

Climate Risk and Financial Systems of Latin America Regulatory, supervisory and industry practices in the region and beyond

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CLIMATE RISK AND FINANCIAL SYSTEMS OF LATIN AMERICA

Regulatory, supervisory and industry practices in the region and beyond



Executive Summary

On September 29, 2015, climate-related risks were officially put on the agenda of financial regulators and supervisors and also financial markets players. In his now famous Tragedy of Horizons speech¹ at Lloyds of London, the Governor of the Bank of England, Mark Carney, outlined the connection between climate change and its related impacts on economic systems, financial markets and their stability.

The speech urged the financial industry - regulators, supervisors, financial institutions and service providers - to look beyond the immediate business and political cycles, and their current mandates, and assess the potential impacts that could derive from unmanaged risks related to global climate change. By linking climate risks to financial stability, this intervention marked a step change in how financial regulators, supervisors and central banks perceived the threat of global warming to financial stability.

The impact of the speech across financial markets was monumental, and four years later much has changed. In December 2015, the G20 Financial Stability Board (FSB) created the Task Force on Climate-related Financial Disclosures (TCFD) with the objective of supporting the financial system (banks, investors, insurance companies and bond and stock issuing companies) to better understand the impact of climate change on financial markets and in the creation of guidelines for the identification, management and communication of climate-related risks. In June 2017, the TCFD published its recommendations², establishing an important framework for the identification and management of climate

risks in the operation of financial and non-financial institutions, including aspects of governance, strategy and business model, risk management processes as well.

In December 2017, eight central banks and financial supervisors created the Network of Central Banks and Supervisors for Greening the Financial System (NGFS)³. The Bank of Mexico was among the founding members and since then the Central Bank of Costa Rica, Superintendency of Colombia and the Mexican National Banking and Securities Commission have also joined. The network is expanding with 42 members and 8 observers as of July 2019, including the Bank of International Settlements, the International Monetary Fund, and multilateral banks as official observers.

In Latin America and the Caribbean (LAC), regional supervisors and regulators have not yet explicitly included nor addressed climate-related risks in binding regulations and/or supervisory measures for the financial sector. This implies significant work ahead for the LAC financial sector to develop effective and complete frameworks to identify, assess, manage and disclose these risks within existing supervisory and regulatory frameworks in the region. At the same time, a lack of clarity prevails on both the taxonomy of such risks and the tools needed to manage them.

In this context, the Inter-American Development Bank (IDB) launched a research program on the relationship between climate change and financial markets in the LAC region, beginning a dialogue with several regulators, central banks and supervisors, alongside an analytical effort that is presented here, consisting of two separate but related reports:

1. Regulating climate-related risks: a map of financial regulations and industry practices in Latin America and the Caribbean: The first paper reviews and maps current financial regulations, voluntary frameworks and guidelines for the financial sector in Latin America and the Caribbean that aims to identify, assess, measure, and manage climate-related risks in financial systems,

¹Bank of England, 2015. <https://www.bankofengland.co.uk/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability>

²TCFD, 2017. <https://www.fsb-tcf.org/publications/final-recommendations-report/>

³<https://www.banque-france.fr/en/financial-stability/international-role/network-greening-financial-system>

providing a regional mapping and also four in-depth case studies on Brazil, Colombia, Mexico, and Peru, supported by interviews and discussion with regulators and supervisors in the countries.

2. “Financial system resilience to climate-related risks: International practices in using supervisory and regulatory instruments”:

The second paper focuses on several measures that central banks and financial regulators in LAC could take to support financial system resilience to climate-related risks by analyzing international practices implemented in other regions, as well as considering their potential and challenges for adoption and replication in LAC.

Research agendas relating to climate-related risk and the resilience of financial systems are incipient in LAC compared to some other regions. Nonetheless, there is an emerging consensus on the taxonomy of such risks (and their specific features when compared with environmental risks) and on the effects and relevance of such risks for financial systems, and on the role of financial regulators in addressing them.

Taxonomy and definitions of Climate Risks

In terms of taxonomy, these studies borrow the definitions of climate risks proposed by the Bank of England in 2016⁴ which are centered on two main pillars⁵. First, climate physical risks that stem from weather-related events, such as floods, storms or higher/lower temperature and precipitation extreme events, causing direct impacts, such as damage to property, and indirect impacts, such as the disruption of global supply chains and/or resource scarcity. Second, climate transition risks caused by structural changes (political, technological or behavioral) in the economic system of countries moving towards low-carbon economic models, causing financial losses and devaluations of certain assets associated with higher carbon-emitting industries and activities.

⁴Batten S., Sowerbutts R., Tanaka M. “Let’s talk about the weather: the impact of climate change on central banks.” Staff Working Paper No. 603. Bank of England. 2016

⁵The Bank of England framework features as well a third pillar – Liability risks that however is here considered a derivative of physical and/or transition risk and for this reason excluded from the main discussion.



In addition, Environmental, Social and Governance (ESG) risks stem from environmental, social, and governance issues and liabilities potentially generated by a business or investment activity. They can represent impacts, losses and damages that assets and activities impose on the environmental system at the time of their execution and operation contrary to the losses and impacts caused by climate and/or environmental (in a forward-looking perspective) systems on the assets and activities during their economic useful life.

Despite these differences, the management of climate-related risks in LAC financial markets could build on the interaction with international initiatives such as the TCFD and NGFS, as well as existing practices for the management of ESG risks, including criteria and standards (the Equator Principles, Principles for Responsible Investment and other), industry-wide agreements and protocols (such as the Green Protocol in Colombia and the Sustainable Roundtable in Paraguay), and binding regulation (as in the case of Brazil). Therefore, this analysis looks at the emerging tools for the management of climate risks in international markets, then to the existing ESG-focused frameworks in LAC that could provide a solid basis to develop models for the inclusion of climate risks, and finally to emerging supervisory and regulatory practices in other regions that could be replicated, at least partially, in LAC.

International frameworks on climate risks in financial systems

As climate-related risk is a new concept for the financial industry and its regulators, an emerging consensus in the industry and amongst regulators on its assessment and management is only just beginning to take shape. At first, the debate focused on whether financial regulators and supervisors should intervene and address these risks, whether climate-related risks do indeed pose a systematic threat to the financial system, or whether such risks would not be better managed by fiscal and economic policymakers. Indeed, the mandates of the institutions providing guidance and supervision to financial systems (Financial Stability Board, International Monetary Fund, the Bank for International Settlements and

the International Organization of Securities Commissions) do not currently include nor foresee any role in terms of management of climate-related or environmental risks. They do however include tasks such as promotion of confidence in the market, promotion of economic growth, preservation of financial stability, and management of systemic risk. Based on this situation, assessing whether climate risks pose a systemic threat to global financial markets' stability meant assessing whether it was to be a key item in the agenda of financial regulators and supervisors.

In such context, a first comprehensive solution comes from the TCFD recommendations released in July 2017. They proposed a voluntary, consistent management and disclosure framework, structured in four thematic areas: (i) Governance, structure and disclosure of an organization's governance on climate-related risks and opportunities, (ii) Strategy, disclosure of potential impacts and opportunities related to climate risks from the organization's businesses, strategy and financial planning perspectives, (iii) Risk Management, disclosure of the processes through which the organization identifies, assesses, and manages climate-related risks, and (iv) Metrics and Targets, disclosure of the metrics and targets used to assess and manage climate-related risks and opportunities.

In terms of risk management framework (identification, quantification, modeling, strategy, and disclosure), the TCFD recommendations are largely consistent with most ESG standards, especially regarding identification and assessment of risks. Notably, the most significant difference is on the focus of the TCFD recommendations on modeling tools for the whole portfolio (for example stress testing) and for the forward-looking perspective in the identification of risks and in their management, with the recommended uses of scenario analysis and sensitivity tests (transition risks are an example). The TCFD recommendations do not imply a change in the mission of the companies that adopt the frameworks, nor do they suggest divestment of specific projects or exclusion of certain activities. Conversely, despite other voluntary frameworks such as the Equator Principles and the PRI, the proposed frameworks under TCFD do not include a verification and compliance system

of the climate related reporting, albeit they explicitly require disclosed information to be as verifiable as possible.

While the TCFD was conceived as a private sector initiative for the market, the Network of Central Banks and Supervisors for Greening the Financial System (NGFS) was set up by supervisors with the aim of providing an international forum of discussion and knowledge exchange for regulators and supervisors on the issues of green finance and systemic risks from climate change. The network published its first progress report in October 2018 highlighting that physical and transition risks from climate change

can have serious consequences for financial institutions and are a threat to the stability of the global financial system.

The NGFS considers climate risks are material, system-wide and possibly destabilizing for the financial system and regards climate risks as falling within the supervisory and financial stability mandates of central banks and financial supervisors. It concludes that even if climate risks may be realized in the long term, their mitigation requires action in the short-term. In 2019, the NGFS published a series of recommendations aimed at both regulators and supervisors, and policymakers:

For central banks and supervisors to fulfill their mandate in preserving financial stability:

- Integrating climate-related risks into financial monitoring and micro-supervision
- Integrating sustainability factors into own-portfolio management
- Bridging data gaps
- Building awareness and intellectual capacity and encouraging technical assistance and knowledge sharing

For policymakers to encourage broader transparency in financial markets:

- Achieving robust and internationally consistent climate and environment-related disclosure, supporting the framework developed by the TCFD
- Supporting the development of a taxonomy of economic activities

The Latin American and Caribbean Map for financial regulation

Under the definition of climate-related risks of the BoE and TCFD, financial regulators in LAC countries have not yet explicitly included nor addressed climate-related risks in binding regulations and/or supervisory measures of the financial sector. However, several countries show regulatory and self-regulatory actions for environmental and social risk that can be considered a first step towards a more explicit regulation on climate-related risks.

For regulatory and supervisory efforts, countries in the region can be categorized under three major groups, i) countries with regulation (for ESG risks) in place, ii) countries where supervisory measures have been implemented or initiated, and iii) countries where private sector initiatives (or self-regulatory) practices are being

implemented or have led the efforts of the financial system. These categories are not mutually exclusive from one another, in fact in most cases private-public voluntary agreements have preceded regulation or supervisory actions.

i. Three countries with regulation is in place:

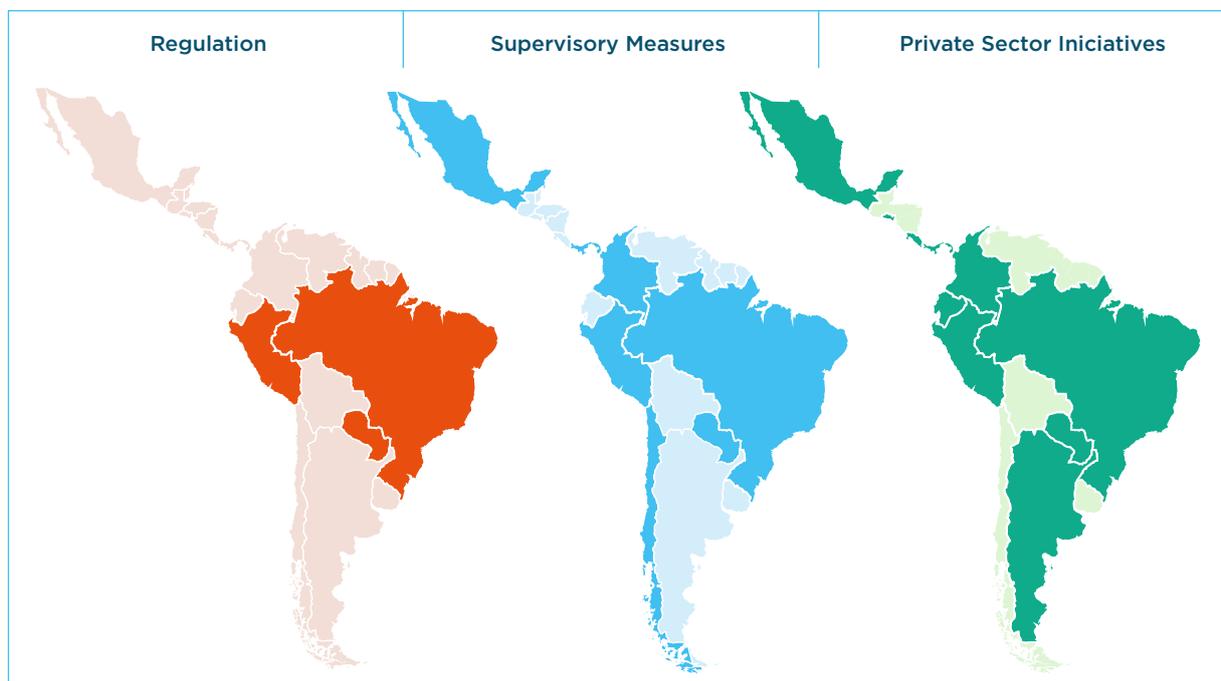
- Brazil, with Resolution 4327 from the Central Bank enacted in 2014
- Peru, with Resolution 1928-2015 from the Superintendent, enacted in 2015
- Paraguay, with Resolution 8 from the Central Bank enacted in 2018

ii. There are seven countries where supervisory measures are being implemented: Brazil, Peru and Paraguay with actions emerging from their regulations. Chile and Mexico are performing a survey of the financial sector on ESG and climate-risk practices. In Colombia, a supervisory statement was

produced following the implementation of a survey; and Panama which has included environment and social risk within the list of 13 risk that banks need to provision against. Finally, the Central Bank of Costa Rica, the Financial Superintendency of Colombia, the Mexican National Banking and Securities Commission and the Central Bank of Mexico are now members of the NGFS.

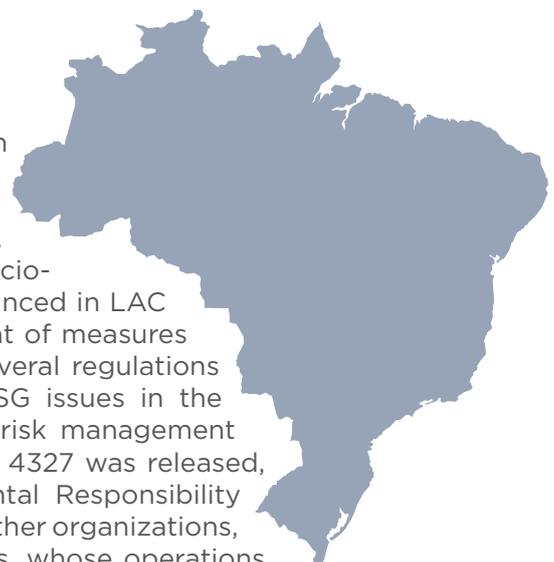
iii. Ten countries with private-sector led initiatives: Argentina with the Sustainability Protocol for Public Banks from 2018, Brazil with the Protocolo verde (banks) dates back to 2009, Colombia with the Protocolo

Verde from 2012 and the Protocolo Verde Ampliado from 2016 (bank and later finance sector), Costa Rica with the commitment to elaborate a Roadmap for Sustainable Insurance in 2018, Ecuador with the Sustainability Protocol from 2016 (banks), El Salvador with their Sustainability Protocol for Public Banks dated from 2018, Mexico with their Sustainability Protocol dated from 2016 (banks); Panama with the Sustainability Protocol from 2018 (banks), Paraguay with the Mesa de Finanzas Sostenibles from 2012 (Banks), Peru with the Programa de Inversión Responsable (PIR) and the Green Protocol.



Brazil

Brazil is strongly involved in international initiatives on climate change and the financial industry, supporting research on solutions to scale up green finance, and to reduce financial vulnerability to climate risks. Brazilian financial regulation has long incorporated socio-environmental principles and is one of the more advanced in LAC in tackling these risks. Starting with the establishment of measures regarding the protection of the Amazon in 2008, several regulations have been established with the goal to address ESG issues in the financial system and to integrate them in the core risk management functions of financial institutions. In 2014, Resolution 4327 was released, requiring implementation of Social and Environmental Responsibility Policies (SERP) in regulated financial institutions and other organizations, such as cooperatives and federations of cooperatives, whose operations



are authorized by the BCB??. The regulation provides specific criteria for the risk assessment of high-risk activities and requires institutions to keep records of losses generated by socio-environmental damage, which is to be monitored and recorded for a minimum period of five years.

In 1995, several state-owned banks signed The Green Protocol,⁶ the first effort of integration of sustainability concerns in the banking industry. The Brazilian Federation of Banks (FEBRABAN⁷) supports the UN Environment Finance Initiative and more than 50 institutions such as asset owners,

investment managers, and service providers are signatories of the UN backed Principles of Responsible Investments (PRI). Another key initiative is the Brazilian Business Council for Sustainable Development (Conselho Empresarial Brasileiro para Desenvolvimento Sustentável, CEBDS). Officially launched in 2005, the group includes the largest financial institutions⁸ (e.g. Santander and Itaú Unibanco), and with FEBRABAN has initiated a roadmap for the adoption of TCFD recommendations by the banks in Brazil. The roadmap identifies 10 landmarks to be accomplished in the next 5 years.



Chile

While there is not yet specific financial regulation in Chile on environmental and climate related risks, in 2019 the ministry of Finance has promoted a coordinated effort among the regulators and supervisors of the Chilean financial system including banking, asset management, pension and insurance to improve the understanding of climate-related risks and opportunities and support a platform of dialogue with the private sector. With the support of the IDB, the British Embassy and UNEP FI, the Ministry of Finance, the Central Bank, the Commission for the Financial Market (CMF) and the Superintendent of Pensions, launched in July 2019 a Public-Private Dialogue on Green Finance with the aim of agreeing by the end of 2019 a formal Green Agreement between Regulators and the Private Sector, a Joint-Declaration from the Regulators on the importance of climate issues for the financial system and a Road Map for Climate Finance 2020-2024 that will aim to support the integration of climate factors in the decision making process of financial institutions of the country.

Colombia

The Colombian financial regulatory framework does not yet include rules that explicitly address climate-related risks for financial institutions. However, with Decree 2555 of 2010, the government introduced regulation on environmental and social practices, risks and disclosure for financial companies in banking, insurance and capital markets sectors. The same title determines the frequency and the content of the reporting on ESG issues, to be released with annual frequency and using their communication instruments with the highest coverage and public access.

The most relevant initiative for the domestic market is the Green Protocol.⁹ It is a joint initiative of the Colombian government and the Colombian banking sector, focused

⁶UNEP. "The Brazilian Financial System and the Green Economy" Center for Sustainability Studies at Getulio Vargas Foundation. 2014.

⁷FEBRABAN represents 122 banks which accounts for 93% of shareholder's equity and 97% of the total assets of the national banking system in Brazil retrieved from <https://www.febraban.org.br>.

⁸Banco do Brasil, BNDES, Bradesco, Bradesco Seguros, Caixa, Mapfre Seguros, Itau and Santander.

⁹Asociacion Bancaria de Colombia, retrieved from Official document: <http://www.asobancaria.com/protocolo-verde/>

on promoting green financing and a more efficient use of natural resources. The protocol was signed in 2012 by the government, Asobancaria and 15 banks and lending institutions. This protocol, through a set of guidelines, encourages financial institutions to incorporate climate finance into their strategies, as well as to establish lines of action for the analysis of environmental risks and efficiency in the use of resources. The protocol has been expanded in 2016 to include the asset management and insurance industry.

Finally, in 2019, the Financial Superintendency (SFC) formally joined the NGFS and at the same time presented the results of the first

survey of climate risk and green finance in the financial sector. The financial system as a whole has not yet integrated ESG and climate risks in a systemic way, with only 42% of banks, 21% of general insurance companies, 20% of life insurance companies and 13% of trust funds with integrated environmental and social risk assessment systems. As a result, the SFC established an agenda with four key areas to strengthen climate risk awareness and management: Develop a taxonomy based on international experience and local priorities; adoption of ESG criteria by investment funds; Transparency and disclosure regarding climate change; and finally, capacity building of the sector.



Mexico

The Mexican government and the institutions of the financial sector are highly active and involved in international dialogues on climate change, especially with the Central Bank as an active participant of the G20 Sustainable Finance Study Group and a founding member of the NGFS together with seven other institutions from Asia and Europe; and the Mexican Association of Banks (ABM) and the Ministry of Environment as both members of the Sustainable Banking Network.

The only regulation that explicitly addresses ESG risks in financial activities is the disclosure requirements by the Securities Exchange Commission, for the firms that are listed on the Mexican Stock Exchange. Firms are required to include a detailed description of their environmental performance, including (i) their environmental policy, (ii) their environmental management system, (iii) an environmental certificate or environmental recognition, either by the competent authority or an accredited entity, and (iv) a program or projects for the protection, defense, or restoration of the environment

and natural resources. Moreover, an issuer must disclose whether their activities pose considerable environmental risk, and importantly whether climate change and/or legislation related to climate change might affect the issuer's business, such as in variation of demand for carbon-intensive goods. Finally, Banco de Mexico is currently undertaking a survey of sustainability practices and climate risk assessment in financial institutions with the objective to assess the level of awareness, adoption and interest on these measures in the sector to inform its further actions and its inputs to the NGFS.

Peru

In the financial sector, there is a growing levels of awareness regarding extreme weather events and their impact on financial assets. In this context, the Superintendency of Banks, Pensions and Insurance (SBS) issued Resolution 1928 in 2015. In line with international ESG standards - and especially the Equator Principles - the resolution aims at establishing minimum requirements for socioenvironmental risk management to encourage financial firms to implement robust due diligence consultations, as well as an investment decision-



making processes that would address socio-environmental risks. While Resolution 1928 applies to financial institutions, companies listed on the stock market comply with the Resolution 033-2015-SMV/01, with the aim to increase available information on corporates' sustainability practices through mandatory disclosure. This resolution is closely aligned with the Sustainable Stock Exchanges (SSE) principles and intends to identify those companies that are implementing actions and standards to ensure their corporate sustainability and at the same time make public the efforts of each firm on environmental and social development. In this sense, this resolution is forward looking and incentivizes firms to have in place a measure to address and mitigate potential issues in the future.

Comparing LAC Environmental Risk Regulations and the Climate-related Risk Frameworks

Despite none of the regulations identified having been formulated to address climate risks, there are elements of convergence with climate risks framework that could provide important synergies to support regulators and supervisors wishing to develop this agenda.

The banking regulations analyzed in Brazil and Peru share a risk approach that is aligned with the recommendations of the TCFD. They are required to classify, assess and evaluate environmental risks (with clear overlaps with climate risks) as well as integrating environmental risks in the governance process of the financial institutions. However, they notably differ in two distinctive ways from the TCFD in not requiring modeling of risk at the portfolio level (e.g. stress testing), nor in a forward-looking fashion with the use of, for example, scenarios analysis.

In terms of disclosures, the stock market regulations as well the reporting framework of the Green Protocol in Colombia do partially align with the disclosure framework of the TCFD. At the same time, the Circular Unica de Emisoras in Mexico requires financial and non-financial listed companies to disclose specific exposure to environmental risks and as well to climate change effects and climate-related legislation (an equivalent

of transition risk in the TCFD taxonomy). Resolution SMV 033-2015-SMV/01 in Peru requires listed companies to disclose to market participants their current corporate practices on sustainability and when performed metrics on energy-intensity, greenhouse gases emissions and use of water. In Colombia, instead, part of the guidelines provided through the Green Protocol is the assessment and disclosure of the greenhouse gas emissions of lender's portfolios, which is at the core of the TCFD climate-related disclosure framework.

International measures and their relevance for Latin America and the Caribbean Region

The second part of this work provides insights on potential measures that central banks and financial regulators in LAC could take to build resilience in financial systems. It focuses on three main options deemed as the most relevant for the region after considering a more comprehensive list of options available globally to central banks and financial regulators:

- 1) Assessing the climate risk exposure of national financial systems
- 2) Encouraging national financial institutions to take climate risks into account in their operations
- 3) Developing national green credit markets to accelerate the transition to a low-carbon economy.

In a first step, we analyse the implementations of these measures in three countries, selected for their role at the forefront of research and policy implementation: the Bank of England (BoE) in the United Kingdom and the Central Bank of the Netherlands (DNB) for the first measure and the People's Bank of China (PBOC) for the last two measures. In a second step, we presented our results to selected LAC central bankers and financial regulators to gather their feedbacks on a potential implementation in LAC.

For the BoE and the DNB the perception of an exposure to climate-related risks of their national financial sector was the main driving factor to undertake an estimation of climate risk exposure of financial markets. Such perception was however due to different reasons specific to the national contexts.

The sheer size of the insurance sector in the UK and the clear link between climate-related hazards and insurance sector's profitability was a key trigger for the BoE. In the Netherlands instead, the dependence of the national economy on polluting sources of energy and the geographical specificity of the country with large areas under the sea level, which makes it particularly vulnerable to physical risks like floods, were the trigger. The BoE started with a qualitative approach (sectoral surveys) to assess the industry's level of awareness and preparation on these risks, to then consider a quantitative analysis to assess their exposure; the DNB instead chose a quantitative assessment of the country's exposure to physical risks (especially flooding) and then to transition risks in order to assess the significant and magnitude of climate risks.

Both the BoE and the DNB found that physical and transition risks are material for the financial sector, and that given the sensitivity of the potential results, a clear communication strategy must be chosen and decided relatively early in their analysis process to be as transparent as possible. Finally, as there is currently no consensus on which methodology is best to assess climate risk exposure of financial institutions, the two institutions realized that a learning process is inevitable and there is value in testing pioneering approaches.

The PBOC and the financial sector regulators in China aimed to build a coherent regulatory framework to on the one side promote the integration of environmental and climate risk into the core risk management processes of financial institutions (especially banks and insurers). On the other to promote the creation and use of green financial products to finance opportunities aligned with a transition to a low carbon economic model. Between 2012 and the present, several guidelines on green credit, statistics, and bonds have been issued and form the backbone of a green finance market that in 2018 accounted for US\$1.09tn in loans labeled green according to national taxonomies.¹⁰ The key elements

of the Chinese green framework could be summarized as follows: a green credit policy and accompanying guidelines; a green statistics system for data collection and a taxonomy, a green bond catalogue and incentives to issuance, green performance indicators to support risk management and reporting, and finally an expansion of the collateral framework together with green factors in the macro-prudential assessment framework to support banks extending finance to green activities via credit and bonds.

As part of the second step, the interviewed institutions in LAC¹¹ welcomed the initiative and highlighted 1) the need to better gauge the exposure of their national financial sectors to climate risks and 2) the need to increase awareness and management of these risks in national financial institutions. Data collection and use have been identified as a key element to improve, both to allow financial supervisors to better assess financial sector's exposure to climate risks and for financial institutions to better integrate these risks into their lending operations and into their risk management.

Financial regulators and central banks of the region underline that assessing the financial sector's exposure to climate risks is a learning process and that they are at the beginning of the learning curve. A qualitative assessment of this exposure, as done first by the Bank of England (BoE), seems to be an adequate and quickly implementable first step to make a more quantitative approach, through e.g. climate stress tests, as done by the (DNB), which would require building internal capacity and adapting available methodologies to LAC's specificities.

LAC financial regulators and central banks also acknowledge that their national financial institutions should engage more on climate risk issues. As highlighted in the Chinese case, LAC interviewees think that the development of taxonomies and guidelines by national authorities would help financial institutions, especially small and medium institutions with limited resources, to better

¹⁰Lu and Tang, 2017.

¹¹These include the Ministry of Finance and the Financial Market Commission of Chile; the Financial Superintendency of Colombia; the Central Bank and the Superintendency of Financial Institutions of Costa Rica; and the Central Bank of Mexico.

integrate climate risks into their operations and into their risk management.

The countries of Latin America and the Caribbean, and their financial systems as well, are at very different stages of development regarding the tools to support financial system resilience to climate-related risks. This heterogeneity would

need to be used as an enabling factor as the most advanced countries can share their experiences with less advanced ones. The IDB and other Development Finance Institutions (DFIs) could play an important role in the generation of data and evidence, in the piloting of innovative approaches and the transmission of knowledge between countries.

The IDB has identified 5 areas of support for Regulators, Supervisors and Financial Sector Policymakers that are interested in supporting their country to transition towards sustainable finance. Each of these areas will require a series of specific activities and engagements

The areas identified follow a logical sequence from introductory/basic to more advanced topics and are aligned with international best practices. Any one of these areas can serve as a starting point, incorporating local characteristics and differentiated requirements of countries.

Areas of potential support are:

- 1 Introduction to international fora and discussions:** a short series of workshops or presentations aiming to update and create awareness of different actors and initiatives.

- 2 National surveys of ESG or climate risk practices in financial institutions:** The survey aims at understanding the current practices and tools implemented at the national level whether on ESG or climate risk topics.

- 3 Supervisory statements or climate risk assessments:** Support with either a supervisory statement on ESG and/or climate risk practices, and/or undertake a quantitative exercise such as climate risk assessment to measure the level of exposure of the financial system.

- 4 National dialogues on sustainable finance:** Support to guide and structure a national dialogue according to the objectives of the country, while building linkages with international actors.

- 5 Capacity building:** these processes require a strong and constant capacity building component and data to strengthen the ability of financial institutions and supervisors to guide the national process.

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Part 1

Regulating climate-related risks in financial systems: a map of regulatory, supervisory, and industry practices in Latin America and the Caribbean

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List of Abbreviations

- CAM** Central American Monetary Council
- CBRC** China Banking Regulatory Commission
- CVM** Comissão de Valores Mobiliários (Securities and Exchange Commission)
- DNP** Departamento Nacional de Planeación (National Planning Department)
- ECCB** Eastern Caribbean Central Bank
- ERA** Environmental Risk Analysis
- E&S** Environmental and social
- ESG** Environmental, Social and Governance
- FASECOLDA** Federación de Aseguradores Colombianos (Colombian Insurance Association)
- FEBRABAN** Brazilian Federation of Banks
- FIRA** Fideicomisos Instituidos en Relación con la Agricultura (Trust Funds for Agricultural Development)
- FNMC** Fundos Nacionais de Mudança do Clima (National Fund for Climate Change)
- FOGACOOP** Fondo de Garantías de Entidades Cooperativas (Guarantee Fund for Cooperative Entities)
- FOGAFIN** Fondo de Garantías de Instituciones Financieras (Financial Institutions Guarantee Fund)
- FSB** Financial Stability Board
- GFSG** Green Finance Study Group
- GHG** Greenhouse gas
- GIZ** Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation)
- IAIS** International Association of Insurance Supervisors
- IASB** International Accounting Standards Board
- ICBC** Industrial and Commercial Bank of China
- IDEAM** Instituto de Hidrología, Meteorología y Estudios Ambientales (Institute of Hydrology, Meteorology and Environmental Studies)
- IFC** International Finance Corporation
- IMF** International Monetary Fund
- IOPS** International Organization of Pension Supervisors
- IOSCO** International Organization of Securities Commissions
- LAC** Latin America and the Caribbean
- MADS** Ministerio de Ambiente y Desarrollo Sostenible (Ministry of Environment and Sustainable Development)
- MCIT** Ministerio de Comercio, Industria y Turismo (Ministry of Commerce, Industry and Tourism)

MEF Ministerio de Economía y Finanzas (Ministry of Economy and Finance)

MHCP Ministerio de Hacienda y Crédito Público (Ministry of Finance and Public Credit)

MINAM Ministerio del Ambiente (Ministry of Environment)

MRE Ministerio de Relaciones Exteriores (Ministry of Foreign Affairs)

NGFS Network to support the greening of financial systems

OECD Organization for Economic Co-operation and Development

PIR Programa de Inversión Responsable (Program of Responsible Investment)

PRA Prudential Regulation Authority

PREVIC Superintendência Nacional de Previdência Complementar (National Complementary Pension Superintendency)

PRI Principles for Responsible Investment

PRSA Política de Responsabilidade Social e Ambiental (Social and Environmental Responsibility Policy)

PSI Principles for Sustainable Insurance

RMS Risk Management Solutions

SBN Sustainable Banking Network

SBS Superintendencia de Banca, Seguros y AFP (Superintendency of Banks, Insurance and Private Pension Funds)

SERP Social and Environmental Responsibility Policies

SFC Financial Superintendency

SFSG Sustainable Finance Study Group

SICOR Sistema de Operações do Crédito Rural e do Proagro (System of Rural Credit and Proagro Operations)

SIF Sustainable Insurance Forum

SISCLIMA Sistema Nacional de Cambio Climático (National System of Climate Change)

SMV Superintendencia del Mercado de Valores (Superintendency of Securities Markets)

SSE Sustainable Stock Exchanges

SUSEP Superintendência de Seguros Privados (Private Insurance Superintendency)

TCFD Disclosure of climate-related financial information

UN United Nations

UNCTAD UN Conference on Trade and Development

UNEP United Nations Environment Program

UNEP FI UN Environment Program Finance Initiative

1

Introduction

This report intends to review and map current financial regulations, voluntary frameworks and guidelines for the financial sector that aim to identify, measure, and manage climate-related risks in financial systems in Latin America and the Caribbean (“LAC”).

Financial regulations and self-regulating practices of financial institutions are key enabling factors of a resilient financial system, providing tools for the identification, assessment and mitigation of potential risks in a financial sector. The financial crisis of 2007-2008 highlighted the need for financial policies oriented towards ensuring the correct management of risks and the resilience of financial systems¹², for which appropriate measures and practices, such as regular update of risk metrics, consideration for idiosyncrasy of each financial industry, and rigorous macro and micro prudential regulations, were recognized to be crucial for the function of a healthy financial system.

With an increasing awareness on climate change and its impact on economic and financial activities, the importance of measures to identify, assess and manage risks related to climate change in financial systems has been increasingly recognized¹³. The concern is shared by policy makers as well as financial supervisors¹⁴ as they realize the necessity to consider the risks related to physical and economic impacts of climate change to their societies. In fact, several central banks including the Bank of England, the Bundesbank, De Nederlandsche Bank,

the Bank of France, the People’s Bank of China have all announced, as part of a new network on greening the financial system (NGFS), that they consider climate-related risks to be a threat to their respective financial systems, and thus intends to strengthen the management of climate-related risks¹⁵.

The relationship between climate-related risks and the resilience of financial systems, however, is still in an early stage of research, with still a forming consensus on the effects and relevance of such risks for financial systems, and on the role of financial regulators in addressing them. This analysis tries to assess the current role of financial regulations in the management of climate-related risks in Latin America and the Caribbean (LAC) region, looking at a wide range of mandatory and voluntary regulatory tools. The report consists of five sections, following this introduction. Section 2 defines climate-related risks according to international policies and standards. Section 3 describes different platforms of international financial regulation and their relevance to the management of climate-related risks. Section 4 elaborates first a regional map of financial regulations in LAC that aim to address how the regulatory architecture of the financial systems affects regulators’ mandates to address climate-related risks; then it conducts an in-depth analysis on financial regulations and related practices relevant to climate-related risks in four selected economies (Brazil, Colombia, Mexico, and Peru).

¹²Galati and Moessler, “Macroprudential policy: a literature review”, BIS Working Papers No 337. 2011.

¹³Batten S., Sowerbutts R., Tanaka M. “Let’s talk about the weather: the impact of climate change on central banks.” Staff Working Paper No. 603. Bank of England, 2016.

¹⁴G20 Green Finance Study Group. “G20 Green Finance Synthesis Report.” 2016.

¹⁵Central Banks and Supervisors Network for Greening the Financial System. “First Progress Report” October 2018.



2

Defining Climate Risk



Climate-related risks and financial stability

As countries recognize the threat that climate change could pose to their economies and financial systems through financial losses induced by climate-related events and impacts on financial valuations of a necessary transition out of high-emitting sectors, several central banks and supervisory bodies have included climate-related risks in their research agenda, focusing on identifying climate-related risks, assessing their materiality, and measuring potential impacts on their

economies¹⁶. Besides, some of them have already introduced well-defined frameworks to define and regulate climate-related risks: the Bank of England (BoE) developed a two-pillar approach to assess the role of central banking to manage climate-related risks; the French government introduced the Article 173 in the Energy Transition Law of 2015, a mandatory requirement on carbon disclosure for all listed companies and institutional investors with the goal to improve the transparency regarding the exposure of firms to climate transition risks; the European Union adopted the new IORP II Directive in December 2016 requiring pension providers to establish and

¹⁶DNB - De Nederlandsche Bank "Waterproof? An exploration of climate-related risks for the Dutch financial sector", October 2017, and Bank of England. "The Bank of England's response to climate change." Quarterly Bulletin Q2, 2017.

disclose their process to assess and manage environmental, social and governance (ESG) risks in their investment reporting and to carry out their own risk assessment, including climate change-related risks, as well as risks caused by the use of resources and related to the depreciation of assets due to regulatory changes;¹⁷ the People's Bank of China has established a national framework and sector guidelines for green lending providing regulatory incentives for financial institutions to utilize green instruments in the capital market¹⁸.

The decision to introduce financial regulation to manage climate-related risk can be seen within the new focus on global financial stability resulted from the aftermaths of financial crisis in 2007 (UN Environment Inquiry, 2017)¹⁹, when additional measures in financial regulation were introduced and responsibility of institutions involved in financial systems was reorganized globally²⁰. The result of this change was a stronger focus on systemic risks and stronger

macroprudential regulations, that has led central banks and regulators to consider a wider range of risks, with potentially systemic consequences, such as climate-related ones, in their scope of activities and mandate. Specifically, amongst the measures suggested to be implemented by central banks as well as financial regulatory authorities, there are disclosure requirements on climate risk exposures, the introduction of climate-related stress testing and differentiation of reserve and capital requirements for banks with assets highly vulnerable to climate risks²¹. In response to this, however, the Bank of International Settlements (BIS), among others, expressed concerns around the risks in overstressing central banks' role: BIS sees a higher urgency in raising awareness about climate-related risks, suggesting that "the financial sector uses its pivotal position to raise awareness, including through its own pricing of risk and reputation²²", rather than deploying monetary policy or prudential tools.

.....

¹⁷European Union "DIRECTIVE (EU) 2016/2341 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 December 2016 on the activities and supervision of institutions for occupational retirement provision (IORPs)". Official Journal of the European Union, December 2016.

¹⁸UNEP. "The Financial System We Need: Aligning the Financial System with Sustainable Development." The UNEP Inquiry Report. 2015

¹⁹Volz U. "On the Role of Central Banks in Enhancing Green Finance." UN Environment Inquiry/CIGI Research Convening. 2017.

²⁰For instance, the Bank of England, which had previously to the crisis transferred supervisory authority to an external Financial Services Authority, reincorporated this supervisory capacity by creating a Financial Policy Committee within the central bank. This reform was motivated by the lack of coordination between the two authorities, which led to the failure of Northern Rock. Goodhart points out the incapability of conventional central banking in guaranteeing financial stability and calls for additional macro-prudential instruments to be implemented. (Goodhart C. "The changing role of central banks." BIS Working Papers No 326. 2010)

²¹Campiglio E., Y. Dafermos, P. Monnin, J. Ryan-Collins, G. Schotten, M. Tanaka "Finance and climate change: what role for central banks and financial regulators?" - Submission to Nature Climate Change (Perspective)

²²Remarks by Mr Luiz Awazu Pereira da Silva, Deputy General Manager of the BIS, at the conference organized by the BIS, OMFIF, the Deutsche Bundesbank and the World Bank Group, Frankfurt, 13 July 2017.

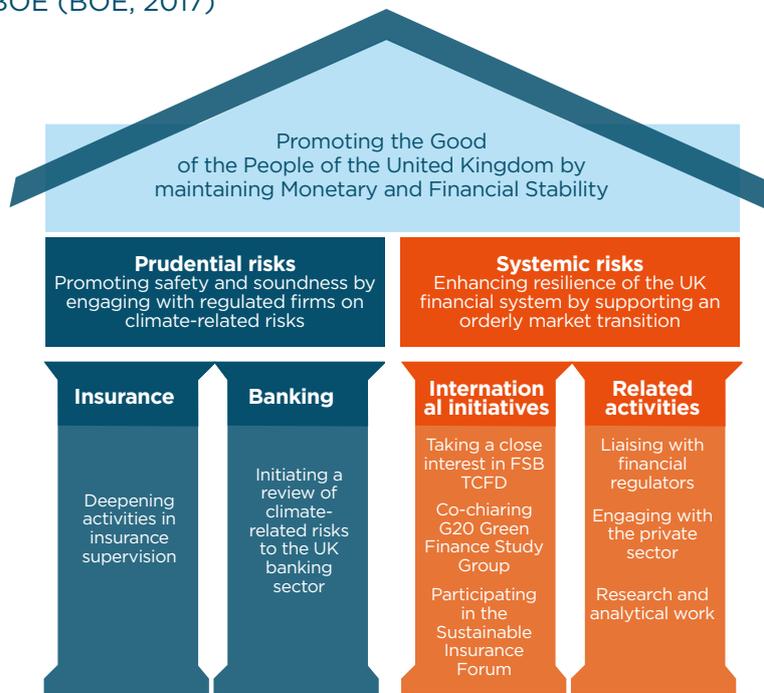
Three Types of Climate-related Risks: physical, transition, and liability

As already mentioned in the previous section, the BoE has a well-defined framework to manage climate-related risks in its financial system. It has recently re-stated its position on climate change granting highest priority to climate-related risks, as it deems the risks highly relevant to the resilience and stability of the economy²³. The BoE argues that climate-related risks could affect financial

systems through two channels: temporary and structural effects. The temporary effects to monetary policy occur through an increase in price volatility and headline inflation due to changes in food and energy prices. The structural effects are related to the transition of economies towards lower-carbon usage, potentially causing a re-valuation of assets in the system. For the BoE, climate risks need to be addressed by different areas of central banking, promoting the soundness of financial systems and to secure financial stability.

FIGURE 1

Prudential and Systemic Risk Approach of the BOE (BOE, 2017)



The BoE produced a two-pillar approach (Figure 1) to assess the role of central banking to manage climate-related risks: prudential risks and systemic risks, where the first pillar focuses on the engagement with firms on climate risks (e.g. extreme weather events and permanent changes in temperatures, precipitation and water availability) and the second aims at supporting a smooth transition to a lower-carbon economy.

²³Bank of England. "The Bank of England's response to climate change." Quarterly Bulletin Q2. 2017.

Further, BoE created a classification system for climate-related risks based on three types of risk factors²⁴: physical, transition, and liability risks. Batten, Sowerbutts & Tanaka (2016)²⁵ provided a definition of each risk factor.

Physical risks stem from weather-related events, such as floods, storms or higher/lower temperature and precipitation extreme events, causing direct impacts, such as damage to property, and indirect impacts, such as the disruption of global supply chains and/or resource scarcity. In other words, the acute damage caused by physical risks could translate into chronic issues including economic disruptions and lower productivity as they cause permanent damage to economic activities such as the destruction of productive assets, and an increase in diseases, and thus, a reduction in the labor force and a shortage of resources such as water²⁶.

Financial institutions are not typically directly exposed to physical risks except for their physical facilities such as branches and ATMs. However, they have close financial relationships (both lending and investments) with a wide range of economic actors that are directly exposed to climate-related physical risks. Physical damages to the business partners and clients could lead to deterioration of their loan/trading portfolios and reduction of asset value²⁷. Furthermore, an asset re-valuation could cause a systemic impact, potentially leading to sovereign credit risk re-valuation.²⁸

Transition risks are the risks caused by structural changes of economies moving towards low-carbon economic systems, causing financial losses to certain assets associated with higher carbon-emitting industries and activities. Transitioning to a lower-carbon economy could occur due to changes in the process of mitigation and adaptation to a lower-carbon economy, either through changes in policy/legal frameworks, technological challenges or

shift in consumer and investor sentiments. Transition risks are particularly relevant for those entities directly involved with resource-intensive institutions with high greenhouse gas (GHG) emissions in their value chains, for example in the extractive sector, that could be affected by a tightening of policies on overall amount of emissions, as it would result in holding “unburnable carbon”, carbon assets such as oil reserves that would no longer be available to exploit.

Transition risks are not only relevant for extractive sectors, but also for those institutions that are reliant on the use of fossil fuels and/or those that are energy intensive such as utilities, heavy industries, and transportation companies.²⁹ Similar to physical risks’ effects on the financial sector, transition risks can affect financial institutions through the devaluation of assets since they hold assets from firms that are directly and indirectly vulnerable to these types of risks, as well as from a reduction of the clients’ ability to repay their loans.

Finally, **liability risks** arise when parties that suffered losses caused by climate change seek to recover the losses from third parties, who they believe should be held responsible for the damage caused. The prudential regulation authority (PRA)’s 2015 Insurance Report noted there are three categories of liabilities that could be established: failure to mitigate (e.g. GHG emitters who fail to mitigate climate change), failure to adapt (e.g. a company failing to react to a new regulation to provide satisfactory products and services), and failure to disclose (e.g. a firm not disclosing information relevant to climate change or disclosing misleading information). However, due to the lack of sufficient scientific understanding regarding the causality of the behaviors of certain parties and specific extreme events, it is considered difficult at this moment to attribute specific damages to a third party effectively in order to demand compensation for losses.³⁰

²⁴Bank of England. “The Bank of England’s response to climate change.” Quarterly Bulletin Q2. 2017.

²⁵Batten S., Sowerbutts R., Tanaka M. “Let’s talk about the weather: the impact of climate change on central banks.” Staff Working Paper No. 603. Bank of England. 2016

²⁶TFCD. “Recommendations of the Task Force on Climate-related Financial Disclosures.” Final Document TFCD. 2017.

²⁷Klomp J. “Financial fragility and natural disasters: An empirical analysis”. *Journal of Financial Stability*. 2014

²⁸ TFCD. “Recommendations of the Task Force on Climate-related Financial Disclosures.” Final Document TFCD. 2017

²⁹Prudential Regulation Authority. “The impact of climate change on the UK insurance sector.” Bank of England. 2015

³⁰Prudential Regulation Authority. “The impact of climate change on the UK insurance sector.” Bank of England. 2015

Environmental, Social, and Governance risks (ESG)

The management of climate-related risks in financial markets can build upon existing practices for the management of Environmental, Social and Governance (ESG) risks, such as criteria and standards, that show significant complementarities and similarities with climate risks.

ESG risks stem from environmental, social, and governance issues and liabilities potentially generated by a business or investment activity. ESG risks in the financial sector are typically managed through ESG standards and/or screening criteria³¹, which allow stakeholders to assess and manage the exposure to these risks from their lending and investing activities where their largest exposure typically originates, compared to their own operations. ESG standards could be established based on the experience and data collected within the organization,³² or through the adoption of third-party standards³³ such as the IFC's Environmental and Social Performance Standards, that form the base for the Equator Principles³⁴ that have been adopted by financial institutions internationally.

Despite the common nature of many climate and environmental risks, the BoE (2017) contrasts ESG risks to climate-related risks especially in terms of their management: first, whereas ESG risks are typically related to damages that could arise within the time of operation of an economic activity, climate risks' time horizons tend to be beyond the activity's useful life; second, climate-related risks are focused not only on the direct impact caused by the activity on the adjacent environment, but also to damages due to the exposure of the activity to incremental and extreme climatic events. A forward-looking perspective such as an estimated increase in frequency of storms in

the future, for example, could be an element for a climate risk assessment, but not for a more traditional ESG assessment, as a business activity most likely has no impact on the increase of storm frequency.

For financial institutions, there are a few **leading standards and tools for ESG risk management.**

The Equator Principles, supported by the Equator Principles Association, provide a risk management framework for financial institutions, guiding on the determination, assessment, and management of ESG risks. Based on the International Finance Corporation (IFC) Performance Standards, Equator Principles were developed in 2003 as voluntary guidelines on ESG risks primarily for project finance in developing and emerging economies, where borrowers rely heavily on external resources. These principles primarily intend to provide a minimum standard for due diligence to support responsible risk decision-making. Currently, there are 92 financial institutions from 37 countries signatories of the Principles, 11 of them being from LAC³⁵. These standards can be subscribed by any institution of any size, but a compliance requirement from the principles is that the standards must be applied to all financing projects larger than USD 10 million.

OECD's Responsible Business Conduct for Institutional Investors (OECD-Investors)³⁶ provides guidance for institutional investors and their stakeholders to help investors implement the recommendations throughout their investment value chain. Specifically, it supports institutional investors by explaining due diligence requirements and discussing key considerations for investors' decision making. OECD-Investors provides different approaches for each investor type (i.e. asset owners vs investment managers), and recommends different approach for each asset class (i.e. public equity, corporate

³¹US SIF, "ESG Incorporation", retrieved from <https://www.ussif.org/esg>

³²Busch T., Bauer R., Orlitzky M., 2015

³³ESG standards can take the form of an environmental management systems (EMS). An EMS is a tool to ensure a continuous improvement for a firm's environmental performance. There are certifications that verify if the implementation of an EMS was according to the standard.

³⁴IFC Performance Standards, retrieved from http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/performance-standards

³⁵Equator Principles, accessed in November, 2017 <http://www.equator-principles.com/>

³⁶OECD's Responsible Business Conduct for Institutional Investors, retrieved from <https://mneguidelines.oecd.org/RBC-for-Institutional-Investors.pdf>

bonds, private equity, infrastructure, and real estate). The standard can be signed by any financial institution of any size, and there is not certification process.

In early 2005, the United Nations Secretary invited a group of the world's largest institutional investors to join a process to develop the **UN Principles for Responsible Investment (PRI)**³⁷. The group consisted of institutions from 12 countries, including experts from investment industry, intergovernmental organizations, and civil society. PRI was launched in April 2006 at the New York Stock Exchange. Through its six principles, the PRI proposes voluntary principles offering possible actions to incorporate ESG issues into investment practice. This standard can be signed by any institutional investor of any size or financial niche, it is fully voluntary and follows a validation process.

In 2012 during the UN Conference on Sustainable Development the **Principles for Sustainable Insurance (PSI)**³⁸ were presented. Similarly, to the Principles for Responsible Investment, this set of principles serves as a global framework for the insurance industry to address environmental, social and governance risks and opportunities. Over 120 organizations worldwide have adopted PSI under a vision of a risk-aware world.

Besides these standards applicable in financial industry, there are ESG-related standards that are established for other sectors, such as ISO 14000³⁹, UN Global Compact⁴⁰, and OECD Guidelines for Multinational Enterprises⁴¹. Furthermore, it is expected that United Nations Environment Program (UNEP) will present the Principles for Responsible Banking (PRB)⁴² in September 2019.



³⁷UN-backed Principles for Responsible Investment, retrieved from <https://www.unpri.org/>

³⁸Principles for Sustainable Insurance (PSI), retrieved from <https://www.unepfi.org/psi/vision-purpose/>

³⁹The ISO 14000 is a series of international standards developed to integrate environmental aspects into processes and product standards. ISO 14001 Environmental management, retrieved from <https://www.iso.org/iso-14001-environmental-management.html>

⁴⁰UN Global Compact provides a framework with five pillars for a responsible climate policy engagement. UN Global Compact, retrieved from <https://www.unglobalcompact.org/>

⁴¹The OECD Guidelines for Multinational Enterprises is a set of recommendations for managers of multinational enterprises including proper attention to environmental issues in their business strategies and operations. OECD Guidelines for Multinational Enterprises, retrieved from <http://www.oecd.org/corporate/mne/>

⁴²United Nations Environment Program (UNEP), through its Finance Initiative (UNEP FI) is working with banks at the global level to establish the Principles for Responsible Banking (PRB) which are expected to be presented in September 2019 during the annual United Nations General Assembly, retrieved from <https://www.unepfi.org/banking/bankingprinciples/>

3

International frameworks on climate risks in financial systems



Differently from ESG principles and frameworks, **climate-related risk** is a relatively new concept for the financial industry and its regulators, and hence a consensus in the industry and amongst regulators on its assessment and management is emerging only now. Interestingly, at first, there has been lack of consensus on whether financial regulators should intervene and address climate-related risks, on whether climate-related risks do indeed pose a systematic threat

to the financial system, and whether such risks would not be better managed by fiscal and economic policymakers, instead of by financial and monetary ones. However, in the past years, different framework proposals for climate-related risk management have been developed: The Environmental Risk Analysis (ERA) proposed by **The Green Finance Study Group (GFSG) of the G20**⁴³, the recommendations by **the Financial Stability Board (FSB)'s Task Force on Climate Related Financial Disclosure (FSB-TCFD)**⁴⁴

⁴³G20 Green Finance Study Group. "G20 Green Finance Synthesis Report." 2017.

⁴⁴Financial Stability Board (FSB), retrieved from <https://www.fsb-tcfd.org/>

and, more recently, the recommendations by the **Central Banks and Supervisors Network for Greening the Financial Sectors (NGFS)**. This section presents the position and latest efforts of leading institutions regulating global financial systems in addressing climate-related risks in financial sectors, as they might affect markets and regulations in Latin America; before discussing in more detail the aforementioned frameworks.

Mapping international regulatory and supervisory initiatives on climate-related risk

There are a number of international actors that provide guidance and frameworks to financial institutions, coordinating regulatory, supervisory and financial stability frameworks at global level. These include organizations with a mandate to develop and provide regulation and standards to be implemented by national institutions, and organizations with a mandate to promote knowledge sharing and provide advisory services to their member countries.

The first segment includes the FSB, the International Monetary Fund (IMF), the

Bank for International Settlements (BIS)⁴⁵, the International Organization of Securities Commissions (IOSCO)⁴⁶, the International Organization of Pension Supervisors (IOPS)⁴⁷, the International Association of Insurance Supervisors (IAIS)⁴⁸, and the International Accounting Standards Board (IASB)⁴⁹. The second group includes the G20, the United Nations (UN) and the Organization for Economic Co-operation and Development (OECD).⁵⁰

While the mandates of the vast majority of these international initiatives does not include nor mention climate-related risks (Table 1), such risks have increasingly become relevant to their efforts and mission, with specific initiatives being launched within such fora (Table 2). For example, the FSB coordinates international standard setting bodies and national financial regulators, monitoring and assessing vulnerabilities in international financial systems and providing recommendations on measures to address systemic issues. Precisely under this role, it is leading the discussion on the disclosure of information related to climate-related risks in financial systems, with the launch of the Task Force for Climate Related Financial Disclosure (TCFD).

⁴⁵Its Basel Committee on Banking Supervision developed the Basel III, which is a comprehensive set of supervisory measures to strengthen the regulation, supervision and risk management of banking sectors. This committee has also performed 12 country assessments on the domestic adoption of the Basel Standards. The committee plans to assess the consistency of the Basel III Standards in all of its 27 member jurisdictions by the end of 2017. The LAC region membership is represented by Argentina, Brazil and Mexico. BIS "Twelfth progress report on adoption of the Basel Regulatory Framework." BIS, 2017

⁴⁶The IOSCO provides technical assistance, education and training, and research to its 127 members and other regulators. IOSCO contributes to building sound global capital markets and a robust global regulatory framework. IOSCO's objectives and its Principles of Securities Regulation have been endorsed by the G20 and the FSB as the relevant standards in this arena. IOSCO supports financial stability structures in the sectorial evaluation conducted by the Financial Sector Assessment Program (FSAP) of the International Monetary Fund (IMF) and the World Bank. OICV-IOSCO. "Objectives and Principles of Securities Regulation" IOSCO, 2017

⁴⁷The IOPS aims to "improve the quality and effectiveness of the supervision of private pension systems throughout the world, thereby enhancing their development and operational efficiency, and allowing for the provision of secure sources of retirement income in as many countries as possible." It currently has 87 members and observers representing 76 countries and territories worldwide among its affiliated including the main institutional investors worldwide, with around \$19 USD trillion in assets. IOPS. Program of Work 2017-2018" IOPS, 2017

⁴⁸The IAIS issues the Recommendations on Insurance Regulations and Standards as part of a self-regulatory body that include Insurance Core Principles, Standards, Guidance and Assessment. Originally, Solvency I was released by the European Insurance and Occupational Pensions Authority (EIOPA), but currently Solvency II is the standard guiding the management and regulation of insurance companies, as recognized by the IAIS. IAIS, "Financial Stability & Macroprudential Policy & Surveillance" IAIS, 2017

⁴⁹The IASB is an independent private-sector organ that develops and approves the International Financial Reporting Standards (IFRSs). The IASB operates under the oversight of the IFRS-Foundation. The foundation is governed by a board of 22 trustees. Currently, the IASB has 14 members. IFRSs are the requirements used by issuers of financial statements that follow this standard, including how financial statements should be structured, the minimum requirements for their contents and overriding concepts such as going concerns, the accrual basis of accounting and the current / non-current distinction. IFRS. "Annual Report 2016." IFRS, 2016.

⁵⁰The latter institutions play a crucial role in supporting an architecture for a sound functioning of economic systems and provide recommendations for international and national policies, international standards and principles. For example, the G20's synthesis report of 2017 sets out guidelines to financial institutions to identify environmental risks in their financial activities and provides an analysis of challenges and possible solutions to their quantification and pricing. Within the UN system, the United Nations Environment Programme (UNEP) has two initiatives, the Finance Initiative (UENP FI) and the Inquiry into the Design of a Sustainable Financial System (UNEP Inquiry), both conduct analysis and propose policy options for the strengthening of financial systems and mobilization of capital towards green and inclusive economies. The OECD explores ways to standardize methodologies for measuring, managing, and reporting socio-environmental impacts in financial systems (OECD, 2015).

TABLE 1

Mandates of International Regulatory Institutions

Organization	Mandate
G20** ⁵¹	Its initial objective was to preempt balance of payments problems, and turmoil in the financial markets by providing improved coordination of monetary, fiscal, and <u>financial policies</u> . Currently, the G20's guiding principles were set out in the <u>Framework for Strong, Sustainable and Balanced Growth</u> , in 2009. This was officially declared to be the premier international economic forum. The G20 shall, in addition to coordinating fiscal and monetary policies, <u>deal with financial supervision including macro prudential and regulatory policies</u> , trade and investment, structural reforms, anti-corruption, and balanced and <u>sustainable economic development</u> .
OECD** ⁵²	The OECD's mission is to promote policies that will improve the economic and social well-being of people around the world. It is focused on helping governments around the world to: <u>restore confidence in markets and the institutions that make them function</u> ; re-establish healthy public finances as a basis for <u>future sustainable economic growth</u> ; foster and support new sources of growth through innovation, <u>environmentally friendly 'green growth' strategies</u> and the development of emerging economies; and ensure that people of all ages can develop the skills to work productively and satisfyingly in the jobs of tomorrow.
FSB ⁵³	<u>Monitors and assesses vulnerabilities affecting the global financial system and proposes actions needed to address them</u> . It coordinates information exchange among authorities responsible for financial stability. It advises on market developments and their implications for regulatory policy, as well as best practices in regulatory standards.
IMF ⁵⁴	Promotes international monetary cooperation and provides policy advice and technical assistance. It also makes loans and helps countries design policy programs to solve balance-of-payments problems when sufficient financing on affordable terms cannot be obtained to meet net international payments. IMF loans are short- and medium-term and are funded mainly by the pool of quota contributions that its members provide. As part of its global and country-level surveillance, <u>the IMF highlights possible risks to stability and advises on policy adjustments</u> .
BIS ⁵⁵	Serves <u>central banks in their pursuit of monetary and financial stability</u> , promotes cooperation between central banks and facilitates international financial operations.
IOSCO ⁵⁶	Develops, implements and promotes adherence to internationally recognized standards for securities regulation; enhances investor protection; and <u>reduces systemic risk</u> .
IOPS ⁵⁷	The IOPS goal is to <u>improve the quality and effectiveness of the supervision of private pension systems throughout the world</u> , thereby enhancing their development and operational efficiency, and allowing for the provision of a secure source of retirement income in as many countries as possible.
IAIS ⁵⁸	Promotes effective and globally consistent supervision of the insurance industry; <u>develops and maintains fair, safe and stable insurance markets; and contributes to global financial stability</u> .
IASB ⁵⁹	Brings transparency, accountability and efficiency to financial markets around the world by developing IFRS Standards. It works to serve <u>the public interest by fostering trust, growth and long-term financial stability in the global economy</u> .

Source: * *The Economist Intelligence Unit (2017)*, ** *Institutions' websites*.

⁵¹G20, retrieved from <https://www.b20germany.org/the-b20/about-g20/>

⁵²OECD, retrieved from <https://www.oecd.org/site/ecoedrc/mandate.htm>

⁵³FSB, retrieved from <http://www.fsb.org/about/>

⁵⁴IMF, retrieved from <http://www.imf.org/en/About/Factsheets/Sheets/2016/07/27/15/31/IMF-World-Bank>

⁵⁵BIS, retrieved from <https://www.bis.org/cgfs/mandate.htm?m=3%7C15%7C81>

⁵⁶IOSCO, retrieved from https://www.iosco.org/about/?subsection=about_iosco

⁵⁷IOPS, retrieved from <http://www.iopsweb.org/about/>

⁵⁸IAIS, retrieved from <https://www.iaisweb.org/page/about-the-iais>

⁵⁹IFRS, retrieved from <http://www.ifrs.org/about-us/>

TABLE 2

International Organizations Involvement in Climate-related Risk Issues (as per April 2019)

	(I)	(II)	(III)	(IV)	(V)
	Address Climate Change explicitly at mandate level	Mandate is linked explicitly to sustainability agenda	Mandate is linked with risk regarding financial stability or systemic risk	Engagement and partnership on climate change	Conduct research on climate change released to public
FSB	No	No	Yes	Yes	Yes
IMF	No	No	Yes	Yes	Yes
G20	No	Yes	Yes	Yes	Yes
OECD	No	Yes	Yes	Yes	Yes
BIS	No	No	Yes	No	Yes
IOSCO	No	No	Yes	Yes	No
IAIS	No	No	Yes	Yes	No
IOPS	No	No	Yes	No	No
IASB	No	No	Yes	No	No

Source. authors with data taken from the UN Environment (2017) and The Economist, Intelligence Unit (2017).

Indeed, most of these institutions have engaged with partnerships and joined initiatives on climate change-related issues (column iv) and are conducting research work on issues closely related to climate change, and see climate-related risks as one of the factors that threaten economic growth, well-functioning financial systems and the resilience of financial institutions. For example, according to IMF research, climate change is expected to significantly impact global economic growth in the coming decades: temperature increases, ecosystems disruption and water stress, among other physical effects, would translate into significant market impacts though output losses especially in climate-sensitive sectors (e.g. agriculture, energy)⁶⁰.

The Sustainable Banking Network (SBN)

The SBN is a network of financial regulators and banking associations that have an interest in policies, guidelines and related initiatives to support the financial sector in adopting environmental and social risk

management and green lending. The SBN currently has 48 members, mostly from emerging economies: 28 are regulators (including 7 from Latin American countries) and 20 are banking associations (including 10 from Latin America countries).⁶¹ The network was established in September 2012, following a proposition made during the first International Green Credit Forum, hosted by the International Finance Corporation (IFC) and the China Banking Regulatory Commission (CBRC) in Beijing in May 2012.

The current work of the SBN is centred around two working groups: the Measurement Working Group – which conducts research and develops a commonly agreed framework for benchmarking member experiences in adopting national sustainable finance frameworks – and the Green Bond Working Group – which supports members in their efforts to develop green bond markets and facilitate increased flow of international and domestic investment to achieve national sustainable development goals.

The latest SBN global progress report (SBN 2018a) lists the policies and principles that

⁶⁰IMF, "After Paris: Fiscal, Macroeconomic, and Financial Implications of Climate Change." IMF Discussion Note. SDN/16/01. 2016.

⁶¹Latin American regulators include Brazil, Chile, Colombia, Honduras, Mexico, Paraguay and Peru. Latin American banking associations include Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Honduras, Mexico, Panama, Paraguay and the Federation of Latin American Banks.

are considered or have been implemented by the member countries. Most of these policies and principles are not hard regulations but strategic and technical “how to” guidance to help financial institutions to systematically integrate sustainability considerations into business strategies and operations. This guidance varies from one country to another: some countries have mandatory policies, guidelines and roadmaps developed by regulators (e.g. China, Indonesia, Peru), others have voluntary principles led by banking associations (e.g. Mongolia, Colombia, Kenya) or a mix of both (e.g. Brazil, South Africa). The stage of implementation of these policies and guidelines also differs among countries: 19 members are still at an “initiating” stage⁶²(i.e. countries have demonstrated a commitment to take action), one is at a “formative” stage⁶³(i.e. the policies are formalized but not yet implemented), 6 members are at the “emerging” stage⁶⁴ (i.e. the policies are beginning to be implemented) and, finally, 8 countries are at the “established” stage⁶⁵ (i.e. policies are implemented and countries have begun to report on results and impacts).

Note that all 15 national policies and principles that are currently beyond the formative stage require financial institutions to perform environmental and social (E&S) risk assessment to guide credit decision making, which is one example of practice to support financial system resilience to climate-related risks studied in this report. China is a pioneer in this domain. The CBRC for example explicitly requires banks to develop E&S risk ratings, to identify high E&S risk clients and to conduct comprehensive E&S risk evaluations at least twice a year. China will be used as case study for good practices in the domain of encouraging financial institutions to analyze climate risks.

The G20 Sustainable Finance Study Group (SFSG) framework to assess environmental risks in financial systems

The Sustainable Finance Study Group (SFSG) was launched in 2016, during China’s presidency in the G20 as the Green Finance Study Group (GFSG). In 2018 under the Argentinean presidency of the G20 the group was renamed as Sustainable Finance Study group, under the premise that the agenda needed to inform developing economies as well with particular emphasis on the LAC region. The group was co-chaired by China and the United Kingdom, with the UN Inquiry as secretariat⁶⁶. Since its launch, the SFSG has provided significant inputs and frameworks aimed at “strong, sustainable, balanced, and inclusive growth”⁶⁷. In 2017 the group focused on the application of environmental risks analysis (ERA) in the financial sector, based on research pointing out the lack of robust measures to assess environmental risks, leading to asset mispricing⁶⁸. It further elaborates the problematics of the sector, highlighting the risk of maintained exposure to stranded assets which causes inefficient capital allocation. This group’s focus is to address barriers to green finance, by supporting financial systems to strengthen their capacity to attract and facilitate the mobilization of green investment. Consistently with the framework presented by the BoE, the SFSG defines climate-related risks as results of physical and transition factors.⁶⁹

The SFSG’s research efforts in 2017 included a series of analyses on efforts made by financial institutions, regulators, and central

⁶²Argentina, Chile, Dominican Republic, Honduras, Panama and Paraguay for Latin American countries.

⁶³Ecuador.

⁶⁴Mexico and Peru for Latin American countries.

⁶⁵Brazil and Colombia for Latin American countries.

⁶⁶G20 Green Finance Study Group. “G20 Green Finance Synthesis Report.” 2016.

⁶⁷G20 Leaders Declaration, Hamburg, Germany, 7-8 July 2017, http://unepinquiry.org/wp-content/uploads/2017/07/G20_leaders_declaration.pdf

⁶⁸Bank of England, UN Environment Inquiry, ICBC. “Enhancing Environmental Risk Assessment in Financial Decision-making.” Document In support of the G20 Green Finance Study Group. 2017.

⁶⁹The G20 GFSG 2016 Synthesis Report outlined physical and transition factors can pose business, market, credit, and legal risks to financial institutions Physical shock events – such as natural catastrophes – can have a direct effect on financial institution’ balance sheets, notably in the insurance sector, while changes in trends, such as water scarcity, can pose risks to corporate sectors such as agriculture and power generation. Policy action, market dynamics, and public sentiment relating to the low-carbon transition have had notable impacts on value generation in high-carbon sectors, with impacts on financial assets: structural changes in the German electricity sector have significantly reduced profitability of Germany’s biggest utilities; the largest US coal company, Peabody Energy, filed for bankruptcy in 2016 after shares plunged more than 99% from their 2008 peak; and Volkswagen lost 23% of its equity market value as a result of the 2015 emissions scandal.

banks in assessing environmental risk, in countries such as China, India, Germany, US. These studies cover a broad range of environmental risks including climate-related risks, identifying different methods and time horizons. The SFSG established an approach “Environmental Risk Analysis” (ERA), proposing tools and methodologies to enable decision makers to integrate environmental data. This approach goes beyond climate-related risks to support appropriate asset allocation and integral environmental risk management.

The ERA framework consists of two components: First, the assessment of environmental factors, which include both direct risks such as physical damages to assets and indirect risks stemming from policy and market responses to environmental factors. Second, the adoption of financial risk tools to translate environmental risks quantitatively to determine how they affect the balance sheet of a financial institution. This framework is to provide a standardized template and metrics for the pricing of climate risks to help decision makers in their asset allocation policies.

The ERA also considers different levels of analysis: individual assets level, portfolio level, and macroeconomic and systemic level. At the individual assets level, it suggests equity analysts to incorporate environmental factors by adjusting expected future cash flow or risk premium applied to future cash flows. For credit analysis on loans and debt instruments with long-term maturity, it argues that environment factors and their impact on future cash flow need to be taken into consideration for their impact on ratings and borrowers’ ability to repay on time and fully. For insurers, the sector which has the longest track record and expertise in developing and applying models to estimate financial losses arising from environmental hazards, it recommends catastrophe risk models be modified to integrate information on incremental environmental hazard.

At the portfolio level, an aggregate exposure is to be assessed: for example, an assessment of value at risk of the portfolio could be



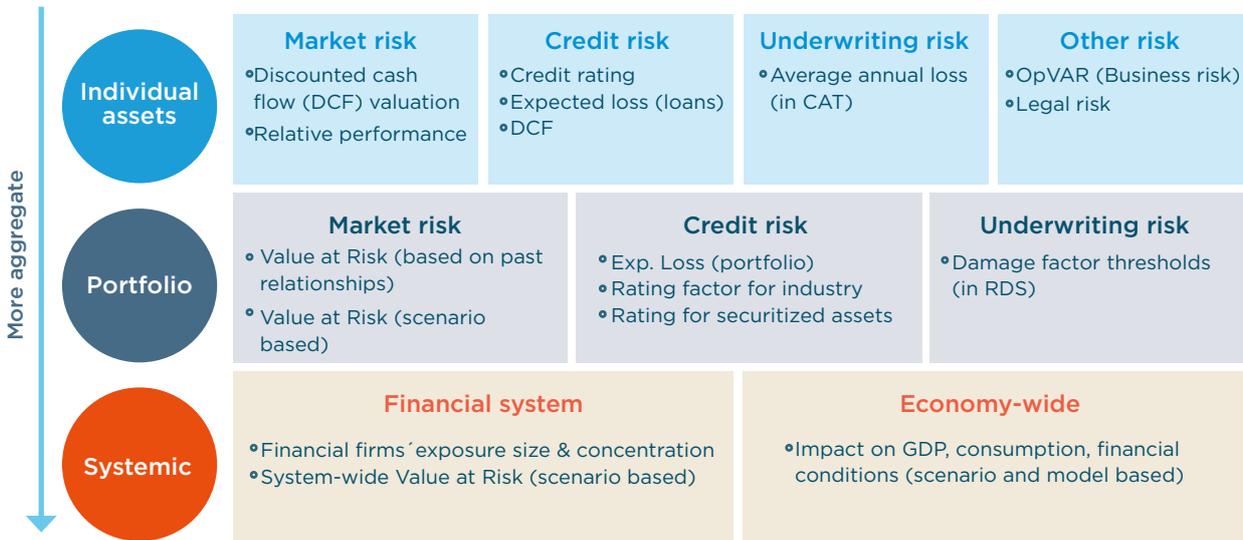
obtained incorporating forward-looking estimates of environmental risk⁷⁰. On the systemic level, the assessment is focused on financial stability and beyond, where regulators and central banks, in addition to individual firms may benefit from estimating potential impacts of environmental risks on GDP and other macroeconomic indicators. Figure 2 summarizes the framework for the identification and application of metrics under the toolbox for environmental risk assessment. The SFSG, however, also notes that the experience on pricing environmental risks is limited in number and sectors: so far, progress has been concentrated on the assessment of portfolio impact by high-carbon assets and in the areas of physical risks to insurance liabilities.

Figure 2 below is the toolbox proposed by BoE, UN Environment Inquiry and Industrial and Commercial Bank of China (ICBC), for an effective ERA.

⁷⁰Mercer, UKaid, Department of Energy & climate Change UK, IFC, and Federal Ministry for Economic Cooperation and Development, “Investing in a Time of Climate Change”, 2015

FIGURE 2

Toolbox for Environmental Risk Assessment (G20 GFSG, 2017)



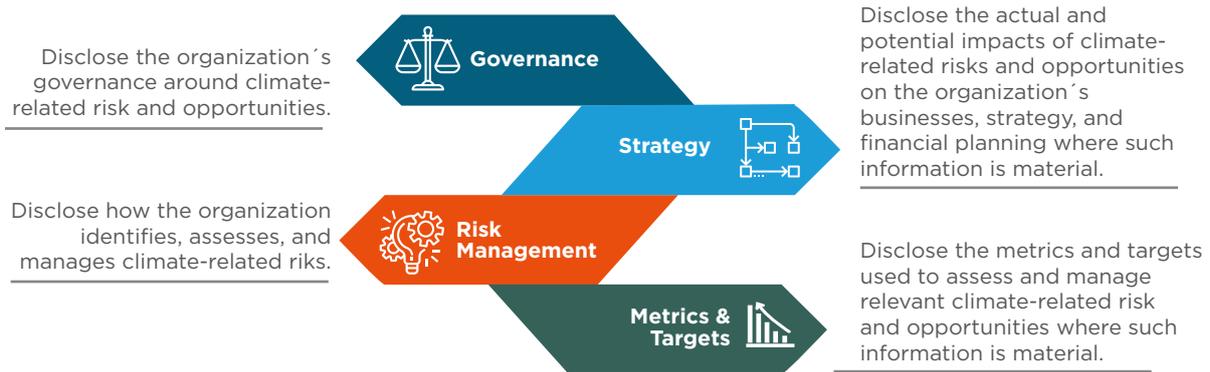
The recommendations from the Task Force for Climate-related Disclosure (TCFD)

In December 2015, the FSB established the Task Force on Climate-related Financial Disclosures. The task force was created based on the consultation made earlier with public and private sector firms regarding the incorporation of climate related issues in financial reporting. The objective of the group is to design a set of concrete recommendations for efficient and effective disclosures of climate-related risks, which address the needs of actors in financial industry.

In July 2017, the FSB-TCFD published recommendations for the disclosure of climate-related information⁷¹, which aim at a smooth transition toward lower-carbon economies by facilitating well-informed investment decision-making. These recommendations intend to help investors to be better informed about their portfolio

exposures to climate-related risks in financial systems. With these objectives, the TCFD proposed a voluntary, consistent disclosure framework. These recommendations consist of four thematic areas: (i) Governance, disclosure of an organization’s governance on climate-related risks and opportunities, (ii) Strategy, disclosure of potential impacts and opportunities related to climate risks from the organization’s businesses, strategy and financial planning perspectives, (iii) Risk Management, disclosure of the processes through which the organization identifies, assesses, and manages climate-related risks, and (iv) Metrics and Targets, disclosure of the metrics and targets used to assess and manage climate-related risks and opportunities. In addition, the TCFD developed supplemental guidance for financial (banks, insurance companies, asset managers, asset owners, etc.) and non-financial organizations (energy, transportation, materials and buildings, agriculture, food, and forest products, etc.). These recommendations intend to tailor the recommendations to each sector, considering idiosyncrasy of each, for smooth implementation.

⁷¹Financial Stability Board (FSB), retrieved from <https://www.fsb-tcfd.org/>

FIGURE 3 TCFD Recommendations (TCFD, 2017)

The implementation of the TCFD is still in ongoing process: so far, nearly 800 public and private organizations, including global financial firms responsible for assets in excess of USD \$118 trillion have publicly committed to support the recommendation. Supporting companies range from industries, including construction, consumer goods, energy, metals and mining to transport, from about 30 countries.

Comparison between TCFD recommendation on climate-related risk and ESG standards

As discussed above, the ESG standards and frameworks already established and adopted in the financial industry could be a starting point on which to build the framework to assess and manage climate-related risks, with in some cases only marginal changes required - for example, in November 2017 the PRI has added a new suite of climate-related indicators to the Reporting Framework for 2018 to support their signatories to comply with the recommendations of the TCFD⁷². By 2020 PRI signatories will be required to disclose climate risk under TCFD- based reporting⁷³.

Table 3 contrasts the current ESG frameworks presented in the section with the frameworks for climate-risk assessment and reporting suggested by the TCFD, to identify areas of existing convergence in treating and disclosing climate-related risks, as well as areas of needed additional work.

In terms of scope of application, differently from the ESG standards analyzed, the framework of the **TCFD can apply to a wide range of industries in addition to financial ones**, albeit suggesting specific tools and risk management strategies for the financial sector. Being focused on improving risk management and disclosure and reporting of risk, rather than as a tool to assess and report the overall sustainability of operations, the **TCFD recommendations do not imply a change in the mission of the companies** that adopt the frameworks, nor do they suggest divestment of specific projects or exclusion of certain activities. Conversely, despite other voluntary frameworks such as the Equator Principles and the PRI, the proposed frameworks under **TCFD don't include a verification and compliance system** of the climate-related reporting, albeit they explicitly require disclosed information to be as verifiable as possible.

In terms of risk management framework (identification, quantification, modeling, strategy, and disclosure), **the TCFD recommendations are largely consistent with most ESG standards considered**, especially regarding identification and assessment of risks. Notably, the **most significant difference is on the focus of the TCFD recommendations on modeling tools for the whole portfolio (for example stress testing) and for the forward-looking perspective in the identification of risks** and in their management, with the **recommended uses of scenario analysis and sensitivity tests** (Transition risks are an example).

⁷²UN PRI Reporting Framework 2018 - Climate-related Indicators https://www.unpri.org/download_report/44249

⁷³Principles of Responsible Investment PRI, extracted from <https://www.unpri.org/news-and-press/tcfd-based-reporting-to-become-mandatory-for-pri-signatories-in-2020/4116.article>

TABLE 3

Comparison of ESG standards and Climate Risk Standards in Financial sector

Issue areas		Financial Sector ESG Standards			TCFD
		Equator Principles	OECD Resp. Conduct for Inst. Investors	PRI	
Scope	Climate change mentioned	✓	✓	✓	✓
	Address Financial Industries	✓	✓	✓	✓
	Address Non-Financial Groups	X	X	X	✓
	Divestment from certain projects	✓	✓	X	X
	Validation of adoption and implementation	✓	X	✓	X
Risk Approach	Identifying risk	✓	✓	✓	✓
	Quantifying risk	✓	✓	✓	✓
	Modeling risk (e.g. Stress testing)	X	X	✓	✓
	Risk Strategy (including env. risk)	✓	✓	✓	✓
	Governance (considering env. risk)	✓	✓	✓	✓
	Forward-looking Perspective (e.g. Scenario Analysis)	X	X	✓	✓
Process	Review and categorization of projects	✓	✓	✓	✓
	Compliance with applicable environmental standards	✓	✓	✓	✓
	Risk management system and action plan	✓	✓	✓	✓
	Participation of interest groups	✓	✓	✓	X
	Independent review of claim mechanism	✓	✓	X	X
	Presentation of Reports and Transparency	✓	✓	✓	✓
Disclosure	Climate risk explicitly mentioned	X	X	✓	✓
	Recognition of climate risk as financial risk	X	✓	✓	✓
	Requirement on disclosure of climate risk	X	X	✓	✓
	Report of GHG Emissions	✓	✓	✓	✓

The **recommended risk management process is also largely convergent among the frameworks analyzed**: the starting point is the classification and risk identification at project level, the establishment of risk management strategy and an action plan, and finally the preparation of reports and transparent information. As the focus is on climate-related issues, the framework suggested by the TCFD doesn't require the participation of interest groups and the engagement of the affected stakeholders in the risk assessment and management strategy.

Notable differences exist as well on the disclosure requirements (a stronger focus for the PRI and TCFD framework); on the explicit role of climate-related risks as financial risks (not yet present in the Equator Principles and recently added to the PRI) and on the role of independent verification and review of the released information (absent in the TCFD framework given the nature of its voluntary practice).

Network of Central Banks and Regulators for Greening the Financial System (NGFS)

In December 2017, eight central banks and supervisors (including Banco de Mexico) established the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), which held its first plenary meeting in January 2018. This network, as of July 2019, includes 42 members from all continents and 8 multinational organizations as observers⁷⁴. The NGFS is chaired by Frank Elderson, member of DNB's Governing Board. The Banque de France serves as the Secretariat.

The goal of this network is to contribute to the analysis and management of climate (and environmental) risks in the financial sector, and to mobilize mainstream finance to support the transition toward a sustainable economy. Members of the network exchange experiences and share best practices toward this goal. The NGFS is organized around three workstreams. Workstream 1 (Microprudential and supervisory workstream) is conducting a mapping of current supervisory practices for integrating environmental and climate risks into microprudential supervision, a review of the current practices and options to encourage environmental and climate information disclosure by banks and asset managers, as well as an analysis on the risk differential that could exist between “green” and “brown” assets. Workstream 2 (Macrofinancial workstream) is in charge of assessing how climate change and the transition to a low-carbon economy affect the macroeconomy and financial stability, as well as identifying good practices and the knowledge gaps in these areas. Finally, workstream 3 (“Scaling up green finance” workstream) is outlining the role that central banks and supervisors could play in promoting the scale up of green finance by greening the activities of central banks and supervisors, understanding and monitoring the market dynamics of green finance, as well as serving as catalyst for greening the financial system.

In October 2018, the NGFS published its first progress report, highlighting that the physical and transition risks arising from climate change and the transition to a low-carbon economy can have serious consequences for financial institutions and are a source of threat for the stability of the financial system as a whole. The NGFS considers climate risks are material, system-wide and possibly destabilizing for the financial system – a conclusion backed by a wide range of academic studies. Against this background, the **NGFS regards climate risks as falling within the supervisory and financial stability mandates of central banks and financial supervisors**. It concludes that even if climate risks may be realized in the long term, their mitigation requires action in the short-term.

In April 2019, the NGFS released its first comprehensive report, confirming the urgency of action on climate-related risks and their substantial relevance for financial stability, and issuing a set of **recommendations for supervisors, financial regulators and policy-makers**:

For central banks and supervisors to fulfill their mandate in preserving financial stability:

- Integrating climate-related risks into financial monitoring and micro-supervision.
- Integrating sustainability factors into own-portfolio management.
- Bridging data gaps.
- Building awareness and intellectual capacity and encouraging technical assistance and knowledge sharing.

For policymakers, towards broader transparency in financial markets:

- Achieving robust and internationally consistent climate and environment-related disclosure, supporting the framework developed by the TCFD.
- Supporting the development of a taxonomy of economic activities.

⁷⁴The IDB is in the process of joining the NGFS as observer and has been collaborating with its members since the network inception.

4

The Latin America and the Caribbean Map for financial regulation and progress in the incorporation of climate-related risks



This section presents a summary of the progress of financial regulation in the region, first highlighting the prevailing regulatory structures in the countries - to assess how the financial stability mandate is shared among regulators in the countries- then addressing whether and how environmental and climate risks are treated by financial regulation. For this analysis it is important to consider that following the definition

of climate-related risks by the FSB-TCFD, regulators in LAC countries have not yet explicitly included and addressed climate-related risks in binding regulations of the financial sector. However, considering the comparison between ESG standards and TCFD recommendations, regulatory actions that address environmental and social risk are considered a first step towards a more explicit regulation on climate-related risks.

Finally, this section concludes with a more detailed analysis of the selected four countries regarding how formal and informal rules address environmental and climate-related risks and, when possible, to show the evolution over the years of relevant financial regulation and voluntary frameworks. The analysis has been performed utilizing desk and literature research, as well as semi-structured interviews and written questionnaires submitted to both regulators and regulated entities.

Financial Regulation in LAC

There are different types of financial regulation and institutional arrangements in the Latin America and Caribbean region that differ, especially in terms of the “ownership” of the mandates for financial stability and market supervision: in some cases, central banks have a concentration of supervisory mandates for monetary policies (e.g. Brazil and Uruguay); in other cases, the financial regulatory responsibility is shared among the Central Bank, the Finance Ministry, the Treasury and other regulatory/supervisory bodies such as superintendencies.

In most countries (with the notable exceptions of Colombia and Bolivia), the mandate of central banks includes financial stability, alongside monetary policy and price stability, hence potentially justifying (as in the case of the Bank of England and the DNB Dutch Central Bank) the engagement of the central bank with issues related to the exposure of financial systems and financial actors to climate risks. The financial stability mandate is often shared with the regulator of the banking and/or capital markets sectors- typically Financial Superintendencies- on one side increasing the collegiality of the approach and allowing sector-specific measures, on the other side, however, increasing coordination and transaction costs. This often results, as in the case of Peru, with risk management regulation being issued as well by the Superintendency of Banks, Insurance and Pension Funds (SBS) and the Superintendency of the Capital Markets (SMV).

In some of the countries, multi-sectoral councils of financial authorities are charged with the mandate of generating recommendations on regulatory matters and might also consider financial stability issues. Countries like Bolivia, Brazil, Chile, Costa Rica, Ecuador, Mexico and Uruguay have a council on financial issues, where responsibilities are divided among member institutions, and coordination areas range from generating public financial policy, issuing regulations, and generating recommendations on the coordination among the institutions. These councils could typically play two roles, i) as a regulator fully capable to issue regulation to the financial markets (the less common in the region) and ii) as an advisor (the most common) to the ministries or superintendencies, providing advisory or forum to discuss regulatory issues, while the ministries and superintendence remain as the sole issuers of regulation, such as the case of the Mexican Financial Stability Council.

It is also valuable to note that at the sub-regional level, there are two relevant councils: the Board of the Eastern Caribbean Central Bank (ECCB) takes the role, among other essential roles, of a council, providing recommendations on financial regulations to the member countries and providing supervision. The ECCB acts in line with the first type of council described. The second council is the Central American Monetary Council (CAM), the board of which is composed of the Central Banks of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and the Dominican Republic. In this case, CAM is a council that performs both types of roles, as regulator and as advisor.

Identifying the methodology each country follows is of a high relevance to climate issues, as this model allows the inclusion of unidentified risks under Basel III or Solvency II (e.g. climate risk) into their risk management frameworks as they identify risks firms are exposed to. This could also help institutions generate risk-related feedback to regulators, which could also facilitate a future incorporation of other risks that are currently not on their radar, into formal regulations. In general, the common

denominator is that in LAC, rules-based regulation is still predominant. By industry, it is observed that the banking industry is where many authorities have manifested their desire to follow risk-based regulation (all 31 countries)⁷⁵, followed by insurers (13 of 31 countries).

Regulatory and supervisory approaches for Climate-related and socio-environmental risks

As mentioned before, regulators in LAC countries have not yet explicitly included or addressed climate-related risk as defined by the FSB-TCFD, although a few supervisors and regulators are supporting capacity building activities in the financial sector on climate-related risk management and disclosure practices - a few have also joined as members of the NGFS Network. There are countries in the region that have addressed environmental and social risk within their regulation. Considering ESG practices as a steppingstone towards climate risk, the ESG regulation represents a first move on regulation.

Regulatory efforts in the region can be categorized under three major groups, (i) countries with regulation in place, (ii) countries where supervisory measures have been implemented or initiated, and (iii) countries where private sector initiatives (or self-regulatory) practices are implemented. These categories are not mutually exclusive from one another, in fact in most cases voluntary agreements preceded regulation or regulatory actions (Figure 4).

i. Countries with regulation is in place: there are three cases in the region with ESG regulation, Brazil, Peru and most recently Paraguay

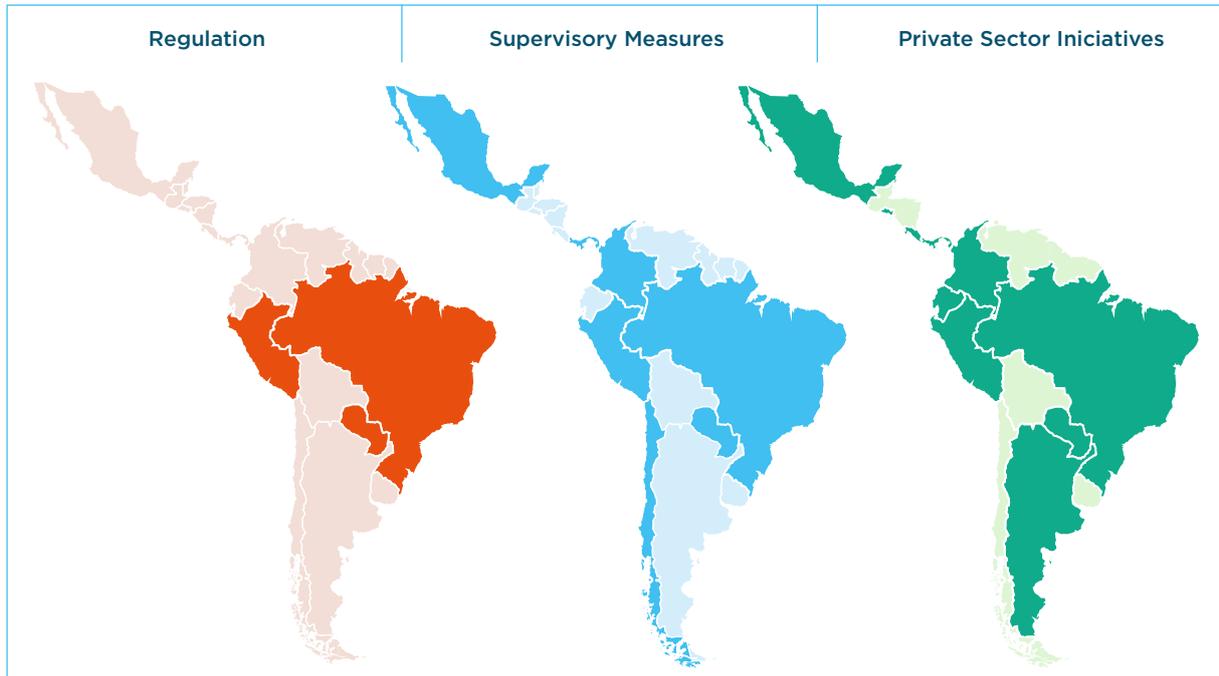
- Brazil, with Resolution 4327 from the Central Bank enacted in 2014
- Peru, with Resolution 1928-2015 from the Superintendent, enacted in 2015
- Paraguay, with Resolution 8 from the Central Bank enacted in 2018

ii. Countries where supervisory measures have been implemented: there are seven countries with this kind of measure implemented or in process of implementation. Countries include, Brazil, Peru and Paraguay with actions emerging from their regulations, as well as, Chile and Mexico who are performing a survey of the financial sector on ESG and Climate-risk practices, Colombia with a supervisory statement following the implementation of a survey, and Panama which has included environment and social risk within the list of 13 risk banks need to provision against. There are also two other countries, Ecuador and Honduras, considering and discussing potential regulation, but there is not yet clarity on how long these processes could take or if they will materialize. Finally, the Central Bank of Costa Rica, the Financial Superintendency of Colombia and the Central Bank of Mexico are now members of the NGFS.

iii. Countries with private sector initiatives: there are ten countries in the region with private sector initiatives. Argentina with the Sustainability Protocol for Public Banks from 2018, Brazil with the Protocolo verde (banks) dated back to 2009, Colombia with the Protocolo Verde from 2012 and the Protocolo Verde Ampliado from 2016 (bank-focused at first and later widened to the finance sector), Costa Rica with the commitment to elaborate a Roadmap for Sustainable Insurance in 2018, Ecuador with the Sustainability Protocol from 2016 (banks), El Salvador with their Sustainability Protocol for Public Banks dated from 2018, Mexico with their Sustainability Protocol dated from 2016 (banks); Panama with the Sustainability Protocol from 2018 (banks), Paraguay with the Mesa de Finanzas Sostenibles from 2012 (Banks), Peru with the Programa de Inversión Responsable (PIR) and the Green Protocol.

⁷⁵EY. "Risk-based capital and governance in Latin America: Emerging regulations." EY Solvency II. 2013

FIGURE 4

Climate-related Risk Regulatory, Supervisory and Private Sector Initiatives in LAC

The sections that follow assess in more detail the national context in four countries, presenting their specific financial stability architecture, the initiatives led by the regulators and supervisors, and those instead promoted by the private sector.

Box

The Public-Private Dialogue on Green Finance in Chile

While there is not yet specific financial regulation in Chile on environmental and climate-related risks, in 2019 the ministry of Finance has promoted a coordinated effort among the regulators and supervisors of the Chilean financial system – including banking, asset management, pension and insurance – to improve the understanding of climate-related risks and opportunities in the country and support a platform of dialogue with the private sector.

With the support of the IDB, the British Embassy and UNEP FI, the Ministry of Finance, the Central Bank, the Commission for the Financial Market (CMF) and the Superintendent of Pensions, launched in July 2019 a Public-Private Dialogue on Green Finance with the aim of agreeing by the end of 2019 a formal Green Agreement between Regulators and the Private Sector, a Joint-Declaration from the Regulators on the importance of climate issues for the financial system and a Road Map for Climate Finance 2020-2024 that will aim to support the integration of climate factors in the decision making process of financial institutions of the country, as well as in the prudential supervisory tools of regulating entities.

One of the first activities of the Public-Private Dialogue on Green Finance was to launch a survey on adoption of climate-related risks within financial institution in Chile in the summer of 2019. Initial conclusions of the survey highlight the following: there is strength in the governance and strategy and opportunities pillars with evidence that

54% of banks, 50% of investment funds, 83% of pension funds and 36% of Insurers have established a policy or strategy on climate change. At the same time, 69% of banks, 92% of investment funds, 67% of pension funds and 64% of insurers identify climate risk as a source of risk for their companies. However, on the implementation of solutions, there is a low level of knowledge and capacity to adopt and apply methodologies to address this risk, with only a small percentage of the interviewed financial institutions that already have used or piloted instruments for the management of climate-related risks.

At the same time, the Commission for the Financial Market (Commission) of Chile – a recently consolidated financial supervisor⁷⁷ of the banking, insurance and securities markets, with a legal mandate comprising financial stability, market development and market conduct – decided to include in the Securities Markets 2019 annual regulation plan the development of an ESG reporting regulation. The goal is to further promote transparency in the securities market, to increase ESG information as well as products and, in general, to enhance market development. The regulation will include an update on the disclosure requirements regarding public companies and how they address ESG issues.

Conversely, on the private sector side, the Santiago Stock Exchange launched in 2015 the Dow Jones Sustainability Chile Index, in 2016 the Integrated Annual Sustainability Reporting and a set of guidelines for listed companies, and in 2017 a Green and Social Bond Segment to facilitate the issuance and trading of labeled green and social bonds.

Finally, in 2019, the Stock Exchange and national investors (Pension Funds, Investment and Mutual Fund Managers), with the support of PRI, signed a *Declaration of Support for Sustainable Finance*⁷⁸ to highlight the need for the investors, as well as for the issuers, to address ESG factors in the evaluation of opportunities and in the risk management decisions.

⁷⁷ The Commission absorbed the Superintendencia de Bancos and Financial Institutions on June 1st 2019, becoming the supervisor of the abovementioned markets. The regulatory perimeter of the Commission comprises approximately 75% of Chile's financial sector.

⁷⁸ Santiago Stock Exchange, <https://servicioscms.bolsadesantiago.com/Corporativo/Documentos/Declaraci%C3%B3n%20de%20Inversionistas.pdf>

Country Analysis I: Brazil

Financial stability architecture

The Brazilian Financial System is overseen by the National Monetary Council (CMN), composed by the Ministry of Finance, the Ministry of Planning, Development and Management, and the Governor of the Brazilian Central Bank (BCB). The Council does not explicitly assign financial stability to any regulator, and in practice the BCB takes the leading role. The BCB assumes de facto responsibility for macro-prudential policy but does not have an explicit legal mandate for this (IMF, 2012). The regulatory architecture is completed by the National Council for Private Insurance (CNSP) and the National Council for Complementary Pensions (CNPIC), and supervising entities such as the Securities and Exchange Commission (CVM), the Private Insurance Superintendency (SUSEP), and the National Complementary Pension Superintendency (PREVIC).

According to Article 192 of the Brazilian Constitution, and Law 4594, the Brazilian Central Bank's mission is to "ensure the stability of its country's currency's purchasing power to create a solid and efficient financial system," in order to maintain the soundness, efficiency, and proper functioning of the National Financial System and the infrastructure of its financial market. In addition, in 2011, the BCB established a Financial Stability Committee (COMEF) to better identify and monitor the sources of systemic risk and to define strategies to mitigate such risks, as monetary and financial stability is at the core of the BCB mission (Jacome et al, 2012⁷⁹).

Regulation on climate related risks

Climate-related risks, following the taxonomy of the FSB-TCFD and the BoE, are not explicitly mentioned in financial regulations in Brazil. However, Brazil is strongly involved



in international initiatives on climate change in financial industry, supporting research on solutions to the increase in green financing in the economy, and to reduce financial vulnerability to climate change⁸⁰. Brazilian financial regulators are strongly involved in key international forums: The Central Bank of Brazil has participated in the G20 Sustainable Finance Study Group and takes part in the Sustainable Banking Network (SBN) and the Private Insurance Superintendency (Superintendência de Seguros Privados, SUSEP) is a supporting institutions of the Principles for Sustainable Insurance (PSI) and a member of the Sustainable Insurance Forum (SIF).

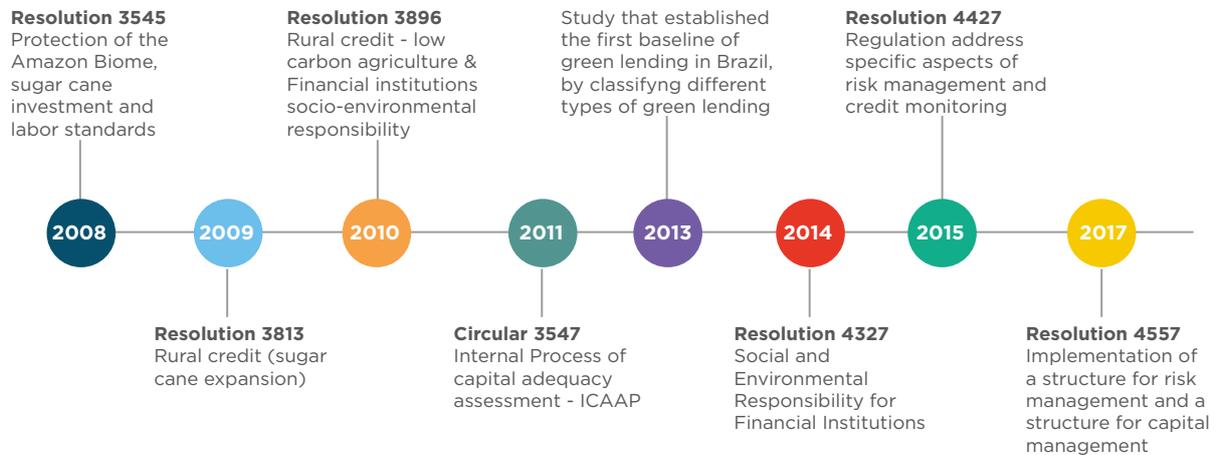
Although there is no formal regulation explicitly addressing climate-related risks, Brazilian financial regulation has long incorporated socio-environmental principles and is one of the more advanced in LAC in tackling these risks. Figure 5 shows the development of financial regulatory actions related to socio-environmental issues in Brazil: Starting with the establishment of measures regarding the protection of the Amazon in 2008, several regulations have been established with the goal to address ESG issues in sub-sectors in the financial system and to integrate them in the core risk management functions of financial institutions.

⁷⁹Jacome, L., Nier, E., Iman, P., "Building Blocks for Effective Macroprudential Policies in Latin America: Institutional Considerations" IMF working paper WP/12/183, 2012.

⁸⁰FGV-EAESP. "The Brazilian Financial System and the Green Economy." Prepared for UNEP and FEBRABAN in the Framework of Inquiry into the Design of a Sustainable Financial System. 2014.

FIGURE 5

Timeline of Regulatory Actions issued by BCB



There has been a significantly high-level awareness on potential financial impact stemming from climate change or socio-environmental issues in Brazil. As the graphic describes, regulations were initially tailored to respond to specific concerns about investments in the Amazonian Forest through the Resolution 3545 in 2008⁸¹, and then to the support for rural credit through Resolutions 3813 & 3896⁸². In 2011 then, Circular 3.547 was the first attempt to widen the scope of environmental and social risks regulation to the whole financial industry, requiring institutions to demonstrate how they were identifying their risk exposure to socio-environmental damages and calculating the capital needed to deal with potential losses due to such risks. The Resolutions 4327 and 4427 then redefined capital requirements according to levels of risk assumed, explicitly considering environmental risk.

In 2012, several public consultations⁸³ were conducted, based on which the Resolution 4327 was established. The Resolution 4327 was released on April 28, 2014, establishing guidelines for financial institutions and other organizations, such as cooperatives and federations of cooperatives, whose

operations are authorized by the BCB. It promotes implementation of Social and Environmental Responsibility Policies (SERP) in regulated entities. The resolution requires the implementation of social and environmental policy for financial institutions' own operations with direct clients and counterparts, and on the voluntary basis, for the relationship with that of its clients and counterparts⁸⁴. The regulation provides specific criteria for the risk assessment of high-risk activities and requires institutions to keep records of losses generated by socio-environmental damage, which is to be monitored and recorded for a minimum period of five years. In addition, regulated institutions must assess potential, negative socio-environmental impacts of new products and services, including their relationship with reputational risks. This mandatory SERP implementation is a significant development in LAC that not only allows institutions to identify and quantify the risk but also disseminates risk-related information to the financial systems through the Central Bank, which will enable monitoring environmental risks in a structured manner.

⁸¹Resolution 3545, Retrieved from: https://www.bcb.gov.br/pre/normativos/busca/downloadNormativo.asp?arquivo=/Lists/Normativos/Attachments/47956/Res_3545_v1_O.pdf

⁸²Resolution 3896 provides guidelines to be observed upon establishing and deploying socio-environmental responsibilities by national financial system institutions.

⁸³According to the Central Bank of Brazil's Public Hearing 41/2012 held on June 13, 2012.

⁸⁴Article 32, paragraph 1 of the Resolution 4327.

The Resolution 4557 provides a framework for a more integrated risk management with strengthened capital management processes that explicitly adds socio-environmental risk⁸⁵, in addition to conventional risk areas such as credit, market, and operational risks, to capital adequacy considerations. The Resolution 4557 is still in the process of implementation; its provisions became effective only in August 2017 for internationally active and systemically important banks and became effective in February 2018 for the remaining financial institutions.

TABLE 4

Circulars and Resolutions Related to Socio-environmental Topics

Resolution/circular	Bank operations impacted	Description
Resolution BCB 3545/2008	Rural credit – environmental compliance in the Amazon Credit for mitigation and adaptation to climate change	Applies to the Amazon biome. Requires financial institutions to demand documentation from credit borrowers proving their environmental compliance. Creates rules for the financing of projects aimed at climate mitigation and adaptation, backed by resources from the National Plan for Climate Change (FNMC).
Resolution BCB 3813/2009	Rural credit – sugar cane expansion	Links credit for the agricultural industry to agroecological zoning for the expansion and industrialization of sugar cane. Prohibits financing for crop expansion in the Amazon and Pantanal biomes, as well as in the Upper Paraguay River Basin, among other areas.
Resolution PREVIC 3792/2009	Pensions Funds	Governs investment practices and disclosures by pension schemes. Came into force in 2009 and requires the use of due diligence practices, compliance, and adoption of high ethical standards in investment processes and decision making. Currently it is expected to include several changes: Increased focus on risks, internal organizational controls and governance of investment. Expected to contain an expanded set of requirements for ESG risk.
Resolution BCB 3896/2010	Rural credit – low carbon agriculture Financial institutions socio-environmental responsibility	Establishes a program for reducing greenhouse gas emissions ('ABC Program') through the framework of the Brazilian Development Bank. Guidelines to be observed when establishing and deploying socio-environmental responsibilities by SFN (Sistema Financeiro Nacional - in its Portuguese acronym) institutions.
Circular BCB 3547/2011	Internal Process of capital adequacy assessment - ICAAP	Requires that institutions demonstrate how they are considering the risk of exposure to socio-environmental damages in their assessment processes and in their calculation of the capital needed for dealing with risks.
Resolution BCB 4090/2012	Financial institutions	Defines guidelines for Financial institutions and other institutions authorized to operate by the Central Bank of Brazil must maintain a structure of liquidity risk management compatible with the nature of their operations, the complexity of the products and services offered and the extent of their exposure to that risk.
Resolution BCB 4327/2014	Financial institutions	Defines guidelines that, considering the principles of relevance and proportionality, must be observed in the establishment and implementation of the Social and Environmental Responsibility Policy (PRSA) by financial institutions and other institutions authorized to operate by the Central Bank of Brazil.
Resolution BCB 4427/2014	Rural credit	Authorizes the use of remote sensors for supervising rural credit operations and determines the registration of the geodetic coordinates of the enterprise financed by credit operations rural development in the Rural Credit Operations System and the Proagro (SICOR).
Resolution BCB 4557/2017	Rural credit	Implementation of a structure for risk management and a structure for capital management.

⁸⁵Brazilian Central Bank, retrieved from <http://www.bcb.gov.br/>

Besides the resolutions issued by the BCB, other financial authorities are also involved in the efforts to incorporate socio-environmental risks in their regulations. For instance, the Superintendency of Private Pension Funds (PREVIC) is in the process of reviewing Resolution 3792, the resolution that governs investment practices and disclosure by pension schemes. This resolution, which came into force in 2009, requires pension funds to use due diligence, and comply with the law and adopt high ethical standards in investment processes and decision making. PREVIC requires pension funds to explicitly state in their annual policy statements whether they comply with environmental and social principles. The resolution was reviewed in 2016 and a proposal for amendment was created in 2017 to increase its focus on risks, internal organizational controls, and governance of investments, with an enhanced requirement related to ESG.

SUSEP (the Private Insurance Superintendence) has been assessing climate change impact on the insurance industry. In November 2016, SUSEP launched a survey process with regulated entities to obtain data and information about market practices on sustainability issues, gathering responses from 75% of Brazil's 172 insurance companies. The survey found that while 80% of Brazilian insurance companies consider environmental issues to be important to their overall business strategy, very few have implemented policies or mechanisms to consider and mitigate the impacts of climate change within underwriting policies, risk management or investment decision-making. This study was the first step of the SUSEP towards engaging with insurance companies on the climate-related issues and with the Brazilian Insurance Market Confederation (CNseg) to encourage ESG actions for the industry.

Self-regulatory bodies and private sector initiatives

Not only are regulators playing a relevant role in the international arena, but also private financial institutions. The Brazilian Federation of Banks (FEBRABAN⁸⁶) supports the UN Environment Finance Initiative and more than 50 institutions such as asset owners, investment managers, and service providers are signatories of the UN backed Principles of Responsible Investments (PRI). FEBRABAN is indeed playing a crucial role in encouraging self-regulatory efforts: after the release of Resolution 4327, FEBRABAN published a Self-Regulation Framework called SARB 14⁸⁷, which provides guidelines and procedures for the socio-environmental practices. The aim of the guidelines is to prepare and support FEBRABAN members in the implementation of responsible corporate policies, incorporating those issues addressed in the Resolution 4327/2014.

In 1995, several state-owned banks including BNDES, Caixa Econômica Federal, Bank of the Amazon, Central Bank, and Banco do Nordeste, signed the Green Protocol,⁸⁸ the first effort of integration of sustainability concerns in the banking industry. In 2008, the Ministry of the Environment and the banks signed The Protocol of Intentions for Socio-environmental Responsibility, an updated revision of the 1995 Green Protocol⁸⁹. The Green Protocol aimed to create banking policies and practices with socio-environmental responsibility and in harmony with sustainable development. The signatories committed to financing schemes through credit lines and programs with considerations for the population's standards of living and environmental protection.

⁸⁶FEBRABAN represents 122 banks which accounts for 93% of shareholder's equity and 97% of the total assets of the national banking system in Brazil retrieved from <https://www.febraban.org.br>.

⁸⁷Brazilian Federation of Banks (FEBRABAN), retrieved from <http://relatorioanual.febraban.org.br/en/07.htm?s=SARB14#self-regulation>

⁸⁸UNEP, "The Brazilian Financial System and the Green Economy" Center for Sustainability Studies at Getulio Vargas Foundation. 2014.

⁸⁹*ibid.*

Another key initiative is the Brazilian Business Council for Sustainable Development (Conselho Empresarial Brasileiro para Desenvolvimento Sustentável, CEBDS). CEBDS is a non-profit civil association that promotes sustainable development for companies operating in Brazil. It interacts with governments and the civil society and disseminates the most modern concepts and practices pertaining to this theme. One of its working groups is focused on sustainable financing. Officially launched in 2005, the group includes the largest financial institutions⁹⁰ (e.g. Santander and Itaú Unibanco) and has already consolidated its position as a promotion source for a new developmental model⁹¹. Currently CEBDS and FEBRABAN have initiated a process in which they have established a roadmap for adoption of TCFD recommendations by the banks in Brazil. The roadmap identifies 10 landmarks to be accomplished in the next 5 years.

Moreover, the Brazilian stock market is one of the five partner exchanges founding members of the Sustainable Stock Exchanges (SSE)⁹². This initiative is sponsored by the UN Conference on Trade and Development (UNCTAD), the UN Global Compact, the UN Environment Program Finance Initiative (UNEP FI), and the Principles for Responsible Investment (PRI). The aim of this initiative is to enhance corporate transparency related to ESG issues, and encourage sustainable investment.

The Brazilian insurance market, under the leadership of the National Confederation of Insurance Companies (Confederação Nacional das Empresas de Seguros

Gerais, Previdência Privada e Vida, Saúde Suplementar e Capitalização, CNseg) has committed to promote the Principles for Sustainable Insurance (PSI). CNseg annual sustainability report is built upon the four principles of PSI. Brazil has the largest membership of PSI signatories in the world with 10 companies listed plus CNseg and SUSEP are supporting institutions of the principles⁹³. Furthermore, in May 2018 Brazil became the world's first insurance market to commit to climate risk transparency through the Rio declaration on climate risk transparency by the Brazilian insurance industry⁹⁴. The declaration states that signatory companies declare their support for dialogue on practical and effective ways to meet the recommendations of the FSB-TCFD, and it is signed by 15 organizations

Finally, five of the major Brazilian banks have committed to the Equator Principles. Banco Bradesco and Itaú Unibanco were among the earliest banks to sign up, followed by Banco do Brasil, Banco Votorantim and CAIXA. This level of engagement by Brazilian banks reaffirms the strong concern and business risk for a better management of socio-environmental risks. Moreover, the largest banks in the country are supporting initiatives on climate-related risks: Bradesco's executive director is the vice chair of the TCFD⁹⁵, and the financial group together with Itaú Unibanco has joined the UNEP FI-TCFD pilot project to develop and test strategies and tools for the implementation of the TCFD recommendations⁹⁶. Bradesco has also opted to form part of the core group of banks globally that is drafting the Principles for Responsible Banking (PRB), this group was convened by UNEP FI.

⁹⁰Banco do Brasil, BNDES, Bradesco, Bradesco Seguros, Caixa, Mapfre Seguros, Itaú and Santander.

⁹¹Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável (CEBDS), retrieved from <http://cebds.org/>

⁹²The Brazilian stock market (FBOVESPA), the Egyptian Exchange, Johannesburg Stock Exchange, Borsa Istanbul and Nasdaq.

⁹³UNEP FI PSI, accessed on June 26th, 2019 <https://www.unepfi.org/psi/psi-cnseg-event/>

⁹⁴UNEP FI PSI, accessed on June 26th, 2019 <https://www.unepfi.org/psi/wp-content/uploads/2018/05/Rio-declaration-on-climate-risk-transparency-English.pdf>

⁹⁵FSB, retrieved from <https://www.fsb-tcfid.org/about/>

⁹⁶UNEP FI, October 2017: <http://www.unepfi.org/news/industries/banking/eleven-unep-fi-member-banks-representing-over-7-trillion-are-first-in-industry-to-jointly-pilot-the-tcfid-recommendations/>

Country Analysis II: Colombia

Financial Stability Architecture

The financial stability of the Colombian financial system is overseen by the “Financial System Monitoring Coordination Committee” (Comité de Coordinación para el Seguimiento al Sistema Financiero, CCSSF), created by the Colombian Government with the Law 795 of 2003 and regulated by Decree 1044 of 2003, after operating informally during the financial crisis of the late 90’s⁹⁷. Currently, the committee is composed of four institutions that regulate and oversee the country financial system: (i) Ministry of Finance and Public Credit (the sole regulator of the financial system through its Unit for Financial Regulation, UFR), (ii) the Bank of the Republic (which monitors the adoption of macro-prudential measures, and provides oversight of the payment system, as well as acts as a liquidity provider and lender of last resort), (iii) the Financial Superintendence (in charge of supervising regulated entities and implementing intervention measures), (iv) FOGAFIN (administers deposit insurance and arranges resources for the patrimonial strengthening of the inscribed institutions, for financial institutions) and (v) FOGACOOP (administers deposit insurance and arranges resources for the patrimonial strengthening of the inscribed institutions, for cooperatives)⁹⁸.

The CSSF is composed of a presidency, a general secretary, a subcommittee and three main working groups: 1) Systemic risk, including assessment of macroprudential and microprudential risks, and support to development of prudential policies; 2) Rescue mechanisms and protocols for dispute resolution and legal protection; and 3) Management and exchange of information.⁹⁹



Regulation on climate related risks

The Colombian financial regulatory framework does not yet include rules that explicitly address climate-related risks for financial institutions; however, with the Decree 2555 of 2010, the Government introduced regulation on environmental and social practices, risks and disclosure for financial companies in banking, insurance and capital markets sectors.¹⁰⁰ Article 2.36.8.1.1 and the following ones of the decree require financial entities such as banks, insurance and intermediaries to inform the public about the social programs that they have implemented, and explicitly ask them include programs with positive

⁹⁷Hernández G. “Coordinación de la Red de Seguridad Financiera.” VIII Reunión del Comité Regional de América Latina.” March 10. 2011.

⁹⁸Ministerio de Hacienda y Crédito Público, Colombia, retrieved from <http://www.minhacienda.gov.co/>

⁹⁹Hernández G. “Coordinación de la Red de Seguridad Financiera.” VIII Reunión del Comité Regional de América Latina.” March 10. 2011.

¹⁰⁰Superintendencia Financiera de Colombia. Decreto 2555 de 2010. Retrieved from <https://www.superfinanciera.gov.co/publicacion/10083580>

environmental impact. The same title determines the frequency and the content of the informational report on ESG issues, to be included with annual frequency and using their communication instruments with the highest coverage and public access.

In March 2019 the Financial Superintendence (SFC) presented the results of the first survey of climate risk and green finance in the financial sector. The results show that despite the process achieved in the banking sector, based on the Green Protocol, the financial system has not yet integrated E&S risk in a systemic way. Only 42% of banks, 21% of general insurance companies, 20% of life insurance companies and 13% of trust have integrated environmental and social risk in assessment systems. As a result, the SFC established a four action areas to strengthen climate risk, which are: Taxonomy based on international experience and local priorities; adoption of ESG criteria by investment funds; Transparency and disclosure that allows the reduction of information asymmetry regarding climate change; capacity building as a crosscutting theme¹⁰¹.

Moreover, in 2016 the Colombian government through the Ministry of the Environment created the Financial Management Committee of the National System of Climate Change (SISCLIMA) to carry out inter-institutional coordination and public-private dialogue on finance and climate change¹⁰². The aim of this committee is to generate public policy guidelines for the inclusion of climate change criteria in the economic and financial planning of the country. The participating entities on the committee include public governmental entities (the National Planning Department (DNP), the Ministry of Finance and Public Credit (MHCP), the Ministry of Environment and Sustainable Development (MADS), the Ministry of Commerce, Industry and Tourism (MCIT), the Ministry of Foreign Affairs (MRE), the Presidential Agency for International Cooperation (APC)); public finance institutions (the Adaptation Fund, IDEAM, Bancoldex, Findeter, Finagro); and a representation of the private finance sector through the Green Protocol.

The work areas of the committee include: a) public finances and economic instruments, inclusion of climate change criteria in the

budget planning and in the design and implementation of economic instruments; b) international public resources: systematic planning for access to international public sources as a financing mechanism for the nation guaranteeing the mobilization of additional sources of financing in alignment with national frameworks and country ownership; c) the Private Sector: analysis of the financial sector and the development of regulatory frameworks and incentives for the promotion of private investment in low-carbon development projects and climate resilience; and d) the monitoring and systematic reporting of financing flows related to climate change issues.

Self-regulatory bodies

In addition to the efforts by the public sector, there are a number of initiatives focused private sector, related to the management of ESG issues and the promotion of climate friendly investments, with Asobancaria being a member of the Sustainable Banking Network and a supporting institution of UNEP FI, the Colombia Stock Exchange (BVC) having joined the UN Global Compact in 2011 and the UN Sustainable Stock Exchange Initiative in 2014. There is only one bank as a signatory of the Equator Principles, Bancolombia. Probably the most relevant initiative for the domestic market is the Green Protocol.¹⁰³ It is a joint initiative of the Colombian Government and the Colombian banking sector, focused on promoting green financing and a more efficient use of natural resources. The Protocol was signed in 2012 by the Government, Asobancaria and 15 banks and lending institutions. This protocol, through a set of guidelines, encourages financial institutions in Colombia to incorporate climate finance into their strategies, as well as to establish lines of action for the analysis of environmental risks and efficiency in the use of resources. On ESG and climate risks, the Protocol has also produced practical guidelines for the assessment, reporting and management of greenhouse gas emissions, and for the establishment and implementation of a

¹⁰¹ Riesgos y oportunidades del cambio climático, Superintendencia Financiera de Colombia, 2019 <https://www.superfinanciera.gov.co/jsp/10099920>

¹⁰² Sisclima, Ministerio de Medio Ambiente, Colombia, retrieved from <http://www.minambiente.gov.co/index.php/politica-nacional-de-cambio-climatico-2/sisclima>

¹⁰³ Asociación Bancaria de Colombia, retrieved from Official document: <http://www.asobancaria.com/protocolo-verde/>

complete Environmental and Social Risk Management System (ARAS for its Spanish acronym), including identification and assessment of risks in the projects, decision making and risk management, monitoring and reporting of overall risk exposure.

The Green Protocol was revalidated and expanded in March 2018, by the financial sector, including the insurance association (FASECOLDA), stockbroker's association (ASOBOLSA), and the microfinance and fiduciary associations. The extended

protocol includes four areas of action: 1) green products and services, 2) eco-efficiency, 3) environmental and social risks and 4) disclosure and reporting. Finally, the extended Green Protocol was identified as one of the mechanisms to achieve the national objectives regarding climate change, in particular through the Finance Innovation Pilots. These pilots seek to address the climate challenges through mitigation and adaptation projects and eco-efficiency.

Country Analysis III: Mexico

Financial Stability Architecture

Responsibility for overseeing the stability of the Mexican financial system mainly resides with the “Stability Board of the Financial System” (Consejo de Estabilidad del Sistema Financiero, CESF), created in 2010 by the Mexican government as an “entity for the evaluation, analysis and coordination of authorities in financial matters.” Its mandate is “to promote financial stability, avoiding interruptions or substantial alterations in the operation of the financial system and, when appropriate, to minimize their impact when these do occur.”¹⁰⁴The Council is composed of representatives of the main regulatory entities of the financial system: Ministry of Finance and Public Credit, the National Banking and Securities Commission, the National Insurance and Bonding Commission, the National Commission of the Retirement Savings System, Mexico’s Institute for the Protection of Bank Savings and the Bank of Mexico. The presidency of the Council lays with Mexico’s Ministry of Finance while the Bank of Mexico acts as the Secretary.

The core mandate of the Central Bank (Banco de Mexico) is maintaining the purchasing

power of the national currency, but also states that additionally the institution promotes the healthy development of the financial system and the correct functioning of the payment system¹⁰⁵. The Bank supports financial stability through monetary policy tools, by monitoring continuously all risks potentially threatening financial stability, and finally by supporting regulation and supervision of the whole financial system.

Regulation on climate related risks

Mexican financial regulatory framework does not have an explicit mention to climate-related risks or socio-environmental risks; however, the Mexican government and

¹⁰⁴Mexican Financial Stability Council, retrieved from <http://www.cesf.gob.mx/>

¹⁰⁵Banco de Mexico “El Sistema Financiero”, retrieved from <http://www.banxico.org.mx/divulgacion/sistema-financiero/sistema-financiero.html>

the institutions of the financial sector are highly active and involved in international dialogues on climate change: the Central Bank was an active participant of the G20 Sustainable Finance Study Group and is a founding member of the *Network of Central Banks and Supervisors for Greening the Financial System* together with seven other institutions from Asia and Europe; the Mexican Association of Banks (ABM) and the Ministry of Environment are both members of the aforementioned Sustainable Banking Network; the ABM is also a supporting institution of UNEP FI, the Mexico Stock Exchange is member of the Sustainable Stock Exchange Initiative, and finally, the Mexican Association of Insurance (AMIS) and Agroasemex, the government Insurance company for rural activities, are a supporting institution and signatory of the Principles for Sustainable Insurance respectively.

Most notable examples of the climate-related formal regulations in Mexico are a few laws introduced in the energy sector¹⁰⁶ and agriculture and fishery sector¹⁰⁷, which are focused primarily on reducing carbon footprints, and also on stimulating investments in climate-friendly activities¹⁰⁸. Although the financial industry is not their main scope, they are highly relevant to financial activities in the country.

The only regulation that explicitly addresses ESG risks in financial activities is the disclosure requirements by the Securities Exchange Commission, which is required to the firms that are listed on the Mexican Stock Exchange (Bolsa Mexicana de Valores, BMV)¹⁰⁹. The firms are required to include a detailed description of their environmental performance, with the issuers required to describe (i) their environmental policy, (ii) their environmental management system, (iii) an environmental certificate or environmental recognition, either by the competent authority or an accredited

entity, and (iv) a program or projects for the protection, defense, or restoration of the environment and natural resources. Moreover, an issuer must disclose how their activities pose considerable environmental risk, and importantly whether climate change and/or legislation related to climate change might affect the issuer's business, such as in variation of demand for carbon-intensive goods.

Banco de Mexico has indicated that it will undertake a survey of sustainability practices and climate risk assessment to financial institutions this year. This survey has the objective to inform Banco de Mexico of the level of adoption and interest on the issue in the sector to inform its further actions and its inputs to the NGFS.

Self-regulatory bodies and private sector initiatives

The stock exchange (BMV) develops an annual report on sustainability, which is composed of the information submitted by its issuers. This requirement follows a methodology based on the standards of social, environment and governance. Explicitly addressing climate-related risks in the financial industry, the BMV Consultative Council in Climate Finance plays an important role, whose members range from industry associations, institutional investors, development banks, multilateral banks, investment banks, corporate and tax lawyers, specialized consultants, certifiers, to Mexican governmental authorities. The council aims at promoting dialogue among various financial market players, with the goal to contribute to creating incentives for investment into green projects and thus to developing a "greener" financial market.¹¹⁰

In 2016 the Mexican Association of Banks (ABM) presented a Sustainability Protocol

¹⁰⁶The Energy Transition Law Regulation, the Mining Law Regulation: the New Regulation, the General Law for the Prevention of and Integral Management of Waste Regulation. Text currently in force: the General Law of Ecological Equilibrium and Environmental Protection in Matters of Ecological Regulation, and the General Law of Sustainable Forestal Development Regulation.

¹⁰⁷General Law of Sustainable Fisheries and Aquaculture; General Law of Ecological Equilibrium and Environmental Protection; General Law of Sustainable Forestal Development; Labor Law; Law of Sustainable Development; and General Law of Climate Change.

¹⁰⁸Tamayo A. "Social responsibility is growing in Mexico." Social Value & Intangibles. April. 2015.

¹⁰⁹Annex "N" of "Provisions of a general nature applicable to issuers of securities and other participants of the Securities Market," (August 11, 2017). <http://www.cnbv.gob.mx/Anexos/Anexo%20N%20CUE.pdf>

¹¹⁰Mexican Stock Exchange, retrieved from https://www.bmv.com.mx/docs-pub/SALA_PRENSA/CTEN_BOLE/Bolet%3ADn%20de%20Prensa%20Integraci%C3%B3n%20Consejo%202016%2003.11.16.pdf

that was signed by 22 of the 52 banks operating in the country. The protocol consists of five strategic areas of action, which are: strengthening of corporate governance through internal policies of sustainability; Environmental and social risk management in the investment and loan operations; sustainable investment; efficient use of resources in internal processes; and monitoring and communications of sustainability policies and practices in the sector.

In 2016, 57 institutional investors signed a declaration in favor of financing green bonds in Mexico. Included among these investors are pension funds, insurance companies, multilateral banks, investment fund operators and independent investment advisors. The signed document encourages the governmental and financial sector authorities to consider public policies, regulations, and risk mitigation mechanisms that support the development of the local green bond market¹¹¹.

The issue of climate-related risks is highly analyzed and addressed at the corporate level in Mexico. For example, individual firms and industry associations have a long-time track record of involvement in sustainability issues and of setting up self-regulatory initiatives¹¹². Recent examples of self-regulatory framework implemented are: The transition of BANOBRAS towards a green bank¹¹³, through the implementation of a socio-environmental risk management system for its lending activities; an institutional strategy focused

on improving efficiency of use of resources in its own operations, and on strengthening partnership with other institutions leading on sustainability issues; and through an increase of its lending towards sustainable projects. In August 2017, the infrastructure bank also issued its first green bond, advancing its mandates to support the development of green financial markets¹¹⁴.

The second example is the participation of three Mexican financial institutions in a pilot assessment of a stress-testing methodology for environmental risks (e.g. droughts) developed by the Natural Capital Alliance¹¹⁵ with Risk Management Solutions (RMS) and supported by GIZ and UNEP FI. The analysis uses drought scenarios for Brazil, China, Mexico and the United States to account for direct and indirect impacts of droughts on 19 industry sectors. In the case of Mexico, the model was applied to the loans portfolios of three Mexican banks, the Fideicomisos Instituidos en Relación con la Agricultura (FIRA), a public bank for agriculture lending, and Banorte and Banamex, two commercial ones. One of the portfolios analyzed reveals that the most vulnerable economic activity to revenue changes caused by droughts is crop production, while the largest drivers of losses for this portfolio were oil and gas extraction and food manufacturing.

There are 2 Mexican banks listed as signatories to the Equator Principles, Banorte, CIBanco. Banorte at the same time is part of the core groups of banks drafting the Principles for Responsible Banking (PRB), an initiative convened by UNEP FI.



¹¹¹Currently, the main issuer in the Mexican green bond market is the new international airport of Mexico City, the Banobras and Nacional Financiera (State-owned banks). According to our talks with Banobras. Plataforma Mexicana de Carbono. "Inversionistas Firman Declaración de Bonos Verdes en la Bolsa Mexicana de Valores" Retrieved from <http://www.mexico2.com.mx/noticia-finanzas-contenido.php?id=110>.

¹¹²Mexico has a long track record of private sector involvement in the sustainability issues. Dating back to the 90s, the Commission for Private Sector Studies for Sustainable Development (CESPEDES) was founded in 1994 by Mexican corporations to tackle sustainable development challenges posed by the incorporation of Mexico into global markets via OMC (1988), NAFTA (1994) and the Rio Summit (1992). CESPEDES is the Mexican chapter of the World Business Council for Sustainable Development (WBCSD).

¹¹³<https://www.gob.mx/banobras/articulos/sabes-que-es-un-bancoverde?idiom=es>

¹¹⁴Issuance of green bond by Banobras, <https://www.gob.mx/banobras/prensa/banobras-colo-ca-bono-sustentable-el-primero-en-su-tipo-emitido-por-un-banco-de-desarrollo-en-america-latina?idiom=es-MX>

¹¹⁵RMS. "Drought Stress Testing for Financial Institutions" RMS/GIZ/NCFA. 2017.

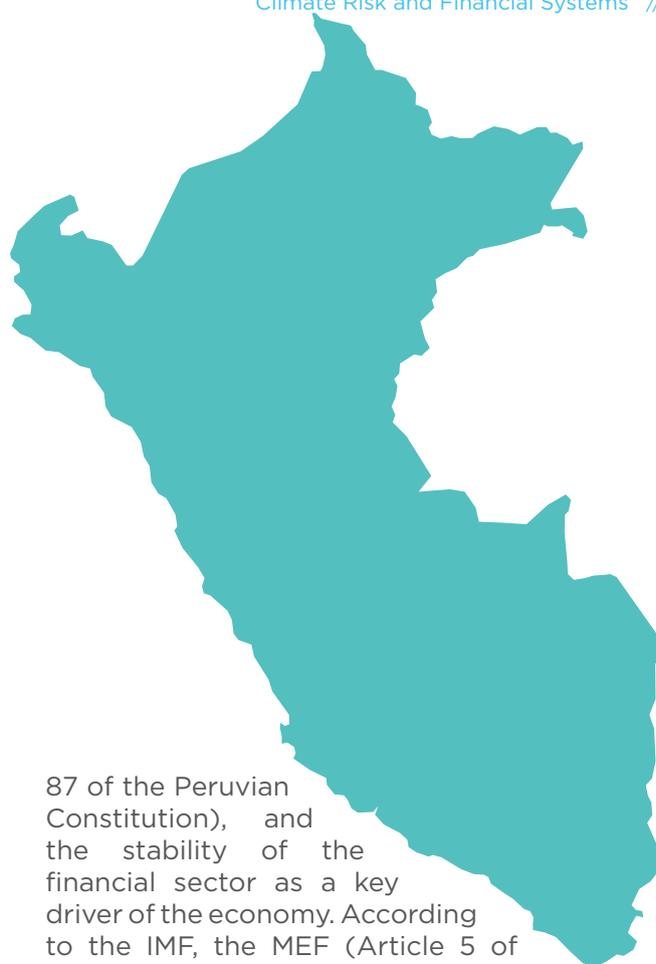
Country Analysis IV: Peru

Financial stability architecture

The Peruvian regulatory architecture for financial markets includes the Central Bank (*Banco Central de Reserva del Peru, BCRP*), the Superintendency of Banks, Insurance and Private Pension Funds (*Superintendencia de Banca, Seguros y AFP, SBS*), the Superintendency of Capital Markets (*Superintendencia del Mercado de Valores, SMV*) and the Ministry of Economy and Finance (*Ministerio de Economía y Finanzas, MEF*).

According to the IMF (2012), financial stability objectives are not explicitly expressed in Peru's legal framework but are implicitly established in the objectives of its different authorities. Therefore, responsibility for financial stability is not explicitly assigned to any institution, but, in practice, is the common goal of all its financial authorities, including the BCRP, SBS, and MEF – however, the mandate of the central bank is highly focused on monetary stability, while the one of the SBS looks at the wider stability and proper functioning of the financial market as well as of the insurance one (article 2, SBS Law¹¹⁶).

There is no formal inter-institutional stability committee in the country, although the mandates that each financial authority pursues include key objectives to preserve financial stability. The BCRP¹¹⁷ is the only authority with staff specifically focused on stability research (Law 4500, BCRP) ; it has clear involvement in financial stability issues through its mandate on ensuring monetary stability (Article 84 of the Peruvian Constitution), and more specifically, ensuring the stability of its payment systems and in being a lender of last resort. The SBS, as a micro-prudential regulator, is responsible for the health of financial institutions (Article



87 of the Peruvian Constitution), and the stability of the financial sector as a key driver of the economy. According to the IMF, the MEF (Article 5 of the Peruvian Constitution) assumes a more passive role in carrying out macro-prudential policy during non-crisis times, as its main responsibility is public spending.

Regulation on climate related risks

The Peruvian government is an active actor of climate change dialogues internationally, for a wide range of economic sectors. For example, the Law 30215, the National Forestry and Climate Change Strategy, and the Law No. 26-2014-SERNANP, are for the preservation of natural ecosystems, and the Decree 1058 and 1002, the Law No. 28054, and the Federal Decree No. 013-2005-EM are to promote renewable energy investment. And finally, the Decree No. 238-2010-MINAM is to establish an action plan for adaptation and mitigation against climate change.

¹¹⁶Ley General del Sistema Financiero y del Sistema de Seguros y Orgánica de la Superintendencia de Banca y Seguros - Ley N 26702 [http://www2.congreso.gob.pe/sicr/cendocbib/con4_uibd.nsf/8CEF5E01E937E76105257A0700610870/\\$FILE/26702.pdf](http://www2.congreso.gob.pe/sicr/cendocbib/con4_uibd.nsf/8CEF5E01E937E76105257A0700610870/$FILE/26702.pdf)

¹¹⁷Central Bank of Peru, retrieved from <http://www.bcrp.gob.pe/docs/Transparencia/Normas-Legales/ley-4500.pdf>

In April 2018, led by the Ministry of Environment (MINAM), the climate change law was approved¹¹⁸. The objective of the law is to establish a unified climate change policy that guides, directs, facilitates, monitors and promotes management of the issue. It aims to promote how public entities at national, regional and local levels defines, prioritizes and reports concrete actions of adaptation and mitigation. These actions are expected to encourage management, development planning, and sector investment to include adaptation and mitigation actions.

In the financial sector, there has been in recent years a high level of awareness regarding extreme weather events and their impact on financial assets: in this context, the SBS issued Resolution 1928-2015 in March 2015, a socio-environmental regulation developed in line with the international ESG standards. This resolution aims at establishing minimum requirements for socio-environmental risk management to encourage financial firms to implement robust due diligence consultation, as well as prudent analysis and decision-making processes. According to the SBS Working Paper (SBSN°01-2015¹¹⁹), this regulation was originally designed against the backdrop of socio-environmental conflicts such as the Conga and Tia Maria projects, which raised awareness of financial institutions to regard socio-environmental conflicts as financial risks for their operations. The resolution was modeled on several international principles and standards such as the UN Guiding Principles on Business and Human Rights, ISO 26000 on Social Responsibility, the OECD Guidelines for Multinational Enterprises, IFC Performance Standards, the Equator Principles, the UN PRI and UNEP FI Statement of Commitment, which were adopted and applied to the Peruvian context. Prior to the design of the resolution, workshops were held with financial institutions and other stakeholders to discuss economic impact of potential ESG-related events in sectors such as mining, manufacturing, timber, and infrastructure. This regulation is applicable to financial institutions including banks, municipal credit institutions, rural credit institutions, financial

leasing companies, factoring companies and surety and warranty companies, microcredit agencies, as well as public entities, which provide advisory services and financing. It establishes how financial institutions evaluate and categorize the risk factors of their clients by applying a screening survey for all transactions larger than USD 10 million. The outcome of this screening defines the level of riskiness in these transactions, and to each level of riskiness, it establishes an appropriate action to measure and mitigate the risk. For example, for a high-risk project, financial institutions must require their clients to undergo socio-environmental assessment by a third-party expert. The third-party expert must also provide support for the clients in drafting a strategy for the risk management. The risk management plan is then included as a binding loan covenant and monitored on a regular basis. Given the transaction threshold in the regulation, it tends to apply to only the four largest banks in Peru; they must report quarterly to the SBS and based on what is reported, the on-site supervision for ESG risks will be adjusted. This resolution is applicable to those financing projects with external funds from international investors as well, as they are required to have guarantee provided by a local institution.

In 2017, in response to the severe impacts from El Niño Costero for the Peruvian economy, the SBS issued the Resolution N°10250-2017 to allow financial institutions an unilateral renegotiation of the terms of payments for the clients severely affected by the natural disaster, in order to avoid the classification of such clients as in default, and the writing down of their corresponding debt. At the same time, the SBS commits to monitor the quality and evolution of the loans affected by the disaster with the objective to preserve the stability of the financial system, while supporting the recovery of economic activities affected. While there's no mention of climate change in the resolution, it does provide a precedent for the disclosure, management and monitoring framework for financial assets exposure to physical climate risks.

¹¹⁸MINAM, Ley Cambio Climático, <https://busquedas.elperuano.pe/normaslegales/ley-marco-sobre-cambio-climatico-ley-n-30754-1638161-1/>

¹¹⁹SBS. "The role of enhanced due diligence in the regulation of socio-environmental risk management for financial firms." Paper SBS N°01-2015. 2015.

For capital markets, the Superintendence of Stock Market released the Resolution 033-2015-SMV/01, with the aim to increase available information on corporates' sustainability practices through mandatory disclosure for listed companies. The Peruvian Stock Exchange is a member of the Sustainable Stock Exchanges (SSE)¹²⁰, which also provides a voluntary public commitment to promote improved ESG disclosure and performance among listed companies. This resolution is closely aligned with the SSE principles and intends to identify those companies that are implementing actions and standards to ensure their corporate sustainability and at the same time make public the efforts of each firm on environmental and social development. In this sense, this resolution is forward looking and incentivizes firms to have in place a measure to address and mitigate potential issues in the future.

This resolution requires the release of a corporate sustainability report (CSR), through an annex added to an organization's annual report. The CSR should gather information on the level of progress of these practices and in detail their implementation in the entities that have been using the annual sustainability report, as well as those that have not yet done so. This resolution is consistent with the global trend promoted by the World Federation of Exchanges (WFE)¹²¹, which has launched sustainability guidelines¹²² developed to complement the Sustainable Stock Exchanges Initiative of the UN.

Self-regulatory bodies and private sector initiatives

Finally, there are two notable voluntary practices in the Peruvian financial sector. At the World Summit on Climate Change in Lima entities of the Peruvian National Financial

System signed the implementation of a Green Protocol that will regulate financial services in the country for the promotion of environmentally sustainable investments and projects. This protocol was signed by the Association of Banks of Peru (ASBANC), the Association of Microfinance Institutions of Peru (ASOMIF) and AGROBANCO, as well as Peru's Ministry of the Environment and its Ministry of Agriculture and Irrigation¹²³. The protocol consists of three strategies; The first is to generate guidelines and instruments that promote financing of sustainable development projects with credit facilities and investment, as well as to develop programs that promote the sustainable use of renewable natural resources, protect the environment and the competitiveness of productive sectors. The second is to promote through internal processes the sustainable consumption of renewable natural resources that improve operational efficiency by reducing carbon footprints. The third strategy is to consider the environmental and social impacts and costs generated in the activities and projects to be financed in the credit and investment risk analysis processes, complying with the respective environmental legislation. There is only one Peruvian bank registered as signatory of Equator Principles, Banco de Crédito.

¹²⁰ Sustainable Stock Exchanges, retrieved from <http://www.sseinitiative.org/>

¹²¹ Formerly known as the Federation Internationale des Bourses de Valeurs (FIBV).

¹²² United Nations Conference on Trade and Development, retrieved from http://unctad.org/en/PublicationsLibrary/unctad_sse_2016d1.pdf

¹²³ ASOBANC, Peru, retrieved from <http://www.asbanc.com.pe/>

5

Comparing LAC Environmental Risk Regulations and the Climate-related Risk Frameworks



We provide here a short summary of the main regulatory actions listed in the country analysis and contrast them with the TCFD framework presented in the previous section (Table 5). Most of them do not mention climate change explicitly in their language, with a few efforts to start addressing the issue emerging in the recent years. The only exception being the Circular of the Securities and Exchange Commission (*Comisión*

Nacional Bancaria y de Valores) of Mexico that requires listed companies to disclose specific exposure to environmental risks and as well to climate change effects and climate-related legislation (*an equivalent of transition risk in the TCFD taxonomy*).

The first official regulation in LAC that addressed environmental risks is the Resolution 4327 by the Central Bank of Brazil

TABLE 5

Coverage by the Socio-environmental Risk related Regulations vs Climate Risk Standards

Issue areas		TCFD	Brazil	Colombia	Mexico	Peru	
		Climate Risk Standards	Res. 4327 Res. 4557	Protocolo Verde	Stock Market Circular	SBS 1928-2015	SMV 033-2015-01
Scope	Climate change mentioned	√	X	√	√	X	X
	Address Financial Industries	√	√	√	√	√	√
	Address Non-Financial Groups	√	X	X	√	√	√
	Divestment from certain projects	X	X	X	X	X	X
	Validation of approach and implementation	X	√	X	X	√	X
Risk Approach	Identifying risk	√	√	√	√	√	√
	Quantifying risk	√	√	√	X	√	X
	Modeling risk (e.g. Stress testing)	√	X	X	X	X	X
	Risk Strategy (including env. risk)	√	√	√	X	√	X
	Governance (considering env. risk)	√	√	√	X	√	X
	Forward-looking Perspective (e.g. Scenario Analysis)	√	X	X	X	X	X
Process	Review and categorization of projects	√	√	√	X	√	X
	Compliance with applicable environmental standards	√	√	√	X	√	X
	Risk management system and action plan	√	√	√	X	√	X
	Participation of interest groups	X	√	X	X	√	X
	Independent review of claim mechanism	X	√	X	X	√	X
	Presentation of Reports and Transparency	√	√	√	X	√	X
Disclosure	Climate risk explicitly mentioned	√	X	√	√	X	X
	Recognition of climate risk as financial risk	√	√	√	X	√	X
	Requirement on disclosure of climate risk	√	X	X	√	X	X
	Report of GHG Emissions (voluntary)	√	X	√	X	X	√

6

Conclusions



Climate change can pose a threat to the stability of our financial systems, affecting the health of financial institutions (banks, insurers, investors) through the performance of their lending activities, and the valuation of the financial assets in their investment portfolios. The relationship between climate-related risks and financial stability calls financial regulators to action, widening their mandate to include the assessment and management of impacts of a changing climate on financial assets and capital markets. Indeed, several global initiatives have begun to identify a potential role for regulation and have proposed regulatory tools to support financial institutions to assess and manage climate-related risks.

Pioneering work from the Bank of England and the Financial Stability Board (FSB) has shown how such threat can occur both via the impacts of physical climate-related events on the value of financial assets and the ability of borrowers to honor their liabilities (**climate physical risk**), and via a forced revaluation of investment assets due to economic and financial policies necessary to reduce greenhouse gases emissions to levels consistent with internationally agreed targets (**climate transition risks**). In 2016, the FSB launched a Task Force on Climate-related Risk Disclosures to develop and promote a disclosure framework on such risks to better support investment decisions; at the same time the European Union and

the French government have introduced regulation for the asset management industry asking investors to disclose their management process and their exposure of climate-related risks.

Within this emerging global framework, it's not surprising to see that climate-related risks do not feature much in financial regulation in Latin America and the Caribbean yet. This report has, however, focused on the green shoots - indeed several regulatory actions in the region, including financial sector's self-regulatory protocols, already include several aspects of the suggested frameworks to assess and manage climate-related risks, mostly through the management of environmental and social risks. The Central Bank of Brazil, for example, requires financial institutions to identify and assess environmental risks, to indicate how such risks impact their reserve provisioning, and to record and store any financial losses due to environmental and social risk related event. In Mexico, the financial and stock exchange regulator requires each listed company to disclose their environmental policy, including any potential environmental impact due to their economic activity and, furthermore, any estimated impact of climate-related legislation on the issuer's business activity or market - such as change in demand for carbon-intensive goods.

Finally, often anticipating regulations, the region's financial sector has also been advancing on the inclusion of climate-related risks in lending and investment processes, with the practice of Private Sector Initiatives now established in 10 countries in the region, and with a few of the largest banks joining pilots and working groups to test innovative instruments such as climate stress testing and scenario analysis within the TCFD framework. In the case of Colombia, the Green Protocol also offers guidelines and benchmarks for the identification of environmental risks and the assessment of the carbon emissions of portfolios.

Despite the significant work ahead for the financial sector in LAC to develop effective and complete frameworks to identify and manage climate-related risks, especially in terms of assessment methodologies and risk management tools (e.g. scenario analysis, stress testing), we can evidence current regulation and self-regulatory practices already established in several countries of the region will serve as important building blocks on which regulators and the financial sector can rely in developing a financial sector able to identify, assess, manage and price adequately risks related to physical and transitional impacts of climate change.

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Annex: Interviews and Survey Methodology

A set of semi-structured interviews and a questionnaire was developed for each of the countries studied, which was sent to the authorities of the respective financial systems of each country (Brazil, Colombia, Mexico and Peru) as well as to regulated financial organizations in those countries. The objective of the interviews and questionnaires was to assess in each country the perception of the current state of financial regulation related to climate change and its risks for the financial sector; to assess the drivers for issuing already established regulations, and as well to gather details on incipient regulation and self-regulatory practices in the sector.

A total of 27 institutions responded to either the interview request or the written questionnaire.

Brazil	<ol style="list-style-type: none"> 1. Banco Central de Brasil 2. Caixa Econômica Federal 3. Comissão de Valores Mobiliários 4. Superintendência Nacional de Previdência Complementar (PREVIC) 5. Superintendência de Seguros Privados (SUSEP)
Colombia	<ol style="list-style-type: none"> 1. Asociación Bancaria de Entidades Financieras (ASOBANCARIA) 2. Asofondos 3. Banco de la República 4. Bancoldex 5. Ministerio de Hacienda y Crédito Público 6. Superintendencia Financiera de Colombia
Mexico	<ol style="list-style-type: none"> 1. Asociación de Bancos de México 2. Banco de México 3. Banobras 4. Comisión Nacional del Sistema de Ahorro Para el Retiro (CON SAR) 5. Comisión Nacional de Seguros y Fianzas 6. HSBC 7. Secretaria de Hacienda y Crédito Público 8. S&P
Peru	<ol style="list-style-type: none"> 1. Agrobanco 2. Asociación Peruana de Seguros 3. COFIDE 4. Fondo MiVivienda 5. Ministerio de Economía y Finanzas (MEF) 6. Ministerio del Ambiente 7. Programa Inversión Responsable 8. Superintendencia de Banca, Seguros y AFP (SBS)

Part 2

Financial system resilience to climate-related risks: International practices in using supervisory and regulatory instruments

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List of Abbreviations

BoE	Bank of England
CBRC	China Banking Regulation Commission
CCFC	National Council for Climate Finance
CCRA	Climate Change Risk Assessment
CIB	China Industrial Bank
CIRC	China Insurance Regulatory Commission
CSRC	China Securities Regulatory Commission
DNB	De Nederlandsche Bank
E&S	Environmental and Social
GFTF	Green Finance Task Force
ICBC	Industrial Commercial Bank of China
IDB	Inter-American Development Bank
LAC	Latin America and the Caribbean
MEE	Ministry of Ecology and Environment
MEP	Ministry of Environmental Protection
MLF	Medium-term Lending Facility
MoF	Ministry of Finance
MPA	Macro-Prudential Assessment
NAFMII	National Association of Financial Market Institutional Investors
NDRC	National Development and Reform Commission
NGFS	Network for Greening the Financial System
NPL	Non-Performing Loans
PBoC	People's Bank of China
PRA	Prudential Regulation Authority
TCFD	Disclosure of climate-related financial information
UN	United Nations

1

Introduction

Awareness of climate-related financial risks has been growing in the past years. These risks are increasingly perceived as material and potentially destabilizing for the financial system. In its first progress report, for example, the Central Banks and Regulators Network for Greening the Financial System (NGFS) acknowledges that “climate-related risks are a source of financial risk. It is therefore within the mandates of Central Banks and Supervisors to ensure the financial system is resilient to these risks.” (NGFS 2018, p. 3). This calls on financial regulators, supervisors and central banks to support and guide financial institutions to make the financial system more resilient to climate risks. Prudential regulation and central banks’ operations are areas where financial authorities can explore tools and policies to mitigate financial system’s exposure to climate risks. Yet micro and macroprudential tools, as well as monetary policy tools, have only recently started to be considered as options to strengthen the overall resilience of financial systems.

Against this background, in support of the work ahead for Latin-American and Caribbean countries (LAC), this note provides insights on potential measures that central banks and financial regulators could take to build resilience in financial systems. It focuses on three main options that LAC institutions could consider: 1)

assessing the climate risk exposure of national financial systems, 2) encouraging national financial institutions to take climate risks into account in their operations and 3) developing national green credit markets to accelerate the transition to a low-carbon economy. These three measures have been selected as the most relevant for LAC after considering a more comprehensive list of options available to central banks and financial regulators (see Appendix A).

In a first step, we analysed the implementations of these measures in three countries: the United Kingdom and the Netherlands for the first measure, China for the last two measures. These countries were selected for their role at the forefront of research and policy implementation in this field. In a second step, we presented our results to selected LAC central bankers and financial regulators to gather their feedbacks on a potential implementation in LAC.

The interviewed institutions in LAC welcomed the initiative of the Inter-American Development Bank (IDB) to look at the potential measures that they could take in their own countries and found the international experiences presented in this study insightful. Interviewees in LAC highlighted 1) the need to better gauge the exposure of their national financial sectors

to climate risks and 2) the need to increase awareness and management of these risks in national financial institutions. Data collection and use have been identified as a key element to improve, both to allow financial supervisors to better assess financial sector's exposure to climate risks and for financial institutions to better integrate these risks into their lending operations and into their risk management.

LAC financial regulators and central banks underline that assessing financial sector's exposure to climate risks is a learning process and that they are at the beginning of the learning curve. Against this background, a qualitative assessment of this exposure, as done by the Bank of England (BoE), seems to be an adequate and quickly implementable first step to make. This approach would allow LAC central banks and regulators to engage with national financial institutions and raise their awareness of climate risks, as well as to get a better view of the data available in each country. A more quantitative approach, through e.g. climate stress tests, as done by De Nederlandsche Bank (DNB), would require building internal capacity and adapting available methodologies to LAC's specificities. The IDB could help in this process.

LAC financial regulators and central banks also acknowledge that their national financial institutions should engage more on climate risk issues. As highlighted in the Chinese case, LAC interviewees think that the development

of taxonomies and guidelines by national authorities would help financial institutions – especially small and medium institutions with limited resources – to better integrate climate risks into their lending operations and into their risk management. They also highlight that the development of such taxonomies and guidelines should involve several stakeholders, as it was done in China and in Europe. The IDB could help identifying the best international practices that could serve as basis for LAC taxonomies and guidelines.

Our interviews also show that LAC are at different stages of development regarding the tools to support financial system resilience to climate-related risks. This heterogeneity is an enabling factor as the most advanced countries can share their experiences with less advanced ones. The IDB could play an important role in the transmission of knowledge between countries.

The three sections that follow present each a possible measure that could be implemented in LAC countries and illustrate it with international case studies, considering institutional mandates and context, effectiveness of the measure and challenges for their replication. The fourth section summarizes the feedbacks that we collected from different LAC central banks and regulators on these case studies. The last section concludes.

2

Assessment of the Climate Risk Exposure of the Financial Sector



Financial regulators and central banks around the world now widely acknowledge that climate-related risks are a source of financial risks. As underlined by the NGFS, the first step to successfully integrate climate risks into supervision is to better understand their possible financial impact. However, assessing climate risks for financial institutions and for the financial system is not a straightforward exercise. Tools and methodologies available for that are still

at an early stage and are facing several analytical challenges.¹²⁸This section takes a closer look at how the BoE and the DNB, two institutions at the forefront of such assessments, tackled these difficulties.

Both case studies rely on the documents published by the BoE and the DNB and on interviews with some of their representatives. This section first presents the context that led the BoE and the DNB to undertake their

¹²⁸Appendix B describes these challenges and lists some options to meet them.

assessments, it then turns to an analysis of their methodologies and results before describing what such assessments brought to these institutions.

National contexts and institutional mandates

Both the BoE and the DNB are the financial sector's supervisors in their respective countries.¹²⁹ The BoE, through the Prudential Regulation Authority (PRA), is also the regulator of the UK financial sector, whereas, in the Netherlands, the financial regulator is the Netherlands Authority for Financial Markets, which works closely with the DNB. The BoE, through the PRA, supervises and regulates banks, building societies, credit unions, insurers and major investment firms. The DNB supervises banks, pension funds, insurers and other financial institutions.

For both the BoE and the DNB the perception of an exposure to climate-related risks of their national financial sector was the main driving factor to undertake an estimation of climate risk exposure of financial markets. Such perception was however due to different reasons specific to the national contexts. The sheer size of the insurance sector in the UK and the clear link between climate-related hazards and insurance sector's profitability was a key trigger for the BoE. Insurance regulation is one area which needs to consider a relatively long-time horizon. The PRA's role as insurance supervisor therefore brings challenges such as climate change much more clearly into focus and provides a natural starting point for BoE's work examining the impact of systemic climate risks. In the Netherlands instead, the dependence of the national economy on polluting sources of energy and the geographical specificity of the country with large areas under the sea level, which makes it particularly vulnerable to physical risks like floods, were the trigger for the DNB to undertake its climate risk exposure analyses.

The impulse to undertake such assessments was mainly internal to the DNB: it started

in 2011 with a newly appointed Governing Board, which reflected on the past financial crisis to redefine the core missions of the DNB. The result of this reflection was the DNB should seek to safeguard financial stability and thus contribute to sustainable prosperity in the Netherlands. Climate risks were identified as one key threat both for financial stability and sustainable prosperity, which prompted the engagement of the DNB to better understand and monitor climate change and its consequences. At the BoE, the impulse was also given by the Board and by its Governor Mark Carney, but it was accompanied by external demands. In the UK, the Climate Change Act 2008 provides for public bodies to report on how they are addressing current and future climate effects. This act requires the UK government to publish a UK-wide Climate Change Risk Assessment (CCRA) every five years. In this context, the PRA accepted an invitation from the Department for Environment, Food and Rural Affairs to examine the impact of climate change on the PRA's objectives in relation to insurers for the CCRA of 2017. In addition, several members of the UK parliament regularly questioned the BoE about the impact of climate change on its activities.

Methodologies and key lessons

Although both the BoE and the DNB worked in parallel on the estimation of their national financial system's exposure to climate risks, the approaches that they chose differ significantly. The next section presents these two approaches, but a more detailed description of both methodologies can be found in Appendix C for the BoE and in Appendix D for the DNB. Both institutions underline that assessing the climate risk exposure of a financial sector is a learning process. Their key lessons differ sometimes but are worth considering for LAC central banks and financial regulators that would like to undertake such an assessment (see Table 1).

¹²⁹The DNB shares the supervision tasks with the Netherlands Authority for Financial Markets (AFM): the DNB does prudential supervision and the AFM is responsible for the conduct-of-business supervision.

TABLE 1

Comparison of BoE and DNB frameworks

	Bank of England	De Nederlandsche Bank
Institutional role	Supervisor and regulator (through the PRA) of banks, building societies, credit unions, insurers and major investment firms	Supervisor of banks, pension funds, insurers and other financial institutions
National context	Substantial size of the insurance sector, perceived as directly exposed to climate risk	Dependence of national economy on polluting sources of energy and geographical exposure to flood risk
Action triggers	Internal (Governing Board and Governor) and external (Department for Environment, Food and Rural Affairs' request and Member of Parliament questions)	Internal (Governing Board)
Subject of analysis	Insurance sector first, then banking sector	Banks, pension funds and insurers simultaneously
Risks analysed	Physical, transition and liability risks	Physical (flood) and transition risks
Methodology	Survey (with some case studies on specific topics)	Quantitative analysis (global and focused case studies)
Cooperation with other institutions	Meteorological office and sectoral organisations	Meteorological office and research institutes
Key results	<p>Insurance sector:</p> <ul style="list-style-type: none"> - clearest risks for insurers are physical risks, but transition and liability risks are also relevant - increasing physical risks present challenges to insurance business models - Climate risks are more relevant for liability-side of insurers' balance sheets, but asset-side can also be impacted. <p>Banking sector:</p> <ul style="list-style-type: none"> - climate change presents financial risks to the UK banking sector - financial risks arising from climate change are sufficiently material to be considered at banks' board level - only 10% of banks have a strategic approach to climate change – i.e. are taking a comprehensive approach of long-term financial risks 	<p>Physical risks:</p> <ul style="list-style-type: none"> - Greatest climate-related losses in the Netherlands can occur through flooding - Floods could lead to significant losses for firms and households but also for financial institutions <p>Transition risks:</p> <ul style="list-style-type: none"> - The transition to a low-carbon economy is likely to affect the financial sector - The speed of the energy transition has a key impact on how climate risks will materialise - Stress-tests show that financial losses due to a transition can be sizeable (up to 11% of portfolio values) - Transition scenarios can be multiple, but they all have a significant impact on financial losses

► Different approaches

The methodologies used by the BoE and the DNB differ in two dimensions:

1. The BoE chose a sectoral approach – i.e. it started with the insurance sector before turning to the banking sector – whereas the DNB looked at the range of institutions under its regulatory mandate (banks, insurances and pension funds) from the beginning. The DNB focused more on looking at types of risks separately – i.e. with first a focus on physical risks from flood and then on transitions risks – whereas the BoE used a more holistic approach because its research team felt that it should not narrow its analysis to one single source of risk. Note however, that the DNB always considered both types of risks but put emphasize on one or the other in their different reports:
2. The BoE chose a qualitative approach using surveys of main institutions whereas the DNB chose a more quantitative approach aiming at measuring the size of physical and transition risks.¹³⁰ The BoE chose to use a survey because they thought that it was a good way to engage with market players on the issue of climate change. The DNB chose to quantify the risk from the beginning because its Governing Board saw climate change as a risk for financial institutions and wanted to know how significant this risk was. Note that the DNB used a stress test methodology to quantify physical and transition risk because stress tests are a natural instrument to use in the context of financial stability and an instrument for which they had developed expertise in the past. In addition, considering the complexity of climate change impacts and uncertainty of future climate patterns, stress tests allow insights on extreme scenarios regardless of the probability of occurrence: the DNB research team

chose first to focus on extreme cases in context-specific scenarios¹³¹, and then in systemic scenarios for the energy sector.

► It's a learning process!

Both institutions underline that assessing the climate risk exposure of the financial system is a learning process. The report on insurances, for example, allowed the BoE to better understand what climate risks for financial institutions are¹³² – i.e. it allows the BoE to identify physical, transition and liability risks. As stated by our interviewees, it also made the BoE aware of the potential risk of climate change for other part of the financial system – i.e. it made them aware that transition risk might be relevant for banks – which led the BoE to start its study on the banking sector. Drafting the different reports also allowed the BoE to identify which case studies that could be analyzed in more depth. Discussion with different stakeholders helped the BoE to decide on which case studies to focus.¹³³ The BoE also discovered which data on climate risk and financial risk were available and usable for case studies during the elaboration of the different reports.¹³⁴

For the DNB, the different reports allowed to develop better tools and quantitative estimations of climate risks for the financial sector: from initial rough estimates of banks', insurances' and pension funds' CO₂ exposures to fully-fledged stress tests. Each new report helped deepening the methodology used to assess climate risk exposures and better knowing which data could be used for that.

Both the BoE and the DNB also underlined that they learnt a lot from exchanges with different stakeholders – i.e. from sectoral organizations and the Met office for the BoE and from the Netherland Bureau of Environmental Analysis for the DNB. The DNB however indicated that central banks and financial regulators that want to undertake

¹³⁰Note that the DNB also includes some qualitative elements in some of its studies.

¹³¹As in the case of the stress test for extreme flooding in two river basins in Regelink et al. (2017).

¹³²For example, the BoE highlight that physical risks are very relevant for the property-related classes of insurance business, which account for 38% of the GBP 78 billion of gross written premiums underwritten by the UK general insurance market. It also points out that the number of registered weather-related natural hazard loss events has tripled since the 1980s and inflation-adjusted insurance losses from these events have increased from an annual average of around US\$10 billion in the 1980s to around US\$50 billion over the past decade.

¹³³E.g. the case studies on a tightening energy efficiency standards and the UK buy-to-let market, on the low-carbon transition and the automotive industry, on the energy transition and the coal industry or on the impact of flood risk on residential mortgage portfolio.

¹³⁴For example, data on energy efficiency standards of rental housing by regions, estimations on coal power plant losses under different transition scenarios or data on mortgage exposure to flood risks.

an assessment of their financial sector must be aware that a large part of the work must be done internally due to the confidentiality of the financial institutions' data. The DNB also underlined that the quantitative analysis that they conducted were resource intensive even though some crucial competences, like e.g. macroeconomic modeling and stress testing know-how, were already available internally.

▶ *Key lessons and results*

Three key lessons emerge from interviews with BoE's and DNB's staff:

1. Climate risks for the financial sector are material: both the BoE and the DNB found that physical and transition risks are material for the financial sector, justifying the resources spent in their analyses and the inclusion of such issues in their supervisory activities. Both also highlighted that a disorderly transition is the worst scenario for the financial sector. This speaks in favor of measures that can foster an early and smooth transition and avoid acting too late. Finally, they also emphasized that even if the consequences of climate change for the financial sectors might materialize in the long term only, avoiding this risk requires acting now.

2. Communication is key: given the sensitivity of the potential results, a clear communication strategy must be chosen. Both the BoE and the DNB decided relatively early in their analysis process to be as transparent as possible. The BoE highlighted that as most of the input data that they use are from public sources, there was no reason not to be transparent. The DNB emphasized that their communication always made clear that their analysis was only a first attempt and should not be taken as definitive results. Both institutions reported that their analyses were welcomed by market participants. They also highlighted that being open allows to engage straightforwardly with different stakeholders and get useful feedbacks from them.

3. Do not wait for the perfect methodology: there is currently no consensus on which methodology is best to assess climate risk exposure of financial institutions. However, central banks and financial regulators should not wait to have the perfect methodology before undertaking such assessment for three reasons: 1) such assessments are learning processes and thus should start somewhere, 2) the insights on trends and system's behavior under extreme scenarios are more important than exact numbers at this stage; and finally 3) they allow central banks and regulators to engage with financial institutions, make them aware of climate risks and get useful feedback from them. The DNB emphasized that quantitative estimations rely on many assumptions and simplifications that can be infinitely discussed and refined. DNB's staff advised however to quickly decide on such assumptions and proceed swiftly to estimations. Being transparent about assumptions is more important than improving them endlessly.

Assessment of the effectiveness of practice

Both the BoE and the DNB report very positive feedback about the usefulness of undertaking the assessment of their national financial sector's exposure to climate risks. Even if they judge these exercises as preliminary and thus not mature enough to trigger concrete regulatory policy change, they underline that such assessments:

- allow engaging a positive dialogue with supervised institutions, educate them on climate risk sources for their activities and on how to measure them;
- allow central banks and financial regulators to get an overview of relevant and available quantitative information on climate risks, as well as of the gaps in data;

- allow sizing the risks linked to climate change for the financial sector and raise awareness of the supervised institutions;
- allow a formal engagement of the board and set the issue on their agenda;
- generate a very useful content to “spread the word” in different forums;
- develop internal expertise and awareness on climate risk issues.

For both institutions, the analyses presented so far are only the beginning of a journey. The most concrete measure stemming from them is that methodologies have been refined and will continue to be. None of them consider such assessments as a one-off exercise and expect to conduct them regularly in the future.

The assessment of the banking sector in the UK led the PRA to publish a consultation paper on a draft supervisory statement which sets out expectations regarding firms’ approaches to managing the financial risks from climate change on October 15, 2018. The feedbacks of these consultation resulted in a formal statement on PRA’s expectations for banks, insurers and investment firms (collectively “the firms”) and was released on April 2019. In line with the principles of materiality and relevance, and following the taxonomy and structure of the Task Force on Climate-Related Financial Disclosure (TCFD 2018), the PRA expects firms to adopt measures that integrate climate risk assessment into their operations in a way that is “proportionate to the nature, scale and complexity of their business”; such measures include governance, risk identification, management and monitoring, scenario analysis and disclosure (BoE 2019a). In June 2019, the PRA added exploratory climate stress tests to its 2019 biennial insurance stress tests (PRA 2019a, PRA 2019b). In July 2019, the BoE announced that it will also conduct a climate stress test for selected financial institutions in its 2021 biennial exploratory scenarios (BoE 2019b). Such exploratory scenarios have no regulatory consequences – i.e. a bank cannot pass or fail them – but are meant to inform the BoE on specific issues.



3

Encouraging Climate Risk Analysis by Financial Institutions



An adequate reflection of climate risks by financial institutions in their loan origination process and in their risk management is important for at least two reasons: first, climate risks are a source of financial risk like any other. The materialization of these risks can trigger losses that can impair financial institutions' sustainability. Climate risks must thus be fully integrated into financial institutions' risk management to guarantee their soundness in the long term. Second, financial prices, including loan prices, are a key determinant of capital and credit allocation. Prices that correctly reflect climate risks are a necessary condition to redirect financial flows towards sustainable

investments (see Cœuré 2018). If financial institutions do not integrate climate risks into their loan origination processes, then they introduce biases in credit allocation in favor of climate risky project – the example of the 2018 financial crisis for many large banks in India for their large “bad” debts with the coal sector (estimated at \$132 billion in March 2018) is the latest example (Worrall et al, 2018). Such bias in favor of climate risky project goes against environmental sustainability.

This section analyzes the measures taken by Chinese authorities – which have been early movers in this field – to encourage and

support financial institutions in integrating environmental risk¹³⁶ analysis into their operations. It first describes the measures adopted, then examines how they were perceived by commercial banks, with the aim to identify which measures were the most useful to change commercial banks' practices and strategies regarding environmental risk analysis.

The identification of governmental measures is based on written sources; the analysis of their impact on commercial banks is based on interviews. We focused on the analysis through interviews on the instruments and processes adopted by the Industrial Commercial Bank of China (ICBC) – the biggest commercial bank in China, with the largest amount of green credits – and with the China Industrial Bank (CIB) – the Chinese bank with the highest proportion of green credits in the country.

Note that the Chinese governmental bodies that are involved in these measures are multiple as the regulatory framework around financial markets has been, until recently, very fragmented. Appendix E provides an overview of this framework and of the actors that can potentially have an impact on commercial banks' practices.

Measures taken by governmental authorities

In the past decades, the negative effects of economic activities on the environment have become a major concern in China, leading the government to integrate environmental measures in the key priorities of the country, with the release of the 12th National Five-year Plan on Environmental Protection¹³⁷ in 2011. Interestingly, both domestically and internationally¹³⁸, China was indeed among the first countries to bring financial regulators and supervisors in the environmental and climate agenda, realizing that the financial sector would be a key enabling actor in achieving emission and pollution reduction goals, and at the same time one of the sectors affected by

the risks that this transition could imply. Different authorities worked in parallel on the implementation of these measures and on the development of tools to support Chinese economic actors in their effort to address environmental issues. Integrating environmental credit risk into commercial banks' operations is a good example of such parallel work. Many governmental bodies were involved in providing guidelines, regulations and tools to help financial institutions in this process.

The goal of this section is not to enumerate all the measures that have been taken by Chinese authorities but rather to highlight which principles they followed to build a framework that encourages climate risk analysis by commercial banks (for a summary see Table 2). The development of this framework is centred around three principles: progressivity in measures, coordination between governmental bodies and complementarity of measures:

Progressivity in measures: Chinese authorities did not implement their framework all at once; they chose to progressively introduce its different elements. This progressivity is observed in the legal “strength” of the different documents issued: the first documents are “Opinions” or “Guiding opinions” in which government bodies lay out their expectations about what financial institutions should do. These opinions are followed by more formal “Guidelines”, which are more advanced technically and that financial institutions are expected to use but not obliged to. The final level of documents are “Requirements”, with which financial institutions must comply. This sequence allows financial institutions to have a clear view of the direction toward which the legal framework is evolving and thus to prepare for changes. This progressivity also allows the authorities to get feedbacks from financial institutions at each step.

Coordination between governmental bodies: as mentioned above, the regulatory framework around financial institutions in China is – or was until very recently

¹³⁶Note that in the case of China, we talk about environmental risk and not only climate risks as Chinese authorities decided from the beginning to focus on a broader definition of environmental risks than just climate-related risks.

¹³⁷<http://www.greengrowthknowledge.org/sites/default/files/downloads/policy-database/CHINA%29%20The%2012th%20Five-Year%20Plan%20for%20the%20Environmental%20Protection%20%282011%29.pdf>

¹³⁸Via the establishment of the G20 Green Finance Working Group under the Chinese Presidency.

- very fragmented (see Appendix E). Thus, the implementation of a coherent framework around financial markets requires coordination between the different governmental bodies. Regarding the measures taken to encourage financial institutions to analyze environmental risks, the China Banking Regulation Commission (CBRC) played a crucial role by issuing most of the guidelines. The Ministry of Environmental Protection (MEP) also played a key role for the collection of data related to firms' environmental disclosures. Note that Green Finance Task Force (GFTF), a body which has no formal authority, was used to provide and disseminate recommendations that helped shape expectations of market players regarding future regulation. Note also that the People's Bank of China (PBoC) was a background driving force to push the agenda forward, even though it was not the most active in issuing formal guidelines or regulations.

Complementary of measures: Chinese authorities did not only impose new regulation to financial institutions. They also simultaneously provided tools and data that helped them adapt to the new standards. In each time sequence, the measures announced by governmental authorities combine new formal requirements with new data sets and new tools available. For example:

The Green Credit Policy¹³⁹ in 2007 prohibits banks from lending to firms blacklisted by the MEP for environmental violations but it also provides recommendations on how to include environmental and social (E&S) risk assessment in their loan origination processes and starts the collection information on environmental violations.

- The Green Credit Guidelines in 2012 requires to use E&S risk ratings to identify high E&S risk clients but it also provides operational guidance on E&S risk management and starts collecting key performance indicators for green loans.
- The Green Credit Statistics System in 2013 provides a standardized definition of green loans, based on consensus within industries and develops tools for banks to calculate environmental benefits of loans. It also tracks data on loans with compliance issues on environment and lists technologies to be phased out.
- The Green Credit Key Performance Indicators in 2014 provides a list of quantitative and qualitative key performance indicators that banks can use but also requires them to report on E&S risks twice a year.

TABLE 2

Encouraging Environmental Risk Analysis: Measures Taken in China

<p><i>Green Credit Policy (2007) by PBoC, CBRC, MEP</i></p>	<ul style="list-style-type: none"> - Opinions on implementing environmental protection policies and rules and preventing credit risk. - Recommends banks to include environmental compliance and environmental risk assessment as criteria included in the loan origination process. - Prohibits banks from lending to firms blacklisted by the MEP for environmental violations and regulation. - Collects information on environmental violations in the corporate sector and provides it to the Local Environmental Protection Bureaus.
<p><i>Green Credit Guidelines (2012) by CBRC</i></p>	<ul style="list-style-type: none"> - Operational guidance on how to implement green banking in three categories: one is E&S risk management. - Requires the identification of high E&S risk clients. - CBRC collects a set of green credit key performance indicators (KPI) which were at the time not accessible to the public. - Guidelines indicate the application scope but are not detailed by type of activity (project finance, asset management, private banking). - No formal definition of green credit. - No regulation requiring assessment of transition risks.

¹³⁹The official description of the Green Credit Policy is only available in Chinese language, see http://zfs.mee.gov.cn/hjjj/gjfbdjzcx/lxsdzc/201502/t20150209_295652.shtml.

<p>Green Credit Statistics System (2013) by CBRC</p>	<ul style="list-style-type: none"> - Develops a standardized definition for green loans. - Classification of what is considered green in 12 categories (with subcategories), which reflects the consensus within industries. - Develops tools for banks to calculate the environmental benefits from green credit lending. - Track data on loans with compliance issues on (a) environment, (b) safety, (c) deploying technologies mandated to be phased out, and (d) occupational health.
<p>Green Credit Key Performance Indicators (2014) by CBRC</p>	<p>Consists of a list of quantitative KPIs and qualitative KPIs organized in five chapters, including organization and management, internal controls, monitoring and examination, etc.</p> <ul style="list-style-type: none"> - Requires the implementation by banks themselves. - Reporting obligation of E&S risks for banks at least twice a year.
<p>Establishing China's Green Financial System (2015) by GFTF</p>	<ul style="list-style-type: none"> - Establish a green rating system that awards higher ratings for green enterprises or projects to bring down their financing costs. - Identify green rating metrics and methods; - Rating agencies to experiment with the dual rating system to complement traditional credit ratings; - Institutional investors encouraged to use the green rating in allocating their funds. - Create a non-profit environmental cost analysis system and database to give access to environmental data and methodologies, and thereby reducing the costs investors incur to evaluate projects. This implies: <ul style="list-style-type: none"> - Encourage the development of a consistent and replicable corporate environmental cost accounting method; - MEP to take the lead in creating a public-interest corporate environmental cost database.
<p>Disclosure of Environmental Information (2017) by MEP</p>	<ul style="list-style-type: none"> - Requires public disclosure of basic environmental information on the MEP platform. - Applies to Enterprises and Public Institutions

This combination of progressively more stringent requirements and of a help with better tools and data was perceived as a positive signal by financial institutions. The continuous sequence of such incentives was also key in anchoring financial institutions' expectations about future development in the legal framework and convincing them of the resoluteness of the government to implement its environmental policy agenda.

Feedbacks from commercial banks

A first important point highlighted in our interviews with Chinese financial institutions is that, although the measures taken by financial authorities helped them in their efforts to integrate environmental risk in their loan procedures, these measures were not the main trigger of this process. The main triggers were different for the two banks that we consulted. The ICBC started studying how they could integrate environmental risks in their loan origination process when the top management realized that environmental

risks had material financial consequences for their borrowers. Two observations were at the roots of this: first, the ICBC observed an increase in environmental litigations that had consequences on borrower's ability to repay their loans. Second, they gathered concrete experience on the material costs for borrowers to switch from carbon-intensive technologies to low-carbon ones. These observations combined with their forecasts of an increasing pressure by authorities on borrowers to take environmental measures made them include environmental risks in their credit risk assessment methodology. For CIB instead it was more a strategy and market positioning decision: since CIB is a relatively new bank on the market, its top management considered that being a leader in the assessment of environmental credit risk could provide them with a comparative advantage in the sector, in terms of marketing for the short-term but also in financial terms in the long-term. Both examples underline the defining role of banks' top management rather than simply of government's signals and regulatory pressure.

The role of the measures taken by governmental authorities was however perceived as very positive by both banks for three reasons:

1. The different authorities provided useful database to support the development and implementation of banks' methodologies. The ICBC, for example, extensively used the map of major factories and utilities assets in heavy industries as well as data on compliance, emissions, regulation limits, air pollution and water pollution (See Box 1). The MEP, for example, collects most information regarding regulatory compliance and share them with banks: the two banks in our sample then would combine official data with their own data sources for their specific portfolio's exposure. ICBC also highlighted that carbon trading platforms were useful for carbon accounting, estimating the price of carbon and for compliance data, which help them to build scenarios for their analyses. The ICBC highlighted that developing a proprietary methodology might be too expensive for small banks, consequently, official data that are freely available is a key public good for such institutions if they want to analyze environmental credit risk. As another example of how governmental information can feed into banks credit assessment, the CIB mentioned that it used the Ministry of Ecology and Environment's (MEE) monitoring system to assess firm's environmental risks.

2. The guidance given by authorities was very useful for banks to have a clear view of the governmental environmental policies ahead. Guidelines helped banks better understand what governmental authorities will consider as green finance, hence establish a shared taxonomy for the sector, as well as develop the methodologies to respond to authorities' expectations. Governmental measures also convinced banks' top management about the resoluteness of the government in implementing environmental policies and about the pace at which it will do so. This led top management to put environmental credit risk on top of their agenda, as it convinced them that environmental regulation will have material financial consequences for their loan operations.

3. There were some feedback loops between authorities and banks. The ICBC, for example, started to develop its methodology after Ma Jun, Chief economist of the PBoC Research Bureau at the time, suggested that they could set an example for the rest of the banking sector. This methodology was then used by authorities as a starting point for discussions on which tools could be used for banks' reporting. The ICBC also mentioned that the GFTF was very useful by suggesting international experts to work with and by promoting their research.

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BOX 1

ICBC's Environmental Stress Testing for Credit Risk

The Industrial and Commercial Bank of China (ICBC), published a report in 2016 on the environmental stress test that it implemented. The report provides an assessment of environmental risk factors concerning commercial banks' long-term profitability; describes the methodology and the process of the stress test; and discusses results that lead up to recommendations for policymakers.

Facing heightened environmentally induced business risks, the ICBC conducted the stress test to evaluate the impact of internalizing environmental costs on a firm's balance sheet and the consequential risks for commercial banks. The initial risk assessment highlighted three risks that could materialize due to environmental factors: **credit risk**, the risk of **joint liability**, and **reputation risk**. In its study, the ICBC focused on credit risk, which is considered as the main risk for commercial banks due to potential financial loss caused by the devaluation of collateral and securitized

assets in the event of environmental risk materialization.

ICBC first selected core sectors of focus: thermal power and cement industry – as both considered high pollution and high consumption industries. Secondly, the research team measured the impact of stricter environmental standards on enterprises' unit cost under three scenarios (mild, moderate, and severe). For both industries, stricter environmental standards were defined following policy guidelines on higher emission standards and sewage charges standards. Specific guidelines on waste disposal assistance and regional standards were taken into concern for the thermal power and cement industry, respectively. Finally, the ICBC developed a financial transmission model that measured the impact of enterprises' unit cost increase on credit rating, probability of default, and non-performing loan ratio.

The results of the test show that, first, stricter **environmental standards have significant negative influence on operating costs** and benefits of companies, in particular small and medium-sized firms; second, **ICBC's clients reflect strong risk tolerance** and have their credit risk generally under control; and finally, the **companies are willing to mitigate** the adverse impact of environmental factors by adopting measures such as technical upgrade and operating cost reduction.

Assessment of the effectiveness of practice

Interviews with commercial banks showed that the measures taken by Chinese authorities were not the main driver behind ICBC's or CIB's move toward including environmental risk in their loan origination process. The recognition that environmental risks have material financial implications and the willingness to be early movers in this field were key incentives. However, the different initiatives taken by governmental authorities helped these banks in two ways: first, it provided them with useful databases as well as definitions, classifications and standards that they could use in their methodology. These tools and data might be even more important for smaller banks that do not have the capacities to develop their own methodologies. Second, the different guidelines issued by authorities helped banks assessing future policy developments and trends. It also convinced them of the materiality of the costs that might occur due to more stringent policies and gave them some clarity on this aspect.

An important aspect of the Chinese case is the progressivity in the implementation of measures. Progressively implementing environmental standards for banks has

several advantages: first, it helps banks to adapt to and anticipate new regulation. Second, it allows the authorities to get some feedback from the banking sector. The feedback between ICBC and the Chinese authorities highlighted in our interviews is cases in point. Finally, a progressive implementation is a way to cope with the trade-off between implementing measures to preserve financial stability and triggering instability by setting measures that generate high transition costs for banks.

Both commercial banks that we interviewed highlighted that a standardization of green evaluation systems would be a positive point for the banking sector, especially for medium and small banks as it would spare them some costs in developing their own expertise. Interviewees highlighted that integrating environmental risks in their credit assessment requires extensive knowledge of the green sector, which is something that traditional finance staff lacks. More "ready-to-use" tools from governmental bodies could substantially reduce these costs.

Finally, the examples of ICBC and CIB illustrate that the long-term commitment of top management to green finance is key. To ensure that, the ICBC recommends authorities to use green finance criteria to assess top managers in the country.



4

Creating a Green Credit Market



The transition to a low-carbon economy will require a shift in investments from carbon-intensive economic activities to low-carbon activities. Green credit, through both bank loans and bond issuances, is a key element in this process. At a global level, the green credit market, and especially the green bond market, has been growing exponentially over the past five years, with issuance of green bonds going from less than \$50bl in 2014, to more than \$150bl in 2017 and 2018, whereas the 21 biggest Chinese banks doubled their green loans between 2013 and 2018 to reach a total of \$1.09tn in June 2018¹⁴⁰. Green

bond issuances in Latin America, and other emerging economies have been increasing but at a slower pace than in developed countries, with the exception of China, that has become in less than 2 years, the second largest market¹⁴¹ after the United States, with \$30bl issued in 2018. This section highlights what has made China exceptional in emerging economies and which lessons LAC can draw from the Chinese experience.

Note that the initiatives taken by the different Chinese authorities to develop green credit markets are part of a broader effort to

¹⁴⁰ Lu and Tang, 2017.

¹⁴¹ Incidentally in 2016 China was the largest green bond market by annual issuance.

foster the transition of the Chinese financial system to an environmentally sustainable model. This comprehensive effort involves the coordination of several ministries and governmental bodies. Creating a green credit market, and a green bond market is only one part of a widespread plan to develop green finance in China (as reflected in the Guidelines for Establishing the Green Financial System published by the People's Bank of China and six other agencies in 2016). The measures taken in this context, and their results, should be analyzed in the light of this general effort made by Chinese authorities.

Like for the previous case (see Section III), the aim of this section is not to give an exhaustive list of all the measures taken by the different governmental bodies involved in the development of a green credit market, but rather to highlight their principal and essential components. The governmental bodies involved are multiple; for a description of them see Appendix E.

Measures taken by governmental authorities

In this section, we highlight the measures that we have assessed as the most determinant or innovative in the Chinese case. A more complete description of all measures can be found in, e.g., International Institute of Green Finance and UN Environment (2017) or in International Institute for Sustainable Development (2015). An exhaustive analysis of how to develop green bonds markets in emerging markets can be found in Sustainable Banking Network (2018).

Note that the Chinese authorities started by focusing on measures aiming at developing the green bank loan market before turning to the green bond market.

The main measures taken by Chinese governmental bodies to develop the green loan market are closely related to measures taken to encourage financial institutions to take environmental risks into account in their loan origination process (see Section III). As described above, these measures are a progressive combination of more stringent regulation and help with tools and database

for banks' analysis. In addition to that, we can highlight the following new elements:

- **Green Credit Policy** (2007, PBoC, CBRC and MEP): this policy calls on Chinese banks to direct loan financing away from highly polluting and high energy consuming enterprises and projects toward enterprises favoring energy efficiency and emission reduction projects.
 - **Green Credit Guidelines** (2012, CBRC): these guidelines encourage banks to identify priority areas for green credit and to customize their granting credit process for green loans.
 - **Green Credit Statistics System** (2014, CBRC): this system is the first emerging market example of regulatory guidance to define green loans, proving a national taxonomy for green credit instruments; it helps banks and financial actors determine the categories of green credit loans.
 - **Recommendations by the GFTF** (2015, GFTF): the GFTF recommends improving the system by which the government provides funding at discounted interest rates for green project (e.g. by raising the level of discount, easing the eligibility criteria for subsidies, streamlining the review approval process, etc.)
- After implementing measures to develop the green loan market, Chinese authorities turned to the green bond market. This market officially started in 2016. The following measures helped its rapid development:
- **Green Bond Endorsed Project Catalogue** (2015, PBoC): this regulation preceded the launch of the green bond market. It provides clear mandatory criteria for the use and management of proceeds of green bonds as well as the identification of eligible projects.
 - **Guidelines for Establishing the Green Financial System** (2016, approved by the State Council and jointly issued by PBoC, MoF, NDRC, MEP, CBRC, CSRC, CIRC): these guidelines are a cornerstone for the development of the credit bond market.

They define the scope of investment for green bonds, create incentivizing policies, create tracking and evaluation system, simplify the review and approval procedures and increase bond issuance efficiency.

- Guidelines for specific green securities (2017, CSRC, NAFMII and PBoC): following the general guidelines for establishing the green financial system, several authorities have issued specific guidelines for different types of green securities.¹⁴² The CSRC released its guidelines for green bonds and the NAFMII issued guidelines for green debt financing instruments. The PBoC also issued guidelines regarding green bonds external review and verification processes, as well as guidance on post-issuance disclosures for green bonds (in 2018).
- **Expansion of collateral framework** (2018, PBoC): to support an expansion of the green bond market, the PBoC decided to expand its collateral framework to include AA (and above) green bonds in its Medium-term Lending Facility (MLF)¹⁴³ – i.e. to accept green bonds as

collateral even if they are of lower quality than AAA assets otherwise accepted. Importantly, these measures do support as well the expansion of the green credit market, as banks are more incentivized to extend credit for green activities, considering the opportunity to access the re-lending facility. At the same time, the PBoC begun piloting the inclusion of green finance indicators in the Macro-Prudential Assessment (MPA) framework, in order to modulate the interest rate that banks and financial institutions get on their reserves in function of their holding of green securities (loans and bonds)¹⁴⁴.

Note also that the Chinese government established five Green Finance Pilot Zones in 2017 in which financial institutions are given a variety of incentives to provide credit and special funds for environmentally friendly industries and to explore new financing mechanisms. Other regions also implemented incentives for green bonds. The Beijing Zhongguancun Administrative Committee, for example, implemented a 30% discount on the interest rate of some green bonds; Shenzhen Futian District government has announced a 2% subsidy on green bonds interest rates.¹⁴⁵



¹⁴²The CSRC, for example, issued guidelines to establish a green channel that accelerates the approval of bond issuance, to encourage financial institutions to invest in such bonds and to define into which green industries, such as clean energy and other environmental protection technologies, the funds raised from green bonds must be channeled. See: http://english.gov.cn/state_council/ministries/2017/03/03/content_281475583659044.htm.

¹⁴³<https://www.bloomberg.com/news/articles/2018-06-01/china-s-central-bank-expands-collateral-for-medium-term-lending>

¹⁴⁴https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/738876/China_Financial_Services_Special_Report_-_Green_Finance.pdf

¹⁴⁵See https://www.climatebonds.net/files/reports/chinalocalgovt_02_13.04_final_a4.pdf.

Impact of measures

With the range of measures taken by the different authorities, the Chinese government aims mainly at three goals to develop the green finance market:

- ***Increase the volume and quality of green lending from financial institutions:*** the size of green finance in the Chinese banking system has increased significantly since the first policies were introduced in 2011 – from 5 trillion yuan (8.5% of overall bank assets) in 2014, to 8.2 trillion yuan in 2017 (9.5% of overall banking assets) (Lu and Tang, 2017). At the same time, green securities have shown a better risk profile than traditional securities as loan defaults and the ratio of Non-Performing Loans (NPL) seem lower for green loans than traditional loans (Yujun et al, 2018).
- ***Decrease the cost of issuing green bonds:*** the different guidelines issued on green bonds are expected to be key in dispelling misconception regarding the costs and the complexities of green debt issuance. Clear standards for green bonds reduce issuance costs by providing a clear and easy-to-adopt framework for banks willing to issue green bonds. The different incentives schemes for green bonds described above, like for example the opening of the PBoC’s collateral framework to green bonds of lower quality, are also expected to reduce their costs. Finally, the different “fast-track” procedures implemented by the CSRC in 2017 (see above) for the issuance of green bonds can also contribute to reducing their issuance costs.
- ***Increase market integrity and credibility of green bonds:*** an important aspect for developing the green bond market is to establish its credibility and make it accepted by investors. This aspect was highlighted several times in our interviews. Credible third-party verification plays a key role for this. Guidelines have been issued to ensure the quality of external verification and several verification agencies have emerged in this process. National guidance was essential in enhancing market integrity by imposing high standards of transparency. The expansion of PBoC’s collateral framework to green bonds also contributed to consolidating their attractiveness for financial investors. Finally, multiple green bond indexes such as the Shanghai Stock Exchange Green Bond Index have emerged and provided investors with performance benchmarks as well as new targets for green investments that strengthen the trading of green bonds. Chinese authorities also aligned their guidelines with international standards to gain credibility for international investors.

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5

Feedbacks from Latin American Countries



General remarks

The conclusions of the three case studies were presented to representatives of LAC central banks and financial regulators in phone interviews. The aim of these interviews was to gauge potential interests for the measures analyzed in this report, to compare them with similar initiatives already in place in LAC, as well as to identify the key challenges and enabling factors for their implementation in LAC. Representatives from the central banks of Brazil, Costa Rica, Dominican Republic and Mexico and from financial regulators of Chile, Costa Rica and Colombia were interviewed. Their feedback is summarized below.

All LAC interviewees appreciated the initiative taken by the IDB to look at potential measures that they could implement in their own countries. They all found the international experiences presented in this study insightful. They also highlighted that such measures to strengthen the resilience of the financial sector to climate risks are on their radar screen and that they are internally considering options to meet the environmental challenges that their countries are facing. Five general remarks are worth noting before looking at feedback on specific measures.

▸ *LAC are at different stages of implementation*

The use of monetary and regulatory instruments to support financial system resilience to climate-related risks is very heterogeneous in LAC. Some countries are starting to study the different options available to them (e.g. Costa Rica, Dominican Republic), whereas some have already defined implementation plans for the next years (e.g. Colombia). In terms of capacities, some LAC central banks and regulators have already internal teams dedicated to environmental issues (e.g. Brazil), others are at the beginning of the learning curve (e.g. Costa Rica). Similarly, some countries already have governmental guidelines and regulation in place (e.g. Brazil), others rely on private initiatives (e.g. green bonds principles and verification process in Chile).

This heterogeneity between LAC could be an enabling factor for the development of monetary and regulatory tools in the continent as the most advanced countries can share their experiences with less advanced ones. The IDB could play an important role in the transmission of knowledge between countries.

▸ *Coordination between institutions is important*

Several interviewees highlighted that the coordination between the different governmental bodies is a key element to consider. As financial regulation and supervision is usually dispersed across several institutions in LAC, implementing new measures effectively requires significant coordination across design, implementation and monitoring. This could be a hurdle for the implementation of such measures, especially when related to transversal mandates, such as financial stability.¹⁴⁶ Note that including several institutions in the implementation process is also seen as important to incorporate different perspectives, as well as to align incentives with different objectives. For

example, one interviewee underlined that including central banks in the discussion is important because it gives this institution an opportunity to bring its views regarding financial stability into the conception of the measures (Brazil).

Coordination however goes beyond financial regulatory bodies. Several interviewees (e.g. Brazil, Mexico) highlighted that the development and implementation of measures to support the resilience of the financial system to climate-related risks involve a large range of stakeholders. Other ministries (ministries in charge of environmental regulation in particular), financial institutions, financial markets participants, think tanks and academics must also be included – as in the example of the involvement of the Mexican Central Bank in the work of the National Council for Climate Finance (CCFC). Cooperation with international institutions is considered important too, to connect the domestic dialogue with international experiences (e.g. Brazil, Mexico).

▸ *Political support is a key enabling factor*

As several interviewees mentioned (e.g. Brazil, Mexico), the implementation of measures aimed at strengthening the resilience of the financial system to climate risks is easier when there is political support behind it. Political support is also more important to ensure the coordination of the different institutions needed for the implementation, as highlighted above. The political support for environmental policies is also heterogeneous in LAC.

In this context, the interviewees underlined a few political circumstances that could serve as enabling factors in 2019. First, the new head of environment directorate at the OECD is Mexican. Since OECD recommendations are usually influential, this could be used to push the agenda in LAC. Second, within the APEC program of events, Chile has hosted a dedicated forum on ESG investing and climate risk management, to connect the sustainable finance dialogue in

¹⁴⁶One interviewee highlighted that having one single regulator for all types of financial institutions was an enabling factor for them (Chile).

the country with regional and international partners. Third, the Chile presidency of the COP 25 (with pre-meetings in Costa Rica) and its ongoing presidency of the Coalition of Ministers of Finance will further highlight the centrality of the climate change (and sustainable finance) agenda among the region's priorities.

▶ *A taxonomy would be useful*

Most interviewees (e.g. Brazil, Mexico, Costa Rica) underscored that developing a green taxonomy would be an enabling factor for the implementation of the proposed measures. Currently, the development of environmental taxonomy is mostly left to the initiative of the private sector (e.g. Chile, Mexico). Interviewees reckon however that a public taxonomy would be beneficial for financial institutions, especially for medium and small banks which do not have the resources to develop their own classification. Some public projects are already in place but seem slow to take off (e.g. in Mexico). Some interviewees (e.g. Brazil) also pointed to the fact that a public taxonomy cannot be developed by one single governmental body but should be the result of a consultation process involving several stakeholders. Interviewees (e.g. Colombia) emphasized that such a consultation process is important because public institutions are also in a learning process.

▶ *Collecting and using data is fundamental*

All interviewees highlighted that collecting and using the right data are crucial. The challenges in this area are of three kinds: first, some LAC central banks and regulators stressed that they basically do not know which data to use to measure the risks related to climate change (e.g. Costa Rica). Second, some central banks and regulators pointed out that useful data are currently missing or incomplete, or in formats not compatible with financial analysis (e.g. Brazil, Costa Rica, Dominican Republic). Third, even when helpful data are available, they are not used by financial institution or governmental bodies (e.g. Mexico).

The first point can be addressed; the knowledge on how to measure climate-related risks is evolving fast and some consensus is forming on these issues (see Monnin, 2018b). On the second point, several international initiatives are currently trying to fill the gap regarding data collection, and their conversion in a language more usable by financial analysts. The IDB could play an important role in providing support to LAC in gathering relevant climate-risk data. Finally, on the third point, governmental bodies could play a leading role in using available data, setting an example that could pave the way for the private sector.

▶ **Assessment of climate risk exposure of the financial sector**

Assessing the exposure of national financial sectors to climate risks has been highlighted as highly relevant by each interviewee. Several comments are however worth noting.

Identifying the relevant risks

Several interviewees noted that, although such an assessment is important for them, the identification of the relevant specific risk factors is key in national contexts. Most interviewees consider that physical risks are more evident than transition risks for them. Physical risks due to hurricanes (Dominican Republic, Costa Rica) or droughts (Chile) have been highlighted as particularly significant in LAC. Note however, that in the case studies presented above, central banks and financial regulators also started their assessments of climate-related risks for the financial sector by looking at physical risks, because they were considered more important. However, the knowledge accumulated during their assessments led them to also focus on transition risks, as they appeared to be non-negligible, especially for the banking sector.

Interviewees also highlighted that such an assessment should be broader than climate risks. Specific sources of risk like, e.g., water

pollution (Mexico) or water scarcity (Chile), are a case in point and would be overlooked within a narrowly defined climate risk exposure.

Possibly, a broader definition of environmental and climate risks, focusing on those relevant to the specific context, should be used in the assessment of the financial system exposure, ideally in coordination with supervised and regulated entities, and considered in a dynamic and evolving way.

► *Choosing the relevant methodology*

Several interviewees highlighted that, although an empirical assessment of financial sector's exposure to climate risks is wanted, governmental bodies lack the data and technical models to do it (e.g. Dominican Republic, Costa Rica). They argued that replicating stress-tests like the one performed by the DNB is too resource intensive and would require acquiring preliminary knowledge on the different methodologies available. The IDB could help these countries in this process.

An alternative would be to turn to the more qualitative approach used by the BoE. Some interviewees highlighted that using a survey instead of a fully-fledged stress test would be a more suitable approach for them (e.g. Costa Rica), and one country – Colombia – has already performed such a survey in 2018 and published its results in March 2019. In context with limited or incipient awareness of the issue, and limited data and tools to deal with climate-related risks, it seems that using a qualitative survey first is the ideal way to start assessing financial sector's exposure to climate risk. It allows regulators and supervisors to engage with supervised institutions, creating awareness in the sector, as well as creating internal knowledge and capacities within the same systemic institutions. The example of the BoE shows that a qualitative survey allowed identifying the different relevant data available to assess climate risk and to acquire a better understanding of the underlying risks linked to climate change. It eventually led to the development of more complex stress tests.

► *Climate stress tests*

Several interviewees underlined that climate stress tests could be integrated into the stress test frameworks that are already in place in several countries (e.g. Brazil, Costa Rica). One country has already provided a climate risk scenario analysis to the national banking association (Mexico). Another country is currently considering including climate scenarios in their stress test set (Costa Rica). The preexistence of stress tests for the financial sector is pointed out as an enabling factor. Another interviewee (Brazil) mentioned that the current stress test framework should be somewhat changed to account for the horizon of climate scenarios, of which effects materialize in a longer horizon than the one currently used for traditional stress tests. One interviewee (Brazil) highlighted that climate stress tests would only make sense if their results can be converted into impacts on regulatory ratios. The DNB stress test allows such a conversion. Finally, one interviewee (Costa Rica) mentioned that annual financial stability surveys or reports are an adequate outlet to communicate on climate risk issues.

Encouraging environmental risk analysis by financial institutions

A better integration of climate risks in financial institutions' operations is also something that LAC central banks and regulators see as important to increase the resilience of the financial system to climate risks.

► *Financial institutions need to engage on climate risk issues*

Most interviewees emphasized that financial institutions need to engage more forcefully in integrating environmental considerations in their loan origination process and in their risk management. The level of financial institutions' engagement is very heterogeneous among the interviewed countries: in some countries, banks need to be made aware of climate risk and get

basic education on it (e.g. Costa Rica, Dominican Republic); in others, they must improve the quality of their analysis (Brazil). Encouraging financial institutions to use data that are already available is one key recommendation by one of the interviewees (Mexico).

Financial institutions are usually asking for help and guidance on how to integrate climate risks into their practices (e.g. Costa Rica). Financial regulators and central banks could play a useful role in marking the field for them and in providing help, particularly to small and medium banks. Some LAC have already taken some steps in this direction: some countries have guidelines on social and environmental risk management (e.g. Brazil, Chile); others are planning to introduce guides of best practices and to help building capacities on environmental and social risk management (e.g. Colombia). Note that one interviewee (Mexico) mentioned that having internationally active financial institutions is an enabling factor, because such institutions need to align on international standards.

▶ *Guidelines would be a useful tool*

Several interviewees pointed out that having guidelines on how to integrate climate-related risks into risk management would be a very efficient way to encourage financial institutions to integrate them into their operations. A first step in that direction would be to identify the best practices in this domain. These best practices could

then serve as basis for the development of meaningful guidelines (e.g. Chile). Such best practice guides are planned in some countries (e.g. Colombia). One interviewee (Colombia) mentioned that qualitative guidelines could be an initial step toward more comprehensive guidelines. Another interviewee (Dominican Republic) reckons that guidelines are a crucial step for implementing new regulation. They would serve as guidance for financial institutions before the implementation.

Creating green credit market

In most LAC, green credit and green bond markets are at the beginning of their development. The interviewees welcome the insights from the Chinese case study in this report. They mostly agree with the recommendations that can be driven from the policies implemented in China. One interviewee (Mexico) underlined the fact that an independent verifying process for green bonds is key in strengthening green bond market credibility. Removing the current national regulatory hurdles that hinder the issuance of green bonds is also important for one interviewee (Costa Rica). Finally, note that in some LAC countries, governmental bodies want to play a shaping role in the development of green bonds while in other this is left to private sector's initiatives (e.g. Chile).



6

Conclusions



Climate change, and the transition to a low-carbon economy that can mitigate it, engender risks for the financial system. This calls on financial regulators and central banks to action. Several measures could be taken to manage these risks; this document studies three of them in detail through country case studies.

The general conclusions from these three case studies are the followings:

- 1. Developing and implementing measures to increase the resilience of the financial system to climate-related**

risks is a learning process. No consensus currently exists on the best way to assess climate risks, neither on which economic activities should be considered green or not. Improving methodologies and taxonomies requires the participation of multiple stakeholders; financial regulators and central banks need the contribution of financial institutions, academics, think tanks and other governmental bodies to solve this problem. Financial regulators and central banks can however play a crucial role in initiating and driving this process. Our case studies also highlight that financial regulators and central

banks should not wait until a perfect methodology or taxonomy exists to engage on environmental issues. Engaging early allows to build up internal capacities and challenges financial institutions on such issues.

2. Since the development of measures to increase financial system's resilience to climate risks necessitates multiple stakeholders, **a coordination between institutions is desirable, especially between governmental bodies.** An example of such coordination can be found in the case studies on China. In a fragmented regulatory framework, a high-level coordination between the different governmental institutions is important – in particular between national financial regulators and ministries in charge of the environment – and can have significant impacts on the effectiveness of the measures throughout their implementation and monitoring. However, the necessary level of coordination is difficult to envisage without some explicit political support.

3. The development and utilization of relevant databases is key. LAC are at different stages for such databases. Governmental bodies (such as the Ministry of Environment) can play a crucial role in identifying existing database and collecting new data to make them available to financial institutions – in the format, scale and level of detail that are necessary. They can also be helpful in providing guidance on how to use them to assess climate risks and integrate these new variables into the existing financial analysis tools (e.g. stress testing and other prudential indicators). For that they can leverage the different international initiatives regarding the collection of environmental data and the production of climate-related financial analysis.

The interviewed institutions in LAC welcomed IDB's initiative to look at the potential measures that they could take in their

own countries and found the international experiences insightful. They highlighted that there is a need in LAC to better assess the exposure of national financial sectors to climate risks and to increase awareness and management of these risks in national financial institutions.

Data collection and use has been identified as a key element to improve by our LAC interviewees. They also underscored that assessing climate risks is a learning process in which most of them are at the beginning of the learning curve. Against this background, a qualitative assessment of national financial sector's exposure to climate risks seems to be a "low hanging" fruit for a first step. This approach, already chosen by the Financial Superintendence of Colombia, would allow LAC central banks and regulators to engage with national financial institutions and raise their awareness of climate risks, as well as to get a better view of the data available in each country.

LAC financial regulators and central banks also acknowledge that their national financial institutions should engage more on social and environmental risk issues with particular emphasis on climate risks. The development of taxonomies and guidelines by national authorities, alongside other stakeholders, would help financial institutions in this process by reducing uncertainty, transaction costs and increasing coordination. The IDB, and development finance institutions, could help LAC financial regulators and central banks in several ways: 1) it could help collect relevant data, 2) it could support in building internal capacities in national institutions, 3) it could assist them in adapting available assessment methodologies to LAC specific contexts, 4) it could participate in the identification of the best international practices regarding taxonomies and guidelines and 5) it could play an important role in the transmission of knowledge from the most advanced LAC to the one at the very beginning of the learning curve.

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Annex A: Current Policy Proposals and Implementations

Policy options for both regulators and central banks

As underlined by the NGFS, climate change and the transition to a low-carbon economy, which mitigates it, are sources of risks for financial institutions. As such, climate risks fall within the supervisory and financial stability mandates of both central banks and financial supervisors. Three policy options are considered, and have been implemented by some countries, to address these risks.

▸ *Assessment of climate risk exposure of the financial sector*

As highlighted in the first NGFS progress report (NGFS 2018), the first step to successfully integrate climate risks into supervision is to better understand their possible financial impact, through both physical and transition effects. On that basis, some countries, including NGFS members, have conducted their own assessment of climate risks for financial institutions.

The NGFS recognizes that the tools and methodologies for such an assessment are still at an early stage and that there are a number of analytical challenges. However, over the last few years, progress has been made to size the financial risks from climate change. The current practices include a range of qualitative and quantitative approaches – through, e.g., scenario analysis or stress tests. Both approaches are studied in depth in this note (see Section III), with the examples of the BoE and the DNB, which are pioneers in this exercise and at the forefront of methodological developments.

▸ *Supporting environmental risk analysis by financial institutions*

Physical risks due to extreme weather events (e.g. droughts, floods and storms) can generate significant losses for households and firms, which can impair their ability to service their debt. Transition costs, whether from higher carbon prices or from adjusting to the standards of a low-carbon economy can also affect firms' financial soundness.

Both effects can potentially result into higher non-performing loans for banks.

To avoid such consequences, it is crucial for financial institutions to take these risks into consideration when granting loans. However, evidence so far shows that they do not systematically do so. Financial regulators and central banks can improve this situation by issuing guidelines on how financial institution should account for climate risks in loans conditions. To illustrate good practices in this domain, we study in detail the case of the guidelines issued by several government bodies in China (see Section IV).

► *Creating green credit market*

The transition to a low-carbon economy is necessary to mitigate physical climate risks in the long-term. This transition will require a shift in investments from carbon-intensive economic activities to low-carbon activities. Green credit, through both bank loans and bond issuances, is a key element in this process. Several studies have highlighted, for example, that the supply of green bonds is currently insufficient to meet the demand by investors. This lack of “labelled” green bonds and green loans has been identified as a key impediment for shifting funding toward environmentally sustainable investments.

International experience has shown that developing a national green credit market requires the involvement of national authorities and clear country-level guidance. Financial supervisors and central banks can play a pivotal role in this process. Against this background, we study the case of China to highlight best practices regarding the development of green credit markets (see Section V).

Policy options for regulators

A few policy options are available to regulators to mitigate the risks that climate change poses to financial institutions – or to create incentives to shift credits from carbon-intensive sectors to low-carbon activities. In this context, differentiated legal requirements attached to loans

and credit quotas are the options most frequently discussed. Some countries have implemented such measures.

► *Differentiated capital requirements*

Financial regulators can influence the volume of credit by changing capital requirements. For each credit that they grant, commercial banks must keep a given amount of capital. Higher capital requirements induce a higher cost for commercial banks and thus discourage lending. By asking more capital for carbon-intensive credits – “brown penalizing factor” – or less capital for low-carbon credit – “green supporting factor” – financial regulators can dampen investment in carbon-intensive activities, or promote investment in low-carbon activities, respectively. The same effect could be obtained by using different reserve requirements for banks according to the environmental “quality” of the assets that they hold.

The possibility of differentiated capital requirement is currently discussed in the European Union. The banking associations have intensively lobbied for the adoption of a green supporting factors. Central banks and regulators consider that a green supporting factor goes against the stability of the financial sector and prefer a brown penalizing factor that would align environmental and financial stability goals (see Villeroy de Galhau 2018 or Dankert et al. 2018). The PBoC has implemented a version of the green supporting factor by including green performance measurement in macro prudential assessment.

► *Minimum and maximum credit quotas*

Minimum credit quotas (or floors) are set by financial regulators or by central banks and require commercial banks to allocate a minimum percentage of their loan portfolio to a specified sector, area or cause (e.g. low-carbon activities). In contrast, maximum credit quotas (or ceilings) are used to limit commercial bank lending to specific sectors (e.g. carbon-intensive activities). Credit ceilings can be used to limit the exposure

of financial institutions to climate-sensitive sectors of firms. Credit quotas are used to steer credit toward specific activities.

Two examples of implemented credit quotas for green activities are found in Bangladesh and India. Bangladesh Bank, the central bank of Bangladesh, has introduced minimum credit quotas to green sectors (5%) in 2016. The Reserve Bank of India (RBI) requires that 40% of commercial bank lending flows to priority sectors. In 2012, the RBI included some off-grid renewable energy solutions into the list of priority sectors. In 2015, The RBI extended the list again to other renewable energy projects.

Policy options for central banks

Central banks can also potentially play a role in steering market asset allocation away from carbon-intensive sectors in direction of low-carbon activities. This would reduce the exposure of financial markets to climate risk, which is in-line with their financial stability mandate, and, in addition, foster the transition to a low-carbon economy. In this context, three policy options are currently on the table.

► *Including environmental considerations into monetary policy operations*

Central banks conduct their monetary policy mainly through three types of operations: by managing foreign exchanges reserves (for central banks that have an exchange rate objective for their monetary policy), by lending liquidity (reserves) to commercial banks against collateral in the case of conventional monetary policy, and by directly purchasing assets in the case of recent unconventional monetary policies. All types of operations have an impact on financial market prices and on capital allocation. The price of foreign and domestic assets that are bought by central banks - in the case of exchange rate policy and unconventional monetary policy, respectively - increases. Similarly, assets that are accepted as collateral by central banks also see their prices increase. This gives an incentive for financial institutions to issue such assets in larger quantities and to provide funding to the corresponding firms at a lower price.

Including low-carbon assets into the lists of eligible assets in the collateral framework or of assets bought by central banks is thus one way to promote low-carbon investment. Conversely, excluding carbon-intensive assets from these lists reduces the incentive for carbon-intensive investment.

Central banks define which assets can be used as collateral and which can be bought based on risk criteria. One proposition currently on the table is that central banks should better reflect climate risks in their asset purchases and their collateral frameworks (see Monnin 2018a). The PBoC recently included green bonds of lower risk quality into the list of assets accepted as collateral, with the aim to give an incentive for issuing these bonds. Since last year, the Bank for International Settlements, which acts as foreign exchange reserve portfolio manager for several central banks, offers the possibility to include ESG criteria in the management of their portfolio. Some central banks are starting to use this option.

► *Preferential refinancing rate for low-carbon sectors*

To incentivize commercial banks to lend to low-carbon sectors at lower rates, a central bank can use different refinancing rates such that banks extending credit for low-carbon investment can rediscount bills at lower rates. This means that financial institutions are compensated partially, fully or even overcompensated for lending at subsidized rate of interest to low-carbon borrowers when they rediscount these loans at the central bank. Bangladesh Bank, for example, has introduced preferential refinancing rates for the green sector in 2009.

► *Central bank assistance to development banks*

Central banks can support specialized financial institutions like, e.g., a green development bank by subscribing to their equity, buying their bonds or providing them with loans. Development banks that help to finance the transition to a low-carbon economy and to overcome the absence of long-term patient capital for this purpose have long been advocated as a solution for the transition to a low-carbon economy. The China Green Finance Taskforce, for example, recommended the creation of a China

Ecological Development Bank, to which the PBoC could provide initial low-interest equity funding.

Annex B: Challenges in Assessing Financial Sector's Exposure to Climate Risks

Assessing financial sector's climate risk exposure requires, first, to quantify the potential losses that climate change (and the transition to a low-carbon economy that mitigates them) can trigger for financial institutions and, second, to determine whether these losses can threaten the stability of the whole system. Quantifying risks for individual institutions and for the system is not straightforward. No consensus exists yet on the methodology and data to use for that. Financial regulators and central banks that want to undertake a comprehensive assessment of their financial sector's to climate risks face several challenges in terms of methodologies and data. We list them below:

Aggregation of physical and climate risk:

a comprehensive assessment of climate risks should include both physical and transition risks. Focusing only on physical risks would lead to overestimate climate risks as risk reductions coming from the transition would not be included. Similarly, looking at transition risks only would not capture physical risks. Unfortunately, the methodologies to assess both types of risks are very different and measuring both at the same time is resource intensive.

Historical data are a poor indication of future risks:

physical and transition risks are phenomenon that haven't been observed yet. Past data (physical, economic and financial) are thus poor

indication of these risks and their usefulness to forecast future physical, economic and financial consequences is limited. To overcome this problem, most methodologies rely on forward-looking scenarios, which combine physical and transition risks. However, several transition scenarios are possible and determining which one should be used is not straightforward, neither is the choice of physical and transition risk sources.

The analysis should be extended beyond traditional market participant horizon:

climate change costs and risks lie behind financial analysis' traditional horizon. The traditional tools and information that financial analysts use for assessing financial risk in the short-term are thus not suitable for climate risks. Long-term risk forecasting requires complex models that deliver imprecise forecasts and results, of which, are very sensitive to underlying assumptions.

Finding the right level of granularity:

climate risk does not affect all firms equally. For example, physical risk is highly dependent on the location of a firm's factories; transition risk depends on firms' business plans. Sector-level analysis might capture some of these transition risk differences, but there will be some significant loser and winners within industry sectors, which can only be captured by an analysis at the firm level. However, firm-level analysis necessitates extensive granular data which are not easily accessible. Furthermore, there is no consensus on which information best reflects the individual firms' exposure to climate risks. There is thus a trade-off between using accessible sector-level data and more precise firm-level data.

Translating physical and economic models into useful financial risk measures:

some relatively advanced models exist to forecast the physical damages generated by climate change and to link them to macroeconomic costs. Similarly, estimations of macroeconomic costs generated by the transition are available. It is however challenging to convert these macroeconomic estimations into firm-level impacts and, even more, to translate them into concrete and useful measures of financial risks.

Annex C: BoE's Assessment of UK Financial Sector's Climate Risk Exposure

The PRA undertook two different assessments of climate risk exposure for the UK financial sector: one focusing on the insurance sector (PRA 2015) and one on the banking sector (PRA 2018). Both assessments rely on surveys and on related discussions with regulated firms and wider stakeholders. They both to a large extent draw on and reflect external research (especially on the findings from the Intergovernmental Panel on Climate Change, IPCC). Both surveys are meant to be an initial risk assessment. They both explore possible responses by supervised institutions to the risks identified but are not intended to provide a policy prescription. They also discuss climate change-related opportunities.

Insurance sector

A climate change adaptation survey was sent to 30 PRA-regulated life and general insurance firms, representing 59% of the UK general insurance market. The survey consists of questions focusing 1) on current and future impacts of climate change on insurers, 2) on the approach to managing climate risks by these institutions and 3) on role of the insurance industry, and within this, of insurance regulation, in supporting adaptations to potential climate change (see PRA, 2015, p. 73-74). The answers to these questions remain qualitative and not quantitative. The PRA met bilaterally with approximately half of insurers that completed the survey to talk through their responses in more detail.

The survey was followed by four roundtables focusing on 1) whether changing climate



risk is being effectively considered across the insurance industry, 2) the market implications of climate risk (using the real estate sector as a case study), 3) the risks arising from climate change for UK financial markets, regulation and society and 4) on the risks that society responses to climate change, such as the transition to a lower carbon economy, may have on the integrity of financial markets. These roundtables were each attended by up to 30 participants, including at least 10 insurance firms.

Banking sector

The PRA sent a survey to 39 PRA-regulated UK and international banks, representing around 90% of the UK banking sector. The survey is very similar to the one conducted for the insurance sector and consists of questions focusing on 1) current and future impacts of climate change on banks, 2) the approach to managing climate change risk by banks and 3) the role of the banking

industry, and within this, of banking regulators, in supporting adaptations to potential climate change (see PRA, 2018, p. 48-49). The answers to these questions are also qualitative. The PRA also met with banks and other stakeholders to complete the inputs from the survey. The PRA analysis also gained from the BoE's wider climate-related work (see, e.g., Bank of England 2017).

The report on the banking sector also focuses on some case study to illustrate the link between climate change and risks for the banking sector. It uses, for example, 1) the case of how tightening energy efficiency standards can impact the UK buy-to-let market, 2) the case of the low-carbon transition and the automotive industry, 3) the case of the energy transition and the coal industry and 4) the case of the impact of flood risk on residential mortgage portfolios. These case studies were identified as relevant during the conversations that the PRA had with banks.

Annex D: DNB's Assessment of Dutch Financial Sector's Climate Risk Exposure

De Nederlandsche Bank (DNB) published three main reports on the links between climate risks and the Dutch financial sector. Each of these reports build on the knowledge acquired in the previous one to sharpen DNB's quantitative assessment of the Dutch financial sector's exposure. From one report to the other quantity and quality of the quantitative measures clearly increases.

The first report (Time for transition) is an exploratory study on how climate change can impact the financial sectors (Schotten et al. 2016). It gives some initial results on the Dutch financial exposure to transition risks. The second report (Waterproof) focus on the physical and transition risks for the insurance sector and on flood risks for the financial sector in general (Regelink et al. 2017). This report recommends the

development of climate stress test for the financial sector to better assess its exposure. This recommendation is implemented for transition risks in the Transition stress test report (Vermeulen et al. 2018).

Physical risks

The Dutch territory is particularly vulnerable to floods and their damages are typically not insured in the Netherlands. This triggered the DNB to take a closer look at the consequences of floods on the balance sheets of financial institutions through increased credit losses and lower market values. The Waterproof reports explores flood scenarios for two different regions in the Netherlands. The direct losses in terms of damages to residential properties, to businesses, to infrastructures and to public goods, of suspensions of business

activities and of emergency services and cleaning expenses have been estimated by an external provider (Deltares Water Research Institute). In addition, the DNB assumes that these events would double the number of corporate bankruptcies in the region and that Dutch sovereign bonds might be downgraded due to widespread losses to the economy, damages to public infrastructure and the public liabilities under the Calamities Compensation Act, which would be funded by public budget.

The results show that such the impact of floods on banks, insurers and pensions fund balance sheets will significantly depends on the level of compensation provided by the government. The losses amount from EUR 14bn to 36bn depending on the region affected and on the compensation level by the government. These estimations do not include secondary effects such as deteriorated economic conditions and second-round effects on asset markets.

Transition risks

The Transition stress test reports develops and applies a methodology based on stress tests to assess transition risks for the Dutch financial sector. The option of using a stress test was chosen because 1) it is an adequate tool to measure the fundamental uncertainty related with transition risks and the potential large losses associated with tail risks and 2) it is a tool that DNB, and central banks in general, is familiar with and for which it has accumulated expertise in other circumstances.

The approach chosen by the DNB follows four steps: 1) define severe but plausible scenario shocks based on literature review and expert views, 2) simulate the impact of shock scenario on the macroeconomy by using DNB's internal macro model, 3) disaggregate the macroeconomic effects across industries based on their embodied carbon emission and 4) calculate the financial impact on financial institutions based on their exposure at end 2017. Four shocks have been analysed: 1) a policy shock (i.e. a global rise of carbon price by USD 100 per ton), 2) a technology shock (i.e. the share of renewable energy in the energy mix doubles exogenously due to a technological breakthrough), 3) a confidence shock (i.e. firms and households postpone investment

and consumption due to uncertainty about policy measures and technology) and 4) a double shock (i.e. the combination of the policy shock and the technology shock described previously).

This methodology allows to assess the impact of the transition on total assets by sectors for banks, insurers and pension funds. It also allows to estimate the impact of asset losses on the supervisory ratios of these institutions (regulatory capital ratio for banks, solvency ratio for insurances and coverage ratio for pension funds). The results show that different types of shock have different implications for asset losses and supervisory ratios, but that the exposure of the Dutch financial sector is sizable: banks' Core Tier 1 impacts vary from 1.8% to 4.3%; while the percentage of stranded assets could surpass 2% of overall asset base (Vermeulen et al, 2018).

Annex E: Green Finance and Governmental Institutions in China

In the past decades, the negative effects of economic activities on the environment have become a major concern in China. This concern is reflected in the 13th Five-Year Plan in which the Chinese government has committed to peak energy-related carbon dioxide emissions by 2030. To achieve this objective, new governmental bodies were established while existing regulatory agencies were given additional mandates to address environmental challenges from multiple regulatory angles. This box presents the governmental bodies and initiatives that have played a significant role in establishing risk assessment measures and introducing a green credit market.

The Ministry of Ecology and Environment (MEE), established this year, is one of the

latest regulatory shakeups addressing environmental challenges. Replacing the Ministry for Environmental Protection (MEP), the MEE embodies a considerable expansion of regulatory power. Compared to the MEP, the MEE boasts a more comprehensive mandate, which covers regulatory functions previously exercised by seven separate ministries. These include formulating and enforcing national environmental policy and conducting environmental impact assessment in areas of climate change; air, water, and soil pollution; ecological and marine conservation; nuclear safety and radiation safety, and environmental protection among project execution. In regard to risk management, the MEE is mandated to require and evaluate environmental information disclosure from corporate enterprises and public institutions.

The Chinese financial regulatory system has been fragmented and, until this year, characterised as an “one bank-three commissions regulatory structure” (see Weiping 2018). Until 1995, the People’s Bank of China (PBoC) was responsible for the regulation of financial markets and of financial institutions. After 1995, the regulatory structure evolved toward a sector-based system, whereas sector-specific institutions and laws separated the functions and mandates of regulators. The PBoC and three specific commissions have been responsible for the regulation of financial markets and of financial institutions until 2017. Since then, Chinese government has set several institutional restructuring designs in motion to actively mend the fragmented system.

The China Securities Regulatory Commission (CSRC), established in 1993, oversees securities, futures, and funds. In general terms, it supervises the issuance, listing, trading, custody, and settlements of stocks, bonds, and other securities. The CSRC monitors market behaviours, investigates activities, and penalizes conduct in violation of the relevant securities and futures laws and regulations. Given its focus on securities, issues considering the issuance of green bonds generally fall under the mandate of CSRC.

The China Banking Regulatory Commission (CBRC) and the China Insurance Regulatory Commission (CIRC) have been merged in



April 2018, forming the China Banking and Insurance Regulatory Commission (CBIRC). The former CBRC conducted regulation and supervision over all banking institutions and their business activities in China. Its objectives included promoting the safety and soundness of the banking industry, improving its competitiveness, as well as using prudential supervision to protect the interests of depositors and consumers and to boost market confidence. The CIRC was mandated to formulate policies and rules concerning commercial insurances.

Under the one bank-three commissions structure, the four governmental bodies (PBoC, CSRC, CIRC and CBRC) were considered equals, each assigned with a specific regulatory function. Over the years, banks and financial institutions have learned to evade regulatory schemes, taking advantage of the regulatory discoordination. Many firms have sought to create a quasi-universal banking structure, using incorporated subsidiaries to conduct complementary banking and non-banking financial business.

Facing such challenges, the government engaged in various efforts of regulatory restructuring. The fusion of the two commissions, CBRC and CIRC, constitutes a step to create a more coherent regulatory system that closes on regulatory loopholes. More importantly, a new powerful committee, the Financial Stability and Development

Committee (FSDC), was established in 2017 to oversee the coordination of the financial regulatory bodies. Not only is the FSDC mandated to break potential deadlocks between the financial regulators, it can also exert greater authority over local governments in order to ensure an overall consistency in financial policymaking. As its daily operations are run out of the PBoC, the latter is expected to gain a considerable expansion of its mandate.

China also cooperated with experts, think tanks, and regulatory institutions at home and overseas to create the Green Finance Task Force (GFTF) in 2015. Under the leadership of Dr Ma Jun, the former chief economist of the PBoC Research Bureau, the GFTF has proposed a preliminary framework and 14 specific recommendations for building China's green finance system. Considered as a step-by-step roadmap, the GFTF recommendations covered issues including green banks, green bonds, green insurance, green IPOs, green credit rating, environmental liabilities of banks, green information disclosure, a green database and a green investor network. The recommendations also gave clear instructions to task assignment between regulatory agencies. Since then, most recommendations of the GFTF have been implemented, promoting a clearer division of task among the regulatory agencies and interdepartmental cooperation.



