European Association of CCP Clearing Houses

EACH Paper – Climate Risk and CCP Risk Management

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1. Introduction

The objective of this paper is to provide an overview of several aspects related to climate risk arising from the discussions of the EACH Climate Risk Working Group[1].

Many national and international supervisors and bodies identify common features of the ways in which financial institutions should approach managing risks from climate change. A non-exhaustive account of these is included in Appendix 1.

As an example, the Bank of England, in its Supervisory Statement SS3/19 issued in April 2019 and aimed at banks and insurers, identified a set of Primary Risk Factors, being Physical, Transition and Liability risks, and the key elements of a Strategic Approach being Governance, Risk Management, Scenario Analysis and Disclosure.[2]

While there is currently no specific guidance or regulation for climate risk management for CCPs, this paper explores these themes as applied to our sector, and is organised in four different areas: climate risk and CCP stress testing; climate risk metrics - intro; climate risk metrics - development, use and disclosure; and future business impact.

2. Climate risk and CCP stress testing

Climate risk refers to risks posed by the exposure of firms acting as clearing members of CCPs, CCPs themselves, and/or the economy more broadly, to factors caused by or related to climate change. These can impact, and typically materialise through, a number of other risks such as credit, market, liquidity, operational and legal risks. Climate risks are commonly categorised into two types: **physical risks**, which are either *acute*, and of immediate effect (e.g. flooding, hurricane, etc.), or *chronic*, occurring over a longer period (e.g. rising sea levels and warming); and **transitional effect risks** (e.g. cost increases related to the adaptation of business practices to low emission rules). Similarly, as with any other type of systemic risk, feedback loops are expected within and across these multiple layers of risk.

Physical risks

Due to their immediate effect, **physical risks** are those of relevance for stress testing. These exercises are designed to test the capacity of the CCP to withstand extreme but plausible conditions that develop in short amounts of time (e.g. 2 days, 5 days, etc.)[3].

Physical risks are already part of the current CCP stress tests. CCPs that clear products directly impacted by climate risk typically develop stress scenarios triggered by natural disasters. For instance, this is the case of energy products which could be impacted by a hurricane, the case

[1] The EACH Climate Risk Working Group is formed by a subset of Members from the EACH Risk Committee and the EACH Secretariat.
[2] Bank of England, Supervisory Statement SS3/19, April 2019.
[3] It is important to emphasise that physical risks may also form part of the operational risk framework, and associated contingency arrangements, for some CCPs.

of agricultural contracts and the effects of a drought, or the case of single name CDS for insurance companies impacted by climate related insurance claims[4]. Nevertheless, all CCPs are impacted to some extent – equity and rates markets are also affected – and model many of the same or similar historical physical stresses.

Stress scenarios that capture physical climate-related risks can be:

- based on past events (i.e. historical),
- derived from mathematical and statistical models (i.e. hypothetical, quantitative), or
- constructed based on expert judgment assumptions (i.e. hypothetical, qualitative).

It should be noted that scenarios must be plausible as well as extreme. There is a great deal of uncertainty and debate around the modelling of physical impacts, and we cannot solely rely on historical experience of extreme shocks to market pricing as a guide to calibrating the stress scenarios.

Transitional effect risks

Transitional effect risks arise over a longer period than the short time considered for CCP stress testing (the purpose of which is to consider worst case market movements during the time it takes to liquidate a defaulted member's portfolio), and are typically captured in other forms of assessments performed by CCPs, such as those that assess business and operational risks, and capital adequacy. Such risk management approaches include scenario analyses run over both short and longer time horizons.

3. Climate risk metrics

While CCPs already include physical risks in stress testing (and transitional risks in other parts of CCP management), this paper suggests considering **climate risk metrics** as a way to better catch those risks in the stress tests or to better disclose the exposure towards them more generally. Climate risk metrics can be broadly viewed from two perspectives; one that focuses on the contribution that each business enterprise may have on the different types of climate risks (i.e. a micro-perspective), and another that assesses how markets where the business enterprise operates can be impacted by those risks (i.e. the macro-perspective). A few examples are presented below:

- Micro-perspective: i) revenue/savings from investments in low carbon assets; ii) proportion of capital allocated to long-lived assets vs short-lived ones; iii) water usage; etc.;

[4] Climate risks have now been introduced in the stress testing conducted banks and insurers. See, for instance, the Bank of England 2021 biennial exploratory scenario (BES). However, it is important to note that these stress scenarios are fundamentally different from those performed by CCPs. Using a 30-year horizon, scenarios are based on adoption of climate change policies (e.g. the Paris Agreement), and focus on the vulnerabilities of individual counterparties' business models to the underlying climate-related risks.

- Macro-perspective: i) credit exposure of clearing members to climate risks; ii) market risk exposure of assets cleared to climate risks; iii) business and operational exposure of the CCP to climate risks; etc.

4. Climate risk metrics - development, use and disclosure

The development, use, and disclose of climate risk metrics are key factors to the next phase of improving climate risk management within CCPs, their investors and participants of cleared markets.[5] Similar to the development of other areas of risk management, the risk approaches and frameworks needed to identify, measure and mitigate climate risks are yet to fully mature. As such, some aspects are worth highlighting:

- **Development** - to the extent possible it is important that climate risk metrics be harmonised across industries/products/services. Common standards and definitions will aid comparison and consistency of model outputs. For instance, for credit risk, probability of default (PD), exposure at default (EAD) and recovery rate (RR) there are industry-standard definitions, but no equivalent concepts exist for climate risk metrics;
- **Use** - CCPs, and when appropriate the economic groups to which they belong, typically manage their climate-related risks through an ESG or Sustainability Programme for the micro-perspective and the Enterprise Risk Management for the macro-perspective. There is, however, a common understanding that such use can yet be expanded. For instance, as a part of the CCP credit risk management and scoring models, clearing members could provide non-public data on climate impact data. Similarly, driven by CCPs' governance and risk frameworks, climate-related data and metrics could be used to formulate Key Risk Indicators (KRIs) that track climate (or in a broader sense ESG) risks over time. These could be used to strategically steer businesses towards offering more sustainable products and services, as well as adjusting CCPs' own behaviour. Care should be taken to ensure a level playing field (globally), i.e. that those companies which disclose climate change related metrics should not be disadvantaged over those which do not disclose;
- **Disclosure** - as with any other area of risk management, for climate risk metrics to fully realise their effectiveness they must be transparent. CCPs, and when appropriate their economic groups or corporations, can contribute to climate risk management by offering such disclosures in line with the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD)[6]. In addition, equity and bond issuers should be encouraged to report their environmental impact (including measures like carbon footprint, water use, waste generation etc.) and exposure to climate risks as a part of information provided to trading and clearing.[7] The disclosed data would support informed investment, credit, and insurance underwriting decisions, and will enable a variety of stakeholders (e.g. investors, regulators, risk managers and data

[5] Please see Appendix 2 for some examples. It is important to note that today these indicators are presented at the group-level. If these were to be assessed at the business unit level some additional work should be required.
[6] Final Report June 2017: Recommendations of the Task Force on Climate-related Financial Disclosures.
[7] One possibility could be ESG portals, including a wider disclosure capacity covering also Social and Governance factors and metrics.

product vendors) to understand the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risk.

5. Future business impact

CCPs will continue to evolve in their mission to provide efficient, robust and safe financial markets. Within such objective, a key function performed is the capacity to centralise and process information spread in the market, supporting reliable price discovery and formation, product standardisation and liquidity, in exchanges and execution facilities.[8]
The future business impact of climate risk management needs to include the ability to 'price' climate risk more accurately, and potentially direct market participants towards more sustainable and climate friendly investments and behaviour.[9]

The range of tradeable ESG and climate-related products is expanding and many already benefit from central clearing which provides the benefits described above and can also, for example, enable better:

- credit scoring for CCP participants with high climate impact;
- market risk assessments, and associated prudential requirements, for products with high/inherent climate risk/impact.

- END -

[8] Please see ICE Sustainable Finance for some examples.
[9] Note that this objective is in line with the mandate given by the FSB to Task Force on Climate-related Financial Disclosures (TCFD), which states that such disclosures "would enable stakeholders to understand better the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risks."

Appendix 1 – Resources

Body	Date	Title	Contents / key elements
BoE Governor Mark Carney	Sep 2015	Breaking the Tragedy of the Horizon – climate change and financial stability	Until recently, central banks had never publicly discussed climate change. This changed in September 2015, when BoE governor Mark Carney trailblazed the idea that financial regulators should take an active role in promoting green risk management practices. In his landmark speech at Lloyds, Carney warned that climate change had become a growing risk to financial stability.
Task Force on Climate-Related Financial Disclosures (TCFD)	Dec 2015	TCFD established	A key objective of the Task Force's work, as outlined by the FSB, is to promote more effective climate-related disclosures that (1) will support informed investment, credit, and insurance underwriting decisions about reporting companies, and (2) will enable a variety of stakeholders to understand the concentrations of carbon-related assets in the financial sector and the financial system's exposures to climate-related risk.
TCFD	June 2017	Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures	Climate-Related Risks, Opportunities, and Financial Impacts Recommendations and Guidance: • Governance / Strategy / Risk management / Metrics and targets Scenario Analysis and Climate-Related Issues Key Issues Considered and Areas for Further Work

Network of Central Banks and Supervisors for Greening the Financial System (NGFS)	Dec 2017	NGFS established	At the Paris "One Planet Summit" in December 2017, eight central banks and supervisors established the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). Since then, the membership of the Network has grown dramatically, across the five continents (Membership).
European Commission	Mar 2018	Action Plan: Financing Sustainable Growth	▪ Finance for a more sustainable world ; Reorienting capital flows to a more sustainable economy ▪ Mainstreaming sustainability into risk management; Fostering transparency and long-termism ▪ The way forward
Bank of England	Apr 2019	Supervisory Statement | SS3/19 Enhancing banks' and insurers' approaches to managing the financial risks from climate change	1. Introduction 2. Financial risks from climate change – two primary risk factors, physical and transition, plus liability risks for insurers 3. A strategic approach to managing the financial risks from climate change • Governance / Risk management / Scenario analysis / Disclosure
Basel Committee on Banking Supervision (BCBS)	Apr 2020	Survey results - Climate-related financial risks: a survey on current initiatives	Stocktake of Central Banks' progress on Climate Risk. With respect to climate-related financial risks, most members: consider it appropriate to address such risks; have conducted research related to their measurement; have

			raised risk awareness with banks through different channels, and many banks are disclosing information to some extent; (two fifths) are issuing principles-based guidance; are not yet factoring the mitigation of such risks into the prudential capital framework.
NGFS	June 2020	NGFS Climate Scenarios for central banks and supervisors	1. Climate Scenarios in detail: 2. Transition risks; 3. Physical risks; 4. Economic impacts; 5. Future development (includes a Covid-19 assessment)
CFTC MRAC Climate-Related Market Risk Sub-committee	Sep 2020	Managing Climate Risk in the U.S. Financial System	1: Finance in the Face of Climate Change; 2: Physical and Transition Risks in the Context of the US 3: Implications of Climate Change for the U.S. Financial System; 4: Existing Authorities and Recommendations for Financial Regulators; 5: Climate Risk Management and Data; 6: Climate Scenarios; 7: Climate Risk Disclosure; 8: Financing the Net-Zero Transition
FIA	Sep 2020	How derivatives markets are helping the world fight climate change	How? - Innovation – list of Emissions, ESG and Renewables derivatives instruments by exchange – **Nodal, ICE, Nasdaq, NYMEx, EEE, Eurex, CME, Euronext** Standardisation; Harmonisation Current and Future Risks – Physical, Transition, Liability , Reputational, Operational

Appendix 2 – Sample CCP / Parent Strategic Approaches

EACH WG Topic	Deutsche Börse[1] (Eurex)	ICE[2]	LSEG[3] (LCH & CC&G)	Nasdaq[4]
Climate Risk and stress testing	Y	Y	Y	Y
Climate metrics	Y	Y	Y	Y
Climate-related disclosures	Y	Y	Y	Y
Future business impact	Y	Y	Y	Y
ESG or Sustainability Committee	Y	Y	Y	Y

1 Climate strategy of Deutsche Börse Group according to the TCFD recommendations
2 Intercontinental Exchange Corporate Responsibility Report 2019
3 London Stock Exchange Group Corporate Sustainability Report December 2019
4 Nasdaq 2018 Sustainability Report GRI Standards (Core), and 2019 Sustainability Overview