on an analysis of sustainability reports and in-person interviews with commercial banks in Jiangsu province). The fundamental importance of reliable information on environmental credit risk has been noted in studies predating the 2015–2016 reforms. *See, e.g.*, *id.* at 1322 (observing that green credit policy implementation depends on the "amount and quality of corporate environmental information available to bank lenders"). Prior studies also uniformly note that information deficiencies are the primary obstacle to green credit implementation. *See, e.g.*, Aizawa & Yang, *supra* note 23; Hu & Li, *supra* note 114; Zhang, et al., *supra* note 8, at 1325, tbl. 4 (2011).

257. *See* Arthur P. J. Mol et al., *Information Disclosure in Environmental Risk Management: Developments in China*, 40 J. CURRENT CHINESE AFF. 163, 176–78 (2011) (presenting findings from comprehensive interview and survey research of EPB practices). *See also* Wang, *supra* note 256, at 879, 880, 887.

258. The CBIRC is working with the MEE on reforms that would facilitate aggregation of environmental data at the provincial level to address this issue. Interview with senior official, CBRC, *supra* note 150.

259. Interview with branch Chief Executive Officer, Bank C, *supra* note 131.

260. Several banks in this study indicate that they only monitor environmental credit risk for those in the "two high, one overcapacity" sectors identified by the CBRC.

261. This may be because banks recognize the risks outlined here and so will only loan to "green" projects where other credit risk indicators are strong, or it may be due to the fact that some government programs offer subsidies for energy-efficient projects, which reduces default risk. *Id.*; interview with Senior operations & CHUEE program officer, IFC, in Beijing (July 2017); interview with branch division managers, Bank B,

lished companies with assets or cash flows that can be secured in order to lower the cost of the debt and ensure repayment. One common model involves lending to an energy services company, which then uses the loan proceeds for equipment that is ultimately used by other entities.[262] On the other hand, many investments that count as "green" because they reduce pollution or focus on remediation are also inherently high risk because they involve lending to high polluters and heavy industry sectors that may be targeted by restructuring or may be vulnerable as market demand shifts. Many of the companies in both categories will fail, but in such cases, the source of the default risk has more to do with the financial condition of the borrower or the projects' cash flows than with their environmental or social risk. Therefore, improving environmental credit risk management may do little to reduce underlying credit risk.

Whether lenders can effectively monitor corporate borrowers also depends on the identity of the borrowers and the term of the debt. SOEs and large private firms are the primary clients of the banks that are leaders in green credit implementation.[263] Many of the banks in this study who are active green credit lenders also finance government debt, and some green credit financing does involve local government partners.[264] Financial institutions' ability to negotiate against state-sector clients depends on the state's interest in the project and the relative position of the bank and the client in the party-state institutional structure.[265] In addition, most commercial loans are relatively short-term.[266] This creates more opportunities for the bank to revisit the loan terms and to identify sources of environmental risk,[267] but a loan period of only one to three years may deter some banks from robust pre-issuance or post-issuance due diligence.

The primary reason banks have yet to fully implement ECRM processes has to do with the problem of pricing risk even when risk can be reasonably measured in advance. The International Monetary Fund

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supra note 248. A number of banks report that their NPLs for green credit are low relative to the NPL rate for all commercial loans. *See*, *e.g.*, CDB, SUSTAINABILITY REPORT 12, 19, 35, 92 (2014).

262. Interview with senior operations & CHUEE program officer, IFC, *supra* note 261; interview with headquarters manager, Bank C, *supra* note 245.

263. This was confirmed by numerous interviewees. For an example of the collateralization of green credit lending, see, e.g., CHINA EVERBRIGHT BANK, CORPORATE SOCIAL RESPONSIBILITY REPORT 58 (2015) (describing the bank's support of "the development of green enterprises by pledging loans based on the expected income right[s] from water supply, heat supply, power generation, sewage/garbage treatment and other projects").

264. *See* SHANGHAI PUDONG DEVELOPMENT BANK, SUSTAINABILITY REPORT 52 (2016) (providing examples).

265. These enforcement challenges are at the heart of other weaknesses in the Chinese banking system. *See, e.g.*, Donald Clark & Fang Lu, *The Law of China's Local Government Debt: Local Government Financing Vehicles and Their Bonds,* 65 AM. J. COMP. L. 751 (2017) (discussing the uncertain status of debt obligations issued by local government financing vehicles).

266. Interview with lawyer, international law firm banking practice, in Shanghai (July 2017); interview with branch division managers, Bank B, *supra* note 248.

267. A number of banks in this study report that they prefer to lend on a relatively short-term basis with the opportunity to renew for up to ten or twenty years. The lower risk also lowers interest rates, so clients can access capital more cheaply.

reports that variation in bank lending rates has increased since China began liberalizing its interest rate policies in 2012.[268] However, bank managers interviewed for this study indicated that while they have the ability to raise interest rates for projects that are more environmentally risky, doing so may make their banks less competitive.[269] By the same token, lenders find it difficult to push for tighter covenants or the right to monitor environmental outcomes if other banks will not.[270]

For projects in greentech, renewable energy, or other green sectors, banks do not offer cheaper financing for projects that offer relatively better environmental benefits, explaining that they must "cover their costs."[271] As a result, the cost of debt capital does not reflect environmental credit risk, and borrowers in sectors that account for the bulk of green credit recipients have no incentive to manage environmental risk or impacts more efficiently; it is enough that they are in a green line of business.[272] The general consensus of many interviewees is that without PBOC financial incentives or government subsidies, it is impossible to offer preferential interest rates for green credit loans.[273]

4. Environmental Credit Risk Shifting

In addition, the corporate governance literature indicates that creditors' incentives to engage in monitoring may weaken if they can share risk with other creditors or shift risk to a third party or to shareholders.[274] Green insurance, financial intermediation, and multi-lender financing structures are all increasingly common forms of risk transfer in China that complicate the account of direct lender monitoring developed here thus far. On the other hand, the literature also posits that risk-sharing among multiple lenders or other stakeholders can be value-enhancing when one lender,

268. IMF, *supra* note 107, at 12–14. *See* Tan et al., *supra* note 94, at 10–11 & tbl. 1 (detailing reforms between 2012 and 2015).

269. Interview with branch managers, Bank A, *supra* note 236; interview with headquarters department manager, Bank C, in Beijing (July 2017).

270. Interview with green finance consultant, IFC, *supra* note 131.

271. Interview with branch managers, Bank A, *supra* note 236; interview with branch division managers, Bank B, *supra* note 248. With limited exceptions, neither the PBOC nor local governments offer interest rate subsidies or any other financial incentives to banks or bank clients that could reduce the cost of green lending.

272. Interview with branch managers, Bank A, *supra* note 236. The relative benefits of green credit in environmental terms do not, as of the time of this writing, appear to be part of bank lending considerations or CBIRC policy. Interview with senior official, CBRC, *supra* note 150. Local governments in Xiamen have reportedly offered up to a 40% interest rate subsidy for green credit, but these appear to be relatively isolated examples. Interview with Syntao Sustainable Finance Consultants, *supra* note 232.

273. The PBOC introduced policies to incentivize green credit in 2018, including adjustments to its collateral requirements based on eligible green credit loans and lending support for green projects; tax incentives for green projects are also being considered. Interview with China Banking Association representatives, in Beijing (July 2018); Kevin Yao, *China Central Bank Plans Fresh Incentives to Support Green Financing,* REUTERS (June 16, 2017), https://www.reuters.com/article/us-china-banking-greenfinance/china-central-bank-plans-fresh-incentives-to-support-green-financing-idUSKBN1970R1 [https://perma.cc/39FV-TGMN].

274. Tung, *supra* note 17, at 161–69.

often a bank, serves as the "designated monitor." This approach generates efficiencies since the designated monitor is generally the party that can more cheaply obtain information from the borrower and has the greatest incentives to monitor the borrower's compliance.[275]

Getting a sense of how common risk-sharing structures are relative to the total green credit loan balances of Chinese commercial banks and whether they facilitate or discourage creditor monitoring is difficult since neither the CBIRC nor the banks themselves disclose details on how green credit facilities are structured. In addition, this study does not examine how frequently lenders require green insurance, even though green insurance is one pillar of China's recent green finance reforms and is an important form of risk transfer.[276]

There is evidence, however, that some forms of risk transfer are masking risk within the Chinese financial system, even though it is unclear how much these practices affect green credit transactions. In 2017, the CBRC began an enforcement drive targeting aggressive risk-taking across the financial sector and raised concerns about high levels of intermediation between the initial lender and the ultimate borrower.[277] The CBRC also targeted continued lending to "zombie companies" and urged banks to improve credit risk management, particularly with respect to risks related to local government debt and strategies for managing NPLs.[278] Expanded securitization of green loans and the development of new green financial products may exacerbate these trends even as they shift financial risk away from bank lenders.[279]

However, based on the transactions described in interviews and in the bank sustainability reports reviewed in this study, risk transfer has enabled many of the banks who are leaders in green credit to reduce their risk exposure and build their own internal risk management capacity. One key example of such a program is the IFC's China Utility-Based Energy Efficiency Finance Program (CHUEE), which began in 2006 and concluded in 2015.[280] Under several iterations of the CHUEE Program, which

275. *See* Triantis & Daniels, *supra* note 18, at 1090–92, 1106–08 (explaining the dynamics of delegated monitoring); Baird & Rasmussen, *supra* note 17, at 1244 (noting that the monitoring bank would be the one that holds the largest share of a syndicated loan).

276. Green insurance includes programs and products that can protect banks who lend to environmentally risky projects, as well as their clients. According to a senior official at the CBRC, the China Insurance Regulatory Commission (CIRC) has been developing environmental responsibility insurance since 2014 and related policies are now being implemented in several provinces. Interview with senior official, CBRC, *supra* note 150.

277. *See* Yun et al., *supra* note 110.

278. *Id.* (noting illegal transfers of performing loans and improper transfer, write-off, and securitization of NPLs in violation of current regulations).

279. Examples from the U.S. market, where structured finance products built on home mortgage debt led to the recent financial crisis, illustrate the point. *But see* Yesha Yadav, *The Case for a Market in Debt Governance*, 67 VAND. L. REV. 771 (2014) (arguing that with appropriate contracting in derivatives markets, credit derivatives could co-exist with good debt governance).

280. IFC, *supra* note 125, at 51–52.

expanded from energy efficiency to renewable energy and resource conservation projects, the IFC guaranteed loans to joint-stock and municipal commercial banks, in some instances with funding from provincial governments or central-level agencies, such as the Ministry of Finance and China's Clean Development Mechanism (CDM).[281] In most cases, the World Bank provided up to 50% of the financing, and local banks the other half, with risk being allocated first to investment vehicles established by the IFC and the residual to the Chinese commercial bank partner.[282] These banks then extended loans to their clients for projects within the CHUEE Program's scope, such as facilities upgrades.[283] In these examples, credit facilities were established in partnership with international lenders who not only bore part of the risk of the transaction but also provided an experienced source of delegated monitoring.

The IFC's role and its expertise in evaluating and advising on energy-efficient financing and related risks have also enabled the CIB and the Bank of Beijing—both IFC clients, as well as other non-client banks, to provide green credit financing to companies more cheaply and to extend financing to borrowers who would otherwise have been unable to obtain it.[284] In the case of CIB, the CHUEE Program led the bank to develop its own guidelines and processes for energy-efficient lending.[285]

Another common green credit model for a number of top-tier commercial banks involves commercial on-lending, where Chinese banks are intermediary lenders for funds borrowed from foreign banks, either directly or through the Ministry of Finance. In these structures, the Chinese bank commits to reinvest the funds for particular green purposes, such as energy conservation or emissions reduction. But the bank's own funds are not at risk, and the foreign lender may, as in the IFC examples, offer assistance to the bank in identifying projects that are within the approved use of loan proceeds.[286] These examples suggest that some risk-sharing structures indeed facilitate more effective environmental credit risk assessment and ongoing monitoring and also help Chinese commercial banks develop their own internal capacity.

5. Transparency

More stringent mandatory disclosure requirements and higher stakeholder expectations regarding voluntary reporting are other factors that are likely to create stronger incentives for banks to improve corporate governance, risk management, and environmental credit risk management prac-

281. *Id.* at 52–55.

282. Interview, senior operations & CHUEE program officer, IFC, *supra* note 261.

283. For example, Fujian Sanxinlong Co. Ltd., a manhole-cover manufacturer, received funding from Industrial Bank through the CHUEE program for upgrades that generated energy savings and emissions reductions. IFC, *supra* note 125, at 54.

284. In these transactions, the IFC undertook the environmental and social risk analysis. Interview, senior operations & CHUEE program officer, IFC, *supra* note 261.

285. IFC, *supra* note 125, at 54.

286. *See, e.g.*, CHINA CITIC BANK, *supra* note 249, at 91 (2015) (reporting that the balance of its "green intermediary credit business" was 33.47 million euros in 2014).

tices.[287] As indicated in Appendix B, key indicators of bank transparency include (i) the extent to which green finance is discussed in the annual report, which is subject to regulatory standards and enforcement, or in a sustainability report, which is not; and (ii) the level of reliability of the sustainability report, which can be measured by whether the report is based on an independent third-party standard and whether the sustainability report is assured or certified by an accounting firm or other independent third party.[288] The banks included in this study must already provide internal reports to the CBIRC on their implementation of green credit policies in accordance with the 2014 Audit Standards and the Green Credit Statistics System.[289]

The level of bank accountability for green credit implementation is improving over time, driven in part by the sustainability reporting requirements of the Hong Kong and Shanghai stock exchanges, where most top-tier banks are listed.[290] Over the past decade, both the CBRC and the China Banking Association, the trade association for financial institutions, have also encouraged banks to improve their "social responsibility" and to adopt regular sustainability reporting practices; and as of 2016, over half of the banks referenced these standards in their reports.[291] Eleven of the 18 banks reviewed here (61%) base their reports on the standards developed by the Global Reporting Initiative—which are widely recognized as the international standard for sustainability reporting—in addition to Everbright Bank, which uses other international standards.[292] Thirteen of the 18 (72%) use third-party certification of their sustainability reports, and as of 2016, all used international auditors, such as PWC and KPMG, for this purpose.[293] The level of space devoted to green credit programs in both the annual and sustainability reports and the use of quantitative indicators

287. Disclosure is widely used in voluntary governance programs, including the Equator Principles, for this reason. *See* EQUATOR PRINCIPLES, *supra* note 77, at 5.

288. These reliability measures for voluntary reporting are adopted in most standard assessments of reporting quality and maturity, such as KPMG's global voluntary reporting review. *See* KPMG, THE ROAD AHEAD: THE KPMG SURVEY OF CORPORATE RESPONSIBILITY REPORTING, 4, 26 (2017), https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2017/10/kpmg-survey-of-corporate-responsibility-reporting-2017.pdf [https://perma.cc/PNH4-B7CT].

289. *See supra* notes 147–154 and accompanying text (discussing the 2014 Audit Standards).

290. As of 2016, the eleven banks in this study that are listed on the Hong Kong Stock Exchange were required to produce mandatory sustainability reports that comply with the stock exchange's ESG reporting standards. *See supra* notes 97 & 118 and sources cited therein.

291. The China Banking Association's CSR standards for member banks expressly encourage support for the government's environmental policies, the integration of environmental indicators in credit assessment, adoption of the Equator Principles and other international audit standards, and annual CSR reporting certified through third-party assurance. *See* CHINA BANKING ASS'N, *supra* note 91, art. 2(3), 17, 20, 25.

292. Other standards widely adopted by banks in this sample in addition to the G4 include ISO26000, AccountAbility 1000, the United Nations' Global Compact, and the Hong Kong Stock Exchange ESG Guidelines.

293. Because they are listed companies, all banks' financial reports are externally audited, typically by affiliates of the Big Four accounting firms.

related to green credit also appear to be increasing over time for most of the banks in this sample, particularly since 2015. These external reporting obligations create incentives for banks to improve their own environmental transparency and practice, as well as core corporate governance and risk management practices.

6. International Standards & Capacity Building

This study also examined the degree of the banks' exposure to international banking practices, which is expected to increase banks' capacity to implement green credit standards and ECRM. Banks with foreign investment or financing should also exhibit better risk management practices and, therefore, better green credit risk monitoring.

Eight of the 18 commercial banks in this study have had direct access to international expertise and investment with respect to green finance implementation.[294] The IFC, in particular, has played a significant role in capacity building and direct lending to seven of these banks since the introduction of China's initial green credit reforms.[295] At least 6 of the 18 commercial banks in this study (33%)—including CIB, SPDB, and the Bank of Beijing—are current or former clients of the IFC, and the IFC was a strategic investor in CIB when it was first listed as a public company.[296] In addition, the IFC may serve as a guarantor for its clients' green loans, in which case the IFC's own standards govern the terms of the loan and environmental and social risk management.[297] The IFC has also been instrumental in helping the PBOC develop its credit registration system and has advised other Chinese state agencies in developing the infrastructure of China's current financial system.[298]

Other factors also point to the deep influence of international standards on Chinese banks' capacity to implement green credit reforms. Five Chinese banks are members of the United Nations' Environmental Programme Finance Initiative (UNEP-FI), including one in the present sample, Merchant's Bank. Two Chinese banks, CIB and the Bank of Jiangsu (not included in this study), are Equator Principles signatories; and ICBC, one of the market leaders in green credit lending, also applies the Equator Principles to all of its international investments, some of which may be counted within its green credit loan portfolio.[299] Other international financial

294. This figure is based on direct references in these banks' public reports.
295. *See generally* IFC, *supra* note 125.
296. *Id.* at 52.
297. The International Finance Corporation (IFC) continues to serve as a guarantor on much of CIB's green credit financing. Interview with branch Chief Executive Officer, Bank C, *supra* note 131.
298. IFC, *supra* note 125, at 6–7, 10–11, 40, 45.
299. *See* UNEP FI GUIDE, 1st ed., *supra* note 73, Annex II (Signatories), at 34–35. UNEP-FI members commit to abide by nineteen voluntary principles related to sustainability risk management and transparency. *Id.* at Annex IB. CIB became the first mainland Chinese financial institution to sign onto the Equator Principles in 2008. *See* EQUATOR PRINCIPLES, *EP Association Members & Reporting*, http://equator-principles.com/members-reporting/ [https://perma.cc/83E4-DXYX] (last visited Nov. 5, 2018).

institutions (IFIs) have also supported a number of China's commercial banks as guarantors or investors.[300] For example, Huaxia Bank has obtained funding from the World Bank and the ADB that enabled it to extend subloans governed by terms and conditions the IFIs provided,[301] and SPDB has served as an on-lender for financing from the ADB and the French Development Agency.[302] The presence of IFIs in green credit finance reduces Chinese banks' risk, builds their capacity to evaluate green credit risk, and allows Chinese banks to rely on the IFIs' expertise in environmental due diligence.

C. Limitations

Because this study is subject to several methodological limitations, its findings are necessarily preliminary. First, although the documentary and interview-based data sources here describe the procedures banks have adopted for environmental credit risk monitoring, the degree to which interview respondents addressed their implementation varied. Interviewees may also have been hesitant to discuss weaknesses and problems with a foreign researcher, though some of these gaps were filled through meetings with IFC representatives, consultants, and other professionals who are familiar with bank practice.[303] Without access to details regarding transactions and interactions within bank departments and between banks and their clients, which are generally proprietary or subject to confidentiality obligations, it is not possible to gauge the impact of bank monitoring on the borrower or project's environmental impact. In addition, interviews with bank personnel were conducted only at a subset of the banks included in this study, so further research is necessary to substantiate these findings.

Although banks provide more detailed information on green credit in their sustainability reports than in their annual reports, sustainability reporting is also subject to important limitations.[304] Because sustainability reporting is not subject to the same requirements that apply to mandatory financial disclosure, banks may provide different information in different years and according to different criteria, even when using an

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The U.S. signatories are Ex-Im Bank, JPMorgan Chase, Bank of America, Citigroup, and Wells Fargo. *Id.*

300. For example, in 2015, the Bank of Beijing participated in a green finance training program sponsored by the IFC and remains an IFC green finance client. BANK OF BEIJING, SUSTAINABILITY REPORT 40 (2016); interview, senior operations & CHUEE program officer, IFC, *supra* note 261.

301. HUAXIA BANK, ANNUAL REPORT 32 (2016); HUAXIA BANK, ANNUAL REPORT 23 (2014).

302. *See, e.g.*, SPDB, 2015 CORPORATE SOCIAL RESPONSIBILITY REPORT 79 (2016) (describing examples of such transactions).

303. Nearly all interviews conducted in this study involved two representatives of the same institution; this can be expected to reduce incentives to mislead but may also have reduced interviewees' candor.

304. The lack of comparability, reliability, consistency, and conformity to financial materiality standards are common weaknesses of voluntary sustainability reporting globally. *See* TCFD, *supra* note 221, at 8–9, 13.

independent reporting standard, as all of the surveyed reports do. What content is reported remains entirely at the bank's discretion, reducing comparability. For this reason, data is unavailable with respect to some measures, most notably on black credit volume—a number of banks that reported on black credit loan volume prior to 2015 omitted this information in their 2016 reports. Although a growing number of banks indicate that they define green credit loans in accordance with the 2012 Green Credit Guidelines, not all confirm this, making meaningful comparisons across reporting banks difficult. As prior studies have observed, another consequence of bank discretion is that "banks avoid reporting information [that] may be harmful to the reputation of their brand, such as loans to polluting companies who have caused significant damage to the local environment."[305] My analysis of the reports relied on here confirms that banks do not include in their sustainability reports negative information or efforts to respond to risks that may be associated with green credit finance.[306]

IV. Lessons & Implications

This preliminary analysis reveals a mixed picture. On the one hand, it shows that current bank practice has not resolved many of the gaps in green credit implementation identified in prior studies, even for Chinese banks who are green finance leaders.[307] For most banks, green credit implementation appears weighted toward policies that expand access to credit for certain sectors over efforts to integrate environmental credit risk assessment into how interest rates are set and into post-loan management across the corporate loan portfolio. At the same time, this study offers evidence that most of the largest banks have established mechanisms for identifying and monitoring corporate borrowers' environmental credit risk. The indicators of financial institutions' capacity to undertake monitoring that emerge in this study appear to reflect top-down regulatory pressure on banks to expand debt financing to green sectors, to monitor environmental credit risk for certain "black" sectors, and to improve internal reporting of green credit compliance and outcomes to the CBIRC.

This analysis also shows that while some of the challenges confronting green credit implementation in China derive from the Chinese institutional context and its state-led model, others do not. Here, I draw on Part III's analysis to identify these barriers and to distinguish those that are relevant

305. PRICEWATERHOUSECOOPERS, *supra* note 13, *supra* note 23, at 33.

306. *Id.* at 59–60.

307. For example, *id.* summarizes the limits of green credit implementation as of 2013 to include: (i) organization & governance: "lack of board leadership on E&S issues;" "lack of dedicated resources for E&S for all but the leading banks;" (ii) policy, system, and capacity building: "policies on credit screening based on E&S risks tend to be driven by national policies;" "small number of green products and services;" "lack of capacity, training and knowledge in most banks on E&S issues;" (iii) process management: "lack of independence and/or robustness of due diligence process;" (iv) internal controls and information disclosure: "disclosure of green finance limited to positive marketing of banks' activities."

across jurisdictions, discussed in Section A, from those that are unique to the Chinese institutional context, discussed in Section B. As I argue below, these observations have important normative implications for our understanding of the role of creditors in corporate governance within different institutional settings, as well as for the development of future sustainable finance reforms in other markets around the world.

A. Shared Challenges

The most pressing technical and practical challenges that China is facing in implementing green credit and promoting lender monitoring reflect the fact that green or sustainable finance is relatively new and so banks must quickly build capacity to implement these programs. First among these are definitional issues. As the OECD has noted, the relatively recent evolution of green finance innovations means that what constitutes a green investment tends to be defined differently by different companies, in different sectors, and for different purposes.[308] In China, the CBRC's 2012 Guidelines, technical guidance on the Green Credit Statistical System, and regulatory audits go some way in standardizing how the largest Chinese banks define green credit and measure environmental benefits. However, the broad green credit measures currently in use leave open the prospect of greenwashing or a race to the bottom where green loans count toward a bank's own internal loan volume target or toward meeting the regulator's policy goals but do not require any environmental or social risk assessment.

Costs and capacity constraints are another area where Chinese and international banks face similar challenges.[309] First is the cost of getting information. In an era of evolving regulatory and market standards for defining and monitoring green finance products, developing and implementing such standards in-house or obtaining third-party assistance is costly. Both Chinese banks and Western financial institutions must build expertise in assessing environmental issues across the organization to implement green finance programs,[310] either by hiring environmental experts to evaluate environmental credit risk internally, or by outsourcing this responsibility to external consultants. In addition, the longer-term costs of monitoring borrowers post-disbursement mean that banks are more likely to engage in front-end due diligence rather than ongoing oversight. Finally, the fact that green finance is so new means that the historical data that lenders need to confidently assess environmental and social risk is often unavailable.[311]

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308. *See generally* Georg Inderst et al., *Defining and Measuring Green Investments: Implications for Institutional Investors' Asset Allocations* (OECD Working Papers on Finance, Insurance, and Private Pensions, No. 24, 2012) (surveying the range of definitions).

309. These challenges have already been identified in the literature on creditors' role in corporate governance. *See supra* notes 78–81 and accompanying text.

310. *See* PRICEWATERHOUSECOOPERS, *supra* note 13, at 59 (reviewing gaps in Chinese practice).

311. Interview with branch Chief Executive Officer, Bank C, *supra* note 131.

Finally, any effort to develop financial systems that promote, rather than impede, environmental conservation and other important development goals will require new forms of regulatory cooperation and information sharing across traditional administrative silos. The UNEP-FI and the G20's Financial Stability Board are already working with governments and financial institutions worldwide to develop these types of policy initiatives.[312] In addition, national and subnational dynamics will directly affect implementation. For example, in China, regulatory cooperation between environmental agencies and securities and financial regulators, and between the MEE (and formerly, the MEP) at the central level and local EPBs, has not always been smooth. However, the 2016 Green Finance Guiding Opinions signal new efforts to improve cross-agency information exchange and to overcome the technical barriers as well as deeper collaboration among different regulatory arenas that could provide a starting point for other governments to consider.[313]

B. Unique Challenges

The transition from traditional finance to green finance in all jurisdictions necessarily raises novel questions about the degree to which financial markets can and should address public policy goals, but the implementation of China's green finance reforms is particularly complicated by political questions that are a function of its unique institutional context. The state's control of both the banking sector and the heavy industry sectors most responsible for environmental degradation means that reducing debt financing for high-polluting firms or sectors may be possible only with the blessing of the relevant authorities and is not a decision that will be based entirely on credit risk assessments, whether they include environmental and social metrics or not. The tensions inherent in China's current development strategy have also led regulators at times to send mixed signals to banks about their approach to environmental credit risk. For example, in 2015, the CBRC, which had already encouraged banks to curtail financing to high-polluting sectors, cautioned them against "withdrawing, stopping or withholding loans in a one-size-fits-all manner" and urged them instead to consider "local economic and financial performance" and to "strengthen credit support" for companies in "overcapacity" sectors, such as iron, steel, and cement.[314] Also, by defining green finance largely on a sectoral basis, state policy could promote an inflation of green financial products, stimu-

312. The 2015 report of the UNEP Inquiry into the Design of a Sustainable Financial System identifies over 40 different measures and separate policy paths for "banking, bond and equity markets, institutional investors and insurance" to strengthen the role of finance in promoting sustainable development. *See* UNEP-FI ANNUAL OVERVIEW 26 (2015).

313. The 2016 Guiding Opinions stress the need to integrate the EPB's data on environmental compliance violations with the data on credit risk, perhaps to include the PBOC's national credit database, with a goal of creating a common platform for integrating these basic risk indicators into the financial system. *See* GREEN FINANCIAL SYSTEM GUIDING OPINIONS, *supra* note 166, at para. 4.

314. CBRC 2015 REPORT, *supra* note 9, at 75.

late a new bubble in renewable energy and other green sectors, and dilute the market's ability to differentiate among investments based on their real contribution to sustainability.

The core policy question, then, is how strongly China's leadership is committed to market-based reform models. China's green finance policies already endorse a hybrid model where state policy priorities drive bank practice, but where the state must rely on banks' own credit risk assessments, monitoring practices, and market-based pricing to allocate capital. Because China's approach is state-driven, its success depends more heavily on the ability of state agencies at all levels to support green finance initiatives and market-based reforms. Bank responsiveness to market incentives will also depend on banks' ability to address NPL overhangs, maintain profitability, and improve basic corporate governance and risk management practices. Getting these fundamentals right first is particularly important before smaller banks and branches can implement more complex ECRM processes.

C. Unique Tools

One of the pitfalls of contemporary comparative scholarship on China has been the tendency for outside observers to focus on the limits of the Chinese approach and discount elements of the Chinese institutional context that may help it move beyond apparent obstacles to economic or legal reform. This perspective can also obscure innovations that might benefit observers in other jurisdictions. The risks of discounting the Chinese experience are both higher and more problematic in an area like sustainable finance, which has clear global implications and raises questions of first impression in nearly all economies.

A strength of China's green finance model is that the central government tasks Chinese banks with serving the real economy and assesses their performance against both market measures and public policy outcomes.[315] Although party-state control may impede some aspects of market-based green credit reform, political personnel controls and the regulatory oversight that China's central leadership and the CBIRC wield over China's top financial institutions create strong policy levers to promote green credit that are absent in most other countries. In contrast to the United States, for example, where financial regulation does not impose any obligation on financial institutions to incorporate environmental and social indicators into their credit risk assessments, the CBIRC is committed to evaluating banks on their green credit implementation under the 2014 Green Credit Audit Standards.[316]

315. *See* STENT, *supra* note 92, at xi–xii, 1, 24, 212 (describing Chinese banks as a hybrid model, merging modern Western banking practice and traditional Chinese concepts of banks' public role).

316. *See* CBRC 2015 REPORT, *supra* note 9, at 59. As early as 2012, CBRC officials had already signaled their intent to develop this rating system, keyed to banks' implementation of the 2012 Guidelines, as a tool to ultimately determine a banks' "institu-

Of course, there is no guarantee that top-down pressure on financial institutions will resolve the transparency challenges that lie at the heart of green credit implementation. In the absence of high-quality information from either local EPBs or clients to the banks themselves, banks are likely to do the best with what they have, to charge higher interest rates to projects in high-risk sectors, and to hedge or shift risk when necessary. However, the concerted policy priority on green finance at the present time may motivate the CBIRC, the MEE, and other key agencies in the green finance space to tackle some of these barriers to bank monitoring.

Chinese banks are also embedded in the global institutional context of modern capital markets and political and social structures, and as discussed above, Chinese green credit implementation has drawn heavily on international guidance, technical assistance, and investment support. Bank regulators and management are also well aware that international and local NGOs are monitoring how well the banks address the potential impacts of the projects and clients they fund both at home and abroad.[317] The complementary pressures of deepening international capital market integration and top-down regulatory oversight may drive Chinese financial institutions to address some of the technical barriers to green credit reform.

D. Implications for Sustainable Finance Reform

Despite its unique institutional context, there are good reasons to consider what insights for sustainable finance initiatives elsewhere can be drawn from the Chinese green finance test case. First, consider the scale and scope of China's efforts. By some estimates, China will need to raise over $300 billion by 2020 in order to make headway in addressing its vast environmental challenges and transitioning to a low-carbon economy.[318] This reality creates sustained demand for multiple policy experiments that can all be observed in a relatively short timespan and within a single country. And since China's green finance agenda has now been building for more than a decade, it is now possible to trace China's policy progression and begin to see what works and what doesn't. Moreover, the Chinese experiment is, in some respects, more instructive for developing countries, because China began introducing green finance policies, banking sector reforms, and more environmentally conscious development strategies at roughly at the same time in the 2000s, and all from a very low base. The efforts of Western governments, who have spent decades exporting best practices to China and other countries with vastly different economic and

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tional access" and the promotion opportunities of its executives. *See* China Sustainable Finance Letter, No. 15, Aug. 7, 2012 (quoting a senior CBRC official).

317. Interview with branch Chief Executive Officer, Bank C, *supra* note 131; interview with senior official, CBRC, *supra* note 150.

318. *See* Umesh Desai, *China's First Green Bond to Spur Interest for Future Deals,* REUTERS (July 20, 2015), https://www.reuters.com/article/china-greenbond/chinas-first-green-bond-to-spur-interest-for-future-deals-idUSL4N0ZW4XN20150720 [https://perma.cc/5QSQ-3N6W] (quoting China's green financial system taskforce).

political conditions, also suggest that different institutional starting points are not an impassable bar to innovation sharing in the other direction, though institutional differences may affect which lessons will bear fruit.

What then can we learn from the test case of China's green credit reforms? Certainly, the Chinese case shows that public policy matters. Indeed, international organizations have recognized that sustainable finance requires policy coherence across related areas of regulation and have highlighted China's leadership in this regard.[319] For example, tougher environmental enforcement makes environmental risk more material to lenders. In addition, supportive policies to promote access to information about corporate environmental impacts may be necessary to level the playing field for banks and corporate borrowers alike in competitive markets where lenders may be unwilling to undertake environmental due diligence. Of course, financial institutions elsewhere may respond more slowly to policy leadership than banks in the Chinese system, but even in the United States, regulatory oversight is more rigorous for banks than nonfinancial sectors because of their systemic importance and public welfare impacts.[320] As a result, bank regulators may have more power to facilitate ECRM practices even in Western markets. Finally, if the example of Chinese banks is any indication, financial institutions will need time to develop ECRM systems and more sophisticated approaches to identifying, pricing, or managing environmental risk, all of which may proceed more quickly with some degree of policy support.

A more striking conclusion from the Chinese experience to date is that while regulatory guidance can promote sustainable finance, market conditions and incentives matter most if green finance reforms are to succeed. Strong policy support in the past few years has led to annual increases in the level of green credit issued by Chinese banks, but these gains may already have leveled off at around 10% of all corporate lending.[321] Public policy can most easily move banks to expand financing to green sectors. But even without policy leadership, banks might promote green credit programs to gain market access or reputational benefits if market conditions are so aligned.[322] This first dimension of green credit is, therefore, the easiest to implement, and outside of China, green lending also seems to be

319. *See* UNEP INQUIRY, *supra* note 4, at 13.

320. *See, e.g.*, Saule T. Omarova, *Bank Governance and Systemic Stability: The "Golden Share" Approach*, 68 ALA. L. REV. 1029, 1040–41 (2017) (identifying bank governance as a "matter of public interest"); Robert C. Hockett & Saule T. Omarova, *"Special," Vestigial, or Visionary? What Bank Regulation Tells Us About the Corporation . . . And Vice Versa*, 39 SEATTLE L. REV. 453 (2016) (reviewing the historical and contemporary antecedents of banks' public powers and functions).

321. *See* tbl. 1 (showing aggregate green credit volume as a percentage of total corporate lending).

322. For example, major U.S. banks seem to be seeking a first mover advantage through green finance in the first sense. *See, e.g.*, CITI, 2017 CORPORATE SOCIAL RESPONSIBILITY REPORT 10 (highlighting the use of green finance "league tables" to showcase deal volume relative to peer institutions).

taking root most quickly in this limited sense.[323] But truly "greening" the financial system will require more.

Indeed, China's green credit experiment confirms that the second dimension of green lending—undertaking environmental risk monitoring—is harder.[324] For smaller banks, weaker borrowers, and short-term lending, traditional credit risk analysis is more likely to matter to lenders than environmental risk factors.[325] Chinese banks are willing to invest in assessing borrowers' environmental credit risk only when that risk is high enough to justify the monitoring cost: when the project's environmental risk could impair debt repayment. Reported green credit loan volumes do not capture the extent of ECRM practice, and this deeper dimension of green lending is currently reported, if at all, in bank sustainability reports. Still, green finance ultimately depends on banks and other financial institutions being able to distinguish not only "black" and "green" but "shades of green" so they can ultimately incorporate, price, and rate environmental credit risk for all investments and ultimately for more complex financial instruments across public debt and equity markets as well. Many leading Western banks have only recently developed their own ECRM policies,[326] so it may be some time before standard approaches to these challenges emerge.

A final lesson, particularly for developing economies, is that China's green finance innovations have not happened in isolation. Instead, they have been built on over a decade of capacity-building and direct investment support from international financial institutions and on the foundation of international standards for bank operations and oversight. In this respect, banking reform has parallels to the role of foreign direct investment in China's broader economic reforms.[327] For other developing economies whose banks have not yet adopted robust risk management systems, the Chinese model suggests that both state guidance and external support are critical ingredients of the reform process.

Conclusion

Governments worldwide are now considering how best to promote green finance to facilitate growth in a way that not only enhances economic

323. *See, e.g.*, BANK OF AMERICA, 2017 SUSTAINABILITY REPORT, at 2 (setting a goal to reach $125 billion in green finance by 2025); CITI, *supra* note 322, at 8 (defining green finance goals in terms green sectors).

324. Prior studies of European banks from the mid-2000s also found less effort to price environmental and social risk. *See generally* Olaf Weber et al., *Empirical Analysis of the Integration of Environmental Risks into the Credit Risk Management Process of European Banks,* 17 BUS. STRAT. & ENV'T. 149, 154–56 (2008).

325. Interview with bank managers, Bank A, in Shanghai (July 2017).

326. *See, e.g.*, BANK OF AMERICA, *supra* note 323, at 3 (reporting publication of its policy only in 2016).

327. For an account of that history, see generally YASHENG HUANG, SELLING CHINA: FOREIGN DIRECT INVESTMENT DURING THE REFORM ERA (2003).

sustainability but also advances global development goals.[328] Given the size and scale of China's capital markets, China's green finance reforms are significant not only for the Chinese economy but for their potential influence on how global capital markets approach sustainable finance and investment and respond to global environmental crisis.

This study has examined China's latest green credit reforms as a test case of banks' ability to monitor and price corporate borrowers' environmental and social risk. It has shown that the scale of green credit issued by China's largest banks has increased exponentially in recent years, and that green finance policies adopted by the CBIRC and other regulators are motivating top-tier financial institutions to implement environmental and social credit risk monitoring systems. These developments confirm the importance of banks' monitoring role as green finance gatekeepers, particularly in markets like China's where debt financing predominates. However, China's experience also shows that even when policy incentives and state leadership are strong and when the banks at issue are among the largest financial institutions in the world, real costs and capacity constraints can impede banks' ability to measure and monitor environmental risk.

Given the preliminary nature of this study and the novelty of green finance globally, many fundamental questions remain. At a practical level, future research could usefully examine the contractual, structural, and financial tools banks use to manage risk; the relative weight given to environmental, social, and financial sources of credit risk for green credit loans in both green and "non-green" sectors; and how much the strength of regulatory enforcement in different jurisdictions affects banks' incentives to monitor environmental risk. As more banks expand green asset securitization, the impact of financial intermediation on monitoring incentives will also demand further exploration.[329] Future research is also needed to test the impact of bank monitoring on corporate borrowers' own environmental and social risk management practices.

Taken as a whole, the research presented here shows that the rosy picture of green credit presented in banks' public disclosures obscures some of the real obstacles to sustainable finance and investment and to the monitoring role of Chinese banks at the present time. Some of these challenges are deeply rooted in the Chinese institutional structure, but most are common challenges in other jurisdictions as well. Some are part of the growing pains that attend any new large-scale change in a dynamic, competitive, and globally integrated environment. No doubt, some of these innovations will not succeed. But the United States' own experience of initiating sometimes misguided and imperfect reforms shows that even what is done

328. *See* UNEP, G20 Financial Leaders Commit to Exploring Green Finance Options (2016), https://europa.eu/capacity4dev/unep/blog/g20-financial-leaders-commit-exploring-green-finance-options [https://perma.cc/J2VG-MRNG].

329. The IFC has already begun working with Chinese banks on green asset securitization. *See* Agricultural Bank of China, Corporate Social Responsibility Report 72 (2016).

imperfectly can have a huge and often positive effect.[330] Given their visibility, scale, and ambition, the same may be true for green credit reforms in China as well.

330. The halting progress yet global influence of the U.S. Securities and Exchange Commission's 2010 guidance on climate-related risk disclosure is but one example. Commission Guidance Regarding Disclosure Related to Climate Change, Exchange Act Release Nos. 33-9106, 34-61469, FR-82 (Feb. 8, 2010), https://www.sec.gov/rules/interp/2010/33-9106.pdf [https://perma.cc/6MEU-WLP6].

APPENDIX A: Banks Included in the Analysis[331]

Bank	Type	Listing
Agricultural Bank of China 中国农业银行	state-owned commercial bank (SOCB)	HKEx*; SSE**
Agriculture Development Bank of China 中国农业发展银行	policy bank	N/A
Bank of Beijing 北京银行	municipal commercial bank	SSE
Bank of China 中国银行	SOCB	HKEx; SSE
Bank of Communications 中国交通银行	SOCB	HKEx; SSE
China Bohai Bank 渤海银行	joint-stock commercial	N/A
China CITIC Bank 中信银行	joint-stock commercial	HKEx; SSE; NYSE
China Construction Bank 中国建设银行	SOCB	HKEx; SSE
China Development Bank 国家开发银行	policy bank	N/A
China Everbright Bank 中国光大银行	joint-stock commercial	HKEx; SSE
China Industrial Bank 兴业银行	joint-stock commercial	SSE
China Merchants Bank 商银行	joint-stock commercial	HKEx; SSE
China Minsheng Bank 中国民生银行	joint-stock commercial	HKEx; SSE
China Zheshang Bank 浙商银行	joint-stock commercial	HKEx
Export-Import Bank of China 国家开发银行	policy bank	N/A
Hengfeng Bank 恒丰银行	joint-stock commercial	Not yet listed
Huaxia Bank 华夏银行	joint-stock commercial	SSE

331. Source: CBRC, *Financial Institutions in the Domestic Banking Sector*, http://www.cbrc.gov.cn/chinese/jrjg/index.html [https://perma.cc/ZP4D-M75C] (last visited Apr. 3, 2017).

Bank	**Type**	**Listing**
Industrial and Commercial Bank of China 中国工商银行	SOCB	HKEx; SSE
Ping An Bank 平安银行	joint-stock commercial	SZSE***
Postal Savings Bank of China 中国邮政储蓄银行	postal savings bank	HKEx
Shanghai Pudong Development Bank 上海浦东发展银行	joint-stock commercial	SSE

*Hong Kong Stock Exchange
** Shanghai Stock Exchange
*** Shenzhen Stock Exchange

APPENDIX B: Content Analysis

Except as noted, the following indicators were coded as binary variables (1=present, 0=absent), regardless of whether they appeared in the bank's annual report or sustainability report. All results are based on information self-disclosed by the banks. The three policy banks are excluded from this analysis.

		2014 % reporting (n=18)	2015 % reporting (n=18)	2016 % reporting (n=18)
Level of Green Credit	Green credit loan balance	16 (89%)	16 (89%)	16 (89%)
	Black credit loan balance	12 (67%)	10 (56%)	9 (50%)
	Withdraws or rejects "black credit" finance	13 (72%)	6 (33%)	9 (50%)
Priority of Green Credit				
E/S integration in corporate governance*	Board or committee responsibility for E/S oversight	5 (28%)	4 (22%)	4 (22%)
Mitigates own E/S risk	Reports bank mitigation efforts or outcomes	14 (78%)	16 (89%)	16 (89%)
Stakeholder orientation	Discusses stakeholder engagement	9 (50%)	8 (44%)	13 (72%)
	Reports social contribution per share	8 (44%)	10 (56%)	9 (50%)
Bank E/S transparency	Mentions green finance in annual report	10 (56%)	12 (67%)	12 (67%)
ECRM Implementation				
	Mentions green credit policies in annual or sustainability report	12 (67%)	15 (83%)	17 (94%)
	E/S included in credit risk assessment	7 (39%)	7 (39%)	11 (61%)
	Conducts E/S monitoring (post-issuance)	3 (17%)	8 (44%)	8 (44%)
Transparency				
	Mentions green finance in annual report	10 (56%)	12 (67%)	12 (67%)
	Mentions green credit policies in annual or sustainability or report	12 (67%)	15 (83%)	17 (94%)
	Sustainability reporting based on third-party standard	13 (72%)	13 (72%)	13 (72%)

		2014 % reporting (n=18)	**2015 % reporting (n=18)**	**2016 % reporting (n=18)**
	Third-party certification of sustainability report	8 (44%)	12 (67%)	13 (72%)
International Integration				
	Signatory or utilizes Equator Principles.	1 (6%)	1 (6%)	2 (12%)
	Sustainability reporting based on international third-party standard (i.e. GRI4)	8 (44%)	12 (67%)	13 (72%)
	Third-party certification of sustainability report	8 (44%)	12 (67%)	13 (72%)
	Of those, international auditor certified (i.e. KPMG, PWC)	10 (56%)	12 (100%)	13 (100%)

*"E/S" refers to environmental or social factors or performance indicators.

APPENDIX C: Green Credit Loan Volume

Table C-1: Green Credit Loan Balance (2012–2016) (RMB millions) and as Percentage of Corporate Loans

Bank	2012	Green Credit %	2013	Green Credit %	2014	Green Credit %	2015	Green Credit %	2016	Green Credit %
Agricultural Bank of China 中国农业银行	152,200	3.44	330,471	6.99	472,447	9.18	543,131	10.10	649,432	10.94
Bank of Beijing 北京银行	.	.	.	.	18,400	3.60	26,000	4.64	38,900	6.29
Bank of China 中国银行	227,480	6.59	258,759	7.01	301,043	7.49	412,315	9.37	467,342	10.39
Bank of Communications 中国交通银行	144,028	6.14	165,836	6.59	152,421	5.95	204,795	7.51	161,110	5.52
China Bohai Bank 渤海银行	2,903	2.48	4,470	3.29	6,641	4.12	11,191	5.42	15,553	5.80
China CITIC Bank 中信银行	18,960	1.72	20,764	1.62	25,173	1.67	23,696	1.45	25,478	1.38
China Construction Bank 中国建设银行	239,637	4.83	488,390	9.04	487,077	8.46	733,563	12.70	889,221	15.16
China Everbright Bank 中国光大银行	.	.	.	.	34,761	4.24	38,700	4.22	49,376	4.59
China Industrial Bank* 兴业银行	112,609	12.34	170,897	17.28	296,000	25.09	394,200	32.92	494,360	38.88
China Merchants Bank 商银行	109,547	9.50	116,372	8.78	150,947	10.29	156,503	10.38	143,664	9.17

Bank	2012	Green Credit %	2013	Green Credit %	2014	Green Credit %	2015	Green Credit %	2016	Green Credit %
China Minsheng Bank 中国民生银行	.	.	.	.	9,072	0.78	11,404	0.86	13,823	0.89
China Zheshang Bank 浙商银行	.	.	.	.	.	.	.	.	.	.
Hengfeng Bank 恒丰银行	.	.	.	.	.	.	.	.	.	.
Huaxia Bank 华夏银行	36,593	5.91	34,660	5.32	39,440	5.21	39,960	5.08	45,350	5.04
Industrial and Commercial Bank of China 中国工商银行	593,400	9.37	598,000	8.49	811,747	12.02	914,603	11.62	978,560	12.02
Ping An Bank 平安银行	.	.	11,161	2.14	12,494	1.95	16,402	2.12	22,382	2.39
Postal Savings Bank of China 中国邮政储蓄银行	.	.	.	.	54,882	.	63,417	6.46	75,231	6.97
Shanghai Pudong Development Bank 上海浦东发展银行	150,359	12.74	152,104	11.35	156,374	10.29	171,785	10.76	173,813	10.04

*China Industrial Bank has substantial green leasing and other finance businesses, and so it reports on its total "green finance" volume, which is a figure that includes, but is not limited to, green credit lending. This figure is therefore not directly comparable to other banks who report only on green credit lending.

Table C-2: Black Credit Loan Balance (2012–2016) (RMB millions) and as Percentage of Corporate Loans**

Bank	2012	Black Credit %	2013	Black Credit %	2014	Black Credit %	2015	Black Credit %	2016	Black Credit %
Agricultural Bank of China 中国农业银行	.	.	531,952	11.25	521,611	10.13	.	.	.	.
Bank of Beijing 北京银行	.	.	.	.	.	.	.	.	.	.
Bank of China 中国银行	.		514,200	13.94	498,300	12.39	511,800	11.63	.	
Bank of Communications 中国交通银行	66,385	2.83	55,582	2.21	55,112	2.15	49,934	1.83	142,921	4.90
China Bohai Bank 渤海银行	814	6.95	.	.	.	.	.	.	.	.
China CITIC Bank 中信银行	67,655	6.14	63,345	4.95	49,219	3.26	50,180	3.08	48,742	2.64
China Construction Bank 中国建设银行	.	.	.	.	140,707	2.44	130,259	2.25	125,273	2.14
China Everbright Bank 中国光大银行	.	.	39,416	.	30,149	3.68	.	.	.	.
China Industrial Bank* 兴业银行	39,158	4.29	38,738	3.92	39,158	3.32	42,480	3.55	50,537	3.98
China Merchants Bank 商银行	130,717	11.34	121,342	9.15	94,904	6.47	92,903	6.16	88,698	5.66
China Minsheng Bank 中国民生银行	41,724	4.54	57,543	5.94	40,066	3.46	40,657	3.08	49,941	3.20

Bank	2012	Black Credit %	2013	Black Credit %	2014	Black Credit %	2015	Black Credit %	2016	Black Credit %
China Zheshang Bank 浙商银行	.	.	.	.	.	.	.	.	.	.
Hengfeng Bank 恒丰银行	.	.	.	.	.	.	.	.	.	.
Huaxia Bank 华夏银行	.	.	27,472	4.22	23,385	3.09	23,213	2.95	10,617	1.18
Industrial and Commercial Bank of China 中国工商银行	.	.	.	.	.	.	.	.	.	.
Ping An Bank 平安银行	55,500	11.21	60,400	11.58	13,760	2.15	13,180	1.70	85,432	9.14
Postal Savings Bank of China 中国邮政储蓄银行	.	.	.	.	.	.	.	.	.	.
Shanghai Pudong Development Bank 上海浦东发展银行	51,855	4.39	49,783	3.72	46,033	3.03	29,528	1.85	27,009	1.56

** As indicated here, certain banks report only black credit loan volume, others only on the black credit percentage, and others report both. Most banks do not confirm that the black credit percentage is reported relative to the corporate loan balance; if reported relative to total loan volume, the percentage reported here is lower than if reported based on the corporate loan balance.

APPENDIX D: 2014 Green Credit Audit Standards Recommended Content of Environmental and Social Risk Management Contract (Selected)[332]

1. *Borrower Representations & Warrantiess*
   1.1 Representation and Warranty that borrower's internal records regarding environmental and social risk management are compliant with applicable regulations
   1.2 Representation and warranty that borrower has not been subject to significant litigation regarding environmental or social risks
2. *Restrictive Covenants Regarding Lender Supervision & Borrower Environmental & Social Risk Management*
   2.1 Covenant to comply with all regulations (related to environmental and social risk)
   2.2 Covenant to establish an internal risk management system for environmental and social risk
   2.3 Covenant to implement emergency procedures for responding to accidents that have environmental impact
   2.4 Covenant to establish a dedicated department or personnel with responsibility for environmental and social risk management
   2.5 Covenant to comply with lender or qualified third-party requests to conduct environmental or social risk assessment
   [2.6–2.8 omitted]
3. *Borrower Reporting Requirements*
   3.1 Notice confirming receipt of required permits and approvals from environmental and labor authorities.
   3.2 Notice of inspection or assessment of borrower's environmental and social practices by regulatory authorities.
   [3.3–3.5 omitted]
   3.6 Notice of any significant claim by the community against the lender.
   [3.7–3.8 omitted]
4. *Breach Defined*
   4.1 Breach of environmental and social risk management covenants
   4.2 Borrower subject to penalty from relevant government agencies for poor management of environmental and social risks.
   4.3 Borrower criticized by the public or the media for poor management of environmental and social risk.
   [Other breaches defined by contract]
5. *Remedies for Breach*
   5.1 Revocation of loan commitment
   5.2 Temporary suspension of loan disbursement
   5.3 Acceleration of debt repayment

332. AUDIT STANDARDS, *supra* note 149, at app. V. These clauses are selections from the list of twenty-seven recommended provisions.

APPENDIX E: Interview Sources

No.	Date	Title	Institution	Informant Type	City
1	July 2016	Chief Executive Officer	Bank C	commercial bank branch	Hong Kong
2	Apr 2017	staff assistant	China Bank Regulatory Commission	central government	Beijing
3	May 2017	environmental specialist	World Bank (Beijing)	international financial institution	Beijing
4	May 2017	green finance director	Bank B	commercial bank branch	Shanghai
5–6	July 2017	green bond assurance consultants; sustainable finance consultants	Syntao Green Finance	sustainable finance consultancy	Beijing
7	July 2017	senior CBRC official	China Bank Regulatory Commission	central government	Beijing
8	July 2017	senior NDRC official	National Development & Reform Commission	central government	Beijing
9	July 2017	IFC senior operations & CHUEE program officer	International Finance Corporation (Beijing)	international financial institution	Beijing
10	July 2017	bank manager	Bank C	commercial bank headquarters	Beijing
11	July 2017	IFC green finance consultant	International Finance Corporation - Green Credit & Bank Risk Management (Beijing)	international financial institution	Beijing
12-13	July 2017	bank managers	Bank A	commercial bank branch	Shanghai
14	July 2017	lawyer, banking practice	international law firm	lawyer	Shanghai
15	July 2017	division manager	Bank B	commercial bank branch	Shanghai
16	July 2017	staff assistant	Bank B	commercial bank branch	Shanghai
17	July 2017	lawyer, banking practice	international law firm	lawyer	Hong Kong
18	July 2017	lawyer, banking practice	international law firm	lawyer	Beijing
19	July 2017	accountant & senior manager	PricewaterhouseCoopers Business Consulting (Shanghai) Co. Ltd., Sustainability & Climate Change	CSR & green finance assurance	Shanghai

No.	Date	Title	Institution	Informant Type	City
20	July 2017	accountant & manager	PricewaterhouseCoopers Business Consulting (Shanghai) Co. Ltd., Sustainability & Climate Change	CSR & green finance assurance	Shanghai
21	July 2017	bank manager	Bank D	commercial bank (branch)	Shanghai
22	July 2017	financial analyst	investment firm	domestic financial institution (other)	Shanghai
23	July 2017	bank manager	HSBC	international bank (branch)	Hong Kong
24-25	July 2018	green finance committee members	China Banking Association	trade association	Beijing