Principles for financial market infrastructures:

Disclosure framework

Committee on Payments and Market Infrastructures (CPMI)

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Clearstream Banking AG

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Contents

Responding institution: Clearstream Banking AG
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Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and Deutsche Bundesbank

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This disclosure can also be found at www.clearstream.com
For further information, please contact: marketquestionnaires@clearstream.com

Preface

Executive summary

Clearstream Banking AG (CBF) is a central securities depository (CSD) within the meaning of Article 2 (1) number 1 of the EU Central Securities Depositories Regulation (Regulation (EU) No. 909/2014, CSDR), and a leading European post-trade services provider with approximately 300 participants as at 31 December 2023.

The company offers settlement, asset services, as well as various cash management services. CBF contributes to the safety and efficiency of financial markets and provides an exhaustive suite of connectivity to its participants and providers.

CBF is linked to financial markets worldwide as follows:

1. **Direct T2S/investor-CSD link:** CBF establishes a TARGET2-Securities (T2S) link to another CSD directly connected to T2S (T2S In-CSD); settlement is processed in T2S. CBF usually appoints a local bank as an asset servicing provider.

2. **Direct link:** CBF establishes a link to another market where it holds an account at the local CSD; settlement is processed directly between CBF and the local issuer CSD.

Additionally, CBF offers settlement and custody in around 60 domestic markets via Clearstream Banking S.A. (CBL). CBL's access to the domestic markets is either direct or via a foreign custodian whereby the securities are held in the local CSD in a CBL dedicated client account. Cash settlement takes place via foreign correspondent banks.

As part of the Clearstream group (hereinafter "Clearstream", see the General organisation of the FMI and Summary of the major changes since the last update of disclosure sections for details), CBF discloses information about its governance structure via the Company Governance section of its website:

— The company's operational structure;

— The company's shareholding structure;

— The names and titles of the members of its Supervisory Board;

— The names and titles of the members of its Executive Board;

— The roles and functioning of Clearstream group committees.

Clearstream has a multifarious array of stakeholders:

— Stakeholders to whom Clearstream provides a service, that is, issuers, issuer agents and participants;

— Stakeholders who provide a service to Clearstream, that is, CSDs, ICSDs, Transfer Agents and Order Handling Agents;

— Stakeholders involved in the formation of the legislative and regulatory framework in which Clearstream operates, that is, Clearstream's regulator, market associations;

— Stakeholders with a direct influence on Clearstream's equity, that is, parent company and end investors.

As a CSD, CBF is authorised by Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin, German Federal Financial Supervisory Authority) pursuant to Article 16 (core and non-bankingtype ancillary services) and Art. 54 (banking-type ancillary services) of Regulation (EU) No 909/2014 (CSDR). Please refer to the ESMA CSD register for details.

Furthermore, CBF is an authorised and regulated credit institution according to the Kreditwesengesetz (KWG, German Banking Act). Accordingly, it is subject to the supervision of BaFin, which operates in close cooperation with Deutsche Bundesbank (German central bank).

In addition, CBF is designated as an operator of securities settlement systems (SSSs) by Deutsche Bundesbank in accordance with section 24b (1) of the KWG, transposing Article 10 (1) of Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems (SFD), amended by Directive 2009/44/EC of the European Parliament and of the Council of 6 May 2009 and by Directive 2010/78/EU of the European Parliament and of the Council of 24 November 2010.

Risk management is an elementary component of CBF's management and control. Effective and efficient risk management is fundamental to safeguarding the company's interests (both in terms of corporate goals and continued existence). The risk management policy documents Clearstream's risk management concept by describing the risk management framework in terms of processes, roles and responsibilities applicable to all staff and organisations within all legal Clearstream entities. The company has developed its own corporate risk structure and distinguishes between five aggregated risk types: operational, financial, business, pension, as well as winding-down and restructuring risk.

Clearstream has default management process (DMP) rules and procedures in place, which define the circumstances under which a participant is considered to be in default. Referring to the products and services offered, CBF defines two types of default, legal and contractual default. In order to take pre-emptive measures even before a default occurs, Clearstream has also established the Early Warning Framework as an integral part of its DMP.

Clearstream's Business Continuity Management System (BCMS) Policy define requirements and measures to be implemented to support the recovery of services meeting a minimum business continuity objective in case of a disruption to recover within appropriate time scales to:

- Safeguard Clearstream from significant losses, maintain revenue generation and shareholder value.
- Maintain participant confidence, market stability and liquidity and minimise systemic risk.
- Maintain management control, fulfil contractual obligations and regulatory compliance.

When Clearstream decides to enter a new market, it will request proposals (request for proposals, RfPs) from leading banks in this market, who meet Clearstream's stringent requirements for a depository/ agent bank, as well as a cash correspondent bank (CCB), along with criteria such as appropriate licensing for banking and custody, credit rating, industry rank, management competence, liquidity etc. This RfP process ties together a detailed operational review of each individual business process with legal and compliance review of the entire infrastructure as well as credit reviews of the various intermediaries.

Summary of the major changes since the last update of disclosure

Legal and regulatory topics

- **New legal structure for Fund Services:** In 2022, the Clearstream group (that is, Clearstream Holding AG and its subsidiaries) decided to carve out its fund-related business into a new Luxembourg domiciled credit institution called Clearstream Fund Centre S.A. (CFCL). See also the shareholding structure in the General organisation of the FMI section. As part of Deutsche Börse Group's Fund Services business segment, CFCL aims to further strengthen Luxembourg as a global fund hub supported by strong investment and banking services. CFCL intends answering market demands to facilitate and reduce potential transactions risks during the execution and processing of investment fund transactions and related corporate actions.

  As a result of the carve-out of the fund-related business from the Clearstream group, the Clearstream Fund Centre group was activated on 30 December 2022. This group comprises Clearstream Fund Centre Holding S.A., Luxembourg (CFCH), the parent company of Clearstream Fund Centre S.A., Luxembourg (CFCL), which in turn holds all the shares in Clearstream Australia Limited and also inlcudes Clearstream Fund Centre Cork branch (incorporated as a branch on 1 July 2023). For a transitional period to facilitate the orderly migration of fund clients from CBL to CFCL, the Clearstream group serves as a service provider for part of CFCL's business processes.

  Clearstream Fund Centre Holding S.A. (CFCH) was established on 26 July 2022. CFCH is exempted from the requirement to obtain a licence as financial holding company in accordance with Article 34-2(6) of the Luxembourg law of 5 April 1993 on the financial sector, as amended. CFCH acts as holding company of CFCL. Pursuant to Article 31-2(6) of the Luxembourg law of 5 April 1993 on the financial sector, as amended, CFCL is included in the perimeter of supervision on a consolidated basis at the level of CFCH.

  Kneip Communications S.A., a leading European fund data manager, was acquired by Deutsche Börse Group on 28 March 2022. The partnership forms the basis for creating a leading fund data hub based in Luxembourg. Kneip seeks to further scale the business and expand its range of services inside Deutsche Börse Group, including data and post-trade services provided by Clearstream.

  Clearstream Fund Centre S.A. (CFCL) is a public limited liability company, incorporated on 16 November 2021, under Luxembourg law, fully owned by CFCH. CFCL is supervised by the Commission de Surveillance du Secteur Financier (CSSF). CFCL was granted a licence as CRR institution by decision of the European Central Bank on 27 October 2022 and activated its banking licence on 30 December 2022, with the intend to offer and operate in a first stage order routing and at a later point in time, safekeeping and administration of client assets as well as regulated banking activities.

- **Amendments to the Depotgesetz (DepotG, German Securities Deposit Act):** With effect from 15 December 2023, the DepotG was amended to also cover electronic securities issued under foreign law, provided that they are fungible. The provisions of the DepotG on collective safe custody now apply *mutatis mutandis* also to these securities.

Products and services

- **Enhancement of the D7® platform:** The completely digital, cloud-backed and DLT-ready post-trade platform enables the digitisation of financial instruments. Following the successful launch of the structured products offering, Clearstream enhanced D7 to include the digital issuance of debt securities, such as commercial papers and straight bonds. In December 2022, KfW became the first issuer to have launched a digital fixed-income bond based on the Gesetz über elektronische Wertpapiere (eWpG, German Electronic Securities Act). In the meantime, D7 has gained significant traction: Over 25,000 securities have been issued paperless, resulting in more than €3.5 billion of assets under custody of digital securities. In the next phases of development, Clearstream is planning to expand D7 offering along three dimensions: i) geographies, offering digital securities services in Luxembourg and to the international issuance community, ii) asset classes, expanding the coverage scope from structured products, fixed income products, equities, funds and similar listed as well as non-listed asset types and iii) tech stacks, where D7 will expand its offering to decentral blockchain capabilities, allowing for the issuance of tokens on Clearstream's D7 DeFi blockchain solution.

- **Collateral Mobility project:** After the decommissioning of the CBF Securities Lending Service KAGplus end of September 2022, the company started to transition collateral management activities for the German domestic business previously conducted on CBF's Xemac® platform onto CBL's CmaX platform that supports its international triparty collateral management business. Consequently, the CmaX platform centralises all triparty collateral management services. In doing so, Clearstream aims to provide standardised operational procedures and interoperability across the services offered by its Luxembourg-based ICSD and its CSD in Germany. For participants, the aim is to offer efficient mobilisation, optimisation and allocation of collateral across their international and domestic activities from a single pool of securities accounts.

- **Changes in CBF reporting tools:** In 2023, Clearstream has migrated the CBF Fileservice previously offered via Deutsche Börse's platform to the ClearstreamXact landscape. The download functionality for CBF files from different custody services is now provided via Xact Web Portal. The reporting for Bestandsprovisionen (trailer fees) for investment fund companies was migrated to the Fund Management Reporting Service in Vestima®, also accessible via Xact Web Portal.

- **Corporate Actions Harmonisation project:** Since July 2023, Clearstream has offered a single processing environment for the majority of CBF-issued instruments supporting corporate action processing and tax services for the CSD and ICSD participants with a unified service level. This harmonisation ensures compliance with international corporate action standards, for example, by consolidating processing environments, streamlining operating dual asset servicing processing and thus reducing operational complexity.

- **Streamlining channels for communication with T2S:** Effective 8 June 2024, CASCADE-PC, CBF's graphical user interface for settlement instructions, will be decomissioned. Participants have been migrated to alternative solutions such as CASCADE-Host, Xact Web Portal and ISO 15022 messages to benefit from short processing times and real-time access to information.

Market coverage

With CBF having migrated to TARGET2-Securities (T2S), it acts as single gateway for settlement in T2S. The OneClearstream service level – Clearstream's Investor CSD model – provides participants with a single point of access to all T2S markets with comprehensive instrument coverage.

In July 2022, the OneClearstream service level was activated for Denmark, followed by Finland (including market-specific restrictions) in November 2023 and the Slovak Republic in March 2024. For November 2024, it is planned to activate the service level for Slovenia.

Further details are provided in the OneClearstream migration timeline and the OneClearstream rollout documentation on the Clearstream website.

General background on the FMI

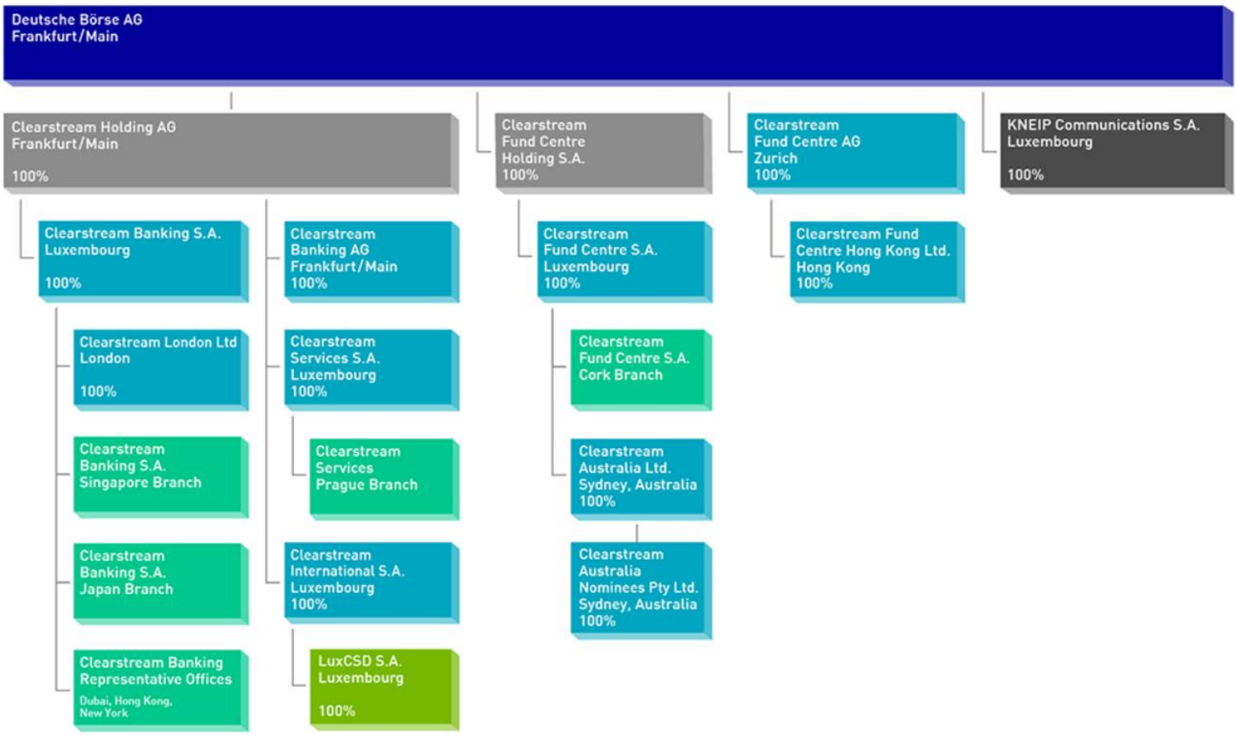
General description of the FMI and the markets it serves

Clearstream provides access to the network of all T2S CSDs which have been fully assessed for monetary policy operations. Additionally, Clearstream participants will have access to all CSD and ICSD counterparties from both CSD and ICSD accounts and benefit from realignment of any Clearstream accounts independent of any system outside Clearstream, including T2S, in real-time and at any time. Participants choose whether the transactions are to be effected in central bank money (via the CSD in Germany) or via commercial bank money, which is offered via the ICSD in Luxembourg.

Clearstream offers access to a large number of securities markets across the globe, providing direct and secure access to domestic liquidity pools and the international market. As the demand for access to new markets and instruments develops, Clearstream will continue to expand its global network and to deliver market access solutions that meet the participants' needs.

General organisation of the FMI

Shareholding structure of the Clearstream group



The Clearstream group focuses on the securities services business. It comprises Clearstream Holding AG and its subsidiaries (held directly or indirectly). Among them are the German CSD Clearstream Banking AG (CBF), the Luxembourgish CSD LuxCSD S.A. and the ICSD Clearstream Banking S.A. (CBL), which are highly integrated into the structure of Clearstream within Deutsche Börse Group.

The Clearstream Fund Centre group, activated in December 2022, covers the investment fund services offered by Deutsche Börse Group. It comprises Clearstream Fund Centre Holding S.A. (CFCH), Clearstream Fund Centre S.A. (CFCL) and their subsidiaries.

Kneip Communications S.A., a leading European fund data manager acquired in March 2022, adds to the fund services offering.

For details on the newly founded or acquired companies, please see the Summary of the major changes since the last update of disclosure.

Governance structure of Clearstream Banking AG

CBF is governed by a two-tier board structure. This approach features a clear separation between the powers of the Supervisory Board, which monitors and advises the Executive Board, and the Executive Board itself, which carries out day-to-day business. As at 31 December 2023, the company's Supervisory and Executive Boards stand as follows:

Supervisory Board

The Supervisory Board of Clearstream Banking AG stands as follows: Stephan Leithner (Chairperson), Oliver Engels (Vice-Chairperson), Peter Gomber, Christina Bannier, Peter Eck, Norfried Stumpf.

Executive Board

The Executive Board of Clearstream Banking AG stands as follows: Stephanie Eckermann (Chief Executive Officer), Martina Gruber, Udo Henkelmann, Dirk Loscher, Volker Riebesell.

List of publicly available sources

General website	www.clearstream.com
General Terms and Conditions	https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/general-terms-and-conditions
Client Handbook(s)	https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/client-handbook https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-oneclearstream/client-handbook https://www.clearstream.com/clearstream-en/keydocuments-1-/icsd-1-/client-handbook
Fee Schedule	https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/fee-schedule
Pillar III	https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/pillar-iii-disclosure-report/pillar-iii-disclosure-report-1278114
Information about governance	https://www.clearstream.com/clearstream-en/about-clearstream/company-governance
Association of Global Custodians disclosure	https://www.clearstream.com/clearstream-en/about-clearstream/due-diligence/agcquestionnaire
Information on remuneration	https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/remuneration-information
Annual accounts	https://www.clearstream.com/clearstream-en/about-clearstream/reports-and-ratings/annual-reports
Cash Timings Matrix	https://www.clearstream.com/clearstream-en/securities-services/asset-types/cash/cash-timings-matrix-1290324
Market Coverage section	https://www.clearstream.com/clearstream-en/securities-services/market-coverage
Default Management Process	https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/clearstream-default-management
Becoming a Clearstream client, Client Access and Acceptance Policy	https://www.clearstream.com/clearstream-en/about-clearstream/becoming-a-clearstream-client
List of depositories	https://www.clearstream.com/clearstream-en/securities-services/market-coverage/sub-custodian-listings-1291442
CSDR Article 38 disclosure document	https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/csdr-article-38-disclosure
Gender Diversity Policy	https://www.clearstream.com/clearstream-en/about-clearstream/company-governance/gender-diversity

List of abbreviations

This list is intended for information purposes only and is designed to help readers to understand the terminology used by CBF in this document. In some cases, the way in which the terms are used in CBF may differ from how the terms may be applied in another context. The descriptions given are not to be considered as legally binding definitions of the terminology used. CBF gratefully acknowledges that some definitions given here are based on those used by the Group of Thirty, the International Society of Securities Administrators (ISSA), the European Central Bank (ECB) and in other market publications.

Abbreviation	Explanation
AMA	Advanced measurement approach; one of four options under the Basel II framework that banks can use to calculate regulatory capital for operational risk. The AMA is based on internal models using internal risk variables and profiles, and not on exposure proxies such as gross income. Only risk-sensitive approach for operational risk allowed and described in Basel II.
AMI-SeCo	Advisory Group on Market Infrastructures for Securities and Collateral; group that counsels the Eurosystem on issues related to the clearing and settlement of securities and to collateral management. The advisory group is composed of market participants (banks active in the EU, CCPs, CSDs and national central banks) and chaired by the ECB.
AFME	Association for Financial Markets in Europe
AML	Anti-money laundering
ARM	Asset Reevaluation Manager; function within Clearstream's SSS to perform collateral reevaluation in predefined cases (market price fluctuation, redemption, security reference data change).
BaFin	Bundesanstalt für Finanzdienstleistungsaufsicht (German Federal Financial Supervisory Authority); located in Bonn and Frankfurt/Main, BaFin supervises banks and financial services providers, insurers and securities trading.
BAIT	Bankaufsichtliche Anforderungen an die IT: Banking prudential requirements for IT; BaFin circular, which, on the basis of the KWG, provides a framework for the technical and organisational equipment of credit and financial services institutions in Germany and, in particular, for the management of IT resources and IT risks.
BCM	Business continuity management; all of the organisational, technical and staffing measures employed in order to ensure continuation of core business activities in the immediate aftermath of a crisis; and gradually ensure the continued operation of all business activities in the event of sustained and severe disruption.
BIA	Business impact assessment
BRA	Business requirements analysis
BRRD	Bank Recovery and Resolution Recovery Directive; Directive 2014/59/EU of the European Parliament and of the Council establishing a harmonised framework for the recovery and

Abbreviation	Explanation
	resolution of credit institutions and investment firms; amended by Directive 2019/879 (BBRD II).
CAAP	Client and Access Acceptance Policy; set up by Clearstream in accordance with the requirements of the CSDR and DR (EU) 2017/392 to support the management of access to the company's SSS. The policy explains the approach adopted by CBL, CBF and LuxCSD to comply with the aforementioned requirements and provides guidance for the analysis and subsequent actions to be taken in order to identify, measure, monitor, manage and enable reporting on the risks incurred by CBF, CBL and LuxCSD and/or their participants and other clients.
CBF	Clearstream Banking AG, Frankfurt
CBL	Clearstream Banking S.A., Luxembourg
CCB	Cash correspondent bank; a bank appointed by CBL, as its agent, to handle external receipt and payment of funds in a specified currency.
CCO	Chief Compliance Officer
CCP	Central counterparty; an entity that interposes itself, in one or more markets, between the counterparties to the contracts traded, becoming the buyer to every seller and the seller to every buyer and thereby guaranteeing the performance of open contracts.
CDM	Clearstream Default Management; unit within the Clearstream group that maintains and continuously improves the default management process in order to prepare for a crisis situation in the most efficient manner.
CeBM	Central bank money; liabilities of a central bank, in the form of either banknotes or bank deposits held at a central bank, which can be used for settlement purposes.
CEO	Chief Executive Officer
CERT	Computer Emergency Response Team; central unit at Deutsche Börse Group for all cyber situational analysis (pro-active, detective and forensic). This includes information security (IS) incident management, IS monitoring, threat and vulnerability management and internet watch to identify new vulnerabilities.
CISO	Chief Information Security Officer
CoBM	Commercial bank money; commercial bank liabilities that take the form of deposits held at a commercial bank which can be used for settlement purposes.
CRC	Clearstream Risk Committee; internal committee at the Clearstream group that steers risk, compliance and cybersecurity matters in order to foster an effective first line of defence across all Clearstream legal entities. The CRC plays an important role in identifying, mitigating and monitoring the company's risk exposures.

Abbreviation	Explanation
CRD	Capital Requirements Directive; Directive 2013/36/EU of the European Parliament and of the Council on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms. The CRR II/CRD V package transposes the global standards on bank capital (the Basel III agreement) into EU law.
CRR	Capital Requirements Regulation; Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012. The CRR II/CRD V package transposes the global standards on bank capital (the Basel III agreement) into EU law.
CSD	Central securities depository; an entity that enables securities transactions to be processed and settled by book entry, provides custody services (for instance, the administration of corporate actions and redemptions), and plays an active role in ensuring the integrity of securities issues. Securities can be held in a physical (but immobilised) form or in a dematerialised form (that is, as electronic records).
CSDR	Central Securities Depository Regulation; Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories.
CSSF	Commission de Surveillance du Secteur Financier
DCA	Dedicated cash account
DCP	Direct connected participant
DDV	Due diligence visit
DepotG	Depotgesetz, German Securities Deposit Act
DR 2017/392	Commission Delegated Regulation (EU) 2017/392 of 11 November 2016 supplementing Regulation (EU) No 909/2014 of the European Parliament and of the Council with regard to regulatory technical standards on authorisation, supervisory and operational requirements for central securities depositories
DvP	Delivery versus payment; the irrevocable exchange of securities (the delivery) and cash value (the payment) to settle a transaction. True DvP involves the simultaneous exchange of securities and cash, as in the case of transactions between CBF counterparties.
EaR	Earnings at risk
EBA	European Banking Authority; based in Paris, has the aim of creating a common legal framework for the national banking supervisory authorities in the EU. Like ESMA and the European Insurance and Occupational Pensions Authority (EIOPA), EBA is part of the European System of Financial Supervision (ESFS).

Abbreviation	Explanation
EBITDA	Earnings before interest, tax, depreciation and amortisation
ECB	European Central Bank
ECSDA	European Central Securities Depositories Association
EPTF	European Post Trade Forum
ESMA	European Securities and Markets Authority; based in Paris, ESMA aims to create a uniform legal framework for the national supervisory authorities in the EU. It is one of the European Supervisory Authorities established on 1 January 2011, alongside EBA and the European Insurance and Occupational Pensions Authority (EIOPA).
EWI	Early warning indicator; parameter monitored within Clearstream to identify triggers or events, which could potentially change the credit standing of a participant and as such jeopardise the fulfilment of contractual obligations to Clearstream (i.e. scheduled repayment obligations) or even lead to default of a participant.
FATCA	U.S. Foreign Account Tax Compliance Act
FATF	Financial Action Task Force; inter-governmental body based in Paris. The FATF sets international standards that aim to prevent money laundering and terrorist financing activities and to ensure national authorities can effectively go after illicit funds linked to drugs trafficking, the illicit arms trade, cyber fraud and other serious crimes. More than 200 countries and jurisdictions have committed to implement the FATF's standards.
FMI	Financial market infrastructure; a multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling or recording payments, securities, derivatives or other financial transactions. Examples: central counterparty (CCP), central securities depository (CSD), clearing house, payment system, securities settlement system (SSS), trade repository (TR).
FX	Foreign exchange
GRM	Group Risk Management; central function at Deutsche Börse Group.
GTC	General Terms and Conditions
HQLA	High-quality liquid asset
ICAAP	Internal capital adequacy assessment process
ICMA	International Capital Market Association; created in July 2005 by the merger of the International Securities Market Association (ISMA) and the International Primary Market Association (IPMA). ICMA is an organisation with a broad franchise across the primary and secondary international capital market. This association has the mandate and the means to represent the interests of the investment

Abbreviation	Explanation
	banking industry in maintaining and developing an efficient and cost effective international market for capital.
ICMSA	International Capital Market Services Association
ICP	Indirect connected participant
ICS	Individual client segregation
ICSD	International securities depository
ISLA	International Securities Lending Association
ISMA	See ICMA
IS	Information security
ISF	Information security framework
ISO	International Organisation for Standardisation; international federation of standardisation bodies for various industries that seeks to set common international standards in a variety of fields.
ISSA	International Securities Services Association
KfW	Kreditanstalt für Wiederaufbau. Promotional bank based in Frankfurt/Main, committed to improve living conditions in Germany and across the globe on behalf of the Federal Republic of Germany and the federal states. To achieve this, KfW grants favourable loans within the framework of the German government's promotional programmes for individuals, start-ups and SMEs as well as for environmental protection and development cooperation.
KPI	Key performance indicator
KRI	Key risk indicator
KWG	Kreditwesengesetz, German Banking Act
KYC	Know your customer
MaRisk	Mindestanforderungen an das Risikomanagement; administrative instructions from BaFin for the structuring of risk management in German credit institutions.
MCP	Material change process; methodology implemented at Deutsche Börse Group to ensure analysis of risks associated with material changes, risk mitigating measures being derived in terms of systems and processes. A robust control framework needs to be carried out and documented accordingly before business is commenced in new products, product variants, product combinations, new distribution channels or go to market activities or before specific changes to the business model and setup become effective.
MCWG	Material Change Working Group
MIS	Management information system

Abbreviation	Explanation
MMR	Market member readiness
MREL	Minimum requirement for own funds and eligible liabilities; set by the NRAs in the EU Member States to ensure that a bank established in the EU maintains at all times sufficient eligible instruments to facilitate the implementation of the preferred resolution strategy according to the Bank Recovery and Resolution Directive (BRRD).
NAV	Net asset value
NM	Network Management; business area of the Clearstream group that is responsible for developing and maintaining relationships and services with CBF's network of suppliers, such as agents, CSDs, central banks or market infrastructures.
NRA	National Resolution Authority
OCS	Omnibus client segregation
PFMI	Principles for Financial Market Infrastructures
PM	Position Management; central Clearstream application managing settlement instruction lifecycle data.
QLR	Qualifying liquidity resource
RfI	Request for information
RfP	Request for proposal
RoPs	Rules of procedure
RTGS	Real-time gross settlement; processing and settlement on a transaction-by-transaction basis in real time.
RTO	Recovery time objective
RTS	Regulatory technical standard
SCV	Security collateral value
SFD	Settlement Finality Directive; Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems, amended by Directive 2009/44/EC of the European Parliament and of the Council of 6 May 2009 and by Directive 2010/78/EU of the European Parliament and of the Council of 24 November 2010
SLA	Service level agreement
SMS	Security management system
SRD II	Shareholder Rights Directive II; Directive (EU) 2017/828 of the European Parliament and of the Council of 17 May 2017 amending Directive 2007/36/EC as regards the encouragement of long-term shareholder engagement

Abbreviation	Explanation
SSS	Securities settlement system; a system which allows the transfer of securities, either free of payment (FoP) or against payment (DvP).
STP	Straight-through processing; the swift, safe and efficient processing of a securities transaction, from order placement to delivery versus payment (DvP) and to the subsequent safe custody of the securities.
Swift	Society for Worldwide Inter-Financial Telecommunications
T2	Third-generation TARGET system that settles payments in euro in CeBM; based on a single IT platform, to which all payment orders are submitted for processing; legally structured as a multiplicity of RTGS systems (TARGET = Trans-European Automated Real-time Gross Settlement Express Transfer System).
T2S	TARGET2-Securities; the Eurosystem's single technical platform enabling CSDs and national central banks to provide core, border-less and neutral securities settlement services in CeBM in Europe.
TA	Transfer agent; the agent appointed by an investment fund to process investment fund orders and perform ancillary services.
U2A	User to application
UCoD	Unauthorised creation and or deletion of securities
VaR	Value at Risk; quantifies the risks to which a company is exposed. It indicates the maximum cumulative loss that CBF could face if certain independent loss events materialise over a specific time horizon for a given probability. CBF's models are based, in line with the Basel framework, on a one-year time horizon.
VPN	Virtual private network

Principle 1: Legal basis

An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

Key consideration 1

The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.

Material aspects of CBF's activities and relevant jurisdictions

CBF is a Central Securities Depository ("CSD") with registered seat in Frankfurt/Main, Germany and as such authorised by Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin, German Federal Financial Supervisory Authority) under Articles 16 and 54 of Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories ("CSDR").

As an authorised CSD, CBF offers:

- Core CSD services, such as the settlement of transactions in domestic and foreign securities (free of payment or against payment, ensuring that cash and securities are promptly, effectively and concurrently delivered between the parties involved), notary services (initial recording of securities in a book-entry system) as well as central maintenance services (providing and maintaining securities accounts at the top-tier level);
- Ancillary services (non-banking and banking) supporting the core activities of CBF, such as, among others, supporting the processing of corporate actions (for example, in relation to the distribution of dividends and interest payments, share splits, spin-offs) and collateral management.

To provide the services described above in line with CSDR, CBF is authorised and regulated as a credit institution according to the provisions of the Kreditwesengesetz (KWG, German Banking Act). Accordingly, CBF is subject to banking supervision, which is carried out by BaFin in close cooperation with Deutsche Bundesbank (German central bank). The latter also has an oversight responsibility for CBF as operator of a securities settlement system ("SSS"). In addition, CBF acts as a central registrar in the meaning of the Gesetz über elektronische Wertpapiere (eWpG, German Electronic Securities Act).

The existing authorisations for CBF's activities are described in the database of companies of BaFin, accessible via the BaFin website. In addition, details on the services for which CBF has been granted authorisation pursuant to Articles 16 and 54 of CSDR is available in the ESMA register of CSDs.

Securities can be held in custody with CBF under the following main structures:

- Girosammelverwahrung (collective safe custody, CSC): CSC is governed by the Depotgesetz (DepotG, German Securities Deposit Act). Currently, CBF is the only national CSD for the German market providing a CSC holding structure. Under German law, holders of securities held in CSC are granted a proprietary right to those securities (a "right in rem") being a pro rata co-ownership right in a fungible pool of securities represented by a global note or a similar number of definite securities held by CBF in its vaults in accordance with section 5 (1) DepotG. Furthermore, there are certain types of securities which can be represented in a dematerialised form via an entry in a central register (electronic securities in accordance with the eWpG) as well as Bundesanleihen (German federal government bonds) and Länderanleihen (German state bonds, that is, bonds issued by the German federal states) held by entry in the respective debt registers of the Federal Republic or State. Equivalent rights are granted under German law for such securities which CBF holds via a cross-border CSD link with a foreign CSD based on an account relationship in accordance with section 5 (4) DepotG. For further details on CSC see Principle 11.

- Lagerstellenverwahrung (vaults services for third parties): for example, insourcing of depository function from custodian banks.

- Streifbandverwahrung (individual safe custody): Jacket custody of fungible and non-fungible securities certificates, where each participant is entitled to receive back the individual securities certificates with a particular serial number.

- Wertpapierrechnung (non-collective safe custody, NCSC): NCSC applies to fungible securities kept abroad. The depository bank where the account is kept becomes the legal owner (acting as trustee) of the rights given to it under the legal system or by the market practice of the country of custody. The investor, as the account holder and beneficial owner, merely has a bilateral claim to the surrender of this legal title vis-à-vis its depository, under the law of obligations, and the rights of a beneficial owner to issue instructions to the trustee. CBF acts as the depository (intermediary) and keeps the positions in the form of book-entry credits on a fiduciary basis through CBL, which uses sub-custodians in various countries for purposes of custody.

Legal basis for the material aspects of CBF's activities

The main legal provisions relevant to the establishment and the operation of CBF as a CSD are given in the European Union's legal framework, more specifically in the Single Rulebook and related directives, regulations and circulars for the financial services sector. This set of harmonised EU prudential rules with regard to banking business and securities markets is crucial for CBF's operational business and strategic development. Against the backdrop of this overall EU framework, CBF is supervised by the German authorities in charge of the supervision of CSDs, banks and SSSs (BaFin and Deutsche Bundesbank).

According to CBF's activities as a CSD with a banking licence, the company's key legal basis consists of provisions pertaining to the rights of CBF's participants to the securities held in accounts with CBF. These comprise the following EU directives, regulations and German national laws, publicly available on the dedicated website of the European Union and the dedicated website of Bundesministerium der Justiz (German Federal Ministry of Justice), respectively:

- CSDR and related Commission Delegated Regulations (DRs);

- Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems (SFD), amended by Directive 2009/44/EC of the European Parliament and of the Council of 6 May 2009 and by Directive 2010/78/EU of the European Parliament and of the Council of 24 November 2010;

- Regulation (EU) No 575/2013 of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012, as amended (CRR);

- Aktiengesetz (AktG, German Stock Corporation Act) for general rules, including company law aspects as well as vindication, transfer of (co-)ownership, regular custody contracts, good faith acquisition, mandate and agency;

- Bundesschuldenwesengesetz (BschuWG, German Federal Government Debt Act) for the entry of a CSD into debt ledger equaling the existence of a pool of certificates (Wertpapiersammelbestand) and the respective acts of the federal states;

- Bürgerliches Gesetzbuch (BGB, German Civil Code);

- Depotgesetz (DepotG, German Securities Deposit Act) on the safe custody and acquisition of securities;

- Gesetz über elektronische Wertpapiere (eWpG, German Electronic Securities Act);
- Insolvenzordnung (German Insolvency Code) in relation to the segregation of assets in the case of CBF's insolvency;
- Kreditwesengesetz (KWG, German Banking Act);
- Sanierungs- und Abwicklungsgesetz (SAG, German Banking Resolution Act) including the default and resolution procedures;
- Schuldverschreibungsgesetz (SchVG, German Bond Act) in relation to restructuring of bonds.

The business relationships between CBF and its participants are subject to contractual rules applicable to each material aspect. These rules are set out in the material legal documentation of CBF and published on the Clearstream website:

1. General Terms and Conditions (GTC);
2. Special Conditions for Collateral Management;
3. Special Conditions for reporting and payment obligations following from the French Financial Transaction Tax and services provided by Clearstream Banking AG;
4. Special Conditions for the re-entry of internal instructions on CBF-i Accounts;
5. Special Conditions of Vestima Service of Clearstream Banking AG.

The GTC and the Special Conditions are accompanied by technical rules (including but not limited to the CBF Client Handbook) which contain a description of the services and the procedures and various technical aspects.

Furthermore, CBF publishes on its website announcements in relation to participant information and specific services on a regular basis.

When becoming a participant of CBF, the relevant participant has to accept CBF's GTC.

CBF will notify its participants in writing, via email and on its website of any changes in relation to the GTC and the effective date thereof. Unless the participant informs CBF in writing of any objection within six weeks after the modification has been communicated to him, the participant will be deemed to have accepted such amendments.

For other CBF contracts and documentation entered into by the participant, amendments follow the procedures agreed by the participant and CBF therein.

In principle, these documents are governed and shall be interpreted by German Law and any disputes arising in relation to them shall be submitted to the competent courts of Germany (see, for instance, the GTC).

Key consideration 2

An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.

CBF has set up clear and understandable rules, procedures and contracts in accordance with Article 43 of CSDR. This set of documentation consists of general governing documents published on the Clearstream website (see list in key consideration 1) and specific contracts that are available to participants on an ad hoc basis.

In order to ensure that the said documentation remains consistent with relevant laws and regulations, the company reviews it on a regular basis and on an ad hoc basis, in particular when:

(i) An update of a key law or regulation applicable to the financial services industry is relevant for CBF and/or its participants;
(ii) The implementation of remedial measures is needed due to a claim affecting a participant or caused by a provision of the governing documents;
(iii) Typos or inconsistencies are detected in the governing documents and/or specific agreements;
(iv) A change of laws or regulations in the local markets shall be reflected;
(v) A court order or a decision from a regulator is taken in favour of the clarification of certain provisions of the governing documents;
(vi) There is a global enhancement of CBF's technical system (such as change of deadlines);
(vii) There are changes of the professional standards (for instance, at the level of the ECSDA) to be reflected in the governing documents and/or the specific agreements;
(viii) Major projects need to be implemented;
(ix) Any other events occur that the control functions (Audit, Risk, Compliance) and/or the legal department consider as essential to be incorporated in the participant documentation.

The reviews are carried out by CBF's control functions teams and the legal department. In addition, the company involves, whenever appropriate, independent external legal counsels to assist in the review and drafting, where needed.

Key consideration 3

An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way

The legal aspects of CBF's settlement services are notably included in the contractual documentation to reflect the principle of finality of the transfer orders in the meaning of the Settlement Finality Directive (SFD). They are also articulated in the CSD link and Links Agreement assessments that are conducted with the support of external local law firms to address any potential risk of conflict of laws and mitigate them by adapting CBF's documentation or its operational process.

In addition, CBF maintains an inventory of the laws and regulations, as well as the main rules relevant for the material aspects of its activities and main business areas in the various markets to ensure proper articulation with the applicable legal framework. This inventory is set up and reviewed at least on an annual basis by the compliance function.

Please also refer to key consideration 2 with regard to disclosures to participants and, where relevant, participants' clients. CBF articulates the legal basis for material aspects of its activities by using well-reasoned legal opinions or analyses, carried out – where reasonably required – with the support of independent law firms of good reputation.

Key consideration 4

An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.

Enforceability of rules, procedures and contracts

As described under key consideration 1, CBF's rules, procedures and contracts are in principle governed by German law. However, there are also foreign law aspects relevant for CBF's services. As part of the internal and, where needed, external reviews of CBF's rules, procedures and contracts, attention is paid on their enforceability in all relevant jurisdictions. The legal relationship between CBF and its participants is a crucial aspect of these reviews, including the situation of the default of a participant (default to be read within the meaning of Article 2 par. 1 (26) of CSDR).

In general, foreign jurisdictions are applicable to custody and settlement of securities held by CBF via a CSD link or via a sub-custodian link. The settlement and custody rules governing such securities are determined by the specific market rules of the foreign CSD/sub-custodian, which are described in the relevant Market Link Guides on the Clearstream website.

To ensure enforceability of said documentation in all relevant jurisdictions, CBF has implemented the following measures:

— Legal opinions are requested annually from independent law firms of good reputation to support the assessment and the review of the CSD links and, via CBL, the sub-custodian links in order to cover, among others, the following main topics:

  (i) Validity and enforceability of the relevant link agreement;
  (ii) Description of the nature of entitlement (i.e. detailing the rights and interest of CBF in respect of the financial instruments sub-deposited);
  (iii) Liability questions;
  (iv) No lien, right of redemption etc. in relation to client assets other than for such claims as may arise from the purchase, administration or safe custody of these securities;
  (v) asset segregation;
  (vi) No upper-tier attachment;
  (vii) Description of the relevant settlement finality rules;
  (viii) Description of the relevant insolvency law proceedings.

— In addition, CBF requires from its contractual CSDs/depositories/agents information on any pertinent changes in domestic laws and regulations pertaining to securities, cash, exchange controls or tax issues.

— A three-point declaration of the relevant CSDs/depositories/agents, where applicable and required under German law, is requested for each link. Under such three-point declaration, the CSDs/depositories/agents) acknowledge that the securities held within the account of CBF are client assets and that no liens of the depository other than for fees as may arise from purchase, administration and safe custody of these securities may be asserted with respect to such securities.

Reversals or stays with respect to actions of CBF under its rules, procedures or contracts, other than the contractual right of CBF according to its relevant key documents not to execute or carry out specific actions which would be in violation of laws, regulations or, in case of violation of the counterparty of the relevant agreement between CBF and the relevant counterparty, could, subject to the rules on finality of settlement, potentially result from the default of a counterparty (such as in the case of insolvency/liquidation) or from court order.

Degree of certainty for rules and procedures

CBF aims at a high degree of certainty for the validity and enforceability of its rules and procedures. In order to ensure that the actions taken by CBF under its contractual documentation will not be voided, the company carries out legal reviews and assessments on a regular and an ad hoc basis.

Regarding transactions of the participants, a high degree of certainty is achieved by the recognition of the finality of the settlement whereby transactions having reached the moment of irrevocability and finality cannot be revoked, respectively unilaterally (when the moment of irrevocability is reached) or by any third party (when the moment of finality is reached).

Key consideration 5

An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.

As outlined in key considerations 1 and 4, the legal relationship between CBF and its participants is governed by German law. This includes CBF's governing documents such as the company's GTC which cover, but are not limited to, the following aspects: the entitlement of CBF's participants, the finality, CBF's liability, the deposit and registration in book-entry of securities, the creation and enforcement of collateral, CBF's insolvency and default procedures.

Third country laws and regulations become relevant to custody and settlement of securities held via a CSD link or via a sub-custodian link. CBF's documentation governing its activities clearly outlines the law that is intended to apply to each aspect of its operations. When CBF concludes contracts that are not governed by German law, the contractual documentation is reviewed internally and submitted to the assessment of an external/local law firm qualified in the relevant jurisdiction to provide comments and issue legal opinions covering, among other things, the validity of the choice of the law and jurisdiction and the identification of potential conflicts of laws.

Should despite all precautions ensured by CBF in its contractual documentation a dispute regarding conflict of laws arise, such dispute would generally be handled by the CBF's legal department who may obtain certainty via a reasoned and independent legal opinion and analysis.

Principle 2: Governance

An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.

Key consideration 1

An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.

Pursuant to the Articles of Incorporation of Clearstream Banking AG (CBF), the "Articles", the main objective of the company is the operation of:

— A securities clearing and deposit bank and the performing of all tasks relating to this, including data and information transfer between shareholders, institutions and issuers as well as the provision of appropriate systems;

— A central accountancy and clearing office in order to facilitate the international securities clearing system;

— A system for collateral provision and management (collateral management).

As a market infrastructure provider, Deutsche Börse Group considers its primary responsibility to ensure the transparency of capital markets. Thus, it fosters stability in these markets, promoting their economic success. CBF, as an integral part of Deutsche Börse Group, aims to ensure the highest standards of safety for participant assets, with a strong focus on risk management.

The tasks and responsibilities of CBF's Executive Board design and establish the business strategy, the risk strategy, the strategy regarding capital adequacy and liquidity, as well as the guiding principles governing the organisational and operational structure including IT (technology) and internal communications processes, the internal control, compliance and risk management mechanisms, the professional conduct and corporate values, including escalation procedures, the central administration, including administrative, accounting and IT organisation, outsourcing, the management of continuing activities and crisis events and the appointment and replacement of persons holding key functions.

CBF' internal control system (ICS) is a fundamental component of the overall risk management culture and of corporate governance. It consists of safeguards and controls embedded in the organisational structure, in particular within the business processes, to ensure that business processes and activities run in an orderly fashion and minimise risks. In accordance with the ICS approach, the duties of the Executive Board of CBF comprise, among other things, analysing and assessing the risk of the business processes, implementing adequate safeguards and controls within these processes, monitoring the application of said safeguards and controls, reporting promptly if material shortcomings in the ICS have been identified and ensuring awareness of the employees regarding the ICS.

A high emphasis is placed on the elimination or minimisation of risk, as also described in detail in the Pillar III report, published and available to participants on the Clearstream website.

As a neutral FMI, CBF contributes to enhancing the safety, efficiency and transparency of the securities markets, safeguard financial markets and give market participants confidence that securities transactions are executed properly and in a timely manner, also during periods of extreme stress. Thus, CBF ensures the continuation of market stability.

CBF is well positioned to capitalise on rapidly changing market conditions thanks to the strength of its franchise and its underlying operating model. Deutsche Börse Group's "Horizon 2026" mid-term growth strategy aims at preserving the strong momentum with an ambitious investment programme that leverages CBF's scale and capabilities. Transition to digital infrastructure, new service and data consumption models and further automation have been identified as key market trends. Future growth is expected to be fueled by new custody mandates, increased demand in collateral management services and scale-up of data and connectivity services. CBF's strategy rests on the following four key strategic development vectors:

— Strengthen investor CSD model in all TARGET2-Securities (T2S) markets;

— Consolidate volumes with "Platform as a Service" model;

— Build-out of data and connectivity solutions.

A key element of the strategy is represented by the development and commercial scaling of the digital environment, D7®. The initial phase focuses on new issues, with the goal of increasing the share of electronic issuance on the German market to take advantage of the eWpG legislation and position CBF at the forefront of digital innovation. The second key play consists in expanding collateral management and investment fund services.

In parallel, CBF will continue to invest in its core custody business. Network expansion, asset servicing enhancements, paperless onboarding and API-based connectivity will increase safety and further strengthen the value proposition for participants. The new investment programme will foster CBF's position as a vital element in the European market infrastructure landscape and enable the continued delivery of efficiency and stability to all market participants.

CBF provides a comprehensive range of services, designed specifically to maximise settlement opportunities while minimising delays. The company's secure, straight-through processing is efficient and near risk-free.

In order to meet the objectives of sustainable growth and market leadership, the Clearstream group strives to improve its proximity to the markets in its network. Improving market proximity means establishing closer strategic partnerships with local agents for asset servicing. This will ensure that the service offering continues to meet the highest industry standards in terms of reliability, quality and efficiency of services.

Key consideration 2

An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.

Governance arrangements

The mandatory board structure of a German stock corporation (Aktiengesellschaft, AG) like CBF is the two-tier system: It is composed of an Executive Board and a Supervisory Board. The Executive Board is the corporate body managing and representing CBF in accordance with section 76 of the Aktiengesetz (AktG, German Stock Corporation Act). The Supervisory Board is supervising and advising the Executive Board in accordance with section 111 of the AktG.

As a public limited liability company, the general principles as set out in the AktG are applicable. Control over the company is exercised by the shareholder(s) in the General Meeting, the roles and the responsibilities of the Executive Board and the Supervisory Board are defined by the AktG, the Articles of Incorporation and the Rules of Procedure for the respective bodies.

General Meeting

The General Meeting is the most significant body of the stock corporation. It appoints the Supervisory Board, ratifies the acts of the Executive and Supervisory Board members and passes resolutions on all fundamental issues.

The Articles of CBF do not expressly reserve specific power to the General Meeting of the shareholders other than the powers set out by the law in sections 119 et. seq. of the AktG. Shareholders may exercise the membership rights that result from holding shares in the General Meeting. CBF has only one shareholder and is therefore wholly-owned. The rights of the General Meeting are listed in section 119 of the AktG. The General Meeting may decide on:

— Appointment (and removal) of Supervisory Board members (unless they are elected by the employees; for CBF, one third of the Supervisory Board members must be elected by the employees due to the One-Third-Participation Act);

— Appropriation of the net income;

— Ratification of the acts of the members of the Executive Board and of the Supervisory Board;

— Appointment of the auditor;

— Fundamental measures, for example, the amendment of the Articles of Incorporation , capital increases or decreases and the approval of the conclusion of intercompany agreements (control and/or profit and loss transfer agreements) and transformations (mergers, spin-offs etc.).

The annual financial statements are prepared by the Executive Board and must be approved by the Supervisory Board. The adopted and approved annual financial statements are then presented to the Annual General Meeting, but a formal approval by the shareholders is usually not required.

Finally, the sole shareholder takes note of the report on the remuneration of the members of the Executive Board, which the chairperson of the Supervisory Board submits for information. The sole shareholder also notes that the Supervisory Board appointed an external auditor for the respective financial year.

In addition, Deutsche Börse AG and CBF entered into a domination agreement according to which Deutsche Börse AG is authorised to issue instructions to the Executive Board of CBF regarding CBF's management, except where the execution of such instructions would cause CBF or its corporate bodies to breach the obligations imposed on them under the KWG (German Banking Act) and its ancillary provisions.

Supervisory Board

Supervisory Board members are elected by the General Meeting for a term of office ending at the closing of the General Meeting which votes on the approval for the fourth fiscal year after the commencement of the term of office. It consists of six members and is bound to advise and supervise the Executive Board while strictly maintaining business information confidential (chapter 9 (1) of the Articles of CBF).

The Supervisory Board has – inter alia – the following tasks:

— Appointment of the members of the Executive Board pursuant to section 84 of the AktG;

— Decision on which of the Executive Board's transactions need previous Supervisory Board consent without violating the Executive Board's representation rights concerning business correspondence (chapter 9 (2) of the articles of CBF).

The Rules of Procedure ("RoPs") of the Supervisory Board set out the procedures for its functioning, including the procedures to identify, address and manage conflicts of interest.

Processes for ensuring performance accountability are defined in the RoPs but also in other internal policies such as the Policy on Conflicts of Interest and the Business Continuity Management Policy. Furthermore, the design of the risk management and internal controls are defined in the corresponding risk management, internal audit and compliance policies/charters in order to provide clear and direct lines of responsibilities and accountability for key functions.

Executive Board

The members of the Executive Board are appointed by the Supervisory Board for a term no longer than five years. They conduct the business of the company in accordance with the applicable law, in particular the AktG, the Kreditwesengesetz (KWG, German Banking Act), relevant EU Regulations and EU Directives – notably the European Central Securities Depositories Regulation (CSDR) –, the Articles of Incorporation of the company, the RoPs, the schedule of responsibilities and their service contracts as well as applicable policies, in particular the Conflicts of Interest Policy.

The Executive Board manages and represents CBF, designs and establishes CBF's business strategy, the risk strategy and the strategy regarding capital adequacy and liquidity. It determines and co-ordinates the various departments of CBF. The Executive Board reports to the Supervisory Board.

Processes for ensuring performance accountability are defined in the RoPs but also in other internal policies such as the Policy on Conflicts of Interest, and the Business Continuity Management Policy. Furthermore, the design of the risk management and internal controls are defined in the corresponding risk management, internal audit and compliance policies/charters in order to provide clear and direct lines of responsibilities and accountability for key functions.

Committees

In line with CSDR, CBF has set up the following committees: Audit Committee, Risk Committee, Remuneration Committee. The members as well as tasks and responsibilities of the committees are described on the Clearstream website.

In addition, CBF established two User Committees pursuant to Article 28 of CSDR in order to advise the Executive Board of CBF (see key consideration 7 for details).

Disclosure of governance arrangements

CBF discloses information about its governance structure publicly in the Company Governance section of its website.

In addition, CBF also publishes a link to its banking licence on its website.

Additional information related to governance provided to the public in the About Clearstream section includes, but is not limited to:

- Articles of Incorporation
- CBF's CPMI-IOSCO disclosure framework
- Remuneration information

Moreover, CBF publishes annually its Association of Global Custodians Questionnaire disclosure response on its website.

Key consideration 3

The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.

As set out in key consideration 2, the mandatory board structure of a German stock corporation such as CBF follows the two-tier system. The Executive Board is the corporate body managing and representing CBF, the Supervisory Board monitors and advises the Executive Board.

Roles and responsibilities of the boards

The Supervisory Board, which is appointed by the General Meeting, is bound to advise and supervise the Executive Board while strictly maintaining business confidential information. The Supervisory Board may choose which of the Executive Board's transactions needs their previous consent without violating the Executive Board's representation rights concerning business correspondence.

Processes for ensuring performance accountability are defined in the respective RoPs but also in other internal policies. Furthermore, the design of the risk management and internal controls are defined in the corresponding risk management, internal audit and compliance policies/charters, including a specific Conflict of Interest Policy, in order to provide clear and direct lines of responsibilities and accountability for key functions.

CBF is accountable to (i) its shareholder(s); (ii) the German authorities in accordance with the Kreditwesengesetz (KWG, German Banking Act) and relevant EU Regulations such as, in particular, the European Central Securities Depositories Regulation (CSDR) and (iii) its participants pursuant to the provisions of its General Term and Conditions (GTC).

A policy on conflicts of interest and principles on the management of conflict of interest have been established in order to ensure long-term awareness and the adequate conduct of individuals regarding the avoidance and, if not possible, the management of situations (potentially) creating any conflicts of interest. It aims to, inter alia, support the Executive and Supervisory Boards as well as employees in identifying and avoiding conflicts of interest and, where the latter is not possible, to show possibilities to manage (potential) conflicts of interest by establishing appropriate transparency and mitigating measures.

Any member of the Executive Board and Supervisory Board is bound to the corporate interest of the company. Each member of the boards must disclose conflicts of interest to the chairperson of the Supervisory Board and the chairperson of the Executive Board without delay and inform the other members of the Executive Board thereof. Adequate measures to prevent, limit or resolve conflicts of interest shall be taken in accordance with legal requirements and the applicable Conflicts of Interest Policy.

Review of performance

In order to be compliant with regulatory requirements, candidates and members of the Executive and Supervisory Boards individually and collectively, must run through a suitability assessment, which is initiated by the chairperson according to the provisions of the KWG and the respective Suitability Assessment Policy of the company.

The performance of the Supervisory Board of CBF is assessed each year at the time when the shareholder(s) approve(s) the annual financial statements of CBF and relief ("quitus") is granted to the directors. The assessment of the performance of the Supervisory Board of CBF is assessed every fifth year by an external third party, this was last performed in 2023.

Key consideration 4

The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).

As required for companies with a two-tier board structure, none of the members of the Supervisory Board of CBF has an executive function within CBF. In addition, one third of the members of the Supervisory Board, two members, are fully independent of the company in accordance with art. 27(2) CSDR. The chairpersons of the Audit Committee and Risk Committee are both independent members of the Supervisory Board.

CBF adopted the policy for the assessment of the suitability of members of the management bodies (Supervisory Board, Executive Board) and key function holders. The objective of the policy is to ensure that members of management bodies and key function holders of the affected companies are suitable in terms of reputation, honesty, and integrity, knowledge, skills, and experience time commitment and independence as stipulated in the joint ESMA and EBA guidelines on the assessment of the suitability of members of the management body and key function holders under Directives 2013/36/EU and 2014/65/ (EBA/GL/2017/12).

CBF organises appropriate quarterly trainings focusing on the requirements for Supervisory Board and Executive Board members and on their proposals made during the assessment of training requests.

Different means ensure that the long-term achievements of the institution's objectives are reflected in the remuneration:

1. The Clearstream group has a remuneration policy pursuant to CRD V which integrates CBF's risk appetite. The interests of investors are taken into consideration and remuneration systems are in line with the company's risk strategy.

   The payment of variable remunerations in CBF can be executed only if a certain number of performance criteria are met by the institution. As mentioned in the remuneration policy, the determination of the total amount of the variable remuneration: (i) "shall take due account of the risk-bearing capacity, the multi-year capital planning and the profitability of the Group and/or respectively Clearstream Banking AG", (ii) "must ensure the Group's and respectively Clearstream Banking AG's ability to maintain or recover appropriate own funds and liquidity and the combined capital buffer requirements in accordance with the German Banking Act (KWG)".
2. The remuneration structure and the pay-out schedule of variable remuneration for Executive Board members are aligned with sustainable and long-term performance (deferral mechanism and instruments ensure an incentivising of sustainable achievement of CBF's financial and non-financial objectives). No performance variable remuneration is guaranteed, and, under performance conditions, Executive Board members are eligible to receive a performance-based variable remuneration.

Key consideration 5

The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.

Roles and responsibilities of management

Please refer to the replies to key considerations 2, 3 and 4 as well as key consideration 6.

Experience, skills and integrity

A member of the Executive Board or the Supervisory Board must fulfil certain criteria. Inter alia, the person shall be of sufficiently good repute and shall have appropriate skills, knowledge and experience. In order to be compliant with regulatory requirements, candidates for and members of the Executive Board and the Supervisory Board individually and collectively, must run through an annual suitability assessment, which is initiated by the chairperson according to the provisions of the KWG and the respective Suitability Assessment Policy of the company but also on an ad hoc basis throughout the year when changes in the Executive Board or the Supervisory Board occur.

The departments of Executive Board members are defined in the schedule of responsibilities. Each Executive Board member has sole managerial authority within the framework of the department assigned to them by the schedule of responsibilities and the resolutions of the joint Executive Board. Without prejudice to the division of responsibilities, each Executive Board member is responsible for management as a whole.

Enactment, modification and revocation of the schedule of responsibilities requires unanimous resolution of the joint Executive Board. If a unanimous resolution does not pass, the chairman of the Executive Board must petition the Supervisory Board to regulate the assignment of duties.

The schedule of responsibilities must be announced to the Supervisory Board without delay following its definition.

Key consideration 6

The board should establish a clear, documented risk management framework that includes the FMI's risk tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk management and internal control functions have sufficient authority, independence, resources, and access to the board.

Risk management framework

Risk management is a fundamental component of the management and control of CBF. Effective and efficient risk management is vital to protect CBF's interests and it enables CBF to achieve its corporate goals and safeguard its presence. The board has established and documented a Clearstream risk strategy which sets out the overall risk strategy for Clearstream Holding AG and its subsidiaries, including CBF. The general risk management concept, describing the risk management framework in terms of processes, roles and responsibilities, is based on the Committee of Sponsoring Organisations of the Treadway Commission – Enterprise Risk Management (COSO ERM framework) and is defined in the Group Risk Management (GRM) Policy, which is applicable to CBF.

The overall objective of the risk management framework is to enable the Executive Board of CBF to monitor the company's overall risk profile, as well as specific material risks, so that developments that could jeopardise the interests of CBF can be identified at an early stage and suitable countermeasures deployed. This is achieved through periodic and ad hoc reporting on all significant risk developments to the Executive Board. The reporting procedures are further described in the handbooks for every risk type. Overall, risk management, acting independently from the business (first line of defence), has direct access to the board.

CBF has been included throughout the development of Deutsche Börse Group's Risk Taxonomy. The taxonomy distinguishes between five aggregated risk types:

— Operational Risk,

— Financial Risk,

— Business Risk,

— Pension Risk,

— Winding-down and Restructuring Risk.

Clearstream's risk strategy is based on its business strategy and sets limits specifying the maximum risk permitted for the above risk types as well as the company's overall risk. This is done by laying down respective requirements for risk management, control and limitation. CBF ensures that appropriate measures are taken to avoid, reduce, transfer, or intentionally accept, risk. Further details are described in Principle 3.

CBF's Risk Committee is responsible for advising the Supervisory Board on the CSD's overall current and future risk tolerance and strategy. Its tasks and responsibilities are to:

— Advise the Supervisory Board on the institution's overall current and future risk appetite, risk tolerance and risk strategy and assist the Supervisory Board in overseeing the implementation of that strategy;

— With the Audit Committee, submit proposals to the Executive Board about how the conditions applied to participants in accordance with the business model and the risk structure could be created;

— Examine whether incentives provided by the remuneration system take into consideration the risk, capital and liquidity structure of the institution, and the likelihood and timing of earnings. The tasks of the Remuneration Committee remain unaffected; and

— Review whether the conditions offered to participants take into account the institution's business model and risk structure. If this is not the case, the Risk Committee takes advice from external experts, if necessary. It determines type, comprehensiveness, format and frequency of information to be provided by the Executive Board with regard to strategy and risk.

Internal Audit is the independent third line of the organisation's risk management and internal controls framework. CBF has appointed a Chief Internal Auditor who provides senior management, the Executive Board, the Supervisory Board/Audit Committee, specific committees, and regulators with reasonable assurance of the adequacy and effectiveness of the company's framework of risk management, control and governance processes and for determining whether:

— Risks are adequately identified and mitigated by appropriate controls;

— Significant financial and operational information is accurate and reliable;

— Resources are efficiently used and adequately protected;

— The organisation is in compliance with internal policies and procedures, as well as applicable laws and regulations;

— Measures for the prevention and detection of fraudulent acts are effective.

The field of Internal Audit activities is oriented along the objectives of the organisation, ensuring that common standards of control are applied across all processes. It covers all activities of the organisation and, whenever applicable, activities outsourced to third parties. Internal Audit uses a risk-based approach in defining specific areas/processes of the organisation to audit. The scope and the assessment of the audit objects are regularly checked for completeness and contemporaneity. The Chief Internal Audit Officer has direct access to and reports directly to the Executive Board and the Supervisory Board/Audit Committee of CBF.

Key consideration 7

The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.

Identification and consideration of stakeholder interests

For the description of CBF's design and strategy, please refer to key consideration 1. For its rules, please refer to key consideration 4 of Principle 1.

CBF has a multifarious array of stakeholders, which can be broadly categorised into four groups as follows:

- Stakeholders to whom CBF provides a service, that is:
  - Issuers;
  - Issuer agents;
  - Participants;
  - Clients of participants;
  - (I)CSDs.
- Stakeholders who provide a service to CBF, that is:
  - Domestic CSDs;
  - Domestic depository banks, agent banks and common depositories;
  - Transfer Agents and Order Handling Agents;
  - CCBs;
  - (I)CSDs;
  - Connectivity providers such as Swift.
- Stakeholders involved in the formation of the legislative and regulatory framework in which the Clearstream group operates, that is:
  - Market associations;
  - National governments;
  - Supranational legislative bodies (such as the EU Commission);
  - CBF's regulators.

- Stakeholders with a direct influence on CBF's equity, that is:
  - Parent companies;
  - End investors.

Stakeholders to whom CBF provides a service

CBF regularly reviews its GTC and governing documents to reflect the changes in legislation or regulatory environment. Any amendment to the GTC and governing documents is communicated to all participants of CBF.

The Clearstream group assists issuers and issuer agents to make their securities eligible on its platform, by support and guidance either via direct contact or via the participation in market associations (ICMA, ICMSA, ISMAG etc.). Furthermore, Clearstream entities are members of working groups of these market associations which aim to promote standards and to define the guidelines for the industry.

CBF operates the securities settlement systems (SSS) CASCADE and Creation and offers services through both systems. Consequently, CBF established two User Committees. Pursuant to Article 28 of CSDR, these User Committees advise CBF's Executive Board on key arrangements that impact their members, including the criteria for accepting issuers or participants in the SSSs and on service level. In addition, the Committees may submit non-binding opinions to the Executive Board, containing detailed reasons regarding the pricing structures of the CASCADE and Creation SSSs.

The advice of the Committees shall be independent from any direct influence of the Executive Board.

The Executive Board may seek advice and recommendation from the User Committees with respect to matters which are of relevance for the business of the Company and its relationship with participants, in particular:

- Business and marketing strategy;
- Development of new products;
- General market trends and requirements.

The criteria that are relevant for the admissibility of a selected member to one of the User Committees are the following:

1. Must be a participant (account holder);
2. Must have a contractual relationship with CBF;
3. Representative of the largest transaction volumes and the highest percentages of market shares in assets under custody;
4. Representative of the largest transaction volumes and the highest percentages of market shares in settlement;
5. Representative of issuer and/or issuer agents of the largest issuing volumes of bonds;
6. Representative of issuer and/or issuer agents of the largest issuing volumes of certificates and warrants;
7. Representative of German banks and foreign investment banks.

CBF strives to achieve a balanced composition of representatives of both issuers and participants.

A description and the Terms of Reference of the User Committees are published on the Clearstream website.

Stakeholders who provide a service to CBF

Existing relationships with CSDs and/or depositories/agent banks, transfer agents (TAs), CCBs, Euroclear Bank and connectivity providers are reviewed on an ongoing basis. In addition to periodic visits according to defined schedules, CBF may also choose to visit a supplier at any time to review the relationship and ascertain that all governing documents remain relevant to the activities and regulations of the market or request that the supplier visits CBF's premises. The service level agreements with its suppliers are updated as and when necessary, and on average, this is done on an annual basis.

Institutions providing links to domestic markets abroad inform CBF of any changes to market practice and regulation in the market in question. Similarly, Clearstream's Network Management team informs such providers of upcoming changes to CBF's services, as well as working with them to develop new service offerings. Furthermore , a legal opinion per country is obtained on an annual basis.

Stakeholders involved in the formation of the legislative and regulatory framework in which the Clearstream group operates

Clearstream entities are represented in numerous market organisations globally:

— International Capital Markets Association (ICMA);

— European Repo and collateral Council (ERCC);

— International Securities Services Association (ISSA);

— International Capital Markets Services Association (ICMSA);

— International Securities Lending Association (ISLA);

— Securities Market Practice Group (SMPG);

— Society for Worldwide Interbank Financial Telecommunications (Swift);

— Association of National Numbering Agents (ANNA).

Within Europe, the Clearstream group plays a leading role in various working groups and associations at EU level:

— T2S Governance Bodies – CSD Steering Group;

— European Central Securities Depositories Association (ECSDA);

— ECB's Advisory Group on Market Infrastructure for Securities and Collateral (AMI-SeCo);

— ESMA's Post-Trading Working Group (PTWG).

On a national level, the Clearstream group maintains a strong network across several domestic markets and is particularly well represented in its home markets: Germany and Luxembourg. In Germany CBF is a member of the Bundesverband deutscher Banken e.V. (Federal Association of German Banks).

CBF covers roughly 50% of Eurozone settlement volumes, and Germany is the home market to Deutsche Bundesbank, one of the four European central banks driving the T2S infrastructure development; the Clearstream entities were the first major (I)CSD group to sign the Framework Agreement. In doing so, the Clearstream entities showed the way to the remaining CSDs and as such continue to contribute actively to the further enhancement of the pan-European settlement platform.

CBF additionally consults and obtains approval from its regulators before making significant changes to its design, rules and procedures.

Stakeholders with a direct influence on CBF's equity

Clearstream Holding AG is the sole shareholder of CBF. Thus, it assumes all powers conferred to the General Meeting of Shareholders (see key consideration 2). Clearstream Holding's decisions are recorded in a minutes register held at the registered office. Concerning the disclosure of major decisions made by CBF's Executive and Supervisory Boards to relevant stakeholders, that is, Clearstream Holding AG, receives extensive reporting on CBF activities.

CBF's Annual Accounts and Management Report are sent to its regulators and made available to its participants via the website.

Major decisions are clearly disclosed to relevant stakeholders and the public: Major changes to CBF's SSSs, its operations and its rules are usually communicated to participants via announcements before they are being integrated into the documentation (Key Documents), like General Terms and Conditions, the Client Handbook and other.

Principle 3: Framework for the comprehensive management of risks

An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.

Key consideration 1

An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk management frameworks should be subject to periodic review.

The Clearstream Risk Management function is responsible for developing risk strategies, policies, procedures and handbooks which enable the identification, measurement, monitoring and reporting of risks that arise in or are borne by the company. Clearstream Risk Management covers the three CSDs of Clearstream, being CBF, CBL and LuxCSD.

Risk management policies and procedures

Deutsche Börse Group's overarching Group Risk Management (GRM) Policy, as applicable to CBF, describes the enterprise-wide risk management concept, including the risk management framework in terms of processes, roles and responsibilities applicable to all staff and organisational units and levels. The Risk Management Process, as documented in the GRM Procedure, consists of the consecutive stages of identification, notification, assessment, treatment and monitoring/reporting of risks.

Deutsche Börse Group's Risk Taxonomy/Inventory, included within the GRM Procedure, provides the risk taxonomy applicable to CBF. The Risk Taxonomy/Inventory is a comprehensive and complete list of all the potential risk items that CBF may be exposed to due to its current and future business operations. The inventory comprises all the risks that CBF is aware of and includes the five aggregated key risk types outlined below.

CBF undertakes a consistent, regular, structured identification and assessment process of all risks the entity might be exposed to due to its business model and industry environment. In addition to the annual Group-wide risk inventory process, risk type specific risk items and drivers may be identified.

Risk types

CBF defines risk as a potential negative impact on its financial, revenue and liquidity situation. In line with Deutsche Börse Group's Risk Taxonomy, CBF differentiates between five aggregated risk types which are managed and controlled with distinct methods. The aggregated risk types are: operational risk, financial risk, business risk, pension risk, as well as winding-down and restructuring risk.

Operational risk

Operational risk encompasses all existing and newly arising risks in the context of the ongoing provision of services by CBF. In accordance with the Basel III framework, operational risk is defined as the risk of losses resulting from inadequate or defective systems and internal processes, from human or technical failure, from inadequate or defective external processes, from damage to physical assets as well as from legal risks that could arise from non- or inappropriate compliance with new or existing laws and regulations and all contractual commitments.

Operational risks that CBF does not want to run and that can be insured against at reasonable cost are transferred by closing insurance policies. All insurance policies are coordinated centrally for entire Deutsche Börse Group thereby ensuring the uniform risk-cost benefit insurance coverage. Operational risk is assessed as a major risk type within CBF.

Financial risk

CBF is exposed to financial risks in the form of credit, market, liquidity and intra-day credit risk. Exposure to the above-mentioned risks is mitigated through the existence of effective control measures.

Credit risk
Credit risk refers to the risk that a counterparty might default and is unable to meet its liabilities against CBF in parts or in full. CBF grants loans to its participants in order to increase the efficiency of securities settlement. However, these lending operations cannot be compared with those of other credit institutions. Firstly, the loans are extended solely on an extremely short-term basis. Secondly, they are extended solely for the purpose of increasing the efficiency of securities settlement. These loans are fully collateralised. Loans are only granted to creditworthy clients with very good credit ratings. Furthermore, credit lines granted are uncommitted and can be revoked at any time.

The creditworthiness of potential participants is assessed before entering into a business relationship. In addition, CBF establishes participant-specific credit lines on the basis of both regular reviews of the participant´s creditworthiness and ad hoc analyses as required.

Additional credit risk is associated with cash investments and cash holdings at cash correspondent banks (CCB) and at CBL. CBF reduces this risk by secured investing via collateralised overnight placements with CBL. CBF establishes credit limits based on annual credit assessments and ad hoc analyses as required. The creditworthiness of CBF's CCBs and counterparties is also assessed on an annual or, if necessary, ad hoc basis.

Market risk
Market risk is the risk of losses arising from holding assets and liabilities – on- or off-balance sheet – with different maturity dates, creating exposure to changes in the level of interest rates, foreign exchange rates or market prices. Market risk may arise in the form of interest rate risk (as a result of fluctuations in interest rates in connection with cash investments or borrowing), currency risk (in the operating business, when recognising net revenues denominated in foreign currencies or when holding positions in foreign currencies) and in the form of equity price risk.

CBF is exposed to interest rate risk in connection with cash investments. Interest rate risk is mitigated using a limit system that only permits maturity transformation to a small extent.

Liquidity risk
Liquidity risk is the risk of losses arising from the inability to meet payment obligations when they come due or without incurring excessive costs. CBF is exposed to liquidity risk in that it may lack sufficient liquidity for its intra-day cash operations or incur increased refinancing costs in the event of liquidity shortage. Daily and intra-day liquidity is monitored closely by the Treasury and Credit departments and managed with the help of a limit system. Sufficient credit lines and funding sources are available to provide cover in extreme situations. Further details on the robust framework to manage CBF's liquidity risk are described under Principle 7, key consideration 1.

Business risk

CBF's business risk is the loss (including losses arising from missed opportunities) arising from strategic decisions and/or their implementation, or from the inability to adapt to external factors. Business risk reflects the sensitivity to macroeconomic evolution and vulnerability to event risk arising from external threats, such as changes in the competitive, macroeconomic, regulatory or political environment or internal weaknesses (incl. erroneous strategic management decisions). It comprises, for example, threats from competition, a negative economic environment and other aspects, which lead to lower than projected revenues or higher than projected costs.

Unexpected loss due to deviations (positive or negative) from earnings before tax is calculated via earnings at risk. Business risk is reported, if the calculated Value at Risk is higher than the budgeted earnings before tax for the next four quarters. Business risk is considered material for CBF.

Pension risk

Pension risk is defined as the risk of losses due to increased costs from post-employment benefit plans based on non-market risk factors. CBF is exposed to Pension Risk by its pension debt obligations, primarily managed through a Contractual Trust Arrangement (CTA). Pension risk is quantitatively shown to be immaterial for CBF. However, pension risk is chosen to be managed as a material risk for CBF. This decision is mainly driven by the extra attention required due to ongoing stress inflation rates. Therefore, pension risk is considered as an immaterial risk in the risk profile, but processes are applied treating it as a material risk type.

Winding-down and restructuring risk

Winding-down and restructuring risk is the risk of losses due to insufficient capital held for an orderly winding-down or restructuring of operations and services, in the case where new capital cannot be raised.

This risk type is addressed by the capital requirements outlined by CSDR as well as comparable requirements laid out in BRRD for CRR institutions (MREL which targets financial and operational continuity). Winding-down and restructuring risk is considered material for CBF.

Risk management handbooks

The Operational Risk Handbook gives a comprehensive description of the objectives, overall approach and scope of operational risk management at Clearstream, considering that operational risk management is an essential component of management and controls of operations. The Handbook includes topics such as the definition of operational risk, operational risk categories for CBF's specific business and root causes, as well as the organisational structure, roles and responsibilities, operational risk instruments and methods used as well as the respective reporting.

Clearstream follows the Advanced Measurement Approach (AMA) for calculating the regulatory capital requirements for operational risk. The AMA requires internal loss data and model-based methods to calculate the regulatory capital requirements. CBF has established a comprehensive operational risk framework and a set of instruments meeting both the requirements from a regulatory and business perspective. The roles and responsibilities within operational risk management are assigned to the organisational units at a local level as well as to Clearstream Risk Management at a central level.

Clearstream Risk Management established an operational risk procedure that serves as a guide in addition to the Operational Risk Handbook, primarily for the business departments within the organisation. This procedure describes the approach and major instruments applied within the process of managing operational risks on a high level. Furthermore, it sets the internal standards regarding roles and responsibilities as well as the related duties of different legal entities within the Clearstream group.

Clearstream Risk Management also follows the Handbook Financial Risk. The main objective of this handbook is to provide a comprehensive description of the organisational structure, processes, models and methodologies that constitute CBF's financial risk approach. Financial risk comprises the risk of losses arising from the default of counterparties (credit risk), from holding assets and liabilities for on- and off-balance sheet items, for instance interest rate risk or currency rate risk (market risk), the risk of losses arising from the inability to meet all short- and long-term obligations resulting from on- and off-balance sheet liabilities (liquidity risk).

In addition, Clearstream Risk Management has established Business Risk Handbooks covering the scope of ICAAP and CSDR perspectives. The objective is to provide a detailed description of the approach and instruments applied within the framework of business risk management. The handbooks present detailed explanations of the framework, including different regulatory requirements and information on the functional organisation, such as governance. The descriptions of the model and validation process, as well as reporting responsibilities are also provided in the handbooks.

The risk management framework including the underlying policies, procedures and handbooks is subject to periodic reviews, at least annually.

Risk measurement

CBF has installed a standardised approach for measuring and reporting all operational, financial and business risks across its organisation: the concept of "Value at Risk" (VaR). The purpose is to allow the overall risk appetite to be expressed in a comprehensive and easily understandable way and to facilitate the prioritisation of risk management actions. Furthermore, risk reporting consolidates all risk measures across the company (operational, financial and business risks), except for liquidity risk, which is covered in the CBF's Liquidity Stress Testing Model.

The VaR quantifies the risks to which a company is exposed. It indicates the maximum cumulative loss that CBF could face if certain independent loss events materialise over a specific time horizon for a given probability. CBF's models are based, in line with the Basel II / III framework, on a one-year time horizon. Correlations between individual risk estimates are recognised when calculating the capital charge for operational risk. Between the individual risk types, the most conservative approach of a correlation of "1" is implemented.

CBF also performs VaR calculations in order to detect potential risk concentrations, as well as stress test calculations, which consider even more conservative model parameters than the regular VaR calculations.

The aim of CBF's risk management framework is to set adequate and comprehensive risk management standards to ensure the sustainability of its operations and thereby smooth and efficient market operations.

This framework ensures that CBF:

- can identify, measure, monitor, manage and report risks it may be exposed to, as well as ensuring it limits the risks its poses to others;
- applies appropriate risk control and monitoring measures to safeguard the integrity of financial markets and limit potential exposures and systemic risks.

CBF has put in place a wide range of internal control processes and procedures, including security, technical and operational organisational arrangements, as well as risk control measures, to ensure they protect both CBF and the interests of the external stakeholders, that is, its participants and their respective clients, the CSD links, CCPs, trading venues, payment systems, settlement banks, liquidity providers and investors.

Key consideration 2

An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.

CBF puts in place a range of internal control processes and procedures in order to ensure that participants and, where relevant, their clients properly manage and address the risks they pose to the CSD. CBF discloses to its participants extensive information in the respective documentation that allows them to assess the risks associated with the products and services CBF provides. The documentation describes the activities performed by the CSD and all related obligations, rights, termination clauses, liabilities, breaches, the default and technical specifications. CBF explicitly states the risks associated with each product or service it offers.

Key participants, identified according to ESMA RTS Article 67, are managed, monitored and reported and, in essence, are subject to enhanced due diligence measures for the assessment of their risk management capabilities, that means:

- Quarterly reviews on participant settlement transaction activities (driven by volumes and values of trades settled in CBF's SSSs) in order to generate key statistical information essential to identify and derive key participants;
- Additionally, the key participant lists are used by operational teams to map the participant causing operational incidents where relevant, further cementing CBF's view of the key participant risk exposures.

Please refer to Principle 19 for details on the identification, management and monitoring of CBF's key participants.

In principle, this approach allows the CSD to derive the relevant risk metrics to support its business continuity management, recovery plan and default management procedures. In doing so, CBF ensures and obliges its key participants to have sufficient measures in place to properly manage and address the risks they pose and thereby minimise to the maximum extent possible the potential risks posed for CBF.

In addition, specifically in relation to KYC/AML, CBF has adapted its participant due diligence procedures to take into account the fact that it may not know the identity of the clients of its participants. For this reason, the enforcement history and exposure of CBF's participants is also subject to continuous review as part of the enhanced KYC programme. To further reduce risks of this type, there are enhanced KYC controls around the use of omnibus accounts and controls around the opening of additional accounts for existing participants.

CBF discloses to its participants extensive information in the respective documentation that allows them to assess the risks associated with the products and services CBF provides. CBF's product documentation, and, in particular, the Client Handbook and Product Guides, provide the necessary information for participants to assess the risks they face from the CSD.

Moreover, CBF participants can choose from a range of reports available to help them manage and contain the risks they pose to CBF's SSSs. Reporting profiles can be set up that are tailored to their own business requirements. Participants are asked to specify which reports they want to receive, respectively to retrieve, and via which communications media.

CBF has established two User Committees composed of issuers and participants, with the mandate to advise the management body on key arrangements that impact CBF's participants.

Key consideration 3

An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.

Material risks CBF bears from other entities

CBF regularly assesses identified material risks it bears from other entities and that can potentially impact the smooth running of business services and the soundness and stability of the financial markets and system as a whole. CBF ensures that appropriate countermeasures are in place to adequately address these risks. Measures include the management of material risks related to:

(i) Availability risk borne from reliance and connectivity to Swift, IT systems and applications for the provision of essential core business services;
(ii) Service deficiency risks borne from operational interdependencies of the company's critical outsourcing and third-party governed services, CSD market links and supplier network providers;
(iii) Operational risks that may be posed by CBF key participants as well as credit risks related to participants in default.

The identification and management of operational risk is further described under Principle 17, key consideration 1.

With regard to critical entities (for example critical providers of services such as Swift), CBF has defined and implemented a critical service provider governance framework procedure based on the CPMI IOSCO FMI assessment methodology. For more details, please refer to Principle 17, key consideration 7.

Material risks associated with products and services provided by CBF

In line with Article 34 (5) of CSDR, CBF discloses to all participants information that allows them to assess the risks associated with the products and services provided. CBF explicitly states the risks associated with each product or service they offer. The CSD's product documentation and, in particular, Client Handbooks and Product Guides provide participants with information necessary to assess the risks they face when contracting with CBF. Thus, participants can perform their own risks assessments and handle the risk the CSD poses to them.

Material risks posed by CBF to other entities

CBF's interconnectedness to other FMIs (for example, stock exchanges, CCPs) makes substitution difficult, thereby increasing its interdependencies and subsequent potential operational and financial risks that could be posed to others.

As a result, CBF addresses the risks arising from interdependencies with other entities via crisis management arrangements outlining different scenarios of disruptions potentially caused by such interdependencies. These procedures also include alert escalation mechanisms, joint key crisis contact lists and joint contingency procedures.

Additionally, a business impact assessment (BIA) is performed on the core CSD functions at business unit level of the business lines in order to identify the critical functions and accordingly define unit recovery plans to support the business continuity and incident and crisis management measures that can assure CBF can adequately address the potential risk exposures identified from internal and external interdependencies and interconnectedness.

Moreover, when a participant is identified as a "key participant", due diligence is complemented by additional questions to assess the key participant's potential interdependencies on third-party providers for critical services.

All relevant data and information are collected, assessed and reported by the company's Risk Management team. The general risk management framework processes and procedures on which CBF relies for (i) assessing the effectiveness and (ii) reviewing risk management systems and tools, as described under key consideration 1, are also applicable to risks related to interdependencies.

Clearstream Risk Management reports to CBF's Executive Board and to the Risk Committee on a quarterly basis and to the Supervisory Board at least on a yearly basis regarding the overall risk exposure profile of CBF. In those reports, the responsible Executive Board members are informed of any material risks, their assessment and possible immediate countermeasures. The risk reports include and focus in particular on the VaR figures as for Pillar II (risk bearing capacity statement), Clearstream's risk strategy and potential issues, as well as stress test results and credit concentration assessment. In case of a material impact of a new risk or the development of an existing risk, the Risk Management team may issue an ad hoc report to the relevant recipients.

Key consideration 4

An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.

Scenarios that may prevent CBF from providing critical operations and services

CBF has identified different idiosyncratic and systemic scenarios, which could potentially prevent it from being able to provide its critical operations and services as going concern. The scenarios are based on plausible near-default events taking into account the requirements of the Annex to DR 2017/390, particularly points 6 and 7. In total, CBF has identified four stress scenarios, which are classified into following categories:

1. Different idiosyncratic scenarios affecting CBF's operational capacity as well as its capital and liquidity profile;
2. Different market-wide scenarios affecting mainly CBF's liquidity and capital profile;
3. A combination of idiosyncratic and market-wide scenarios to derive a larger stress magnitude, based on which the effectiveness of appropriate mitigating tools is tested accordingly.

Recovery and orderly wind-down plans

CBF distinguishes between requirements for a recovery plan (mitigating a near-default situation), a restructuring and wind-down plan (ensuring a solvent wind-down) and a resolution plan (insolvent wind-down).

The recovery plan as well as the restructuring and wind-down plan are drawn up and maintained by CBF. Their purpose is to set out available tools of CBF to overcome severe financial and operational shocks that could potentially undermine CBF's viability and the sustainability of its business. Ultimately, the plans aim at ensuring the continuity of CBF's critical operations and services, also preventing significant adverse effects on the financial system. The resolution plan, on the other hand, is owned and drawn up by the National Resolution Authority (NRA) with the objective to resolve CBF in an orderly manner in case the strategies under the recovery plan or the restructuring and wind-down plan are not sufficient to prevent the failure of CBF. In concrete terms this means that CBF can no longer meet its obligations as they fall due or is at immediate and evident risk of not being able to do so ("fail-or-likely-to-fail" situation according to BRRD). CBF provides continuous support to the NRA for the preparation and maintenance of the resolution plan.

As aforementioned, the recovery, restructuring and wind-down plans, outline the critical operations and services of CBF, which were identified and assessed in accordance with the requirements stipulated in EBA/Op/2015/ 05 and the Commission Delegated Regulation (EU) 2016/778. A function was classified as "critical", when its discontinuance is likely to lead to a disruption of services that are essential to the real economy or financial stability in one or more Member States and when that specific function cannot be adequately substituted, that is, other market participants are not able or willing to take over the functions provided by CBF in an adequate time frame.

The recovery plan includes seven scenarios which assess whether CBF's critical operations and services are affected as a going concern. The selected scenarios stand for severe but plausible near-default situations covering a full range of stresses, both CBF specific (idiosyncratic) and market-wide (systemic). In general, the scenarios simulate the stress on CBF's liquidity, capital, profitability and operational capacity. Furthermore, they test the adequacy of various recovery measures available to CBF, each with an execution plan identifying key processes and potential barriers to implementation.

CBF has identified a number of viable recovery options and evaluated them towards their applicability in times of stress. These options aim at helping CBF to restore its financial and operational viability in stress situations. They are grouped in recovery options covering the aspects of capital, liquidity, risk positions, and operational capacity.

The recovery plan as well as the restructuring and wind-down plan are reviewed and updated by Clearstream Risk Management at least annually to ensure their continuous improvement. The plans are subject to approval by CBF's Executive Board before being submitted to the regulators.

The review and update process is initiated in one of the following cases:

— Regular annual review;

— Significant changes in the legal or organisational structure of Clearstream;

— Significant changes of the business model or the business activities of Clearstream;

— Significant changes with respect to the financial or the risk situation, that have essential effects on the recovery plans;

— Other important reasons that may apply.

Principle 4: Credit risk

An FMI should effectively measure, monitor, and manage its credit exposure to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two largest participants and their affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions. All other CCPs should maintain, at a minimum, total financial resources sufficient to cover the default of the one participant and its affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions.

Key consideration 1

An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.

CBF's framework to manage its credit exposures to its participants and the credit risks related to all of its business activities that give rise to credit risk (see below for details) is composed of the Clearstream Credit Strategy, the Credit Policy and the Credit Handbook. The credit strategy articulates the high-level core credit principles for the maintenance of a robust credit risk framework in order to maintain credit decisions that are determined according to well-defined and objective credit granting criteria. The said principles are designed to ensure the following:

- Credit exposures to individual participants and participant groups are fully secured through the use of collateral and other equivalent financial resources;
- Intraday and overnight credit risk is identified, measured, monitored, and managed;
- Collateral and other equivalent financial resources used to fully cover corresponding credit exposures are measured, monitored, and managed;
- Potential residual credit exposures are identified, measured, monitored and managed;
- Reimbursement procedures along with sanctioning rates are maintained, to discourage overnight credit exposures;
- Controls exist to maintain the reporting of credit exposures in accordance with regulatory requirements;
- Information on aspects of credit risk measurement, monitoring, and management are regularly disclosed to the market.

In principle, CBF, in its role as German CSD (for holdings under collective safe custody), provides neither credit extensions nor advance funds to its participants.

However, for holdings under non-collective safe custody, CBF provides two complementary sets of credit facilities to allow for the highest possible settlement efficiency. These include the unconfirmed funds facility (UCF) and the technical overdraft facility (TOF). The size of these lines is defined as a function of the trading activity and creditworthiness (or internal rating, respectively) of the relevant participant, as well as the availability of appropriate collateral.

Thus, CBF is exposed to credit risk arising from a number of different sources, mainly from settlement and custody activities. Credit appetite is defined as CBF's non-binding tolerance for accepting credit risk. It is approved by the company's Executive Board, taking into account CBF's business strategy, its role as an operator of a securities settlement system (SSS), as well as the target risk profile on its credit portfolio. Credit appetite is expressed numerically as the maximum amount of all credit limits available to participants and counterparties.

Key elements of CBF's framework for managing credit risk include testing of credit limits, collateral, internal credit ratings and credit control, as well as stress testing.

The governing principles of the framework for managing credit risk are determined by CBF's Executive Board. This includes CBF's overall credit granting criteria. The Executive Board also assumes responsibility for ensuring that CBF's credit activities are executed within the said framework. The Board members review and approve the company's credit strategy on an annual basis. In accordance with Article 59 (3) (a) of CSDR, the documents forming the company's credit risk framework has been filed with the relevant competent authorities.

Key consideration 2

An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.

Credit risk may arise from settlement activities (mainly through the cash financing of these activities), custody (generally related to asset servicing activities) and treasury operations.

Participant cash financing is granted on an intra-day basis and solely for the purpose of increasing the efficiency of securities settlement. It is offered via UCFs and TOFs under the stipulations set out in CBF's General Terms and Conditions (GTC) and Credit Terms and Conditions (CTCs). The UCFs and TOFs are only granted on a secured basis and are fully collateralised. Collateral is automatically verified in real-time, and re-evaluations are performed on an intra-day basis.

The collateral eligibility criteria and haircuts are subject to strict rules. With respect to the granting of intra-day credit facilities to participants (TOFs or UCFs), CBF's rules set out a "waterfall principle" that applies to the allocation of the proceeds after the enforcement of the collateral is extended to secure the borrower's exposure under the CTCs.

Furthermore, CBF has in place effective reimbursement procedures of intra-day credit and discourages overnight credit through the application of sanctioning rates applied to all overnight exposures, independent of the root cause, which act as an effective deterrent.

Credit lines remain uncommitted and can be revoked at any time.

Measuring and monitoring of credit exposures

The creditworthiness of potential participants is assessed before entering into a business relationship and before granting credit lines. It is reviewed regularly during the contractual relationship and on an ad hoc basis as required.

Deutsche Börse's Group Credit & Default Management team provides independent credit assessments, internal credit ratings and credit monitoring on all of the Group's credit risk-related activities. These services are offered to several Deutsche Börse Group entities including CBF under the existing outsourcing agreements. All CBF's credit services have been outsourced to Clearstream Services S.A., and to Clearstream Banking S.A. Singapore Branch. Group Credit & Default Management is responsible for implementing the credit strategy and developing policies and procedures aimed at identifying, measuring, monitoring, controlling and reporting credit risk for all activities throughout CBF. Part of the monitoring and reporting function is performed by a Credit Monitoring unit within Group Risk Management.

Group Credit & Default Management also performs independent assessments of the creditworthiness of CBF's counterparties with credit limits. The team maintains systems and operating procedures for early warning and remedial action with respect to credit deterioration.

The tools used to identify and measure intra-day credit risk exposure at CBF, such as the Exposure Management & Collateral reporting tool (EMC2), enable the measurement and monitoring of credit exposures and credit limits at the level of individual accounts, participants, and participant groups. The system updates at regular intervals and provides a consolidated view of credit exposures arising from securities settlement, calculated close to real time. The system also allows the generation of automatic and on-demand reports used in the process of measurement and monitoring of intra-day and overnight credit exposures against limits and collateral, as well as credit concentration risks.

In addition, Group Credit & Default Management ensures that credit exposures remain within levels consistent with prudential standards and within predefined limits, and that exceptions to credit policies, procedures and limits are reported on a timely basis to CBF's Executive Board, the Clearstream Risk Committee, as well as CBF's Supervisory Board and its Risk Committee.

Key consideration 3

A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.

To fully cover exposures to each participant, CBF applies a conservative approach for the credit granting and for the collateral eligibility criteria. The company mitigates credit risk on counterparties by granting credit on a fully collateralised basis. CBF accepts securities as collateral and applies conservative haircuts (please also refer to Principle 5). Through the application of sound collateral eligibility criteria, conservative haircut treatment in the valuation of collateral, and active monitoring for credit deterioration (at the individual participant level and on participant group level), CBF maintains and holds sufficient resources to offset both current and potential future exposure.

Credit limits on settlement of securities transactions

When granting credit with respect to the facilitation of the settlement of securities transactions, collateral is pledged on participants' accounts opened with CBF. In order to mitigate market and liquidity risk on collateral, a haircut is applied to the calculation of the collateral with respect to the valuation of securities. The purpose of the haircuts is to offset the potential loss of value (including liquidation costs) that may result from adverse price moves over the liquidation period (that is, the period between the default of the counterparty and the actual sale of the collateral). For details please refer to Principle 5.

Haircuts are set taking into account the criteria listed in Articles 13 (3) and 14 (2) of DR 2017/390 such as issuer type, term to maturity, credit risk, the country of issuance, and rating of the underlying assets. Additional measures are applied to mitigate, among others, concentration and correlation ("wrong-way") risks. These measures provide an important cushion against the risk of "contagion" under situations of market stress, which is relevant for CBF given that its clientele is naturally concentrated towards financial institutions.

Key consideration 4

A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a morecomplex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.

Not applicable to CBF.

Key consideration 5

A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk-management model should be performed at least annually.

Not applicable to CBF.

Key consideration 6

In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.

Not applicable to CBF.

Key consideration 7

An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.

CBF's TOF and UCF agreement and the GTCs provide that further to the enforcement of the first-ranking-security interest granted over the assets held in pledged accounts in favour of CBF, the latter shall apply any amount of proceeds of such enforcement to payment of the Secured Obligations, as defined in the TOF and UCF agreement.

Potentially uncovered credit losses may materialise when, in the event of liquidation process being triggered, either (i) collateral and other equivalent financial resources (pursuant to Article 15 of DR 2017/390) are insufficient to cover credit exposures or (ii) no collateral is available to cover credit exposures.

Allocation of potentially uncovered credit losses (as per Article 25 (2) (a) of DR2017/390) follows the procedures as defined in the Clearstream Liquidation Framework: If at the end of the liquidation process, (i) all the collateral of the defaulting participant has been liquidated, and (ii) the outstanding exposure has not been fully covered by the corrective measures, and (iii) there is no other recourse to cover the remaining exposure, then the uncovered exposure will lead to the materialisation of a loss for CBF. There is no mutualisation of the loss with other participants.

Additionally, CBF has a recovery plan to ensure the continuity of its critical functions if its capital, liquidity or operational capacity are adversely affected. As such, should operational or credit losses reach an amount that affects the capital situation of CBF significantly and threatens the continuity of its critical functions, CBF has numerous recovery options at its disposal to restore the capital situation and ensure its resolvability, as outlined in the Principle 3, key consideration 4.

For details on replenishment of financial resources, please refer to Principle 7, key consideration 10.

Principle 5: Collateral

An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

Key consideration 1

An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.

The general principles and framework under which CBF considers financial assets acceptable for the collateralisation of credit limits are defined in the Clearstream credit strategy and documented in the Clearstream Credit Policy. Both the Policy and the Strategy are reviewed and approved annually by the Executive Board of CBF.

Within the scope of the Credit Policy, "collateral" means any financial security, in any form, that is held by CBF to mitigate credit risk and that would be liquidated or otherwise used in the event of a counterparty defaulting.

The term "acceptable collateral" is defined in the Policy as financial securities that fulfil certain common standards, also called "collateral eligibility criteria": CBF accepts collateral that fulfils the requirements set in Articles 10 (1), 10 (2), 11 (1) and 11 (2) of the Commission Delegated Regulation (EU) 2017/390 of 11 November 2016 supplementing Regulation (EU) No 909/2014 (hereinafter "DR 2017/390"). As such, only collateral in the form of debt instruments, transferable securities and money market instruments issued by governments, certain public authorities and issuers with low credit risk (rated BBB– or above), low market risk and low liquidity risk may qualify.

Key consideration 2

An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.

CBF has a fully automated collateral valuation system in place to set collateral value based on up-to-date market or evaluated prices and based on haircuts which take into account the criteria such as the instrument type, credit risk associated with the financial instrument, issuer type and country of the issuer, the maturity of the asset, its price volatility and liquidity, as well as the denomination currency. Collateral valuation and monitoring are based on a mark-to-market model and are performed on a near-to real-time basis. Securities for which only old or no market price data are available are excluded from collateral use.

When collateral is considered eligible at the relevant central bank, CBF's collateral management system automatically checks that the haircuts applied are not lower than the haircuts applied by the central bank to that type of collateral. Stressed market conditions are taken into account using the price volatility risk factor of the collateral valuation system; haircuts are assigned accordingly. Regular haircut back testing is conducted in order to assess the robustness of the collateral haircuts.

CBF's collateral management system appropriately covers its core activities as a custodian and securities settlement system (SSS), all by allowing to accommodate potential changes in collateral management practices and procedures. For details on the system's functionalities, please refer to key consideration 6.

Securities recorded in CBF's collateral system are revalued on an ongoing basis against the valuation matrix for changes in the value of risk factors, or changes in parameters within the valuation matrix. Any change in the valuation matrix, or changes in either risk factors or parameters will automatically trigger a recalculation of the haircut applied to the collateral valuation of securities.

In order to mitigate the market and liquidity risks on securities used as collateral, CBF applies a haircut in the calculation of the security collateral value (SCV). Generally, haircuts aim at covering the potential loss of value (current and PFE) due to adverse price moves over the liquidation period (that is, the period between the default of the counterparty and the actual sale of the collateral), as well as costs incurred in the liquidation of the asset. Haircuts are expressed as a percentage and its amount reflects the characteristics of the security and not the participant's creditworthiness.

Key consideration 3

In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.

In accordance with Article 13 (6) of DR 2017/390, collateral haircuts are calculated in a conservative manner to limit pro-cyclicality as much as possible. The CBF system which calculates the collateral haircut is based on a set of different risk categories thus helping to limit the effects of pro-cyclicality that could potentially arise from a single risk category. In line with Article 13.3 of DR 2017/390, the haircuts are determined taking into account the relevant criteria, including the asset's historical and hypothetical future price volatility in stressed market conditions. In addition, calculation takes into consideration a maximum number of days for the liquidation period.

To comply with Article 13 (5) of DR 2017/390, no collateral value is assigned to securities provided by an entity belonging to the same group as the borrower. CBF does not grant collateral value to correlated entities and negates the collateral value from correlated securities. Furthermore, CBF's internal credit rating which is also used to rate the collateral issuer helps to balance any pro-cyclicality that may arise from external rating agencies' ratings.

The collateral policies and procedures are reviewed on at least an annual basis. CBF's policies and procedures on collateral haircut determination take into account the fact that collateral may need to be liquidated under stressed market conditions.

Key consideration 4

An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.

A concentration of credit risk refers to a credit exposure with the potential to produce losses large enough to threaten CBF's financial condition. An unduly high concentration of credit risk has the potential to cause material losses which could significantly weaken the company's competitive position in the market and/or lead to a credit rating downgrade, resulting in a loss of the participants' confidence. In the course of its credit granting activities, CBF might be indirectly exposed to concentration risk arising from its respective collateral pool. This risk might materialise as the potential loss that CBF could suffer during the default management process due to an insufficient diversification of this pool.

Therefore, CBF actively monitors concentration and correlation risks arising from its collateral pool. Collateral concentration limits are monitored at both CBF and participant institution levels. Collateral concentrations are monitored across multiple concentration criteria and limit types, such as issuer, country, wrong way risk, instrument type, settlement currency, instrument's credit rating, ECB eligibility, liquidity and price volatility.

Participants' breaches to any of the said concentration limits are monitored, analysed and reported on a daily basis. Risk mitigation measures may be taken to remediate a specific breach. Collateral concentration limits and procedures are subject to regular review, on at least on an annual basis. More frequent reviews may be conducted in case of deteriorating market conditions or where material change demands such a review.

Key consideration 5

An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.

The legal risks that arise through the use and acceptance of cross-border collateral at CBF relate primarily to conflicts of laws with respect to the creation, perfection, and enforcement of such collateral. The legal framework for the creation, perfection and enforceability of collateral as well as the conflict of law rule is defined under German Law – including but not limited to sections 1204 et seqq. of Bürgerliches Gesetzbuch (BGB, the German Civil Law Code); section 17a of Depotgesetz (DepotG, German Securities Deposit Act) following the implementation of the Financial Collateral Directive 2002/47/EC of 6 June 2002.

The standard TOF and UCF contracts contain rules on the enforcement of pledged securities without any notice according to section 1245 BGB. Thus, collateral can be sold after an event of default has occurred. As per Article 207 (3) of Regulation (EU) No 575/2013, Articles 43 (2) and 38 (13) of DR (EU) 2017/390, CBF has to perform regular assessments covering the financial instruments received by CBF as collateral to ensure the validity and enforceability of CBF's collateral arrangements in certain jurisdictions. As per Article 38 (13) of DR (EU) 2017/390, CBF takes all necessary steps in advance to establish the enforceability of its claim to financial instruments provided as collateral. The majority of CBF's participants are located in Germany; the remainder of the participants are based in another EU Member State. The validity, enforceability and recognition of the pledge governed by German law as set out in number XXX of CBF's GTC apply. Furthermore, CBF's collateral arrangements are designed in such a way as to ensure the best possible effectiveness and enforceability of the pledge. For this purpose, the collateral arrangements include, in particular, provisions on the granting of a first-ranking pledge, the agreement that any pledge of collateral under the arrangement shall be governed by German law and that the lex situs with respect to the collateral covered by the pledge shall be German law. Also, the pledge remains in full force and effect until full payment and performance of all collateralised obligations of the pledger, and remains binding also on successors and assignees of the pledger (provided that the pledger may not assign or otherwise transfer the rights and obligations under the collateral arrangement without the prior written consent of CBF). Moreover, the pledger is obliged, upon the request of CBF, to produce any documents or certificates, to perform any acts or take any steps that can reasonably be required by CBF in enforcing its pledge in accordance with the terms of the collateral arrangement.

Additionally, the documents mentioned in Principle 1 set out provisions to mitigate above identified risks. According to the GTC, all securities held by a participant at CBF, for which the participant has notified CBF of its ownership or unrestricted power of disposal pursuant to section 12 (4) or section 13 of DepotG, are pledged in CBF's favour to secure the entire present or future obligations that the participant has, or may subsequently have, towards CBF in consequence of any services provided by CBF to the participant. CBF has the right to debit the participant's cash account with fees, interest and expenses which accrue when CBF acts on behalf of the participant or in its presumed interest. In addition, the CSD is authorised to sell any collateral securities to cover a debit balance without any prior notice.

CBF ensures that cross-border collateral can be used in a timely manner through the following measures:

— Requiring a first-ranking pledge on the securities pledged as collateral, which is deposited in CBF's system;

— Adhering to a strict policy of selection of its network of depository institutions, including the performance of regular reviews (see Principle 16 for details);

— Maintaining updated default management and collateral realisation procedures (please refer to Principle 13 for more information);

— Monitoring the concentration of collateral per currency.

It is therefore widely accepted that the use and acceptance of cross-border collateral at CBF, whilst subjecting CBF to legal risk, does not carry any additional risk with respect to operational and market risk.

Key consideration 6

An FMI should use a collateral management system that is well-designed and operationally flexible.

CBF's collateral management system (NCMS) is well-designed and equipped with an easy-to-use user interface by the company's IT department which offers full onsite support and maintenance. The collateral management function is sufficiently staffed to ensure maintenance or adaptation of the collateral eligibility parameters even in stressed market conditions. The fully automated system comprises the following main functionalities:

— Automatic collateral haircut calculation;

— Flexible maintenance of haircut parameters;

— Reporting functionality allowing for detailed analysis of collateral pool;

— Automatic exclusion of correlated collateral;

— Maintenance function for classification purposes.

The design of CBF's collateral management system allows for flexible maintenance of haircut parameters. Thus, changes in a collateral haircut due to changes in the value of one of the risk parameters are reflected and applied within CBF's settlement system via the Asset Reevaluation Manager (ARM) function. Furthermore, the system provides a flexible collateral percentage override function, for example for negating collateral value from securities issued by issuers that are facing financial or legal troubles. This is accompanied by the flexible collateral tier override function and flexible query reporting functions.

Principle 6: Margin

A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.

Not applicable to CBF.

Principle 7: Liquidity risk

An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intra-day and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.

Key consideration 1

An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.

CBF has established a robust framework (investment / liquidity management policies, stress testing model and operational procedures) and has tools in place to measure, monitor and manage its corresponding liquidity risks, including intra-day liquidity risks, for each currency of the security settlement system for which it acts as settlement agent. Policies are reviewed and approved at least annually by the CBF Executive Board.

With CASCADE and Creation, CBF operates two securities settlement systems (SSSs). The company manages its liquidity and associated risks arising from its commercial bank money activities (refer to key consideration 2 for details).

CBF's target for its liquidity management is the ability to manage its varying cash positions to have sufficient liquidity available in all currencies for a timely provision of settlement and payment services as they fall due, and have in place measures to deal with unexpected disruptions to its cash flows.

Due to the nature of its business, CBF does not have any long-term obligations and does not require long term funding. Thus, CBF's liquidity requirements are mainly intra-day and overnight.

CBF achieves its liquidity management objectives through permanent measurement, monitoring and management of its liquidity requirements and liquid resources. For this purpose, the company has in place a range of ex-ante and ex-post measures. Ex-ante measures include permanent liquidity buffers in main currencies, committed and uncommitted secured/unsecured liquidity facilities, real-time monitoring of expected cash flows etc., while ex-post measures include escalation procedures and regular stress testing.

CBF's intra-day objective is to execute payments and settlement as they fall due. To determine the amount of liquid resources required on an ongoing basis in each relevant currency, Clearstream Risk Management runs a wide range of stress scenarios (see key consideration 9 on stress testing). The level of required liquidity shall be the highest liquidity exposure identified in the various scenarios of stress.

Key consideration 2

An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intra-day liquidity.

All sources of liquidity risk are considered for the measurement, monitoring and management of CBF's intra-day liquidity management, including its relations to entities and linked FMIs or other entities that may pose liquidity risk to its intra-day liquidity flows.

CBF's Credit department approves credit limits based on the various roles of its counterparts and considers the size of the total exposure on the applicant and all its affiliates. The monitoring process is described in further detail in Principle 4.

The company has defined intra-day liquidity management processes, timelines and thresholds for management escalation in case of non-receipt of funds along with a crisis management system alerting the appropriate level of management depending on the seriousness of incidents.

The CSD's Liquidity Management Policy states the roles and responsibilities when facing a crisis event where day-to-day liquidity generation measures would not be sufficient to cover a liquidity shortage in one or several currencies. The liquidity issue would be escalated to CBF's Executive Board which can decide in view of the liquidity crisis event to activate exceptional liquidity generation measures.

To monitor its actual cash balances held with its cash correspondent banks and central banks, CBF captures credit and debit advice by its agents and intermediaries and compiles the current actual available intra-day cash balances in all currencies on a near to real-time basis. The same applies to the matching of CBF's expected flows against incoming and outgoing funds.

CBF has specific intra-day operational processes and procedures to identify, measure and monitor intra-day liquidity needs. The determination of the potential largest aggregate payment obligation is based on a wide range of stress tests, including stress tests implying participant defaults and idiosyncratic and/or market disruption elements.

To meet its intra-day objectives, CBF has in place intra-day funding sources. To determine the amount of liquid resources required on an on-going basis in each relevant currency, CBF runs a wide range of stress scenarios (see key consideration 9 on stress testing).

According to the European Central Securities Depositories Regulation (CSDR), CBF also measures and monitors its own qualifying liquid resources on a currency basis.

Key consideration 3

A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intra-day or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.

CBF maintains as liquid resources own funds, participants' residual cash balances, multicurrency committed foreign-exchange (FX) swap facilities and an intra-day credit line with CBL.

CBF funds its qualifying liquidity resources (as required by CSDR) with its own funds and own debts. CBF invests its own resources into high-quality liquid assets (HQLAs): bonds issued or guaranteed by top rated governments or supranational issuers. The uninvested part of its own resources is held in an account at Deutsche Bundesbank. CBF has obtained a collateralised credit line of USD 350 million from CBL. For this purpose, CBF pledges government bonds with CBL obtained from a debt issuance by CBF. Uninvested own funds are kept unencumbered on a separate account at Deutsche Bundesbank under the direct management of treasury as its liquidity management function and may only be used as a source of contingent funds during stress periods. These assets are directly transferrable to generate intra-day liquidity.

CBF tests on a regular basis the capacity of its liquidity providers to perform on their commitments to provide intra-day liquidity.

CBF invests its available cash on a secured basis if possible or towards the end of the respective currency deadline to avoid as much as possible an unforeseen liquidity squeeze. CBF has a range of tools in place to manage liquidity gaps, such as, among others, secured borrowing, FX committed funding facilities, as well as a credit line with Deutsche Bundesbank.

CBF calculates the minimum amount of qualifying liquidity resources (QLRs) that it needs to maintain based on the liquidity impact caused by the default of the two participants including their parent undertaking and subsidiaries against whom CBF has the largest intra-day liquidity exposure.

To test the sufficiency its liquid resources to act as a source of backstop liquidity, CBF designed a set of liquidity stress scenarios that are in line with the requirements set out in CSDR and MaRisk. Specifically, CBF defines forward looking liquidity stress tests by considering a number of extreme but plausible stress scenarios, among those the default of the two participants that would generate the largest aggregate payment obligation for CBF under stressed market conditions (Cover 2 + market stress). The stress tests are calculated on CBF level in isolation and group-wide (considering Clearstream group credit institutions as a whole).

Key consideration 4

A CCP should maintain sufficient liquid resources in all relevant currencies to settle securitiesrelated payments, make required variation margin payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.

Not applicable to CBF.

Key consideration 5

For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions.

If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.

CBF's available QLRs are composed of its own funds (cash and securities), central bank facility with Deutsche Bundesbank and a range of committed liquidity facilities with creditworthy financial institutions.

CBF has routine credit access at Deutsche Bundesbank and is able to pledge its ECB-eligible securities from its investment portfolio to generate intra-day liquidity in EUR whenever it would be required.

The minimum amount of CBF's available QLRs shall at any time at least be sufficient to manage the risk to which it would be exposed following the default of at least two participants including its parent undertakings and subsidiaries towards which it has the highest liquidity exposures (Cover 2).

All QLRs mentioned above fulfilling the defined conditions are kept in separate accounts under the direct management of Treasury as CBF's liquidity management function and may only be used as a source of contingent funds during stress periods.

Key consideration 6

An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.

CBF supplements its QLRs with the following additional liquidity sources to fulfil requirements:

- Residual cash of CBF participants;
- Intra-day credit line at CBL to the size of CBF-pledged collateral at CBL;
- Uncommitted and undisclosed overdraft lines with CCBs.

All of these additional liquidity sources are immediately available.

Key consideration 7

An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.

CBF's Treasury team ensures through due diligence that each of the selected committed facility providers has sufficient information to understand and manage their associated liquidity risk and is able to comply with the conditions of a prearranged and highly reliable funding arrangement. A Due Diligence Questionnaire is completed by each facility provider and good candidates for providing a committed facility. This assessment allows the Treasury team to reassess the providers' profiles. Dependent on the outcome of the assessments, contracts may be rolled over/renewed or not.

Treasury in particular reviews if the counterparty meets internal and regulatory criteria. Clearstream defines the following minimum criteria:

— Minimum external credit rating of BBB+/BBB, corresponding to internal "D" rating (strong credit quality);

— Access to the central bank of issue of the currency;

— Settlement instructions in place to settle in the currency of issue;

— Sufficient information to understand and manage its associated liquidity risk.

In its liquidity management function, CBF's Treasury team tests its operational procedures by performing regular liquidity generation tests. The result of the tests is reported to management periodically.

Key consideration 8

An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.

CBF has a central bank account at Deutsche Bundesbank. Liquidity available on this account can be directly accessed via Swift payment message without any restrictions. Unconditional access is guaranteed as funds are held under the sole responsibility of Clearstream Treasury and are unencumbered. The nostro transfer functionality in CBF's trade entry system allows the transfer of funds from CBF's Deutsche Bundesbank account to another cash correspondent bank or to CBL intra-day within the real-time gross settlement (RTGS) opening time.

Through its Deutsche Bundesbank account, CBF has access to the following ECB standing facilities:

— Marginal lending facility to obtain overnight liquidity from the central bank, against the presentation of sufficient eligible assets;

— Deposit facility to make overnight deposits with the central bank to reduce unsecured positions on commercial banks.

CBF also uses its Deutsche Bundesbank account to deposit its non-invested own funds (cash part of its QLRs).

Key consideration 9

An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.

To determine the amount and regularly test the sufficiency of CBF's liquid resources, Clearstream Risk Management performs a number of forward-looking liquidity stress tests on a regular basis. These liquidity stress tests are conducted at the level of CBF itself as well as on the superordinate level of Clearstream Holding AG.

Within a dedicated liquidity stress testing framework, Clearstream clearly defines the objectives of conducting the tests, describes the different scenarios to be calculated (including the underlying parameter calibration and assumptions), sets out the relevant management reporting lines, regulates the ongoing and effective review of the stress testing processes, and ensures that a procedure for follow-up actions based on stress test results is in place.

The liquidity stress tests conducted at CBF level have been designed in line with the requirements set out in the CSDR, while taking MaRisk requirements into account. CSDR ensures that systemically important securities infrastructures are subject to common EU rules. It has mandated the European Banking Authority (EBA) to develop regulatory technical standards (RTSs), which the Commission adopted as DR 2017/390, that specify the details of the frameworks and tools for monitoring, measuring and management, reporting and public disclosure of the liquidity risks, including those that occur intraday. The key requirements on liquidity stress testing are described in Articles 35 (5), 36 (6) and 36 (7) of DR 2017/390.

CBF's liquidity stress tests consider all entities and products that may pose a material liquidity risk to the company. Moreover, the tests are calculated on relevant currency level where the liquidity exposures are tested against CBF's qualifying liquid resources (QLRs). They cover a multi-day period and are tailored to CBF's liquidity risk profile using a wide range of scenarios, considering idiosyncratic and market stress factors as well as combinations thereof. Such stress factors include among others the default of the two participants that would generate the largest aggregate payment obligation for CBF (Cover 2), a multiple default event, the temporary inability of a liquidity provider to provide liquidity, a general economic slowdown (including shifts in market factors) and a change in the institution's reputation. The stress test results show the potential impact that a stress event might have on the liquid resources in each relevant currency. Exposures towards entities that play multiple roles (for example both as nostro agent and as participant of CBF) are aggregated daily and across all roles to ensure that second-round effects are adequately reflected in the stress simulation.

The results of the different liquidity stress tests are reported to appropriate decision makers within CBF such as the Head of Risk Management, the Asset and Liability Committee, Treasury Front Office, and the Executive Board. Based on the results, Risk Management may recommend taking measures concerning CBF's liquid resources.

The stress test assumptions and parameters are reviewed and updated systematically by Clearstream Risk Management at least on an annual basis. Adverse market developments, changes within CBF's business model as well as changes within relevant regulatory requirements can lead to an ad hoc review.

Key consideration 10

An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intra-day and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.

Same-day settlement

In view of the very short-term nature of obligations arising from core settlement activities, liquidity requirements are mainly intra-day and overnight.

Most of the Treasury team's daily investment and funding activities are same-day market transactions. These market transactions are executed in day-to-day cash management to meet intra-day objectives (refer to key consideration 1).

Same-day transactions are also used to place funds overnight with a diversified panel of counterparties. All Treasury transactions are electronically recorded in CBF's trade entry system. After validation from Treasury Back Office (4-eyes principle), payments and repayments are automatically generated at the defined payment/repayment date(s) (same-day or later) from the concluded trade.

CBF may also execute same-day transactions with its liquidity providers (committed and uncommitted) to deal with unexpected disruptions to its intra-day liquidity flows.

Replenishment of liquidity resources

To reduce the risk of a liquidity squeeze to the maximum extent possible and make sure to have sufficient liquidity in all currencies to pay all financial obligations as they fall due at all time (even during a stress event), CBF strictly follows its investment strategy with a main focus on secured investments.

CBF has a range of day-to-day and contingency intra-day liquidity generating measures described in its Liquidity Management Policy and its Liquidity Contingency Funding Plan. These intra-day measures can be repeated to cover a multi-day period until the liquidity stress event is over.

Principle 8: Settlement finality

An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intra-day or in real time.

Key consideration 1

An FMI's rules and procedures should clearly define the point at which settlement is final.

FMI's rules and procedures should clearly define the point at which settlement is final.

- CASCADE for settlement of instructions via the T2S platform provided by the Eurosystem; and
- Creation provided by CBF's sister company CBL.

Through these two SSSs, CBF offers multiple settlement services:

4. T2S settlement against payment in EUR or DKK central bank money in collective safe custody (CSC) and non-collective safe custody T2S-eligibe (NCSC-T) securities;
5. Creation settlement against payment in commercial bank money for non-collective safe custody (NCSC; usually referred to as "CBF-i" settlement) securities as well as T2S settlement against payment in non-T2S eligible currencies;
6. Free of payment settlement in CASCADE/T2S and Creation; and
7. Settlement in domestic markets outside T2S using selected direct CSD links (as defined in Principle 1), referred to as "external settlement".

In accordance with Article 39 (2) and (3) of CSDR, CBF's rules for the SSSs used define and disclose the moments of entry, irrevocability and finality of transfer orders in accordance with Articles 3 and 5 of SFD (please also refer to Principle 1) for each type of transaction settling via CASCADE/T2S, Creation or externally via a CSD link.

Settlement finality is – for both CBF's SSSs – defined in numbers V, XXIV and XXV of CBF's GTC. Additionally, the rules and procedures are defined in CBF's Client Handbook: The "Settlement Finality" chapter provides information on the processing of settlement instructions, in particular the rules determining the ability of a participant to revoke or amend its instructions and the moments in time when instructions become irrevocable, binding and unconditional. The GTC are binding upon all participants and CBF. Both the GTC and Client Handbook are published on the CBF website.

The term "instruction" is used to refer to a "transfer order" within the meaning of Article 2 (i) of SFD, which is defined as "any instruction by a participant to place at the disposal of a recipient an amount of money by means of a book entry on the accounts of a credit institution, a central bank, a central counterparty or a settlement agent, or any instruction which results in the assumption or discharge of a payment obligation as defined by the rules of the system."

For "external" settlement, CBF maintains various links to foreign CSDs outside T2S, that is, such securities transactions do not settle within a CBF SSS. Further details about settlement finality is provided in the "External instructions" section below.

CASCADE/T2S: Moments of entry, irrevocability and finality of instructions

A transfer order for payment and delivery transactions, issued to CBF for settlement in T2S is considered as entered into the CBF system, as soon as T2S discovers that the T2S validation rules have been met.

A transfer order is irrevocable, as soon as it is indicated as "*matched*" by T2S. With this binding booking the transfer order will then be processed in T2S (Settlement).

As soon as the transfer orders are irrevocable as described above and with the binding matching in the relevant accounts, the transfer orders will be processed in T2S for settlement to become final.

Any matched instruction that has not been settled or was only unilaterally cancelled will remain in the system for further reprocessing attempts until such instruction is either successfully settled, cancellation requests were received from both counterparties or when matched transactions are cancelled by T2S (under certain conditions, T2S will automatically cancel matched instructions 60 days after the intended settlement day of the settlement instruction).

Finality is reached when instructions have settled in T2S and the associated re-registering has taken place in the custody ledger (section 14 of DepotG).

The binding booking in T2S is achieved:

— for against payment transactions in a T2S-eligible currency: when the transfer of title of a security in T2S as well as the respective cash payment in T2 have been executed, that is, once the securities are booked in the T2S accounts and the cash is booked on the T2 accounts (DCA) of the CBF participants;

— for against payment transactions in a non-T2S-eligible currency: when the confirmation of cash transfer is received from CBL and when the transfer of title of a security in T2S has been executed;

— for free of payment transactions: when the transfer of title of a security in T2S has been executed.

Final instructions are reported to the participants as settled via the communication means agreed for CBF's settlement services (such as Xact Web Portal or Swift statement).

Creation: Moments of entry, irrevocability and finality of instructions

For settlement in Creation, a transfer order for payment and delivery transactions is considered as entered into the CBF system as soon as the system discovers that the validation rules of Creation have been met.

The transfer or payment order issued to CBF for settlement is irrevocable as soon as it is indicated as matched by Creation. The transfer order will then be processed in Creation for settlement. Matched instructions can only be bilaterally cancelled (please refer to key consideration 3 for details).

Finality of the Creation instructions is reached when those instructions have settled in Creation and the associated re-registering has taken place in the custody ledger (section 14 of DepotG).

The binding booking in Creation is achieved:

— For against payment transactions, when the transfer of a participant's claim against CBF for surrender ("Herausgabeansprüche") of securities that CBF holds within Creation or on a fiduciary basis with a foreign depository as well as the effected cash payment have been executed, that is, once a debit entry in the participant's securities account and a corresponding credit entry into the securities account of another participant are posted and the cash is booked via cashless money transmission to the current accounts maintained by the participants with CBF or to respective accounts of third parties authorised by them;

- For free of payment transactions, when the transfer of a participant's claim against CBF for surrender ("Herausgabeansprüche") of securities that CBF holds within Creation or on a fiduciary basis with a foreign depository in Creation has been executed.

- For transactions in a non-T2S-eligible currency, when the transfer of title of a security in T2S has been executed.

The moments of entry, irrevocability and finality of an instruction are reported to the participants via the communication means agreed for CBF's settlement services (such as Xact Web Portal or Swift statement).

Please also refer to the "Services for collective safe custody (incl. NCSC-T)" chapter of the Client Handbook.

External instructions ("links" settlement) via Creation: Moments of entry, irrevocability and finality of instructions

Transactions settling with a domestic counterparty (in the context of CSD links) are considered by CBF as "external instructions".

For EU/EEA countries, the individual Market Link Guides available in the "Market coverage" section of the Clearstream website provide information about the moments of entry, irrevocability and enforceability and the settlement rules as applicable for each domestic market as well as the rules governing the finality of transfers of securities and cash as defined by each depository or local issuer's SSS (that is, deliveries of securities to or from a domestic counterparty are final depending on the local market regulations and practices).

For the purpose of this section, "depository" shall refer to another CSD, an SSS operated by a CSD (that is, a linked issuer SSS) or to a financial intermediary to which CBF entrusts the safekeeping and administration of securities that CBF holds via its sister company CBL on behalf of the participants. For the avoidance of doubt, the term "depository" shall be understood as the entity with which CBF (via CBL) has its securities account for the deposit of the securities on behalf of its participants.

For domestic markets in which matching is "binding", an instruction can only be cancelled upon bilateral agreement between the parties to the trade. Any specific rules for the cancellation of unsettled transactions with domestic counterparties are published in the respective Market Link Guide.

External instructions that are irrevocable and unconditional in the domestic market – but not yet reported to the CBF participants as settled – are considered as final. Once instructions are final with the depository (or, for the avoidance of doubt, the local issuer SSS) and upon notice of credit/debit of the relevant account of CBF (via CBL) with such depository, CBF will update the participants' accounts accordingly.

Deliveries of securities to or from a domestic counterparty are final depending on local market regulations and practices. Deferral of final settlement as applied per the rules defined in the system of CBF is only experienced in case of deliveries to or from domestic counterparties as finality may depend on local market regulations or practice. For markets where such exception exists, the local market regulations and practice have been published and are accessible to CBF participants.

For links to domestic markets, CBF requests – on an annual basis – legal opinions issued by local external law firms confirming that settlement finality can be achieved in accordance with local laws and regulations, notwithstanding any insolvency procedure. For all such domestic links, CBF ensures that finality is achievable in a way that protects the activity of its participants and guarantees asset protection.

Final instructions are reported to the participants as settled via the communication means agreed for CBF's settlement services (such as Xact Web Portal or Swift statement).

Key consideration 2

An FMI should complete final settlement no later than the end of the value date, and preferably intra-day or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.

The processing day varies depending on the type of settlement instruction, being it in T2S, Creation or external with a domestic counterparty.

Final settlement on value date

For CASCADE/T2S settlement, T2 RTGS settlement applies.

Settlement on value date or same-day settlement can be completed in case that both counterparties fulfil their settlement obligations for processing on the intended settlement day.

It should be noted that CBF cannot influence the point in time when settlement transactions actually settle as this depends on the instructing participants' cash and/or securities resources as well as their settlement priorities (including putting instructions "on hold" to block settlement on the intended settlement date or after for reasons unknown to CBF).

For further information on the completion of final settlement, please refer to the section "Intraday or real-time final settlement" further below.

For external settlement local market rules apply. The respective Market Link Guides provide further details on the final settlement on value date.

Intra-day or real-time final settlement

CASCADE/T2S settlement

Instructions transmitted to T2S are processed in different settlement cycles in T2S. For cash and securities settlement, T2S offers a sequential night-time processing (night-time settlement, NTS) with two cycles and up to two real-time processing cycles (real-time settlement, RTS). Cash entries which result from securities settlement or from interest and redemption payments, cross-border market and reverse claims for foreign CSC securities as well as from fees and charges are booked on the Dedicated Cash Accounts (DCA).

Settlement can take place in both NTS and RTS. T2S NTS is the first settlement cycle with final settlement on the next business day.

The settlement timing slots in T2S are according to business days, that is, start of day for a new business day takes place at about 18:45 CET on the calendar day when the T2S business day ended. Settlement in T2S starts with the NTS at about 20:00 CET and ends with the real-time settlement at about 18:00 CET.

After 16:00 CET, free of payment and delivery versus payment settlement for specific transactions (GC Pooling® in USD, transactions involving foreign currencies) is still possible until 18:00 CET and 17:40 CET, respectively. Cash settlement takes place via participants' T2 DCAs when payments are made in EUR or DKK and through the CBF participants' ICSD linked (CBF-i) accounts when payments are made in other currencies.

For further details please refer to the "Services for collective safe custody (incl. NCSC-T)" chapter of the CBF Client Handbook.

Creation settlement

The settlement day in Creation consists of one main settlement processing, the real-time processing, followed by the end of day processing as described in the "The settlement day" chapter of the CBL Client Handbook applicable to the Creation settlement activity of CBF participants.

In order to detect differences or errors in the instructions submitted, matching attempts are applied as soon as the instruction has been submitted to and validated. Details on the matching process are provided in the "Matching requirements" chapter of the CBL Client Handbook.

External settlement

Individual local market rules apply. Please refer to the respective Market Link Guides for details.

Key consideration 3

An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.

CASCADE/T2S and Creation internal settlement

Unmatched instructions can be revoked (cancelled) anytime.

Matched internal instructions can only be bilaterally cancelled. Participants cannot cancel them unilaterally even if the requested settlement date has not been reached. If no matching cancellations are received by the requested settlement date and the instruction has not settled by the end of day processing on the requested settlement date, CBF will, in the name and on behalf of the participant, issue a renewed cancellation request for the new instruction for settlement on the next settlement date; such new cancellation request must be matched by the participant's counterparty on the same settlement date.

In T2S, under certain conditions, T2S will automatically cancel matched instructions 60 days after the intended settlement day of the settlement instruction. In Creation, matched instructions remain valid for settlement until matching cancellations requests are received from both participants.

Settled instructions cannot be cancelled.

For further details please refer to the sections "Processing instructions" and "Settlement failure" in chapters 4.2 and 4.3. of the CBF Client Handbook.

External settlement

Individual local market rules apply. Please refer to the respective Market Link Guides for details.

Principle 9: Money settlement

An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquiddity risk arising from the use of commercial bank money.

Key consideration 1

An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.

In line with Article 40 (1) of CSDR, cash payments related to delivery versus payment (DVP) transactions are settled in central bank money (CeBM) where available and practical. This currently applies to:

1. Securities settlement with cash (EUR and DKK) in CBF's securities settlement system (SSS) CASCADE via TARGET2-Securities (T2S) through the CBF's clients Dedicated Cash Accounts (DCAs) of a central bank. Every CBF client securities account is associated with a DCA account;
2. Settlement of Swiss securities versus CHF currency via T2S and SECOM[1] for CBF's link to Switzerland.

For non-T2S settlement via CBF's SSS Creation, prior to opening a local/domestic market link, Clearstream Network Management assesses the availability and practicability of processing cash settlement in local currency via an account held with the local central bank. Alternatively, settlement in commercial bank money (CoBM) using a cash correspondent bank (CCB) is applied.

To support day-to-day payment activity, CBF relies primarily on:

— a direct access to T2 for payments in T2S-eligible currencies (payments in CeBM) related to the CASCADE settlement transactions;

— a large network of CCBs (payments in CoBM) related to the Creation settlement transactions.

Information about settlement-related cash processing is described within the chapters "Cash and securities accounts per transaction type", "Cash settlement through T2S", "Cash settlement of non-EUR currency", and "Cash settlement through the Swiss National Bank", "Financing: availability of funds", "Collateral Valuation" of the CBF Client Handbook, as well as the chapters "Settlement services" and "Cash Financing services" of the CBL Client Handbook, published on the Clearstream website.

Cash settlement through T2S

CBF makes use of the T2S platform provided by the Eurosystem for its securities settlement. Cash payments related to DVP transactions are settled in CeBM on the T2S platform through the DCAs of CBF participants who are required to have a DCA linked to their corresponding securities account. The accounting structure (integrated model) gathers cash and securities accounts in the same technical environment. Cash settlements in T2S take place exclusively on DCAs; these cash accounts are opened in the books of a T2S participating central bank and are dedicated to the settlement of the cash leg of

[1] For settlement of cross-border securities transactions and CCP transactions in Swiss CSC securities there exists a mutual account link (CSD link) between CBF and SIX SIS. Cross-border settlement processes are connected and synchronised on the T2S and SECOM platforms. Cash settlement in CHF is carried out for participants by SIX SIS via the Swiss National Bank (SNB). For this purpose, both parties in a securities transaction (buyer and seller) must maintain a cash account link with the SNB. The CBF participant's SNB cash account is lodged with CBF.

securities transactions initiated by CSD participants and the settlement of liquidity transfers for liquidity management purposes initiated by central bank participants. Each DCA is linked through static data to one or more RTGS accounts of the same currency held in a central bank. For the settlement of cash-related operations in T2S, the provision of liquidity to cash accounts (that is, to the DCAs) is necessary. For this purpose, T2S provides the technical means for its participants (CSDs and central banks) to transfer funds from the RTGS accounts onto the technical platform or from one T2S DCA to another. The holders of the DCAs are responsible for monitoring the balance in their DCA(s) and shall be able to issue liquidity transfer orders in T2S.

The cash settlement of securities transactions and certain corporate actions generally involves the following instruction types:

- Transfer of securities against payment: Delivery versus Payment (DvP), Receive versus versus Payment (RvP)

- Transfer of securities with payment: Delivery with Payment (DwP), Receive with Payment (RwP)

- Payment without transfer of securities: Payment Free of Delivery Debit (PFoD-DBIT), Payment Free of Delivery Credit (PFoD-CRDT)

These transactions can settle in T2S during night-time settlement (NTS) as well as during real-time settlement (RTS), until 16:00 CET. In both cases, cash is settled directly via a DCA linked to the respective Securities Account (SAC). The DCA can either be stated in the instruction or be set up as a default DCA at CBF.

Participants can either open their own DCA at one of the central banks participating in T2S or make use of a cash correspondent's DCA for which a respective credit line exists. Each connection between a SAC and a DCA which is to be used for cash settlement must be set up as a SAC link by CBF and authorised via a Credit Memorandum Balance (CMB) by the responsible central bank or CCB in advance.

If a transaction cannot settle due to lack of cash or credit line, T2S will reconsider it for settlement in regular intervals during the day. That means that an increase of cash or the credit line on the DCA is considered in a timely manner.

Funding

Participants in settlement of RvP, DwP or PFoD-DBIT instructions in T2S must generally ensure that there is sufficient cash or an appropriate credit line available on the DCA.

Funding of the DCA, to be used for night-time settlement (NTS) of the following T2S business day, takes place on the basis of an individual or standing instruction to CBF until 18:30 CET. The cash forecast function in CASCADE supports participants in determining how much cash needs to be reserved and takes account of the following transactions:

- Matched OTC transactions against payment;

- Stock exchange trades (CCP and non-CCP);

- Eurex® exercises;

- New issues;

- Interest and redemption payments of German government bonds.

Key consideration 2

If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.

When commercial bank money settlement takes place in relation to the Creation activity, the settlement asset used is a claim on CBF itself. CBF is subject to Article 16 of CSDR and holds a limited purpose banking licence, allowing it to provide banking services in relation to settlement services only. For further information about credit and liquidity risk stemming from the use of commercial bank money for settlement in Creation see Principles 4 and 7; details on collateral management to mitigate credit risk are given in Principle 5.

With regard to CoBM cash processing on the CBF participants' multi-currency cash accounts (that is, the CBF-i accounts), the CBF Client Handbook provides participants with information that is applicable to the SSS Creation (including "Financing" and "Collateral valuation" as stated in key consideration 1).

Commercial bank money settlement applies to:

1. Non-T2S eligible currencies cash settlement: For cash settlement in currencies that are not T2S-eligible and settlement outside T2S (that is, CBF's international services, "CBF-i", using Creation), CBF settles cash payments through its own accounts. The CBF-i (cash) accounts are opened with CBF and technically held on the Creation platform.
2. Cash settlement for internal, external and Bridge transactions: Creation allows for internal and external (local market) settlement processing, including the processing of transactions via the Bridge with Euroclear Bank. CBF participant accounts are associated with multi-currency cash CBF-i accounts for CoBM funding needs in the relevant settlement currencies in the books of CBF. In conjunction with this requirement and in relation to internal settlement in non-EUR currencies and external settlement in all eligible currencies, CBF offers securities settlement solely against payment in CoBM through the respective local CCB, based on the cash funding and provisioning processes of the Creation platform. Cash settlements are effected by crediting and debiting the relevant cash accounts of the CBF participants.

CBF's commercial bank money activity including the respective cash settlement in most currencies other than T2S-eligible currencies is executed through the respective local CCB. For every settlement currency, a CCB (several for Euro) is appointed to handle the external payment and receipt of funds between the domestic banking system for the currency and CBF. All CBF participants have multi-currency cash accounts in the relevant settlement currencies in the books of CBF. Money settlements are affected by crediting and debiting the relevant cash accounts of the participants. CBF operates a DvP Model 1 system, thereby ensuring simultaneous final settlement of securities and cash funds transfers on a gross (transaction by transaction) basis. For all DvP transactions, the cash funds either have to be available on the participant's account or can be made available through CBF's cash financing facilities.

For external settlements in local markets outside T2S via Creation, CBF uses central bank money where feasible. Non-T2S settlement against payment takes place in CoBM (in line with Article 40 (2) of CSDR) in more than 40 currencies eligible for securities settlement for most links.

CoBM settlement adheres to the following principles:

- Cash reporting for CoBM payments is produced exclusively for the CBF-i accounts.

- The availability and funding of CoBM on a CBF-i account is governed by the descriptions available in the CBF Client Handbook; it is the responsibility of the CBF participant to provide adequate cash liquidity required for settlements against that account.

- For every eligible settlement currency, at least one CCB is appointed to handle external payment and receipt of funds between the domestic banking system for the currency and Creation. Details of the CCBs are provided in the Cash Timings Matrix published on the Clearstream website. With regard to CSD links, the CCB is published in each Market Link Guide, section "General information".

- Funds are transferable intra-day depending on the cash deadlines of the respective currencies. Cash deadlines vary in accordance with the time zones of the liquidity providers of the currency. Timings are outlined in the Cash Timings Matrix.

Key consideration 3

If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.

Not applicable. CBF settles the cash leg in its own books (see also key consideration 5).

Key consideration 4

If an FMI conducts money settlement on its own books, it should minimise and strictly control its credit and liquidity risks.

CBF has a limited banking licence that allows it to only offer banking services ancillary to core and non-banking services. All CBF-i participants have cash accounts in the available settlement currencies in the books of CBF. CBF performs cash settlement by debiting and crediting the cash accounts of the participants.

CBF has a robust risk management framework that covers all key sources of risk including credit and liquidity risks. Please refer to Principles 3, 4, 5 and 7.

Key consideration 5

An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intra-day, in order to enable the FMI and its participants to manage credit and liquidity risks.

Not applicable to CBF.

With regard to CASCADE/T2S settlement against payment in T2S-eligible currencies, T2S takes over the entry and the processing, validation, matching and settlement of the transmitted instructions, the administration of positions as well as the reporting of transactions and positions for the T2S securities accounts (SACs). Thereby, the settlement, that is, the exchange of securities and cash, takes place directly on the T2S platform. The cash leg of DvP settlement settles on the associated DCAs; for the CBF-SIX SIS link, both parties in a securities transaction (buyer and seller) maintain a cash account link with the SNB. The CBF participant's SNB cash account is lodged with CBF.

With regard to Creation, CBF settles the cash leg in its own books.

Principle 10: Physical deliveries

An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.

Key consideration 1

An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.

CBF's obligations and responsibilities with respect to the delivery of physical instruments or commodities are defined in accordance with German law. The rules of the Depotgesetz (DepotG, German Securities Deposit Act) regarding the deposit are applicable to CBF.

- According to the company's General Terms and Conditions (GTC), the following securities are accepted for physical delivery into custody with CBF:
- Securities in bearer or registered form issued by German issuers and governed by German law;
- Securities in bearer or registered form issued by foreign issuers and not governed by German law.

For physical delivery, CBF only accepts securities in collective safe custody which are transferable and fungible in accordance with sections 1 (1) and 5 (1) of the DepotG and number XI of the GTC.

For physical deliveries of commodities, CBF relies on bilateral agreements with issuers or agents.

With regard to individual safe custody (also referred to as jacket custody), which is regulated in section 2 of the DepotG, the custodian or, in the case of custody with a third party, CBF, must segregate the securities to be kept in safe custody from other securities holdings it keeps in safe custody (separated from its own- and third persons' holdings), on the depositor's express request. The depositor in question must be identified on the outside. This identification often takes place in the form of a "jacket" marked with the depositor's name. This separation preserves the depositor's sole ownership of the physical securities certificate in question and when the certificate is deposited, this ownership is not transformed into fractional co-ownership of the collective holding.

The procedures relating to the delivery of each of the eligible classes of securities, as well as the instruction requirements and procedure for effecting physical delivery are set out in the GTC, the Client Handbook and other publications, for example, regular client announcements on the Clearstream website.

As CSD subject to CSDR, CBF receives physical deliveries mainly for immobilisation purposes in order to represent such securities as book entries. Circulation of the securities in CBF's systems is performed exclusively in book-entry format in accordance with Article 3 of CSDR.

Settlement process

The TARGET2-Securities (T2S) settlement platform and the vaults platform CARAD support CBF and its participants in the settlement and custody of transactions in physical securities and offer in particular:

- Deposit and withdrawal of physical securities to and from the holdings in the vaults;
- Recording and administration of certificate numbers (ledger);
- Conducting checks against the list of invalidated or stopped securities;
- Processing defective certificates and their replacement.

CBF is a Model 1 delivery versus payment (DVP) system, ensuring simultaneous final settlement of securities and fund transfers on a gross (trade-by-trade) basis. When participants give instructions to deliver or receive securities against payment, each securities transfer is linked to the specific payment

Key consideration 2

An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.

The main risks associated with the immobilisation, storage and delivery of physical instruments is the loss of certificates during the process and the receipt of fraudulent certificates. The costs associated with the immobilisation, storage and delivery of physical instruments or commodities typically include postal costs, insurance costs, physical handling and re-registration fees, as well as custody fees.

CBF has defined processes, procedures and controls to monitor the risks and costs associated with the handling of physical instruments or commodities.

These processes, procedures and controls comprise an operational risk scenario analysis that is updated on a regular basis. The scenarios take into account different risk categories, such as "fraudulent destruction", "theft", "transportation issues", "loss", "betrayal" or "attacks". In addition, root causes with a validated percentage of possible issues in the different categories are established. Offenders, different types of a possible crime, possible loss or damage have been taken into account, based upon statistics of the Bundeskriminalamt (BKA, Federal Criminal Police Office), rounded out by own internal data, if applicable.

The receipt of fraudulent certificates is avoided by undertaking in-depth validation checks upon receipt, including signature checks of transfer documents and validation checks of certificates in accordance with market practice.

In addition, vault reconciliation to avoid loss of certificates, is performed by CBF, including the following:

1. Daily controls of physical security deliveries and receipts together with the corresponding orders on the CASCADE settlement platform to ensure safe receipt and proper recording of deliveries;
2. Daily reconciliation of positions booked in CASCADE following the settlement of securities instructions versus holdings in Vaults Management application;
3. Inventory controls to ensure that all securities deposited with CBF and recorded in the Vaults Management application are also physically deposited in the vaults. This includes a predominantly digital reconciliation process of Global Notes encompassing an electronic annual completeness check of sealed inventory and a more detailed spot-check control on a pre-defined amount of the physical inventory.

Principle 11: Central securities depositories

A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.

Key consideration 1

A CSD should have appropriate rules, procedures, and controls, including robust accounting practices, to safeguard the rights of securities issuers and holders, prevent the unauthorised creation or deletion of securities, and conduct periodic and at least daily reconciliation of securities issues it maintains.

According to the requirements set forth by Articles 26, 37 and 38 of CSDR, CBF has implemented rules, procedures and controls to safeguard the rights of the securities issuers and holders as well as the integrity of issues by preventing the unauthorised creation or deletion of securities (UCoD). These rules are described in CBF's CSDR authorisation file and are designed to comply with the German law framework as described in Principle 1.

Safeguarding the rights of securities issuers and holders

Concerning the protection of the rights of the securities holders, CBF offers the possibility to its participants to choose between a segregated account structure or an omnibus account within the CBF system. Further details are described in key consideration 5.

Please note that CBF as a CSD with registered seat in Frankfurt/Main, Germany, maintains accounts which are indeed opened in the participant's name. A sub-account structure permits to open clearly identifiable accounts to segregate participants' and underlying clients' assets. In the local markets linked to CBF, participant assets are held in an omnibus account in CBF's name. This account however is segregated from the proprietary assets of the local CSD and other CSD participant's assets. CBF does not hold "own" assets in local markets.

CBF does not use, for any purpose, securities that are not proprietary to it. CBF may however use securities of a participant where it has obtained that participant's prior express consent. CBF requires its participants to obtain any necessary prior consent from their clients. This corresponds to the legal requirements of Article 38 (7) of CSDR. For more information regarding the usage of securities and the rules for obtaining written consent may be seen in CBF's GTC.

Securities can be held in custody with CBF under any of the following types:

- **Girosammelverwahrung (collective safe custody, CSC):** The process of admission of securities to CSC by CBF is initiated by the applicant, the issuer (or the issuing bank, that is, the lead manager acting on the issuer's behalf), which submits the request for admission to CBF. The applicant must be a credit institution and a participant of CBF. The admission and depositing of securities in CSC are described in CBF's GTC.

  Holders of securities held in CSC have a proprietary right to those securities (a 'right in rem') being a pro rata co-ownership right in a fungible pool of securities deposited by CBF directly or through a cross border CSD-Link with a foreign CSD based on an account relationship qualified under section 5 paragraph 4 of DepotG.

CBF books a CSC balance (GS-Gutschrift) for its participants. This system enables the transfer of rights inherent to the securities by book entry. This is known as a securities transfer by book entry. The co-ownership of securities held in CSC is transferred in accordance with the principles of property law, that is, by agreement in rem and transfer. Depositories, as CBF's participants and (intermediate) custodians, as well as CBF as a CSD only provide the depositor (third-party) possession of the securities kept in custody, as required by civil law. As custodians, they are not the owners of these securities, neither in the sense of a trustee nor in the sense of a beneficial owner. When a transfer of co-ownership fractions takes place, constructive possession must move from the depositor who sells them to the depositor who buys them or to his depositories, on all levels of the custody chain. Under section 4 (1) DepotG, CBF is deemed to have explicit notice of third-party ownership of the securities that a depository, as an intermediate custodian, keeps in custody with CBF. This means that CBF is attributed with the knowledge that the securities which the depository has delivered into safe custody do not belong to the depository. This applies as long as the depository does not give CBF explicit notice that certain securities are its own positions. The particular consequence of this constructive notice of third-party ownership is that these securities owned by third parties enjoy full protection in the event of debt enforcement measures and similar acts against the depository or CBF.

- Streifbandverwahrung (individual safe custody): Custody of fungible and non-fungible certificates, where each participant is entitled to have the individual certificates with a particular serial number at his disposal. In the case of individual safe custody (also referred to as jacket custody), which is also regulated under the DepotG, the custodian or, in the case of custody with a third party, CBF, must segregate the securities to be kept in safe custody from other securities holdings it keeps in safe custody, on the depositor's express request. The depositor in question must be identified on the outside. This identification often takes place in the form of a "jacket" marked with the depositor's name. This separation preserves the depositor's sole ownership of the physical securities certificate in question and when the certificate is deposited this ownership is not transformed into fractional co-ownership of the collective holding.

- Wertpapierrechnung (non-collective safe custody, NCSC): For securities that are not settled via the TARGET2-Securities (T2S) platform, CBF keeps the positions in the form of book-entry credits on a fiduciary basis, using the technical and functional infrastructure of its sister company Clearstream Banking S.A., Luxembourg, which uses custodians in various countries for purposes of custody. Depositories are under an obligation to obtain what is known as a "Three-Point Declaration" from the (first) custodian outside Germany. The requirements of the "Three-Point Declaration" are explained in detail under key consideration 4. It is the predominant opinion that in the event of insolvency on the part of CBF or the depository, the intermediate custodian's or the beneficial owner's rights to the surrender of these securities are eligible for separation from the debtor's assets.

For certain registered shares, CBF offers a "CASCADE registered shares service" allowing participants to either register the shares under their nominee account name or in the name of the final beneficial owner.

If the collective holding is decreased due to a loss which CBF is not responsible for, the company will apportion such loss on a pro rata basis to the participants according to the fraction each participant holds (for its underlying clients) in this collective holding at the moment that the loss occurred. CBF's liability pursuant to section 7 (2) sentence 2 DepotG and as established in the GTC ("Liability"), shall remain unaffected.

If CBF were to become insolvent, participants' securities would not fall in the bankruptcy estate of CBF. Pursuant to section 47 of the Insolvenzordnung (InsO, German Insolvency Code), participants would be entitled to a right of segregation. If said securities are not sufficient to ensure the full restitution of the securities maintained in the account, they will be allocated between the account holders in proportion to their rights. If CBF is responsible for the loss of securities, such a participant would have a senior claim in an insolvency proceeding, according to section 32 DepotG.

Prevention of the unauthorised creation or deletion of securities

CBF has implemented rules, procedures and controls to prevent unauthorised creation or deletion (UCoD) of securities:

Authorised creation of securities positions in the CBF system is only performed upon receipt of securities to be credited to participant accounts either through a new issue distribution (issuing agent) or the settlement of a corporate action.

Authorised removal of securities positions is generally performed upon final maturity or in the context of a corporate event.

Integrated securities provisions checks are exercised before release of a settlement instruction.

Daily reconciliations are performed to ensure the correct application of the rules to prevent UCoD of securities. The various reconciliation measures as well as the handling of differences are detailed below in "Periodic reconciliation of securities issues" and "Reconciliation frequency" sections of this key consideration.

Periodic reconciliation of securities issues

The internal and external reconciliation procedures and controls ensure on a daily basis that rules are adhered to.

As required by Articles 37 (1) and 37 (3) of CSDR, appropriate reconciliation measures are performed automatically within CBF's systems to verify that the number of securities making up a securities issue or part of a securities issue submitted to CBF is equal to the sum of securities recorded on the securities accounts of the CBF participants of the SSS, and on owner accounts maintained by CBF. Such reconciliation measures are conducted daily. As required by Article 59.1 of RTS 2017/392, CBF ensures that these measures are performed for each securities issue recorded in all securities accounts maintained by CBF (centrally and not centrally).

The validation of securities positions covers the following key processes:

— Validation of the number of securities making up a securities issue or part of a securities issue submitted to CBF versus the total position recorded on the securities accounts of its participants and validation against a negative securities balance (that means that no negative securities balance exists on a participant account);

— Comparison of the previous end-of-day balance with all settlements processed during that day and the current end-of-day balance on CBF's books; and

— Usage of double-entry accounting.

Automated alerts are generated when a mismatch or divergence from established rules is detected.

Further details on reconciliation of securities accounts and registers are provided in number XII of CBF's GTC.

Reconciliation frequency

CBF performs daily internal securities reconciliation processes that it maintains centrally. It involves those functional and non-functional processes performed on CBF's books or in its systems, respectively, ensuring the integrity of a security issue.

CBF also maintains daily securities reconciliation processes with various external parties. This refers to daily reconciliation of movements and positions that relies on reporting to be received from an external party, and securities positions which therefore are not (fully) maintained centrally by CBF. The main purpose of the reconciliation is to ensure the integrity of the issue and minimise operational risk related to open differences in the respective holdings. For investment funds, the daily frequency refers to the frequency of the net asset value (NAV) calculation.

A daily reconciliation of the total holding per security issue is performed automatically by CBF's systems. Validations are performed in accordance with whether settlement data is received from T2S or Creation. The automated checks are performed at minimum once per day.

In addition, daily reconciliation is performed for the following securities positions:

— Securities held or mirrored at external parties, for example, registrars or CSDs;

— Securities held in CSC with the CSDs to which CBF maintains custody network links (investor-CSDs);

— Securities held in NCSC (reconciliation with CBL and its sub-custodians).

Every issuer/registrar of CASCADE-RS-eligible registered securities is provided with the overall reconciliation record by CBF on a daily basis.

Furthermore, CBF has established a reconciliation process with issuer agents as there is no contractual relationship, neither with the issuers of securities in registered form, nor with the entities maintaining the issuers' register. Hence, every day, CBF provides the issuer agents with a reconciliation file containing the total issue outstanding amount (IOA) for the securities requested for admission by the relevant issuer agents as recorded in the books of CBF. Since CBF has no relationship with fund managers or transfer agents, but with the issuer agents, and receives mark-ups and mark-downs directly from them, the daily reconciliation of the IOA issued via CBF is conducted with the issuer agent.

The issuer agent must reconcile the daily report with the information filed in the ownership register of the registrar and with the records of the transfer agent or the entity acting in this capacity. Any identified mismatch or discrepancy must be reported to CBF within the business day following the reception of the report. In addition, the issuer agent must provide all information necessary to enable CBF to ensure the integrity of the issue.

CBF performs the following control and reconciliation processes on physical inventory to ensure duly safekeeping and proper handling of physical securities:

1. Daily controls of physical security deliveries and receipts together with the corresponding order in the CASCADE settlement platform, to ensure safe receipt and proper system recording of deliveries;

2. Daily reconciliation of positions booked in CASCADE following settlement of securities instructions versus holdings in the Vaults Management application;

3. Inventory controls ensuring that all securities deposited with CBF and recorded in the Vaults Management application, are also physically deposited in the vaults. This includes a predominantly digital reconciliation process of global notes encompassing an electronic annual completeness check of sealed inventory and a more detailed spot-check control on a pre-defined amount of the physical inventory.

The control processes are in scope of the annual audit performed by CBF's Internal Audit function and the external auditors, as well as on the field work (during on-site evaluation), samples of evidences are assessed for adequacy of controls and adherence to procedures.

Each remaining difference following reconciliation tasks is reported as open until it is fully resolved, that means, corrective actions have been taken or missing movements have been booked. Once these movements have been reported or transmitted to the reconciliation application, open breaks can be reconciled and the open items authorised and closed. This is documented in CBF's internal reconciliation procedure.

According to CSDR reconciliation requirements, any reconciliation break is immediately investigated by CBF's reconciliation team and the impacted business unit(s). Both will perform all necessary measures to remedy the break without undue delay: the reconciliation team investigates the differences and may identify missing movements to solve them. However, the corrective action itself can only be confirmed as correct and be booked by the impacted CBF business unit or external party.

Where the reconciliation break reveals an UCoD, and CBF fails to solve this reconciliation break by the end of the following business day, CBF will suspend the affected securities issue from settlement until the UCoD is resolved. In such cases, CBF will inform internal and external stakeholders without undue delay of the fact that settlement in the relevant securities issue is suspended. Internal and external stakeholders will also be informed without undue delay when the UCoD is resolved, and settlement in the affected securities issue is resumed

In order to allow its participants to perform their daily reconciliation obligations, the company makes daily statements of holdings and transactions available to participants that they have to subscribe to in line with number XII Reconciliation of securities accounts and registers of the CBF GTC.

The robustness of the system and the daily reconciliation processes is reviewed also by the external auditors.

Key consideration 2

A CSD should prohibit overdrafts and debit balances in securities accounts.

CSDs that have outsourced their settlement activity to T2S have no measures at hand that could prevent negative securities positions as CSDs rely on T2S provision checks and settlement rules. The CSD reflects the T2S settlement results. Negative balances might be accepted if and on accounts that operate as mirror accounts. In these cases, these accounts as well as their counterparty accounts must be included in the reconciliation process.

If the structure of an account does not allow negative securities balances, the settlement platforms also perform a "provision check" before executing a participant instruction, thereby ensuring that sufficient securities are available on the participant account to execute the delivery and preventing a debit balance. This ensures that no negative securities balances can result from the settlement process, even on an intra-day basis.

As per Article 37 (3) of CSDR, no negative securities balances are allowed on participant accounts maintained by a CSD. There is no specific article that covers the securities reconciliation of internal accounts. However, this reconciliation type is an additional check to avoid any mismatch or inconsistency that could lead to the UCoD of securities.

Key consideration 3

A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry. Where appropriate, a CSD should provide incentives to immobilise or dematerialise securities.

The majority of today's issues (roughly 99%) is done in immobilised form. The process for admission of securities to CSC by CBF is initiated by the applicant, either the issuing bank (lead manager) or the issuer itself, that submits the request for admission together with the certificate(s) and various accompanying documents to CBF. To simplify and shorten the admission process for certificates, warrants and certain types of bearer bonds, CBF offers its participants the eMission service. Issuers and issuing banks (lead managers) can use an internet portal to submit to CBF the terms and conditions of issue and the basic data for new issues of securities certificates etc. In addition to government bonds, where dematerialised issuance has been possible for a long time, the dematerialised issuance became compliant with the DepotG. This was enabled through the Gesetz über elektronische Wertpapiere (eWpG, German Electronic Securities Act), which entered into force on 10 June 2021. Issuers are now able to issue securities electronically in dematerialised form.

Key consideration 4

A CSD should protect assets against custody risk through appropriate rules and procedures consistent with its legal framework.

CBF obtains (and subsequently updates as per CSDR requirements) third party legal opinions in respect of the legal protection afforded to the securities deposited with CSDs/sub-custodians in each market pursuant to local laws (in particular insolvency protection). Therefore, when appointing a CSD/sub-custodian, CBF reviews the custody risks associated with the decision to entrust the securities to the sub-custodian.

CBF assesses and reviews the custody risks associated with the decision to entrust the securities to the CSD/sub-custodian on a regular basis.

The essential points of the legal opinions are published in the "Legal arrangements" section of the Market Link Guides on the Clearstream website.

CSDs/sub-custodians are requested to provide a Three-Point Declaration in which the non-German custodian confirms the following:

- The securities positions delivered into safe custody by the depository are kept as participant positions of the depository;
- As a matter of principle, it will not assert any rights of lien or rights of retention in relation to these securities;
- Custody of the securities positions underlying the Three-Point Declaration will not be outsourced to a third party without the consent of CBF.

The Three-Point Declarations are published in the "Regulation" section of the Clearstream website.

Key consideration 5

A CSD should employ a robust system that ensures segregation between the CSD's own assets and the securities of its participants and segregation among the securities of participants. Where supported by the legal framework, the CSD should also support operationally the segregation of securities belonging to a participant's customers on the participant's books and facilitate the transfer of customer holdings.

In order for the safe custody and settlement of securities transactions to be carried out by CBF, participants can maintain a collective account at CBF, in which the securities holdings of multiple underlying clients of the participant are booked. This level of segregation corresponds to the omnibus client segregated account (OCS) as set out in Article 38 (3) of CSDR. Alternatively, the participant may choose to set up separate deposit accounts at CBF to segregate the securities of its individual clients from the holdings of the participant and of its other clients. This level of segregation corresponds to the individual client segregated account (ICS) as set out in Article 38 (4) of CSDR. For either account type (ICS or OCS), CBF books the securities and any other fungible financial instruments received as a deposit or held in an account, separately from its own proprietary positions and off balance sheet (that is, independently of ICS or OCS).

Under German law, Section 2 DepotG provides for a separate safe custody of securities in the case of individual safe custody. Additionally, according to Section 4 (1) DepotG, participant accounts held by CBF are managed as a third-party deposit.

Please refer to CBF's CSDR Article 38 disclosure document for further details.

Participant assets are held in an omnibus account in CBF's name with the local CSD and are therefore segregated from the proprietary assets of the local CSD. CBF does not hold its own assets at the CSD level in the local market.

For assets held in NCSC via 6-series accounts on the Creation platform of CBF's sister company Clearstream Banking S.A. (CBL), a different operating model applies. In this context, CBF uses accounts directly at the CSD or indirectly via a custodian. At the CSD/custodian, CBF holds an account for its proprietary assets and an omnibus account for its participant assets.

This structure simplifies the recovery of assets for participants should CBF become insolvent. CBF participants' assets deposited with CBF are governed and protected by the provisions of the DepotG and the InsO.

As described above and in Principle 1, participants depositing securities in collective safe custody with CBF benefit from a right in rem. They are co-owners in the pool of securities deposited at CBF up to the amount of securities held on its securities account. Clients depositing securities in non-collective safe custody with CBF receive a pro rata claim for delivery in relation to the asset pool for the respective securities' class in the custodian's country. Under German law, in the event of bankruptcy of CBF, the company's participants would be entitled to claim their assets or equivalent assets deposited with CBF in accordance with Section 47 InsO as they have a right to segregate the securities.

The right of segregation would apply, irrespective of whether securities are booked in ICS or OCS, so that both segregation types provide a similar level of protection in the case of insolvency of CBF.

Key consideration 6

A CSD should identify, measure, monitor, and manage its risks from other activities that it may perform; additional tools may be necessary in order to address these risks.

Besides central safekeeping and administration of securities and settlement, CBF offers a variety of services for financial institutions across selected markets and financial instruments. The company identifies, measures, monitors and manages the risks from these activities. The following sections present information complementing the propositions provided in Principles 3, 4, 7, 15, 16 and 17.

CBF performs cash management and FX services, as well as financing services. Comprehensive custody management includes, for example, withholding tax and proxy voting services. In addition, CBF offers related information distribution including participant reporting and a comprehensive new issues service.

Credit and liquidity risks arising from CBF's additional services

Any risk deriving from credit and liquidity activities are addressed in Principles 3, 4 and 7.

CBF considers corporate actions (including proxy voting) as central safekeeping and administrative functions.

Credit and liquidity risks arising from collateral management agency services mainly relate to derived asset servicing and settlement activities; they do not differ from the risks set out in Principles 4, 5 and 7.

For securities lending services, a dedicated legal framework is set up for and with each individual participant in addition to the provisions of CBF's GTC.

CBF offers the following foreign exchange (FX) services to its participants for the CBF-i activity, such as automatic FX services for custody proceeds, interest charges and standard monthly fees, as well as an FX service for securities settlement instructions and the case-by-case FX service.

All of CBF's additional services are delivered in accordance with the company's key risk and credit principles. A permanent monitoring process is in place to identify large participant positions which may lead to unwanted nostro balances, regular daily reconciliation of cash balances and a contractual framework are in place with each of the two CCBs.

Operational risk arising from CBF's additional services

The creation of new products or services is triggered in different manners: through CBF's participants, the company's reply to market or regulatory changes or through CBF's management initiatives.

CBF has put in place a wide range of IT tools, controls and procedures to minimise the impact of sources of risks related to new or existing (enhanced) products and services to ensure the integrity of securities issues, minimise and manage the risks associated with the safekeeping and transfer of securities. Thus, IT tools support the monitoring and reduction of operational risk and ensure that CBF's technical environment remains stable (for example, by ensuring the monitoring of the infrastructure).

With regard to operational risk, CBF in particular uses IT tools and processes to manage and monitor its settlement systems. The control environment includes but is not limited to IT controls: it covers, for instance, cybersecurity measures, local and physical access management, stress testing/VaR, BCM or project management processes, such as the 4-eyes principle. Key controls are detailed and documented in the "Mitigation actions and controls" section of CBF operational scenarios which lists information on controls and procedures (which may also be supported by IT tools). The other controls types are further detailed in internal policies and procedures used by CBF to minimise the impact of sources of operational risk.

CBF's Material Change Process (MCP)

As a general control mechanism, for material changes[2], new business activities and strategic initiatives, Deutsche Börse Group has implemented a Material Change Process (MCP) governance framework. This framework defines rules, roles, processes and responsibilities applicable to all staff and management, as well as the principles to be applied when assessing any material change activity before, during and after their implementation (including intended updates or implementation of new business activities and services).

Within the MCP framework, a Material Change Committee (MCC) has been set up in addition to the Clearstream Risk Committee (CRC) that is chaired by an independent chairperson. Along with the first line of defence management, the MCC comprises the company's Chief Compliance Officer (CCO), Chief Risk Officer (CRO), Chief Information Security Officer (CISO), Chief Information Officer/Chief Technology Officer and permanent guests (for example the Chief Internal Auditor). The MCC is designed to ensure consistency in material change risk assessment reviews, approval processes, completeness of risk impact analysis and adequacy of risk-based measures to manage dependencies and potential risk implications of respective material changes (in accordance with the defined workflow requirements). The MCC has veto right of non-recommendation of a proposed material change by way of their advisory opinions provided for the MCC reviews.

[2] A change activity is classified as "material" where it has the potential to directly or indirectly affect the business and risk profile of one or more of the regulated Clearstream entities. In these regards, the MCP outlines a set of categories that exemplify prominent examples (not exhaustive) of activities included in scope of "material change", in particular those that have an impact on the governance, business products and processes relevant for Clearstream.

Furthermore, the MCC assessment ensures that key factors for relevant risk types are taken into consideration, and potential capital impact is assessed. It is essential for CBF to identify those risks and modify or structure the product in such a way as to mitigate the risks in the best possible manner. Material changes including all new business activities are assessed by the MCC or Clearstream Risk Committee. The outcome of the risk management assessments shall be reported to CBF's Executive Board by the chairperson of the CRC.

Within the MCP framework, various stakeholders are involved both at Deutsche Börse Group and legal-entity level based on a "three lines of defence" strategy. The heads of departments and sections (business owners) are responsible for informing the MCC of any plan to introduce a change activity considered a "material change". In the event that the MCC does not recommend a proposed new business activity, this may nonetheless be proposed to the relevant governing board or committee explicitly stating the conclusions of the MCC.

There are a number of interconnected risks involved in the launch of a new product. Accordingly, it is essential for Clearstream to identify those risks and modify or structure its products in such a way as to mitigate the risks in the best possible manner. Thus, Clearstream Risk Management performs risk assessments and gives recommendations for the respective legal entitie(s) individually and also combined in order to consider the interconnected risks.

Material changes are tracked in a centralised inventory also comprising the full list of Clearstream products and services. This inventory is periodically reviewed to ensure appropriate governance during the lifecycle of the respective products and services.

In accordance with the MCP workflow requirements, the material assessment review will be performed by the business owner responsible for CBF in collaboration with other relevant stakeholders, notably the company's Risk Management, Compliance, Information Security, Data Protection and Legal functions. The assessment review is divided in three phases: initiation, pre-launch and post-launch. "MCC review & recommendation" quality gates (QG) are used to verify that a set of required activities is performed to ensure a sound and reliable analysis of the intended material change to allow for a fact-based decision making by the Executive Board. Following the review performed by the MCC, a recommendation will be provided to CBF's Executive Board (MCC review documentation and minutes are stored in a centralised inventory for reference).

Principle 12: Exchange-of-value settlement systems

If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

Key consideration 1

An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.

CBF settles transactions that involve the settlement of two linked obligations being the delivery of securities against the payment of cash (delivery versus payment, "DVP Model 1"). Principal risk is avoided through the irrevocable, unconditional and simultaneous exchange of the securities (the delivery) and the cash value (the payment) to settle a delivery versus payment transaction. This aspect is covered by the following:

(i) The legal framework applicable to CBF's services and settlement activities as defined in Principle 1;

(ii) With regard to settlement via CASCADE/T2S, the CBF Client Handbook (chapter 4 "Settlement services") sets out the settlement mechanisms and rules applicable to and binding upon CBF and its participants in order to address the principal risk in the system.

(iii) With regard to settlement via the Creation SSS, the information is to be found in the CBF Client Handbook (chapter 3 "Settlement Services").

(iv) From a technical perspective, CBF's two SSSs CASCADE (used for settlement that is outsourced to the T2S platform provided by the Eurosystem for securities settlement of T2S-eligible instruments free of or versus payment in central bank money[3]) and Creation (used for the securities settlement instructions free of or versus payment in commercial bank money) process all instructions in real-time ensuring a simultaneous exchange of delivery and payment. Regarding T2S, a real-time interface between T2S and CBF's SSS CASCADE ensures the exchange of settlement information as well as the consistency of the instructions in T2S and CASCADE. Securities are matched and provisioned prior to settlement to ensure the adequacy of cash and securities for settlement. The timely processing is assured by undertaking regular mitigating measures, such as system developments as soon as potential system performance issues are detected. The high level of system performance is being ensured by regular system regression testing activities.

For external settlement with domestic markets via direct or indirect CSD links through the Creation SSS, the settlement model applied may vary per market. Such information is available in the Market Link Guides on the Clearstream website. Any external receipt or delivery instruction is only released for settlement after successful provisioning of the securities or cash obligation. DvP transactions involving a domestic counterparty are final depending on the receipt of expected settlement results in accordance with local market regulations and practices and in particular under consideration of the processing mode (batch, real time) of the relevant local market and its time zone. Upon successful validation of respective settlement

[3] T2S versus payment settlement comprises transactions in EUR or DKK currency central bank money (with cash settling on T2) as well as versus payment in non-T2S eligible currencies (with securities settling free of payment in T2S, and cash settling on the Creation platform).

results received from domestic markets, real-time processing will take place in Creation in order to reflect the full transfer of securities and cash.

The finality of instructions is further described in Principle 8.

The order in which transactions are considered for provisioning and settlement is generally determined by the transaction priority (assigned by the participant or by CBF), and the settlement sequence option on the account.

Principle 13: Participant-default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

Key consideration 1

An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.

CBF has default management process (DMP) rules and procedures in place which define the circumstances under which a participant is considered to be in default, the measures implemented to mitigate the risks arising from a participant default and the testing activity to ensure its continuous improvement.

Referring to its products and services offered, CBF defines two types of default:

(i) General default: When a participant is unable to fulfil its contractual obligations according to an agreement with CBF where insolvency proceedings, as defined in Article 2 (j) of SFD, are opened against a participant. "Insolvency proceedings" shall mean any collective measure provided for in the law of a EU Member State, or a third country, either to wind up the participant or to reorganise it, where such measure involves the suspending of, or imposing limitations on, transfers or payments.

(ii) Contractual default: When a participant is unable or unwilling to fulfil, in a timely manner, one or more of its scheduled obligations according to an agreement with CBF.

In order to take pre-emptive measures even before a default occurs, CBF has established the Early Warning Framework which is based on early warning indicators (EWIs) and their monitoring thresholds which have been determined based on identified risks in the various business areas like Custody and Settlement, Treasury etc. The continuous monitoring of these indicators and their thresholds ensures an early detection of irregularities in a participant's behaviour, which could ultimately result in the participant's credit deterioration or default.

The DMP of CBF has been implemented in accordance with this Principle and Article 41 of CSDR.

The following chart describes different phases of the DMP, which consist of (i) monitoring (identifying a participant's default at an early stage and taking preliminary measures in order to eliminate/reduce the exposures), (ii) taking corrective measures (liquidation of defaulting participant's pledged collateral in order to cover the outstanding exposure) and (iii) communicating, as per ESMA guidelines, its competent authority and the defaulting participant of the actions to be taken or taken by the CSD following the default and any other persons of the actions taken following the default.

Clearstream Default Management Process

Early Warning Framework	Pre-emptive measures	Consequences of default	Communication
• Continuous monitoring of various qualitative and quantitative parameters to early detect irregularities in customer's behaviour which could ultimately result in credit deterioration and/or default	• Increasing monitoring of collateral • Suspending credit limits • Monitoring settlement instructions and activities	• Termination of business relationship • Blocking accounts • Suspending credit limits • Blocking settlement instructions* • Liquidation of assets pledged as collateral to cover the outstanding exposures • Securities lending positions • Containing losses and liquidity pressures	• External communication in accordance with the ESMA guidelines on CSD participants default rules and procedures*

Testing of default management process

*applicable only to insolvency

Key consideration 2

An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.

The Clearstream Default Management team (CDM) is the owner of the DMP. The process is initiated and coordinated by CDM, which regularly reviews, tests and amends the process, where necessary, in order to be well prepared to act if needed. In case of a participant default CDM would initiate the DMP. Upon approval of default, the DMP foresees the suspension of the credit limits (if not already implemented as a pre-emptive measure) and the liquidation of the defaulting participant's collateral for the purpose of covering their outstanding exposures (if any). Liquidation of collateral is a corrective measure in the process. The key objectives of liquidation are to (i) minimise the losses for CBF, (ii) limit disruptions to the market by ensuring a smooth collateral liquidation and a timely completion of settlement even under stressed market conditions and as a result avoid impact on the normal settlement activity of non-defaulting CBF participants, as well as (iii) sell collateral in a prudent and orderly manner.

CBF's settlement system ensures a clear segregation of the participant's proprietary and their underlying clients' assets. Only participants' proprietary assets pledged as collateral are subject to liquidation in case of default. The underlying clients' assets are segregated on dedicated accounts. They cannot be pledged under the pledge permitted by CBF's GTC and therefore underlying clients' assets are not subject to liquidation or off-setting in case of a participant default (if not specially agreed otherwise).

Upon default of a CBF participant, there are two types of treatment for the underlying clients' assets:

(i) In general, should a CBF participant default contractually, this participant will be able to continue its operations at CBF once the outstanding exposure of CBF, on the given participant, has been covered in accordance with the rules and procedures of the DMP. As such, the defaulting participant will also be able to continue the operations of its underlying clients as its assets remain on the accounts opened with CBF. However, CBF could decide on a case-by-case basis to terminate the relationship in accordance with the GTC and its Client Access and Acceptance Policy.

(ii) Should a CBF participant default legally, CBF would follow the instructions of the appointed administrator in order to transfer the remaining proprietary assets of the defaulted participant as well as the assets of its underlying clients to the dedicated accounts opened by the insolvency administrator. Should an underlying client wish to open a direct account with CBF, CBF would apply the standard due diligence under the participant acceptance criteria and decide whether an underlying client meets the criteria to be accepted as a new CBF participant.

With regard to a participant's underlying client transactions, CBF applies the settlement finality rules, provided the provisioning rules are respected. Should a participant of CBF default, the DMP would be activated and the accounts of the defaulting participant would be blocked. Under the settlement finality rules, CBF would allow manual release of pending transactions.

CBF's GTC and its uncommitted intra-day Technical Overdraft Facility (iTOF) agreement govern the right of pledge over participants' proprietary assets and their enforcement of those assets in case of a participant's default. Based on this, CBF's DMP defines the operational processes which enable the company to promptly access the above-mentioned pledged assets in case of a participant's default and liquidate them in order to cover the outstanding exposures of the defaulted participant.

Additional financial resources that can be used for avoiding liquidity pressures or covering potential liquidity gaps are defined in Principle 7, key consideration 10. In addition, the Clearstream Recovery Plan states that financial resources are to be used for recovering from a major potential loss.

In compliance with the ESMA guidelines on CSD participants default rules and procedures, CBF would communicate the participant's default and/or the measures taken following the default to all relevant stakeholders. CBF's default management procedures define the communication path in case of a participant's default to the relevant internal and external stakeholders. The communication of default to the relevant competent authorities of CBF is part of the communication plan. In order to inform the non-defaulting participants of the actions taken following a participant's default, CBF will publish a press release on its website as well as an alert on Xact Web Portal. All default management processes and procedures are reviewed, tested, updated and approved by CBF's Executive Board at least annually in order to ensure their quality and functionality.

Key consideration 3

An FMI should publicly disclose key aspects of its default rules and procedures.

CBF publishes the overview of its main default management rules on the Clearstream website.

Key consideration 4

An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.

CDM conducts the default management testing in order to ensure a continuous improvement of the DMP and the best possible level of preparation for a crisis situation, which can be triggered either by a participant default or a market crisis. In addition to the regular maintenance of the DMP, CDM undertakes the default management testing following any substantial changes to CBF's default rules and procedures or upon request from its competent authority. In accordance with the ESMA guidelines and depending on the type of test, CDM invites different participants. These can be CBF participants, relevant FMIs and any other entities, as appropriate, for the securities settlement system it operates. The competent authority may also request to take part in such tests. CDM tests the default management process also to ensure that all relevant participants are familiar with their roles and responsibilities in the DMP. Additionally, the objective of default management testing is to provide training and guidance to CBF personnel on how the default rules and procedures should be implemented.

CDM also discloses on Clearstream's website at least a summary of the result of the performed tests and the contemplated changes to its default rules and procedures, if any. Additionally, CBF offers participants the opportunity to be involved in the Clearstream default management framework by going through the company's default rules and procedures as well as the testing activity with the Clearstream Default Management unit.

Principle 14: Segregation and portability

A CCP should have rules and procedures that enable the segregation and portability of positions of a participant's customers and the collateral provided to the CCP with respect to those positions.

Not applicable to CBF.

Principle 15: General business risk

An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

Key consideration 1

An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.

For CBF, business risk is the loss arising from strategic decisions and/or their implementation, or from the inability to adapt to external factors (including losses arising from missed opportunities). Business risk reflects the sensitivity to macroeconomic developments and vulnerability to risk arising from other external threats. It is translated into terms of earnings before tax (EBT), reflecting both a potential revenue decrease and a potential increase of its cost base. The framework to manage and control business risk comprises several instruments including scenario analysis, an early warning system based on KRIs and the capital model.

EaR are calculated using a Value at Risk (VaR) model and are based on the variance-covariance approach using a historical time series of profit and loss figures. The confidence level is of 99.9% in the economic perspective of the internal capital adequacy assessment process (ICAAP) over a specified time horizon of one year. The methodology is based on quarterly relative deviations – positive as well as negative – between expected and actual profit and loss figures. To ensure the quantification of business risk in accordance with the EaR approach, specific profit and loss figures have been identified as suitable, in line with the definition of business risk. These profit and loss figures indicate the sensitivity to macroeconomic developments (including, among others, changes in the competitive, market and political environment) or vulnerabilities arising from the company's internal weaknesses.

CBF's financial performance is subject to the evolution of a number of macroeconomic and business-related factors such as the level of interest rates, projected economic growth of the business segments within CBF, new regulations, unforeseen mergers and acquisitions, poor execution of projects, non-achievement of strategic targets, rising competition levels, reputational risk, and investors' confidence in the economic environment in the Eurozone.

In the quarterly CBF Risk Report for Q4/2023, required economic capital for business risk was reported as nil, because VaR was lower than the budgeted earnings before tax for the next four quarters.

Key consideration 2

An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.

Generally, CBF's own funds cover several risk types (operational risk, business risk, pension risk, financial risk, liquidity risk) and a specific amount is fixed for the business risk ARBC. Own funds are mainly invested in highly liquid assets. As business risk is one of the smallest risk types for CBF – compared to operational and financial risks – it is allocated one of the smallest amounts of own funds as a limit. Thich means that business risk should never exceed this amount of own funds, such amount can be fully recovered by own qualifying liquidity resources (QLRs). The allocation of own funds is based on the approved materiality assessments for each risk type, and this leads to a specific allocation key of own funds based on the quantitative and qualitative assessments.

Capital requirements under CSDR

In order to be compliant with Article 6 "Capital requirements for business risk" of DR (EU) 2017/390, CBF applies the following measures.

For the scenario-based business risk model used under CSDR with regard to relevant business risks, a scenario analysis method is used, that is, a structured form of assessing current business risks based on experts' knowledge, macroeconomic input data and external research. Using the said scenario analysis, CBF achieves several objectives:

— Documenting and assessing business risk and major potential events;

— Establishing a sound basis for risk management, by determining likelihood and effect of potential generic events;

— Allowing for a follow-up on the success of implemented measures;

— Including the macroeconomic and regulatory environment as well as internal factors.

In order to effectively identify, monitor and manage general business risks, scenario analysis and parametrisation are carried out by experts of CBF's first line of defence and of the Clearstream Risk Management team with an oversight of senior management. Senior managers are involved throughout the process and have confirmed the completeness, accuracy, relevance, timeliness and reliability of coverage.

The capital requirements of a CSD for business risk shall be whichever of the following is higher:

— 25% of the CSD's annual gross operational expenses;

— Estimated amount resulting from the application of the scenario analysis, minus whichever of the following is the lowest:

  — Net income after tax of the last audited financial year;

  — Expected net income after tax for the current financial year;

  — Expected net income after tax for the previous financial year where audited results are not yet available.

Overall, Clearstream Risk Management applies a five-step process for risk management:

1. Risk identification;

2. Notification;

3. Assessment;

4. Controlling/Management;

5. Monitoring/Reporting.

The Controlling/Management step describes risk mitigation and encompasses risk avoidance, risk reduction, risk transfer and intentional risk acceptance. All organisational units and employees must perform risk control, implement mitigating actions, and monitor these actions according to the established processes.

CBF has developed business risk-specific key risk indicators (KRIs) which are reported within the quarterly risk reporting. The metrics give an overview of the components that are also used as input data for the EaR business risk model. They may trigger an ad hoc review if considered necessary. KRIs are reviewed at least annually in collaboration with subject matter experts. The KRIs are monitored on a quarterly basis. The purpose of this underlying early warning system is to determine if an ad hoc review of a particular risk component is required and to outline the required reporting to the executive management in case of a trigger event (yellow and red warning lights).

When a breach occurs, the relevant business units shall investigate the related detailed information and especially the root cause(s) of the breach and estimate/calculate the potential impact of the breach. In addition, if deemed necessary and possible, the respective business area can develop and propose a remediation plan to compensate the impact of the breach.

When investigating the root cause(s), the business units shall examine if the breach was the result of a specific event. If the cause/threat is new, that is, it has not been seen or recorded before, an ad hoc business review shall be proposed to the executive management. It is the responsibility of the respective business area to ensure further development/alignment and introduction of mitigating actions. Typically, mitigation actions (for instance, increase of fees or reduction of certain costs) to compensate the impact materialising business risks have to be approved by the responsible executive management.

Moreover, a list of descriptions of mitigating factors is collected for all the scenarios. Estimates are provided net of effects of any mitigating controls and/or actions in place. The aim of the mitigating measures and controls is to reduce the frequency of occurrences. The extent of this reduction is difficult to quantify and is not quantified in the scenario-based risk analysis.

Key consideration 3

An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.

CBF distinguishes between requirements for a recovery plan (mitigating a near-default situation), a restructuring and wind-down plan (ensuring solvent wind-down) and a resolution plan (insolvent wind-down).

The recovery and restructuring and wind-down plans are drawn up and maintained by CBF. Their purpose is to set out available tools of CBF to overcome severe financial and operational shocks that could potentially undermine the viability of CBF and sustainability of its business. Ultimately, the plans aim at ensuring the continuity of CBF's critical services and operations, also preventing significant adverse effects on the financial system.

At present, the recovery capability of CBF is considered to be given. A suitable number of viable recovery options has been identified for the case that CBF is exposed to severe stress. The range of identified recovery options ensures that CBF can raise sufficient capital or funding to withstand severe stress affecting its capital and liquidity profile. In addition, there is a range of recovery measures aimed at restoring the company's operational capacity or strengthening the risk profile.

Operational capability has also been proven to be stable, even in crisis situations. This is the result of robust and efficient crisis management processes and procedures as well as detailed business contingency measures, which are partially also reflected in the recovery plan.

Both risk and financial profiles of CBF prove to be robust and only an extreme event would trigger a near-default situation. As aforementioned, CBF has a number of recovery options, which would be implemented as an appropriate response to severe stress. In addition, CBF has adequate crisis and default management procedures to deal with anomalies and emerging crisis situations. These procedures are regularly tested to ensure their effectiveness and that all relevant stakeholders are familiar with their roles and responsibilities. Hence, CBF is able to respond very quickly to a crisis event and implement the necessary mitigating tools in a timely manner.

The recovery plan is reviewed at least annually and approved by the Executive Board of CBF as described in Principle 3, key consideration 4.

In the restructuring and wind-down plan, several tools have been identified as being applicable in restructuring and wind-down scenarios. The scenarios are differentiated on the basis of the criteria and requirements stipulated by CSDR and taking into account the applicable tools accordingly. These tools vary in their applicability and feasibility depending on the scenario.

The restructuring and wind down plan of CBF defines a restructuring and wind-down timeline based on the relevant scenario and the applicable tools. Accordingly, the necessary amount of capital is derived to ensure that critical operations and services can be continued during the restructuring or wind-down period. Currently, CBF is subject to a restructuring or wind-down period of eight months. However, improvements have been identified which might lead to a reduction of the applicable period to seven months (subject to approval by the national competent authority).

Key consideration 4

Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.

CBF’s investment portfolio is composed of issuers whose bonds have a remaining life to maturity below five years. These assets are exclusively ECB-eligible HQLA Level 1 assets denominated in Euros (CBF's equity is only in EUR currency). They are kept unencumbered on a separate account under the direct management of CBF’s Treasury team as the company’s liquidity management function. The assets may only be used as a source of contingent funds during stress periods. They are directly transferrable to Deutsche Bundesbank to generate intra-day liquidity via CBF’s credit line.

Key consideration 5

An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.

CBF maintains recovery and recapitalisation plans, which include a range of recovery strategies under severe stress scenarios, including situations in which equity falls below the recovery threshold or minimum regulatory requirements.

The Recovery Plan is structured around the following components:

- Strategic analysis;
- Recovery indicators;
- Governance;
- Recovery options;
- Stress scenarios;
- Communication plan.

The Recapitalisation Plan outlines a worst-case scenario to test available recovery options. It includes:

- Scenario description;
- Order of events and governance steps;
- Qualitative and quantitative impact of the scenario;
- Recovery options;
- Communication plan;
- Feasibility assessment – parent support.

The viability of both Recovery Plan and Recapitalisation Plan is ensured through an annual maintenance and update cycle. The Plans are updated considering the input from subject matter experts who bring their expertise to enhance the effectiveness of the Plans. They are reviewed and approved by CBF's Executive Board. Moreover, the Plans are shared with the relevant supervisory authorities, who evaluate the Plans' compliance and feasibility and provide their assessment, which is considered in the ongoing improvement of the Plans. Moreover, the Plans are internally tested for the evaluation of governance processes in place. The testing results as well as any lessons learned, either from tests or real-case scenarios are taken into account to make necessary enhancements to verify Plans' readiness.

Principle 16: Custody and investment risks

An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.

Key consideration 1

An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.

All CSDs and agent banks appointed by CBF in domestic markets are contractually required to obtain and maintain all necessary permits, licences and consents or authorisations required by applicable law(s) to enable them to fulfil their obligations under the agreement. CBF ensures that the CSDs and agent banks have robust accounting practices, safekeeping procedures and internal controls through a set of assessment measures described below.

CBF holds its own and its participants' assets in accounts at a local CSD. In these cases, the role of the CSD/agent bank is reduced to a power of attorney and can be revoked with immediate effect. CBF has established direct links with local CSDs and direct links with local partners that provide asset services (Agents) in a number of domestic markets whereby these types of links qualify as CSD links.

For both link types, CBF reviews the elements necessary to asset protection to make sure it is compliant with its obligations towards its participants. These obligations include the enforceability of the agreement with the CSD/agent bank with whom CBF holds its own or its participants' assets as well as the protection of the assets, for instance, in the event of insolvency of the CSD/agent bank.

How CBF assesses local CSDs and agent banks

The Clearstream Network Management (NM) function develops and maintains relationships and services with CBF's network of CSDs and central banks. The team also assesses the risks resulting from the relationship with the CSDs. Each market linked to CBF is supervised by a dedicated Clearstream Network Manager who performs an "end-to-end" role, covering all CSDs, agent banks and infrastructures for a given market. Relationship management tasks include the following:

- Monitoring and maintenance of legal documentation;
- Policies and guidelines (for example relating to risk management and contractual arrangements);
- Process definitions;
- CSD/agent bank and market review process;
- Management of statistical reporting and business targets;
- KPI reporting, analysis and action planning;
- Issue management;
- Incident management;

- Benchmark development and maintenance;
- Monitoring and communication of market changes internally across impacted departments and externally towards participants;
- Annual credit review (by Credit department on behalf of NM) for non-EEA CSDs.

Through these measures, the NM team, who is located in Luxembourg, Prague and Singapore, ensures that local CSDs and agent banks linked to CBF have in place robust accounting practices, safekeeping procedures and internal controls. The CSDs and agent banks are assessed by NM as part of the selection process during the setup of a new market link and on an annual basis for existing links.

Furthermore, CBF ranks its linked CSDs and agent banks on the basis of MIS data collected by its NM and Operations teams. The rankings are complemented by periodic depository quality assessments for CSDs and agent banks across the network.

Cash correspondent banks (CCBs), in the case of the CBF-i activity, are subject to similar obligations compared to those applicable to CSDs and agent banks as described above and in the following sections.

Selection process via requests for proposal/information (RfP/RfI)

When CBF decides to enter a new market, NM performs a request for proposal (RfP)/request for information (RfI) selection process. This process comprises (i) a detailed operational overview of each individual business process, (ii) a legal and compliance overview of the entire infrastructure and (iii) a credit review. NM assesses candidates based on their responses to RfP/RfI questionnaires. Criteria of the selection process include, among others, the candidate's operational efficiency (such as deadlines, turnaround times), creditworthiness (for instance credit assessment of the intermediary's capitalisation, asset quality, management competence, risk profiles, earnings and liquidity), general standing from a compliance perspective (such as ownership, shareholders, market capitalisation), its compliance with regulations regarding the combat against money laundering and terrorist financing, credit lines granted, fees, as well as the candidate's connectivity and STP standards such as ISO 15022/20022 compliance. In addition, CBF includes as selection criteria, the CSD's/agent bank's presence and importance in the market via, among others, the candidate's market share and its presence on the local market forums. Upon review of the proposals received, candidates are shortlisted, and due diligence visits (DDVs) can be performed on the final candidate. Based on the RfP/RfI responses, the collected documents and the output of the DDVs, NM will have a comprehensive view of the key risks identified for CBF and its participants from the link creation and/or appointment of the new CSD/agent bank. CBF may, if deemed necessary, also contact clients of the candidate institution. Final approval of the CSD or agent bank selection is delivered by CBF's Executive Board.

Once a market link has been established, CBF annually verifies the CSD's/agent bank's compliance with the provisions of the link agreements through a set of tools and measures, of which the most important are outlined below.

Link arrangement review questionnaires

The link arrangement review questionnaires are sent out to each CSD. These questionnaires intend to verify the CSDs' compliance to all key regulatory points of CSDR. It has been based on this regulation and is commonly used by all CSDs in the countries covered by CSDR. For CSDs not covered by CSDR, a more extensive questionnaire is used.

Due diligence inspections including DDVs

Due diligence inspections consist of any verification deemed appropriate in order to ascertain that the CSD/agent bank fulfils its obligations under the legal agreement pursuant to the professional standards of a securities custodian. Hence, the inspections are based on the AFME industry standard questionnaire and an appendix with a set of additional questions that are specific to CBF as CSDR regulated entity, for indirect and operated links. These questionnaires cover aspects such as, among others:

(i) Legal and regulatory frameworks;

(ii) Security and insurance coverage;

(iii) Operational processes and reconciliation items;

(iv) Business continuity management;

(v) AML measures; and

(vi) Recent and forthcoming market changes.

This assessment allows CBF to monitor and manage any additional risks resulting from the use of an agent bank and to verify that the link and the agent bank meet the regulatory requirements set out in CSDR. Like the link arrangement reviews, DDVs provide CBF's NM team with additional information on the respective markets since the Network Managers also use them to discuss subjects such as regulatory changes, market developments, fee renegotiations or potential business developments (for example the inclusion of a new asset class on the link).

Depending on the link structure, DDVs may additionally include a review, among others, of the agent or CSD operations site or vaults if applicable, as well as meetings with regulators or market infrastructures. DDV reports and accompanying material are subject to internal and external audit reviews. As part of the annual CSDR review and evaluation process, CBF shares the outcome of the DDVs with the regulators.

Service reviews

In addition to the annual due diligence inspections, CBF conducts service reviews on its CSDs/agent banks. These service reviews are organised on an ad hoc basis, sometimes in combination with an annual DDV, and may be established on a recurring, periodic basis if required. Generally, service reviews focus on a specific set of issues or topics whereas DDVs are rather an overall assessment of the CSD/agent bank and the respective market.

External legal opinions

CBF requests legal opinions on its custody network links from external legal counsels. These legal opinions are considered an independent and neutral confirmation of key legal requirements, in particular as provided by the CSDR, in respect to the market served.

Among others, these legal opinions include assessment on the following aspects:

- Regulation and supervision of the local CSD and any sub-custodian or account operator;
- Entitlement of and nature of rights on securities;
- Encumbrances and restrictions on use of securities;
- Segregation of assets;
- Recovery proceeding in case of insolvency scenario.

These opinions are subject to renewal and review every twelve months.

Officer's certificates on internal control system

In these certificates, agent banks confirm that an effective internal control system is in place for the securities, that respective controls are reviewed at least annually by their external auditors and that during the preceding year, no such review has revealed any material deficiencies or made any material objections other than those already notified to CBF, as the case may be.

Further documentation

In addition to the above assessment measures to verify its linked CSDs'/agent banks' compliance with contractual, legal and regulatory requirements on an annual basis, CBF requests a documentation of their business continuity management and asks for completion of an AML questionnaire.

Key consideration 2

An FMI should have prompt access to its assets and the assets provided by participants, when required.

CBF has immediate access to its own and its participants' assets.

The company's **own securities and cash assets** are kept unencumbered on separate accounts under the direct management of Treasury in its liquidity management function with immediate access.

Prompt access for CBF's **participant assets held in the CSD** where CBF is a direct participant and held in local markets assessed via the 6-series accounts is granted.

In the depository contracts, it is specified that no lean and no pledge can affect the assets and the legal opinion as described in key consideration 1 verifies this as well.

In case of a participant's default, CBF will ensure that all accounts holding pledged positions will be immediately blocked to avoid any transfer of positions. If the decision to liquidate a participant's portfolio is taken, the pledged assets are segregated to enable the liquidation process. In order to enable prompt access to CBF's own or to its participant's assets, CBF monitors the quality of the services provided by its linked CSDs/agent banks and their adherence to the standards defined in the contractual arrangements as described in key consideration 1.

Key consideration 3

An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

CBF achieves optimal reduction of exposure to linked CSDs and agent banks by holding assets under custody directly with the respective CSD. Currently, the vast majority of securities are held under this structure.

Elements regarding the monitoring of the exposure vis-à-vis CSDs and/or agent banks and CCBs (in the case of the CBF-i activity) are described in further detail in key consideration 1 as well as in Principles 4 and 7.

Key consideration 4

An FMI's investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, highquality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.

Investment strategy

CBF's investment strategy has two main objectives: in the first place, the company aims at the minimisation of credit and market risks by managing its own funds and participant cash in order to ensure capital preservation. The second major objective is CBF's access to liquidity to always ensure the company's ability to satisfy payment obligations in a timely manner. The investment strategy forms part of CBF's liquidity risk management strategy and is described in detail in Principle 7. Further information is available in CBF's Pillar III disclosure report on the Clearstream website.

Risk characteristics of CBF's investments

CBF does not engage in proprietary trading activities and does not maintain a trading book.

Investments in securities as part of the investment or short-term portfolios are only high-quality liquid assets (HQLA) against high-quality obligors. These are purchased with the "buy and hold" strategy and recognised in CBF's banking book. They always remain unencumbered and available for an immediate sale or monetisation if required. CBF's Investment Policy defines limits for securities purchase transactions.

CBF's Treasury team invests in highly liquid financial instruments with minimal market and credit risk. To minimise the counterparty default risk, placements may only be executed with counterparties of adequate creditworthiness. Credit quality is expressed through an internal rating assigned by the Credit department and described in the Credit Policy.[4] The policy requires that at least 90% of available funds are invested in, that means, (i) deposited with central banks, or (ii) through arrangements that ensure the collateralisation of cash with highly liquid assets, or (iii) HQLA securities that can be monetised on an intra-day basis.

If no access to a central bank's deposit facility has been granted or if no other alternative secured instrument is available, Treasury places uninvested funds among several commercial institutions to avoid concentration risk.

[4] Accordingly, placements may only be executed (i) with counterparties with a minimum internal rating of "D" which corresponds to an external rating of BBB+/BBB (Fitch/S&P) or Baa1/Baa2 (Moody's), or (ii) with counterparties exceptionally approved by CBL's/CBF's Executive Board.

Principle 17: Operational risk

An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.

Key consideration 1

An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.

Identification of operational risk

CBF established appropriate systems, policies, procedures and controls which are described within the adopted risk management framework. The company applies a five-step process for risk management, described in Principle 3. Risk identification involves, to the most complete extent possible, all operational risk issues relevant to CBF, as well as risk drivers. Risks may arise as a result of internal activities or external factors. Risk examination must be performed with regard to existing or new processes, when concluding new business or entering new service areas. The identification can be reactive, following an operational risk event, but it should also be pro-active, based on regular reviews of processes in order to identify weak areas, or based on scenarios taking into consideration all potential sources of issues.

Operational risk contains the following sixteen risk clusters: compliance risk, contagion risk, corporate tax risk, custody risk, information security risk, information technology risk, legal risk, model risk, operational project risk, people risk, physical security risk, processing and execution risk, product tax risk, risk management risk, secondary reputational risk, and third-party risk.

CBF also distinguishes between four main operational risk classes, for labelling purposes: Availability risk, service deficiency, damage to physical assets, and legal risks and risk associated with business practices.

The categorisation of operational risk into risk clusters and risk drivers support the internal collection of data on operational risk events. As well as the scenario analysis exercises, and the regular collection of KRIs.

IT tools support the identification, monitoring and management of operational risks and ensure the technical environment of CBF remains stable (for example, ensure processing and monitoring of the infrastructure). With regard to operational risk, CBF is, in particular, using IT tools and processes to manage and monitor its systems to minimise operational risks for the settlement systems.

Furthermore, CBF has in place a wide range of various controls set up with the aim to minimise the impact of sources of operational risk. The control environment includes IT controls themselves but also covers several different other types of controls (cybersecurity, local access management, physical access management, stress testing/value at risk (VaR), BCM, project management process, 4-eyes principle etc.). Some of these controls are detailed and documented in the "Mitigation actions and controls" section of CBF's operational scenarios which lists information on controls and procedures (which may also be supported by IT tools). The other control types are further detailed in the policies and procedures used by CBF to minimise the impact of sources of operational risk.

After the risk identification step, the risks are notified to Clearstream Risk Management in the **notification stage**. All risks are centrally recorded. All organisational units and individual employees must timely notify Risk Management on risks which they have identified and evaluated. Depending on the materiality two forms of notification can be distinguished: Periodic and ad hoc.

The next stage is the **assessment**: All operational risk events or potential new risk developments are assessed qualitatively or in financial terms. The assessment of an incident or a potential risk development aims at quantifying the risk in financial terms using the VaR methodology and comparing the result with the available risk cover. It takes into account mitigation measures currently in place.

The assessment is followed by the stage of **controlling/management**. The most adequate treatment is applied to the identified risk in order to mitigate them or actively control/manage them. In general, mitigation encompasses the following: risk avoidance, risk reduction, risk transfer and intentional risk acceptance. All organisational units and employees must perform risk control, implement mitigating action, and monitor these actions according to the established processes.

The last stage of the process is monitoring and reporting of the identified risks to the Executive Board. The Board is at least on a quarterly basis and in addition on ad hoc basis – if required – and consistently informed about material risks and the related risk control measures.

CBF employs several policies, processes and controls that are designed to ensure that operational procedures are implemented appropriately:

— Risk strategy

— Operational Risk Handbook: The objective of the Operational Risk Handbook is to give a comprehensive description of the processes and methodologies that constitute CBF's AMA.

— Operational Risk Procedure: This Procedure describes the approach and major instruments applied within the process of managing operational risk on a high level. Furthermore, CBF has established a segregation of duties and follows the three lines of defence governance concept for operational risk management (the business functions as first line, the Risk Management function as second line and Internal Audit as third line).

— Reviews: CBF also conducts reviews of its risk management framework to identify the necessity or possibilities for amendments and improvements. This is performed at least once a year in the context of the Internal Capital Adequacy Assessment Process (ICAAP).

Change management and project management policies

CBF follows a stringent project management process which consists of three steps:

— Project planning and initiation, including the creation of a project charter, a project management plan, and other key project management deliverables.

— Project monitoring control and reporting: This describes the series of activities involved in managing a project against its approved project plans, managing scope and costs, managing relationships with suppliers to the project, managing stakeholders and communications, risks, issues and dependencies, project change, configuration management and quality, as well as reporting performance.

— Project closure: This describes the series of activities involved in closing a project appropriately, inclusive lessons learnt.

A dedicated Market Member Readiness (MMR) team is involved in projects from their initial set up. Their task includes the review of the Business Requirements Analysis (BRA) to identify any impacts on participants and other market participants, with the objective to communicate these as early as possible and ensure the readiness of these external shareholders. This avoids the risk of participants and other external stakeholders not being able to perform their business activities with CBF.

Software change management takes place according to a defined and documented process. The purpose of this process is to control changes to the application software in an organised manner by implementing approved changes with minimal disruption. Its scope covers the full life cycle of changes, including the correction of software incidents, requests for software change, approval of the change, development activities to realise the change, the initiation of software configuration management activities, testing activities and approval to launch the change in production environment. The standards mentioned above and used by CBF stipulate minimum requirements for availability and service continuity management.

As per CBF's methodology processes, an acceptance, being functional and/or technical, is always mandatory for any change or fix in order to guarantee that the change functions correctly in a replica of the live environment, performs in the manner that was expected, does not cause degradation of other systems, and meets the needs of the business. This is complemented by:

— A system and technical acceptance test: System performs as per technical requirements; no negative impact on other systems; performance check. This can involve testing with external parties, such as depositories.

— A business acceptance test: Development is according to business requirements.

Key consideration 2

An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.

CBF has adopted a two-tier board structure and is therefore currently managed by an executive board which is supervised by a supervisory board. Please refer to Principle 2 for a detailed description of CBF's governance structure. Effective and efficient risk management is vital to protect CBF's interests and it enables CBF to achieve its corporate goals and safeguards its continued existence.

The Executive Board of CBF approves and owns the company's risk strategy according to the Articles of Incorporation of the legal entity in Germany. CBF's Supervisory Board and Risk Committee receive the risk strategy for acknowledgement.

CBF's Executive Board is ultimately responsible for the company's risk strategy. The risk strategy reflects the risk appetite, which defines the maximum loss the Executive Board is willing to take in one year, the tolerance in the light of the risks, as well as the performance levels aspired. The Board ensures that the risk strategy is integrated into the business activities throughout CBF and that adequate measures are in place to implement the strategies, policies and procedures. The Executive Board holds the responsibility to determine and communicate the risk appetite and that the risk management framework is adapted accordingly.

The Executive Board of CBF has the ultimate responsibility to ensure a strong risk management culture. This includes the ultimate responsibility for risk management, including operational risk and the determination of an appropriate level of aggregate risk tolerance and capacity. The Board also establishes a risk management framework that is consistent with the risk tolerance and capacity.

The Executive Board is timely and consistently informed about material risks and the related risk control measures. Reporting is an essential part of risk management and is designed to give the Executive and Supervisory Boards timely and accurate information about the risks that CBF has encountered. All relevant data and information are collected, assessed and prepared by Clearstream Risk Management.

The risk management framework of CBF, as stated in the Operational Risk Procedure, aims at ensuring that all threats, causes of loss and potential disruptions are properly identified as soon as possible, centrally recorded, assessed (that is, quantified in financial terms to the largest possible extent), reported in a timely manner and consistently, together with suitable recommendations to the Executive Board, and controlled.

The risk management framework is constantly challenged by internal auditors, external auditors and regulators. In addition, to make sure that operational risk management approaches and systems are up to date, employees in the Risk Management function are members of different associations of risk management professionals that are engaged in the further development of respective operational risk topics. They regularly check for and take part in risk management conferences or seminars in this area.

Key consideration 3

An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.

From a business perspective, CBF's operational reliability objectives are documented within a large set of key performance indicators (KPIs) that allow a quantifiable and qualitative view of service delivery provided by Business Operations. Such KPIs deliver information on effectiveness, efficiency, degree of automation, turnaround times, operational quality and operational risks for business processes. The operational reliability objectives are, among others:

- Automate processes and operate in STP mode wherever possible, that is, in the areas of income, corporate actions, tax, reconciliation;
- Reduce operational errors to a minimum in all areas;
- Provide competitive deadlines;
- Reduce reversals to a minimum;
- Set up new participant accounts as soon as possible;
- Meet the recovery time objective (RTO) of two hours for time critical systems;
- Provide self-explanatory documentation to decrease number of calls to Client Services.

The above-mentioned KPIs are both of qualitative and quantitative nature and can be classified in three different categories with focus on:

- Quality and risk aspects;
- Capacity and volume aspects;
- Process efficiency aspects.

Key consideration 4

An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

All of CBF's reliability objectives aim at delivering services to participants at the highest level possible while ensuring a robust service resilience. This also includes the operation of systems at defined service levels.

CBF ensures continuously highest levels of system availability for its core systems. (Occasional downtimes are scheduled on weekends for essential system maintenance.) The Creation and CASCADE platforms are designed to cope with settlement volume peaks 50% greater than the average daily activity. Higher peaks can be directly handled by assigning further infrastructure capacity.

CBF has set up a monitoring of volumes in business and IT. Volume information is collected on a daily basis. This is supported by the monitoring of KPIs and deadlines, as defined in the service level agreements. In case of deviation, an analysis is performed. If deviation is due to increasing volumes (changes in the market environment), capacity increases are performed immediately and backed by capacity on demand arrangements with infrastructure providers in order to ensure the performance. Changes follow the IT change management process (see key consideration 1 for details) including impact assessments and subsequent stress tests if necessary.

CBF monitors the capacity of its systems to ensure that a capacity buffer (also known as "headroom") is maintained. The following key internal indicators are used to monitor the CSD's IT system performance: system availability, external deadlines and load/resource consumption. Each month, a capacity management report including volume trends analysis is produced. If one or more of the said indicators fall below specific thresholds, CBF will take appropriate actions to improve or upgrade its systems in order to maintain the capacity buffer.

From a control perspective, during each application audit, KPIs and latest capacity management reports are reviewed and compared with the latest incidents reports. The capacity management process itself is also part of the audit plan.

Thanks to a comprehensive change and release management process, IT systems go through a structured development and testing process before being put into production. Robust tests are also performed throughout the lifetime of the IT systems, for example, whenever material changes are implemented to a system or when a system has suffered a major operational disruption, as applicable on the basis of the underneath root cause.

CBF practices a BCM risk mitigation and avoidance strategy by identifying and assessing the risks and taking preventive precautionary measures to address and mitigate such adverse effects in infrastructure or data centre services in the form of developing and upholding business continuity and disaster recovery procedures. By maintaining a dual data centre strategy and keeping all key components redundant and identical between the two different data centres for Clearstream-hosted applications, it is warranted that mainframe servers operated under full sysplex, enterprises disk storage systems and the tape library infrastructure including peripheral hardware such as storage area network and network components are always fully operational in both locations. This is perpetuated by continuously employing both data centres with running production and test workloads. Running production workloads in both locations will always fully allocate and demand the underlying infrastructure in its entirety for both data centre locations.

Business volume is monitored throughout the day and during night-time batch operations. Systems are equipped with additional headroom of unallocated resources to accommodate higher workloads, should this be necessary due to a significant increase in business volume.

Business Operations has a high level of process automation and therefore a massive, sudden jump of settlement volumes has only a limited impact on Business Operations. Key mitigation actions will be limited to resources measures like extended working hours or temporary allocation of resources from non-impacted business areas to impacted areas.

Key consideration 5

An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

Physical security

CBF's physical security objectives are defined in Deutsche Börse Group's Corporate Security Policy and Physical Security Standard.

Various sources, such as internet and media research, security information providers and governmental institutions are consulted when evaluating physical vulnerabilities and threats. These vulnerabilities and threats, as well as risks resulting thereof and adequate countermeasures are defined on an ongoing basis.

A major component of the defined processes derived from the Corporate Security Policy is the Group-wide Security Manual which describes operational and administrative tasks, divided in a general part and a location specific part. In addition to this Manual, various other processes and procedures are established to ensure the highest possible level of safety for people and assets.

All processes are subject to permanent monitoring and verification which is guaranteed amongst others by security assessments, intelligence and monitoring, risk analysis, internal and external auditing, penetration testing as well as awareness campaigns and trainings.

The main corporate security elements are listed hereafter:

— An access control system is in place for all premises and respective logs are kept. A card access system is in place for all areas, monitored 24 hours, 7 days per week (24/7). There are additionally armoured doorways to high-sensitivity areas, CCTV cameras are installed inside and outside the buildings. They operate in real time 24/7. Security guards are on site 24/7 and all entrances are checked by cameras.

— A security management system (SMS) is connected to the fire control centre and its fire detectors. Furthermore, the SMS is connected to an intrusion alert system. Surveillance of technical installations (temperature etc.) is also installed. Visitors are required to sign in at reception providing valid proof of identity, and must be accompanied by staff on site. Thus, the building is restricted to authorised personnel and accompanied visitors.

All projects have to follow the Corporate Security Policy framework to address sources of physical vulnerability as described in the Security Manual, like the monitoring of third-party providers (for example, access to buildings), information security and data protection principles, fire protection guidelines etc.

Information security

CBF has implemented a comprehensive information security framework (ISF). The ISF is based on the overall information security (IS) objectives and specifies the hierarchy of documents to define IS control requirements along the assets to be protected and their implementation as well as their surveillance to reach and maintain an adequate state of IS at CBF based on their risk appetite and disposition. Consequently, the ISF serves as the foundation for a consistent and homogenous implementation of the ISMS. Furthermore, the ISF defines consistent terms relevant for IS management and specifies the scope and applicability of the rules and requirements. It is approved properly, published and communicated to employees and stakeholders.

The ISF is based on ISO 27001/ 27002/ 27005 standards and considers relevant regulatory requirements such as MaRisk/BAIT, Circular CSSF 12/552 and CSDR.

The following IS objectives as defined in the ISF are key to secure CBF's corporate assets, to support the company's strategy and operations (business enablement) and to comply with relevant laws and regulations:

- Confidentiality: Enabling authorised access to information and associated assets when required;
- Integrity: Guaranteeing the accuracy and completeness of information and processing methods;
- Availability: Enabling access to information and associated assets when required;
- Authenticity: Ensuring genuineness and reliability of information.

CBF has a dedicated Chief Information Security Officer. He reports to the Executive Board and supports colleagues in business, IT and, in particular, information owners to adequately protect their information and corresponding facilities from significant loss and to be compliant with legislative, regulatory and contractual requirements.

The ISF includes information standards which set and describe the security controls which represent an adequate protection for CBF dependent on the information classification. Deviations are assessed for adequate risk management decision. Schemes for information classification, risk assessment and risk management are defined and maintained.

Policies and standards are reviewed on a regular basis, at least annually.

Roles and responsibilities are structured in line with the three Lines of Defence (LoD) model for effective management of information security and adequate control mechanisms:

- Third line of defence (3rd LoD): Internal Audit, acts on behalf of CBF's Executive Board and external stakeholders (for example, supervisory authorities) to provide an independent, objective and critical review of the first and second LoD by conducting regular and event-triggered audits/reviews;
- Second line of defence (2nd LoD): includes the company's Information Security function, holds a steering function and sets, with the support of the Group, the information security requirements for legal entities of the Clearstream group. Furthermore, it oversees the cyber risks and monitors compliance through reviews of the first LoD.
- First line of defence operationalises the second LoD information security requirements and is responsible for protecting the information assets and for managing related cyber risks within pre-defined and appropriate risk appetite.

IT Operations is in charge of operating the IT environment securely. This includes, but is not limited to, the installation, configuration and maintenance of IT systems and applications, handling of related processes, detection of suspicious events, handling of incidents, user and change management, monitoring and assessing risks due to technical evolutions, and escalation of risks to the information owner.

Group Security is in charge of several 1st LoD Information Security processes, for example, access control, privileged access management, vulnerability management, penetration test coordination, information risk assessments and risk register and IS incident management / the Computer Emergency Response Team (CERT).

The CERT is in charge of analysing pro-actively potential impacts of major cyber incidents and determining a regularly updated picture of cyber situational awareness. The CERT is also in charge of managing information security events and incidents.

Security tools are in place and cover, among others, access control, intrusion prevention and detection, denial of service, vulnerability scanning (for identifying potential vulnerabilities on IT applications and underlying IT infrastructure), events logging and monitoring etc.

Tests are performed, for instance, before the implementation of new processes and tools. Regular penetration tests are performed ensuring the effectiveness of the controls in place.

Key consideration 6

An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.

Objectives of CBF's business continuity plan

CBF strives to provide products and services with utmost reliability. It thus gives the highest importance to the resilience of its business to safeguard it against incidents and disasters, as the unavailability of core processes and resources represents a substantial risk for the company and potential systemic risk to the markets as a whole. Therefore, CBF aims to satisfy itself and the markets of its ability to continue to operate under adverse conditions or in the face of unexpected events or disasters.

To achieve that, CBF has developed business continuity measures to address the loss of significant numbers of staff in one location, including dispersed operations and business transfers.

CBF's Business Continuity Management (BCM) policy states that in case of business interruption, operations must be resumed within appropriate time scales in order to:

— Safeguard CBF from significant losses, maintain revenue generation and shareholder value;

— Maintain participant confidence, market stability and liquidity and minimise systemic risk;

— Maintain management control, fulfil contractual obligations and regulatory compliance.

The policy further defines that the functions, which are indispensable for the critical daily operations in view of the above objectives, are called mission critical and must be resumed within a recovery time objective (RTO) of two hours.

In accordance with the policy, business continuity plans (BCPs) define the processes and resources including systems and the associated RTO, thereby observing an RTO of two hours for mission critical functions. Further RTO classes have been defined for functions which need to be recovered for up to 24 hours, up to one week or more than one week.

The BCPs address the unavailability of systems, workspace, staff and suppliers in order to ensure the continuity and rapid resumption of the critical operations in case of major or wide-scale scenarios.

Design of CBF's business continuity plans

BCPs are a collection of information, guidelines and procedures that specify how critical services, processes and resources will be reinstated to a predetermined level within pre-defined timescales after a business disruption, an incident or crisis affecting one or several of the key resources. CBF's BCPs are compiled, developed and maintained by the relevant organisational units for use in the event of a business disruption, an incident or a crisis to maintain the continuity of critical operations.

Mission critical functions as defined above must be resumed within an RTO of two hours. Each mission critical CBF function must establish, implement, develop and maintain a BCP to describe its time critical business activities, associated business recovery requirements and business recovery action plan.

The BCM framework, and associated BCPs, are designed to be as comprehensive as possible. Events which would lead to the unavailability of the key resources (for example, workspace, IT systems, staff, suppliers) fall within the scope of the Clearstream BCM framework. BCPs deal with the direct effects of an event (workspace unavailability, staff unavailability etc.) rather than specific root causes leading to any disruption (for instance, natural disaster, pandemic situations, physical attacks, intrusions, terroristic attacks) as all these events would ultimately lead to the unavailability of facilities, staff, suppliers or technical equipment.

Interface to IT Disaster Recovery

Information and communication technology (ICT) being a fundamental resource to enable effective and smooth operations of CBF's critical operations, an interface to IT Disaster Recovery has been established by BCM.

IT Disaster Recovery plans are established by the respective functions operating the different technology clusters to document the IT related infrastructure recovery, restoration and continuity to respond to incidents that significantly impact ICT which is subject to an annual IT Disaster Recovery Test.

Interface to Incident & Crisis Management

An Incident and Crisis Management process is in place to facilitate the co-ordinated and rapid reaction to an incident/crisis in a controlled and effective manner, in order to contain and resolve the incident, minimise business and market impact and return to normal activity as quickly as possible.

Incident managers are appointed as the single points of contact in their respective business areas in case of incidents and disruptions. This also ensure the proper escalation up to the Executive Board and Executive Committee levels.

An alert system is used to classify incidents and disruptions according to colour codes relating to a respective level of business impact. The alert system ensures an adequate response to incidents and crises, including the potential activation of business continuity plans. The system also provides for the timely notification of relevant internal and external parties, including:

— Communication to participants;

— Communication with external suppliers, other FMIs;

— Communication to the market, as applicable;

— Communication to regulators, as applicable.

Secondary site

Business and IT operations

Clearstream's operativity is distributed across several processing sites around the world, in particular: Luxembourg, Frankfurt, Singapore and Prague. Geographical distance between the mentioned operational hubs ensures diversity in terms of risk profile among processing sites and enables risk mitigation. Processing sites are fully equipped in terms of capabilities, functionalities, staffing arrangements and operational at any time, to ensure that the required RTO can be met in case of incident or crisis.

In addition to the distributed processing mentioned above, in Luxembourg and Frankfurt backup facilities provide alternative office space for Clearstream mission critical units in the event their normal office location would become unavailable. Like the main processing sites, the backup locations are fully equipped in terms of capabilities, functionalities, staffing arrangements and operational at any time, to ensure that the required RTO can be met in case of incident or crisis.

Data centres (DCs)

The systems architecture is designed to satisfy high availability requirements. The systems infrastructure is duplicated between two distant data centres. Components such as network communications, servers and storage are running in parallel in the two centres. Core systems are clustered and load-balanced between the two centres to allow quick take-over in case of failure. Production data is synchronously mirrored in real-time between the two centres, ensuring the preservation, online availability and integrity of transaction data following a disruption without data loss. In addition, data can be restored from off-line data back-ups which are taken at different intervals during the production cycle and are duplicated on libraries located in both data centres.

A failover mechanism ensures that no data is lost. In the event of one component becoming unavailable, the "remaining" data centre can cover workloads on a normal level. Data centre capacities and normal load usage are designed and dimensioned to handle full-load operations alone.

Review and testing

BCP testing

The implemented solutions described above are tested or exercised regularly to ensure their effectiveness, functionality and to provide assurance that a real incident could be successfully managed. Tests and exercises further provide awareness and training to staff members involved in the execution of activities.

Clearstream has therefore adopted a comprehensive BCM testing framework based on key principles and with ambitious BCM testing objectives in order to be as close as possible to real life, in terms of definition of scope and scenarios, and to be comprehensive, in terms of coverage of critical resources, procedures and plans.

The test objectives are based on the following criteria:

— Functional effectiveness: validate that arrangements are technically functioning;

— Execution ability: ensure that staff are familiar and knowledgeable in the execution of plans and procedures;

— Recovery time: confirm that plans and procedures can be executed within the defined recovery time objective.

BCPs are tested on a regular basis, at least annually, either announced or unannounced to the participants and up to several business days to provide best possible assurances of the BCM preparedness.

As BCP tests take place during normal business hours, in live production environment to be as close as possible to real life, participants, external suppliers and other FMIs are always indirectly participating in the BCM tests.

Examples of tests which are conducted:

— Workspace unavailability tests: simulate the loss of one building or location and require the relocation of staff to the secondary site or activation of business transfer plans to other Clearstream locations, depending on what is defined in the respective business recovery plans.

— Staff unavailability tests: simulate the loss of all staff in one location and require the transfer of activities to staff of units in other Clearstream locations, as defined in the continuity plans.

The Incident & Crisis Management process is also tested as part of major/large-scale tests to ensure effectiveness of the end-to-end communication and recovery process.

Test results are consolidated as part of BCM test reports which are then provided to key stakeholders.

IT Disaster Recovery testing

Systems unavailability tests are planned by the respective IT areas and simulate the loss of one data centre. The disaster is simulated by isolating one data centre from the network. All systems are recovered in the second data centre and the capacity and capability to run processing on just one date centre is validated. Participants, CSDs and/or agent banks as well as critical service providers are invited to participate in these tests.

Review and continuous improvement

CBF annually checks the business continuity preparedness of the linked FMIs (agent banks) by collecting information on their business continuity policies, planning and infrastructure including descriptions of the incident and crisis management, training, awareness, testing and pandemic preparedness. The business continuity and disaster recovery plans of the CSDs and/or agent banks are also reviewed as part of the due diligence process.

Key consideration 7

An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.

Risks to CBF's own operations

Potential risks caused by key participants are mainly related to operational problems of the key participants themselves and have no direct and significant impact on CBF. Nevertheless, this may pose risks to their counterparts and subsequently pose risks to CBF's settlement systems' efficiency. To appropriately identify, monitor, manage and report on the key participants' risks, CBF has implemented a key participant procedure that primarily focuses on:

— Identification of key participants and their related material dependencies;

— Periodic enhanced key participant due diligence reviews (which assess key participants' risk control and management capacities to address and manage fraud, cyber, information security, business continuity, disaster recovery, infrastructure technology and application system risk elements);

— Monitoring potential key participant operational risk exposures and assuring the appropriate mitigation measures;

— Ensuring that key participants have sufficient measures in place to properly manage and address the risks they pose to CBF and to thereby minimise to the maximum extent possible the potential risks posed to the CSDs, other participants and, thus, the market as a whole.

Additional measures include:

- Clear and stringent criteria to become a CBF participant; please refer to the Becoming a Clearstream client section – in particular, the Client Access and Acceptance Policy – on www.clearstream.com;
- Continuous monitoring of system usage and the global settlement efficiency level;
- Detailed Market Link Guides documenting the established rules for participants, market practice across the Clearstream network and instruction specifications as well as potential risks (see the Market coverage section of the Clearstream website;
- Choice between CBF proprietary connectivity or Swift;
- Participant training support;
- Clear and timely participant announcements for system changes with impacts on participants;
- Periodic enhanced due diligence on identified key participants.

Risks posed by CBF to others

The CSD's interconnectedness to other FMIs (for example, stock exchanges and CCPs) makes substitution difficult, thereby increasing its interdependencies and subsequent potential operational and financial risks that could be posed to others.

Risk mitigating measures include due diligence reviews performed on the CSD by its participants and service providers to assess their risk and regulatory control framework capacities put in place to manage all related risks. A major element of these reviews is that CBF shares relevant information with other entities that allow them to adequately assess the risks posed to them by CBF.

Furthermore, CBF has implemented many layers of precaution and protection of its processes and services (regular tests of BCPs) and operates a comprehensive risk management framework built on established standards and best practices.

On an annual basis, Clearstream Risk Management publishes the Pillar III disclosure report at parent company level, which describes the current risk situation of the consolidated group including CBF.

Outsourcing of critical operations

For the provision of products and services to its participants, CBF uses a system of mainly intra-Group outsourcing agreements to work effectively and efficiently. All entities within the Group are subject to the same requirements on reliability and contingency. The service delivery between two Clearstream entities is subject to a framework agreement and a formal service definition agreement ("SDS"). The latter also defines qualitative requirements (for example, service features, quality and performance standards and escalation mechanisms). The SDSs also contain KPIs to measure the quality of the respective service.

Any outsourcing is to be based on an initial analysis of the proposed outsourcing (including a pre-assessment, initial outsourcing risk assessment) ensuring compliance with at least current standards as well as fulfilling all legal obligations (that is, being compliant with existing regulation, ensuring banking secrecy, data protection requirements etc.).

Outsourced services and documentation are constantly monitored, and a regular risk assessment is done according to the Outsourcing Policy. The Outsourcing Coordinator, as part of the Central Outsourcing Management, discusses the initial score of the risk assessment with the other second line of defence functions, which are Compliance, Risk Management, Information Security, Data Protection and Internal Audit (as third line of defence). After the review of each participant the Outsourcing Coordinator informs CBF's Executive Board of the results.

Apart from the Central Outsourcing Management, Clearstream's Risk Management might in regular reviews identify several operational and business risks that could arise from service providers, as well as from other FMIs. The outsourced services are included in an appropriate manner in the operational risk management framework.

Principle 18: Access and participation requirements

An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

Key consideration 1

An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.

Participation criteria and requirements

According to Article 33 (1) CSDR, CBF's admission and participation criteria are publicly disclosed in the "Becoming a Clearstream client" section of its website. The criteria fulfil the requirements of the regulation to be transparent, objective, and non-discriminatory so as to ensure fair and open access to CBF with due regard to risks to financial stability and the orderliness of markets. The criteria are described in detail in CBF's Client and Access Acceptance Policy (CAAP) that can be found in said section of the company's website.

Participation criteria that restrict access are permitted only to the extent that their objective is to justifiably control a specified risk for CBF: pursuant to Article 33 (3) CSDR, CBF denies access only where duly justified based on a comprehensive risk assessment. Article 89 DR 2017/392 stipulates the criteria and risks on which basis CBF may refuse access to a requesting party such as a participant or another CSD[5].

Accordingly, CBF shall only consider legal risk (as defined by Article 89 (2) DR 2017/392), financial risk (as defined by Article 89 (7) DR 2017/392) and operational risk (as defined by Article 89 (11) DR 2017/392) when conducting the risk assessment. In addition, requirements from rules on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing and financial sanctions are taken into account.

The regulatory requirements under CSDR and DR 2017/392 mentioned above are applicable to CBF following its authorisation pursuant to Article 16 CSDR on 21 January 2020.

Access to CBF and its settlement services is limited to participants as defined by Directive 98/26/EC but with the possibility of Member States of the European Union to designate further participants pursuant to Article 2 (f) Directive 98/26/EC. CBF considers access requests by applicants who are regulated financial institutions (credit institutions and investment firms), sovereign and supranational institutions (public authorities), and CCPs (trading venues have access rights to allow the trade feed generally to become settled via a CSD). CBF may however accept unregulated entities (other than sovereign and supranational institutions) as eligible for the limited purpose of receiving collateral from participants in the securities settlement system (SSS). Pursuant to No. 3.4. of the CAAP, CBF has defined criteria for persons who are prohibited from participating in the SSS (for example, natural persons, residents of any country that is subject of a "call to action" by the Financial Action Task Force (FATF), participation by persons causing CBF to breach sanction regulation). Lastly, CBF does not foresee indirect participation.

[5] Slightly different rules may apply for deciding on a request for access by an issuer, a CCP or a trading venue.

CBF's admission process

CBF ensures that the applicants are validly incorporated and existing under the relevant jurisdiction of incorporation and have the capacity to enter into agreements with CBF and to perform the activities provided therein. In this respect, CBF requests from its applicants to be provided with the following documents along with the account application forms:

- Articles of association and, if the articles are not available in German, English or French, a legal English translation;
- Proof of regulation, for example business licence or official authorisation to conduct (financial) business; if the licence is not available in German or English, a legal English translation needs to be provided;
- Excerpt of the applicant's register including certificate of residency;
- Applicant's most recent audited annual reports. In the case, the applicant is a subsidiary, the latest audited annual report of the parent company;
- Due diligence questionnaire (Enhanced Due Diligence Questionnaire and ISSA Questionnaire or Financial Crime Compliance Questionnaire or the Wolfsberg CBDDQ or FCCQ) duly filled in and signed;
- FATCA self-certification form, duly filled in and signed;
- Entity's tax residency self-certification form duly filled in and signed;
- Controlling persons' tax residency self-certification form, duly filled in and signed (if applicable);
- U.S. Patriot Act certification (if applicable);
- Ownership/shareholding structure indicating the natural person(s) who own(s) or control(s) 25% or more of the shares and the main shareholders who own 10% or more of the shares;
- Organisational chart (diagram of the high-level management functions);
- Copy of the ID card of the ultimate beneficial owner/notional beneficial owner (if applicable);
- Copy of the ID card of the person acting on behalf of the participant/proxy holders (if applicable);
- General, complete and up-to-date list of all of the applicant company's authorised signatories with specimen signatures.

Key consideration 2

An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.

Justification and rationale of participation criteria

CBF's participation criteria are geared towards avoiding undue legal, financial and operational risk for the safety and efficiency of the SSS CBF operates.

When assessing legal risks, CBF will take into account in particular the following criteria:

- Compliance with the legal requirements for participation in the securities settlement system, including any required legal opinions or legal arrangements;

- Assurance with the rules on the confidentiality of the information provided through the SSS;

- Where a party is established in a third country, either of the following:

  (i) Party is subject to a regulatory and supervisory framework comparable to the regulatory and supervisory framework that would be applicable to a party if it were established in the European Union:
  (ii) Rules of the CSD concerning settlement finality referred to in Article 39 CSDR are not enforceable in the jurisdiction of a party.

When assessing financial risks following a request for access by a party, CBF will take into account whether a party holds sufficient financial resources to fulfil its contractual obligations towards CBF. CBF will also assess the financial resources of the party in order to ensure that it has the capacity to contribute to a sustainable level of settlement efficiency. As to the financial conditions of a potential new participant, the applicant's credit standing is reviewed taking into account various qualitative and quantitative factors such as operating environment, liquidity, capitalisation, asset quality, profitability, financial support by the parent etc.

When assessing operational risks following a request for access, the following criteria are relevant:

- Operational capacity to participate in the SSS, including connectivity, communication and cyber risk considerations;

- Compliance with the risk management rules;

- Existence of business continuity policies or disaster recovery plans;

- Potential changes of its operations and risk management procedures in order to ensure the smooth functioning of the SSS.

As long as the applicant is meeting the criteria defined above, and once the application forms are validated internally, CBF's participants will have in principle access to the full range of services offered by CBF, under the specific terms of each service, subject to credit, operational and legal risk assessments that in some cases are product-specific. For example, a credit vote is given to assess the financial risk involved with a party requesting access and specific assessments are being regularly made for the granting of credit limits for participant relationship.

CBF cannot have relations with indirect participants. Indirect participants would be the underlying client of a participant of CBF whose contractual relation with and contractual obligations to is unique to the CBF participant. Such parties would therefore only benefit from the services CBF offers through CBF's participants, their own custodians, under the same terms. CBF endeavours to identify the participants' clients responsible for a significant proportion of transactions processed by the company and the participants' clients whose transactions, based on their volumes and values, are significant relative to the respective participants' risk management capacity.

CBF considers the risk that an actual or prospective participant may represent and ensures that applicants and participants meet appropriate legal, financial and operational requirements to allow them to fulfil their obligations.

Least restrictive access

The implementation of the above-mentioned access criteria are also geared towards having the least-restrictive impact on access that circumstances permit: (i) a non-regulated party may be granted access for the limited purpose of receiving collateral from participants (ii) enhanced legal, financial operational risk assessment are applied for certain products and a party may therefore be denied access to certain products only, while access to the settlement system is generally granted. Additional risk assessments are performed when existing participants seek access to higher risk products. This is typically the case when an existing participant will request the opening of an additional account for a specific purpose. The whole relation will be considered in the decision to open or not such account. Such review process will trigger the review of the level of access restriction for the services offered, and the different requirements that may be imposed, or lifted, on the participant.

Essential required information on CBF's products and services is publicly available in CBF's Client Handbook. The Client Handbook for clients using the OneClearstream service is also available on the company's website. For the CBF-i activity, clients should refer to the CBL Client Handbook.

Key consideration 3

An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.

Monitoring compliance

CBF has the obligation to ensure that the documents, data and information regarding a business relationship are kept up to date at all times. According to section 10 (1) no. 5 Gesetz über das Aufspüren von Gewinnen aus schweren Straftaten (Geldwäschegesetz – GwG, German Anti-Money Laundering Act), CBF must continuously monitor the business relationship and the transactions carried out within this relationship. In scope of the ongoing monitoring CBF must ensure that the relevant documents, data or information are updated at appropriate intervals considering the level of money-laundering and terrorist financing risk. Therefore, a periodic review cycle applies to all participant relationships and accounts and a prescribed set of documents are collected on an ongoing basis according to the Client Due Diligence Requirements Procedure. Such documents are also collected to review participation requirements and initial risk assessments (for example re-collection of proof of regulation, extract from company's register, annual reports, financial statements). The frequency of the review cycle depends on the risk classification of the participant.

Suspension and orderly exit

The termination of business relationship is stipulated in number VIII of the GTC of CBF in line with regulatory requirements. Possible suspension of services to the participant is covered by numbers VI, XXII and XXVIII of the GTC.

Principle 19: Tiered participation arrangements

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.

Key consideration 1

An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.

Tiered participation arrangements

CBF has contractual relationships covering the delivery of its products and services, in particular settlement and custody services uniquely with its direct participants. It therefore maintains only direct participation arrangements. CBF neither opens accounts for, nor recognises any indirect or tiered participants. Hence, no material risks to CBF can arise due to the absence of any tiered participation arrangements.

CBF owes a duty of redelivery or restitution of assets deposited by a direct participant uniquely to that participant or to its legal successor even if CBF is aware that its direct participant owes generally corresponding duties to its clients and that its direct participants routinely deposit securities which are ultimately owed to other intermediary firms and to investors.

CBF's direct participants are obliged pursuant to number V (3) of CBF's GTC to segregate securities deposited for their own account (proprietary assets) from securities deposited on behalf of third parties (client assets). One of the key provisions of the arrangements governing the deposit of client assets is that each participant account opened in CBF's system must be allocated by its direct participant to one of three categories: (i) proprietary, (ii) client – segregated, or (iii) client – omnibus. Please refer to Principle 11 for more details on the account categories.

On specific occasions, CBF has a right to collect information on its participant's clients as defined by Article 67 DR 2017/392 (cf. number IV of the GTC). CBF may request declarations and representations from a participant's client as to the purpose of an intended transaction and compliance with legal regulations.

CBF gathers information relating to assets deposited on client accounts through four primary mechanisms:

- Participant onboarding process;
- Opening of additional accounts of existing direct participants;
- Regular KYC review;
- Periodic key participant due diligence reviews.

The process is conducted by CBF's Network Management team and reviewed by its Compliance team. In the case of client segregated accounts, CBF seeks to identify the party to whom its direct participant owes the securities deposited on the account and records this information in its KYC file.

In the case of any direct participant depositing assets on client accounts whether in segregated or in omnibus form, CBF collects information relating to the regulatory, business and control arrangements that its direct participant has in place in order to service or to support third party business. CBF also obtains information on the geography, products and type of client that its direct participant supports through any client accounts held with CBF. CBF aims to update this information on an annual basis.

CBF evaluates its risks arising from client accounts, in particular with regard to AML obligations and to sanctions compliance. CBF's compliance risk assessment identifies the conduct of the clients of its direct participants as a significant component of its overall operational risk.These risks are mitigated in the following manner:

— Upon onboarding and during regular KYC review, the competence and the capacity of participants depositing client assets are assessed, including the regulatory capacity of the direct participant to accept client assets and, in the case of omnibus accounts, to commingle them. That assessment includes a determination of whether or not the direct participant is AML regulated in a jurisdiction applying standards equivalent to those that apply in Germany. New client accounts – whether of existing or of new participants – are subject to the prior review of CBF's compliance officers and the approval of the Executive Board.

— To monitor client data and transactions, Deutsche Börse Group, including CBF, implemented a Group-wide sanctions monitoring programme based on industry leading technology. Two times per day, the systems receive updates of sanctions lists in order to screen client and transaction data against the most recent available lists.

— The sanctions monitoring systems screen relevant information such as counterparties, securities, transaction data (settlement and payment instructions, corporate actions etc.) and security prospectuses (issuance of new securities) against EU, U.S., UN and other applicable sanctions lists as well as internal lists.

— Further checks are performed via adverse media lists and lists of politically exposed persons both at the point of onboarding, during regular KYC review and regularly throughout CBF's relationship to its participants.

— A procedure defines roles and responsibilities of compliance teams for 1st and 2nd level review of alerts created by the monitoring tool. Sanctions hits and related issues will be resolved in accordance with CBF's compliance policies and applicable laws and regulations. Risk mitigation measures may include the blocking of transactions, segregation of assets into dedicated sundry accounts and notification to the authorities.

— CBF implemented several quality assurance measures to ensure the effectivity and efficiency of the sanctions monitoring systems such as Swift Sanctions Testing Services, alert sampling activities, an independent audit function and others.

— CBF's screening strategy aims to ensure that the identity of an investor does not expose it to undue compliance risk.

In cases where the identity of the underlying client or information relating to the direct participant's client franchise in general triggers heightened AML, sanctions or related risk concerns, CBF may employ a number of specific mitigation strategies including requiring the direct participant to disclose additional information (including where not previously known, the identity of the underlying client or the beneficial owner), blocking the securities entitlements and disclosure to CBF's regulators, foreign authorities or CBF's sub-depositories or paying agents involved in the custody or administration of specific securities. CBF's contractual right to pursue and to enforce such mitigation strategies is derived from its GTC (cf. number VI of the GTC).

Lastly, in respect of credit risk for the CBF's credit business, the company does not permit assets deposited on client (as opposed to proprietary) accounts to be pledged as collateral to secure credit facilities enjoyed by its direct participants.

Risks to CBF

The principal risks in particular from undisclosed beneficial owners result from potential violations of regulations relating to the prevention of money laundering and terrorist financing, and in particular financial sanctions. Therefore, CBF continuously monitors all of its participants' transactions, including those resulting from underlying clients, with an IT-based compliance monitoring tool, which is supplemented in justified individual cases by manual checks conducted. If the review identifies irregularities, CBF will obtain further clarification as it deems necessary. CBF may cease or temporarily suspend execution of a participant's instructions or the provision of other services (such as collection and payment of interest, dividends, repayments of capital or other amounts owed by the issuer to the participant), without notifying the participant in advance, if:

— Executing the instruction or providing another service violates applicable legal regulations relating to the prevention of money laundering and terrorist financing or financial sanctions (for example, of the UN, EU or U.S.A.);

— Executing the instruction or providing another service would, as a result of legal regulations relating to the prevention of money laundering and terrorist financing or financial sanctions, materially jeopardise the proper provision of CBF's services to its participants or, as a result of such requirements, put CBF's or its participants' assets at significant risk; or

— CBF's participant has not or has not yet provided the declarations and representations that CBF may request.

Key consideration 2

An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.

As a CSD, CBF is under the obligation to:

— Identify, monitor and manage the operational risks it faces from key participants and ensure that the key participants duly meet the CSD's operational requirements in accordance with Article 67 (3) and (4) DR 2017/392;

— Identify, on an ongoing basis, material dependencies between a CBF participant and its clients that might affect CBF, and are responsible for a significant proportion of transactions processed through CBF's SSS or whose transactions, based on their volumes and values, are significant relative to the risk management capacity of the CBF participant in accordance with Article 67 (1) DR 2017/392.

In 2023, CBF has revised and updated its key participant identification procedures to fulfil the requirements stipulated by CSDR. The company has also updated its participant documentation procedure and GTC with the applicable operational standards and measures required from its key participants in order to support settlement efficiency and soundness. Hence, CBF's key participants and related material dependencies (underlying clients who constitute 10% or more of their settlement transaction activity) are identified as follows:

— Identification is driven by volumes and values of their transactional trades settled in CBF's SSS in accordance with the key participant regulatory requirements set out by CSDR.

— Once identified as a CBF key participant, this status is held for twelve months;

— An annual recertification of the key participant status is performed.

In addition, CBF made its key participants aware of enhanced due diligence measures applicable to them (including their material dependencies) and of remediation measures to be assured on their side based on the key participant enhanced due diligence reviews performed.

Further information is given in key consideration 3.

Key consideration 3

An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.

Where a client account is segregated, CBF's direct participant is required to disclose to CBF the identity of its underlying client, that is, the party for which the securities were deposited. The account name may or may not incorporate this disclosure at the discretion of CBF's direct participant.

Where a client account is opened in omnibus form, the direct CBF participant is commingling the assets of several of its underlying clients. CBF requires that no single interest in a client omnibus account should exceed 25% of the total value of assets deposited on that account over time as represented by its direct participant. When a single interest does exceed that threshold, CBF requires the direct account holding participant to segregate the corresponding assets onto a client segregated account.

In line with CSDR, CBF's key participant procedure (see key consideration 2) ensures the identification on an ongoing basis of material dependencies between CBF participants and their clients that might affect it. This procedure also covers the performance of monitoring analyses and management of the operational risks that CBF's key participants may pose to its operations.

Analysis reviews

Clearstream's Risk Management function runs a process to identify CBF's key participants and related material dependencies in the SSS on an ongoing basis. Respective reports are assembled at the end of each quarter and cover settlement activities of the preceding six months. The identification process and the resulting reports are that it operates based on the following factors:

— Participants' transaction volumes and values;

— Material dependencies between its participants and the participants' clients, where the clients are known to CBF and that might affect CBF;

— Their potential impact on other participants and CBF's SSS as a whole in the event of an operational problem affecting the smooth provision of services by CBF.

In addition to the above reports, Risk Management may run ad hoc reports under stressed market conditions or on exceptional events (for instance, when a financial crisis occurs, high volatility is observed or geopolitical changes are expected).

Analysis to identify potential material dependencies of indirect participants is performed at the level of all participants of CBF, that means, by taking into account all settled volumes and values for all participants. Thus, CBF can also identify (i) participants' clients responsible for a significant proportion of transactions processed by CBF, and (ii) participants' clients whose transactions, based on their volumes and values, are significant relative to the respective participants' risk management capacity:

Upon identification of a key participant with material dependencies, Clearstream's Risk Management sends out a formal notification letter to the participants identified as CBF's key participants to duly inform them of their new status as CBF key participant as well as to request them to disclose their underlying clients (material dependencies). This disclosure targets primarily clients that represents a threshold of at least 10% or more of the overall volume/value of transactions processed by the legal entity. In this case, the identified CBF key participant is requested to provide details on those clients and confirm that appropriate measures have been imposed on them to ensure that (potential) operational risk arising from the key participant's clients is adequately managed. In addition, an enhanced key participant due diligence review will be carried out.

Key participants' operational risk exposures (that means, operational incidents, issues, risk loss history and events) are reviewed for the purpose of assessing the evolutions in the CBF key participants' risk profiles. In this regard, a dedicated CBF key participant operational risk scenario was created. The purpose is to ensure that CBF derives a concise view of its key participants risk profile and can assure relevant mitigation measures to manage the key participant operational risks.

In addition, reconciliation breaks caused by CBF key participants are closely monitored. In the event of reconciliation breaks identified for CBF key participants, a potential provisioning allocation may be required.

Key consideration 4

An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.

As explained above no tiered participation arrangements are permissible at CBF. However, participants maintaining client segregated or omnibus accounts are reviewed on a periodic basis (so called KYC review). Periodicity of these reviews depends on the risk classification of the participant:

— High risk → review cycle: one year;

— Medium risk → review cycle: two years;

— Low risk → review cycle: three years.

Key participants are reviewed on a quarterly basis. In addition, ad hoc reviews are performed and mitigating measures are taken when and where appropriate. As an example, when it is detected that assets deposited by a direct participant and held in an omnibus account might expose CBF to the violation of financial sanctions, CBF can transfer the securities to a separate securities account opened for such participant. Such detection also leads to an ad hoc review of the participant and its arrangements for compliance with regulations in the area of financial sanctions.

Principle 20: FMI links

An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link related risks.

Key consideration 1

Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.

CBF has processes in place to identify all potential sources of risk arising from new market links which are described in further detail below.

Initial assessment of (potential) link arrangements

CBF establishes links with one or more FMIs in accordance with the principles set out in CSDR, such as Article 48 of CSDR and Chapter XII of RTS 2017/392 (as defined under Principle 1). The identification, monitoring and management of the risks arising from a CSD link is addressed in particular by Article 48 (1) of CSDR, which requires all CSDs, before establishing a CSD link and on an ongoing basis, to cover: "all potential sources of risk for themselves and for their participants arising from the CSD link and take appropriate measures to mitigate them".

Before opening a CSD link, CBF conducts a general assessment of the prospective link that is presented for assessment to the Clearstream Material Change Working Group (MCWG). This working group will then either make a positive recommendation or decline the proposal to develop this link. If the MCWG approves to move ahead with the link development, a full risk assessment process is coordinated by Network Management with input from various departments, for instance, Credit, Treasury and Operations.

During this full risk assessment, aspects like the following are covered:

(i) Criteria on securities registration, ownership restrictions, reporting obligations and disclosure requirements;

(ii) Market assessment including legal (legal opinion), tax and regulatory issues as well as risks related to the market infrastructure (CSDs, stock exchanges, CCPs) and operational risks (use of Swift, business continuity);

(iii) All agents, where appointed, are evaluated against criteria with regard to anti-money laundering, operational readiness, good reputation and financial soundness.

Ultimately, CBF's Executive Board is responsible for the approval of every new or enhanced link setup and/or appointment of CSD/agent bank. If the risk assessment identifies significant weaknesses resulting from major risks in the local market that cannot be adequately mitigated and/or should no agent meet CBF's criteria, no link will be established with that market.

Ongoing assessment of (existing) link arrangements

Risks from existing direct links are assessed on an ongoing basis, through CBF 's continuous oversight of market developments in the areas of procedures, practices, regulations or other infrastructure related developments.

In addition to the annual due diligence visits (DDVs), CBF may choose to visit CSDs/agent banks at any time to review the relationship and ascertain that all governing documents remain relevant to the activities and regulations of the market. CBF may also request a CSD/agent bank to visit CBF's premises.

Contractual documentation consisting of the legal main agreement and the operational agreements (service level agreement, SLA) are monitored on an ongoing basis. The main agreement is renewed in case of legal or regulatory changes, the SLA is renewed in case of new or enhanced processes.

The legal framework is reviewed at least annually in accordance with Article 84 (1), par. (i) of RTS 2017/392.

CBF also monitors the performance of its network of CSDs and agent banks via an annual internal review of operational areas, the results of which can be shared with the CSD or agent operating the CSD link. The Network Management (NM) team also has access to a number of statistic-based reports that provide an overview on the operational performance of the service provider for the link in relation to the SLA and in relation to other providers. CBF also maintains a database of incident reports that are used to document deviations from expected procedure. These statistics and data are used in scheduled service reviews undertaken by CBF's NM team. The above performance monitoring and reviews also include ongoing monitoring of the creditworthiness of CBF's network of CSDs and agent banks, which is performed by CBF's Credit department.

(i) Updates to contractual arrangements with existing CSDs and agent banks to emphasize responsibility of the CSD or agent bank in relation to any risks identified;

(ii) Establishment of action plans with CSDs and agent banks and subsequent follow-up to ensure any agreed actions are being undertaken. Such follow-up may be conducted via regular meetings/calls and results in a subsequent update of action plans showing the progress of each action;

(iii) Ad hoc testing with CSDs and agent banks to ensure operating effectiveness of processes and related controls;

(iv) Change of agent bank;

(v) Creation and maintenance of internal procedures and processes to document the actions to be taken as part of the risk management of CSDs and agent banks.

In the event of any operational, legal, creditworthiness or regulatory changes or changes that affect the appointed CSD or agent bank, the risk profile of every link is reviewed in the light of the relevant CPMI IOSCO Principles, among others.

Key consideration 2

A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.

All types of links are contractually documented between CBF and the CSD and/or the agent bank and generally include the following:

The Link Agreement

- For direct links, the terms and conditions are set out in the CSD rules, which are generally drafted in the form of standardised general terms and conditions governed by the laws applicable to the issuer CSD;
- For direct links operated by a local agent, which contractual framework is composed by the CSD rules and the account operator agreement setting out the rights and obligations of the agent operating CBF's account with the local issuer CSD. These contractual documents are generally governed by the laws applicable to the issuer CSD.

The Link Agreement sets forth the contractual expectations and responsibilities between CBF and the CSD and/or the agent, as the case may be. It clarifies the choice of law and the rights and obligations of the parties. The Link Agreement with the agent bank furthermore identifies and clarifies:

- Eligible instruments and authorised parties;
- Defined terms and procedures for settlement, safekeeping/recording and administration;
- Required insurance coverage;
- Establishing the agent bank's standard of care;
- Liability of CSD/agent bank to CBF;
- Representation and warranties and confidentiality requirements;
- Incorporation of service level agreement (SLA).

External legal opinions

CBF requests legal opinions on its custody network links from external legal counsels. Please see Principle 16 for details on these legal opinions.

The monitoring of the legal framework of the linked CSDs and agent banks and/or respective jurisdictions is made by such partner CSDs and agent banks. It is their contractual obligation to keep CBF informed of any changes affecting CBF's deposit with them.

In its contractual relationship with both the issuer CSDs and/or agent banks, the liabilities remain subject to the usual force majeure and indirect damages clauses. Concerning in particular, the intermediaries, they generally also exclude their liability for losses caused by the issuer CSDs.

The SLA

This document sets forth the expected action, reaction, deadline and communication format for each individual operational process. It specifies the operational procedures to follow including:

- Authorised instructions and deadlines with regard to settlement and asset servicing;
- Expected actions and contingency action plans;
- Reporting structures related to reconciliation, position management, exceptions with their resolution and inquiries.
- Notification of market information related to custody operations.

CBF has an internal audit function which is audited annually by the external auditors to validate the operating effectiveness of its internal controls and to obtain the sign-off for the accounting and operational audit records, a copy of which will be sent to CBF's regulators, BaFin and Bundesbank. Their activities include a review of the management controls exercised over both accounting and operational activities. Ad hoc visits by both BaFin and Bundesbank may be conducted when considered appropriate.

CBF's platform makes it possible, at all times, to clearly distinguish between accounts and the financial instruments held by different participants. The assets of CBF's participants are also completely segregated in separate accounts from CBF's own assets. Securities deposited with Clearstream are booked on accounts in the name of CBF.

Further information on market practice for each of CBF's domestic links is available in comprehensive Market Profiles and Market Link Guides in the Market coverage section of the Clearstream website.

In addition, based on participant request, CBF has developed a network reporting service to supplement the extensive information. This reporting provided in the form of Domestic Markets Monitoring Reports (DMMR) helps depositaries to monitor the performance of their underlying custody chain and support their due diligence obligations.

Key consideration 3

Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.

CBF performs an annual full credit assessment of any depository and agent it has appointed. These assessments include but are not limited to an evaluation of annual accounts, the management structure as well as the liquidity, their external credit rating and the quality of assets. On this basis, CBF makes an internal rating.

The Treasury & Liquidity Controls unit monitors the nostro balances of all CCBs for the CBF-i activity on a daily basis, Credit Analysis Unit sets intra-day and overnight nostro limits for every nostro account. If a threshold is reached, a report to management is triggered and actions are implemented accordingly. The system is set up to identify large cash balances to be aware of possible credit risk.

As CBF is also a regulated bank, a high level of protection and the highest standard of care are guaranteed.

Key consideration 4

Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.

Provisional transfers are not part of the services offered by CBF. Only in rare cases, when this is a market practice that cannot be avoided, this will be possible. If CBF was faced to provisional transfers in any case, this would be duly documented and participants will be informed via the market documentation.

Key consideration 5

An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.

CBF respects a strict procedure when setting up new links. This procedure includes, but is not limited to, risk, compliance and credit reviews, as well as external legal advice (legal opinion) and a strong contractual framework. Each step of the setup of a new link is reported and approved by senior management committees such as MCWG, CRC, CBF's Executive Board.

Please see key considerations 1, 2 and 3 for more details.

Key consideration 6

An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.

CBF reviews its CSDs and agent banks (intermediaries to support the operation of a link) at least on an annual basis. This review covers the following aspects:

- Creditworthiness;
- AFME questionnaire and underlying documents: The analysis is based on a fixed evaluation grid to be applied in the same manner to all CSDs and agent banks;
- Contractual framework;
- CSD's/agent bank's performance related to the services agreed in the SLA by Clearstream Operations. In case of any issues or weak services detected a close monitoring and follow-up is ensured, until the CSD/agent bank has returned to the agreed level of service performance;
- Service.

Please refer also to key considerations 1, 2 and 3.

Key consideration 7

Before entering into a link with another CCP, a CCP should identify and manage the potential spillover effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.

Not applicable to CBF.

Key consideration 8

Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time.

Not applicable to CBF.

Key consideration 9

A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.

Not applicable to CBF.

Principle 21: Efficiency and effectiveness

An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

Key consideration 1

An FMI should be designed to meet the needs of its participants and the markets it serves, in particular with regard to choice of a clearing and settlement arrangement, operating structure, scope of products cleared, settled, or recorded, and use of technology and procedures.

To ensure that Clearstream Banking AG (CBF) meets the needs of its participants and the markets it serves, the company has adopted an active approach towards its participants by structuring their input in a number of ways. These include a series of industry surveys, organised senior executive sessions, specific participant validation during the product/service development cycle and one-to-one participant sessions during due diligence visits.

Furthermore, CBF works closely with the members of the User Committees established according to the EU Central Securities Depositories Regulation (CSDR). The committees shall advise CBF's Executive Board on key arrangements that impact its participants, including the products and services it offers to its participants in the securities settlement systems (SSSs) CASCADE and Creation as well as on service level. Please refer to Principle 2, key consideration 7 for details.

CBF's product management teams engage with participants in order to determine which new products and services require development either in response to the changing market environment or in order to respond to specific participant needs. In addition, CBF assesses its product portfolio inventory and monitors competition on an ongoing basis. Thus, the company can anticipate participant needs. Getting in contact with the participants and obtaining their voice on the development of CBF's offering is an integral part of the company's product teams' activities. New products and services are announced to participants well in advance (in principle six months prior to implementation) to allow participants to thoroughly test new releases with a technical and/or operational impact.

Clearstream's Network Management team ensures that the services provided by the company's suppliers are continuously meeting Clearstream's and Clearstream participants' expectations. To this end, the team has set up procedures to review CBF's operational reliability as described in detail in Principle 17, key consideration 3. In this respect, key risk indicators are monitored daily and reported on a monthly basis, and any deviations are tackled without delay.

Finally, CBF's efficiency and effectiveness in meeting the requirements of its participants and the markets it serves has been consistently recognised by respected third parties in the form of awards.

Key consideration 2

An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk management expectations, and business priorities.

CBF's business strategy (referring to objectives and goals) is set out in detail in Principle 2, key consideration 1. It is reviewed on a continuous basis and adapted according to the business conditions CBF faces over time. Being part of Deutsche Börse Group, CBF's strategic goals are encapsulated by the Group-wide Horizon 2026 strategy with implementation focusing on strengthening its services, ensuring regulatory compliance and fostering effectiveness in sales and client services by pursuing innovation and operational excellence.

Furthermore, CBF defines its service level and consequent goals and objectives in depository service level agreements (SLAs). These agreements reflect market standards and are the basis for operational procedures and publications of applicable operational processes to CBF participants. Minimum service levels are highly variable according to the market rules and time zones for the securities eligible for deposit and delivery within the CBF systems.

CBF's risk strategy is aligned to its business strategy and its goals of continuously developing new services, enhancing the efficiency of its operations and reducing overall processing costs. The risk strategy defines the risk appetite as a risk limitation, which protects and ensures continuity of operations. CBF's risk appetite framework constitutes the tools and concepts that are used to manage risks. The aim is to be able to monitor risks continuously and thereby manage risks according to the risk appetite. See Principle 3 for details.

Key consideration 3

An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.

CBF has engaged in and works on the basis of a continuous improvement process and has established a very strict service level measurement discipline. The company measures KPIs including operational and service level indicators. These are regularly reported to CBF's Executive Board – the most significant ones also to the User Committees – and constitute the basis for the continuous improvement of the service. The tools used for continuous improvement are the following:

(i) Forum for structured, systematic and creative solution identification, including a post-claim analysis and identification of appropriate measures;

(ii) Key performance indicators (KPIs): quantified, objective view on service delivery of operations and outsourced business activities, for example on effectiveness, efficiency, operational quality, and operational risk;

(iii) KPI engine: data warehouse, linked to major production systems, enabling standard and ad hoc reporting and detailed data analysis.

By applying all of the above tools, a systematic process is set up to ensure a comprehensive detection of quality deficits, leading to their resolution.

KPIs have been defined to measure adherence to the SLA specifications. CBF measures operational KPI straight-through processing target rates to ensure the monitoring of participant instruction processing at the highest possible system standard. The KPIs quantify different dimensions of the operational service delivery, mainly quality (for example error rates, degree of automation and turnaround times) including risk elements and capacity utilisation.

Some IT operations KPIs are also defined to measure the business application's availability, response time and adherence to contracted internal and external deadlines. If the KPIs are risk-related, they are the basis for key risk indicators (KRIs) which are monitored by Risk Management on a monthly basis. In a continuous process, KPIs and KRIs are measured, analysed and reported to the management. At least yearly, target reviews ensure adoption towards a changed market environment, participant demands or a changing internal focus.

Furthermore, CBF strives to provide products and services with utmost reliability. Thus, the company gives the highest importance to the resilience of its business aiming to safeguard it against incidents and disasters, as the unavailability of core processes and resources represents a substantial risk for CBF and potential systemic risk to the markets as a whole. Therefore, CBF aims to satisfy itself and the markets of its ability to continue operations under adverse conditions or in the face of unexpected events or disasters. In case of business interruption, operations must be resumed within appropriate time scales primarily in order to:

- Safeguard CBF from significant losses, maintain revenue generation and shareholder value;
- Maintain participant confidence, market stability and liquidity and minimise systemic risk;
- Maintain management control, fulfil contractual obligations and regulatory compliance.

The functions which are indispensable for the critical daily operations in view of the above objectives are called mission critical and are designed and implemented in such a way that they can be resumed within a recovery time objective (RTO) of two hours following a disruptive incident, crisis or disaster. The RTO is the time period following a disruptive incident within which products, services or activities must be resumed or resources must be recovered.

In order to minimise the impact of unavailability of key resources, that is, information (electronic or other), IT systems and networks, workspace and facilities, staff and suppliers, CBF has implemented and maintains effective and efficient business continuity management (BCM) plans in line with its needs and regulatory requirements. The BCM plans specify how services, processes and resources will be reinstated to a predetermined level within pre-defined time scales after an incident or disaster. Thereby the RTO for mission-critical functions must be observed. The resilience and disaster tolerance of critical processes and resources is commensurate with the business impact and the prevailing risks.

BCM plans are used, tested or exercised regularly in the most realistic way, without causing unacceptable business impact, to ensure their effectiveness and viability and in order to provide assurance that a real incident could be successfully managed. All relevant staff is trained to be competent in the execution of incident and crisis management plans and business recovery procedures.

To ensure that CBF is able to respond to an incident in a rapid, controlled and effective manner, an incident and crisis management process is in place for the timely detection, escalation and assessment of incidents and the prompt activation of the BCM plans.

Additionally, CBF implemented a default management process in order to weather the default of a major CBF participant in an orderly manner, even under stressed market conditions. For further details, please refer to Principle 13.

The systems architecture is designed to satisfy high availability requirements. The systems infrastructure is duplicated between two distant data centres. Components such as network communications, servers and storage are running in parallel in the two centres. Core systems are clustered and load-balanced between the two centres to continue operations in case of a disruption. All data is synchronously mirrored in real-time between the two centres.

The design described above in combination with the RTO of two hours facilitates the completion of settlement by the end of the day also in extreme circumstances such as the full loss of one data centre. The last system unavailability test, based on the scenario of the full loss of one data centre, was conducted in October 2023. The availability of CBF's business critical applications was validated within the RTO period and the infrastructure's security was maintained at all times.

Principle 22: Communication procedures and standards

An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.

Key consideration 1

An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

Communication procedures

CBF fully endorses standardisation and has been leading in standards implementations. All connectivity channels are fully ISO 15022 (and ISO 20022 for investment funds) compliant, IP based, and in line with European Post Trade Forum (EPTF) Barrier 2 (former Giovannini barrier 1) on communication protocols as stipulated in the "Giovannini File Transfer Rulebook" of 2007.

In particular, instructions, be it for securities or cash, can be processed via CBF's suite of connectivity products as described below. All of these settlement services are fully STP compliant:

- **CASCADE:** CASCADE is a mainframe user-to-application (U2A) connectivity channel based on proven, up-to-date technology. The harmonised security and user management streamlines participants' access to a range of services. CASCADE is based on ISO 15022 and ISO 20022 message terminology.

- **CASCADE via Swift:** CASCADE is available via Swift. This solution is used by participants that have large transaction volumes and automated interfaces between their in-house back-office systems and CBF. In the vast majority of cases, for correctly formatted instructions, no manual intervention is required.

- **CASCADE via LIMA/File Transfer:** This service offers bi-directional high-volume data transfer, both ISO 15022 and 20022 messages as well as human readable messages. It can be seamlessly integrated with a participant's in-house systems and is fully automated, making it an ideal component in an STP environment using VPN with standard messaging technology. This solution is used by participants that have large transaction volumes and automated interfaces between their in-house back office systems and CBF for their messages.

- **Xact Web Portal:** The Xact Web Portal is a screen based U2A connectivity channel based on proven, up-to-date portal technology. The harmonised security and user management streamlines participants' access to a range of services. Xact Web Portal is based on ISO 15022 and ISO 20022 message structure and terminology.

- **Xact File Transfer:** This solution offers bi-directional high-volume data transfer, both ISO 15022 and 20022 messages as well as human readable messages. It can be seamlessly integrated with a participant's in-house systems and is fully automated, making it an ideal component in a STP environment. Xact File Transfer can also be used via internet, VPN or SwiftNet.

- **Xact via Swift:** ClearstreamXact is also available via Swift. This solution is preferred by participants that have large transaction volumes and automated interfaces between their in-house back-office systems and CBF. In the vast majority of cases, for correctly formatted instructions, no manual intervention is required.

From a global ISO perspective, CBF is a liaison institution to the Securities Evaluation Group and the Registration Management Group.

When considering messaging standards, CBF has helped develop and has implemented ISO 15022 since its inception. CBF participates in the Maintenance Working Group. This body decides on the yearly evolution of the standard. The other main messaging norm for CBF's industry is ISO 20022. In this area, CBF is already supporting ISO 20022 formats for SRD II Shareholder Identification Requests and will continue to expand its ISO 20022 offering according to the market standards and timelines for adoption of the new format. CBF also contributes to the yearly maintenance of this standard.

In terms of reference data standards, CBF has adopted all the main applicable ISO standards. Cross-border operation is at the heart of CBF's activity. The only way to make processes and systems work efficiently in such an environment is to use ISO standards and to mandate its providers to only use such standards. CBF applies the same communication standards for cross-border operations as for all other operational activities.

Communication standards

For CBF participants acting in ICP (Indirect Connected Participant) mode or DCP (Direct Connected Participant) mode, the following connectivity standards are implemented:

- CASCADE-Host and CASCADE-PC/HOB RD VPN (CASCADE Online);

- Xact File Transfer for the transmission of ISO 15022 and ISO 20022 messages to CBF;

- Swift ISO 15022 messages to CBF via the Swift network;

- ISO 15022 messages to CBF via MQ; Xact Web Portal (based on ISO 20022 standards and terminology);

- Xact via SwiftNet FINplus (also supports Shareholders Identification Disclosure Requests seev.045 and seev.046 in ISO 20022 format).

CBF participants acting in DCP mode can also communicate their instructions using the following standards:

- Web-based T2S GUI via Swift or SIA-Colt;

- ISO 20022 messages to T2S via Swift or SIA-Colt network.

Principle 23: Disclosure of rules, key procedures, and market data

An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.

Key consideration 1

An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.

Rules and procedures

CBF's rules and procedures are set out in a series of documents as defined in Principle 1 that enable the participants to clearly identisfy and fully understand the risks and responsibilities of a participant in CBF's system. These documents are written in comprehensive and clear manner to help participants understand the following:

- Fees applied to the services (the fees are published in the Fee Schedule);
- System design and operations (these are set out in the Client Handbook, the Market Link Guides and Connectivity Manuals);
- Participants' rights and obligations (stipulated in the GTC and Special Conditions); and
- Risks of participating in the system (described in the Client Handbook and the Market Link Guides).

The documents are updated regularly and made available publicly to all current and prospective participants on the website www.clearstream.com.

The main indicators used by CBF to determine whether its rules and procedures are clear and comprehensive are the following:

- Training offers: For new products or major changes to the system, relationship managers provide detailed information to participants, via presentations and – if needed – also in meetings. During these sessions and via Client Services, CBF collects the comments and takes the necessary steps to rectify any perceived lack of understanding by the participants. Especially for connectivity products, CBF offers its participants dedicated training sessions, to which they can subscribe.
- GTC: Section 307 (1) of the Bürgerliches Gesetzbuch (German Civil Code) requires GTC to be clear and comprehensible. CBF's GTC are the legal basis of the contractual relationship between CBF and its participants. The process for changing the company's GTC is described in number II paragraphs 5 and 6 of the GTC.
- Operational information review: Operational information is reviewed at least twice per year, whenever there is a major IT release bringing new and enhanced product and service functionalities.

In addition, updates are implemented on an ad hoc basis, when participants (via Client Services) or internal control bodies request clarifications. The same applies to Market Link Guides as well as Market Taxation Guides.

Furthermore, an overview of CBF's default rules and related procedures, that is the company's default management process, is available online.

CBF also publishes general information on its business continuity framework in Principle 17 and the Association of Global Custodians (AGC) questionnaire.

Key consideration 2

An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.

CBF's as well as the participants' contractual rights and obligations are clearly described in CBF's General Terms and Conditions (GTC). These rules are publicly available on the company's website and can be downloaded in German (binding version) or English (convenience translation). The GTC comprehensively consider CBF's role as the German central securities depository (CSD) in accordance with the Depotgesetz (German Securities Deposit Act) and CSDR, as a credit institution according to the provisions of the Kreditwesengesetz (German Banking Act) and as a recognised SSS. The main legal provisions relevant for the establishment and the operation of CBF are described under Principle 1.

The descriptions and information provided in CBF's Client Handbook are technical rules according to number I of the company's GTC. Such information can be consulted in conjunction with other CBF publications: CASCADE Online Handbook (CASCADE-Host and CASCADE-PC interfaces), Xemac® User Manual and Connectivity Manuals. Moreover, CBF's announcements and other user manuals on connectivity, which contain further details concerning the use of CBF's services, are available on the company's website www.clearstream.com.

The above mentioned connectivity manuals provide details of the communication processes and messages supported by CBF, including the messages that participants may use for sending and processing instructions and the messages that CBF uses for reporting to participants (for details on these communication standards, see Principle 22).

Announcements give details, in English and, for the majority, in German, of changes in custody, clearing and settlement, changes in taxation, changes to fees and charges, and other information about changes in the markets, as well as CBF's products and services. The information given to participants in announcements is integrated, where applicable, into the Client Handbook, the Market Link Guides, the Market Taxation Guides and other reference documents as appropriate.

The Market Link Guides, presented in the Market Coverage section on the Clearstream website, give details of the links that have been established between CBF and domestic markets for which CBF offers settlement and custody services. Details include, among others, types of securities traded, types of link, depositories and agents, cash correspondent banks, settlement rules and times, custody services and foreign exchange. In addition to information on operational arrangements, these Guides provide, in accordance with CSDR, information on the legal terms and conditions of the link arrangements including key elements of the local legislation such as recognition of nominee concept, nature of rights on the securities and impact of insolvency laws. The information is based on legal opinions issued by external law firms appointed by CBF. In this context, the company also provides information on the rules governing the finality of transfers of securities and cash (settlement finality).

Finally, CBF discloses information on its governance (composition of the management bodies, articles of association, shareholding structure and internal control framework), the regulatory status, its annual accounts, the annual reports of the ultimate holding company as well as its ratings. This information helps participants to evaluate the risks regarding CBF's services, but also on the company's legal, regulatory, corporate, commercial and operational environment.

On a non-binding basis, CBF also provides information related to tax regime in connection with the services provided in relation to each market, highlighting that participants shall make their own tax assessment with respect to any aspects of the activities performed with CBF.

Additional information and documentation supporting participants in their risk assessment include:

- Pillar III disclosure report;
- Default management process;
- Business continuity management;
- CSDR Article 38 disclosure document;
- Internal control framework;
- AFME and AGC questionnaires.

Key consideration 3

An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.

The documentation made available through the website provides information related to, without limitation:

- Full range of activities and operations performed in CBF's environment;
- Accounts (opening and closing of accounts), segregation of assets;
- Type of assets, their eligibility and any circumstances that could affect their fungibility;
- Execution of the instructions and communication means, including the key times and dates;
- Liability regime (including the degree of discretion under which CBF exercises its rights, the exclusion of liability and the mitigating measures);
- Securities interest that CBF may have over the assets held in custody, such as the rights of pledge, retention and set off;
- Record keeping and data protection regimes;
- Settlement services, including finality and cancellation;
- Cash financing services;
- New issues and custody business services, including timelines, procedures and dates;
- Fees applicable to the services;
- Markets covered and the specificities of each market, including the local settlement rules and times;

- Impact on participants' assets;
- Conditions leading to a suspension or a termination of the services by CBF;
- Termination of the services by the participant;
- Disclosure requirements applicable in each market.

Within its world-wide Client Services structure, CBF maintains a proactive relationship model. Participants are constantly informed about any changes and enhancements to CBF's systems via announcements on the company's website. Participants can also subscribe to receive email alerts of the publication of such announcements. The Client Services team is the general point of contact for daily operational queries. The Client Services Officers – available on a 24-hour basis through Clearstream's global office presence – provide a single point of entry for queries and issues. Participants are also given the possibility to perform a due diligence visit on CBF, which would allow them to increase their understanding of CBF's rules and procedures. CBF's relationship managers meet with their clients in person on at least an annual basis. This provides an opportunity for participants to bring to their attention potential issues. Furthermore, a regular statistical report, showing, for example, the participant's straight-through processing (STP) rate puts Relationship Management in the position to proactively address a possible lack of understanding at the participant's side.

Participants are offered training on an ad hoc basis on subjects of their choice. Specific training is offered by the Client Connectivity team to help participants understand the technical setup in place and to ensure that they are fully aware of the functionalities available, as well as their limitations, contributing to establish risk awareness on CBF's products.

Relationship managers produce call reports of their interactions with participants. These reports form documentary evidence of the judgement of relationship managers based on these interactions, and, where relevant, will include elements demonstrating whether participants have a clear understanding of CBF's rules and procedures, as well as an appropriate understanding of risk. The reports would lead to further interaction on the part of the relationship manager or escalation within CBF where any of these elements were felt to be insufficient.

Key consideration 4

An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.

Fees are published – in accordance with Article 34 (1) and (2) of CSDR – at the level of individual services in the Fee Schedule and are intended to help participants in understanding the fees applied to the services. The Fee Schedule also contains a statement on CBF's pricing policy and available discounts.

Key consideration 5

An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.

CBF publishes its reply to CPMI-IOSCO disclosure framework every second year on its website. The company also publishes its monthly figures; please refer to the most recent publication in the Headlines section of the Newsroom.

Principle 24: Disclosure of market data by trade repositories

A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

Not applicable to CBF.

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Clearstream Banking AG
www.clearstream.com

Clearstream Banking AG
Mergenthalerallee 61
65760 Eschborn
Germany

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