EXECUTIVE SUMMARY[1]

Clearstream Banking Frankfurt (CBF) is a highly interconnected financial market infrastructure that provides a critical service for German financial markets and beyond. CBF is the central securities depository (CSD) in Germany providing mainly custody and settlement services, having received its license pursuant to Art. 16 of the CSDR on January 21, 2020 allowing it to perform core CSD services as well as non-banking ancillary services. It is also the operator of two securities settlement systems (SSS). In addition, CBF was authorized on August 24, 2021 to provide banking-type ancillary services as envisaged under Art. 54 CSDR. It settles securities transactions for all German securities and futures markets as well as securities traded on various global trading platforms using both free of payment (FoP) and against payment (DvP) mechanisms. CBF also acts as a custodian for securities accepted in Germany and issued by German and international issuers in the form of collective or individual certificates, or registration rights. The total value of securities held on accounts in 2020 amounted to EUR 10.6 trillion.

CBF's customers are credit and financial services institutions based in Germany and abroad. Its customers may also include foreign CSDs, central counterparties, as well as national, international and supranational organisations that provide financial services. As of end-2020, CBF had 290 participants, half of which were domiciled abroad.

As a subsidiary of Clearstream Holding AG, which, in turn, is owned by Deutsche Börse AG, CBF is part of a group of CSDs. This group comprises CBF as German CSD, Clearstream Banking Luxembourg (CBL) as international CSD (ICSD) and LuxCSD as Luxembourg CSD. Under its *OneClearstream* offering, the Clearstream Group of CSDs provides its client base with harmonized services that allows customers to seamlessly access the services of all three, legally separate, CSDs via a single, integrated platform. The Group also makes use of a number of shared services, including the treasury function, credit and liquidity risk management, and collateral management.

The assessment of CBF against the CPSS-IOSCO Principles for Financial Market Infrastructures (PFMI) reveals that CBF is in observance of 20 principles and in broad observance of 1 principle. CBF was assessed holistically, taking into account its function as a CSD and operator of two SSSs. It was found to operate in a highly transparent manner and under a solid legal basis. It has in place robust and comprehensive frameworks for managing collateral, as well as credit, liquidity, operational, and business risks. In addition, CBF has clear and well-documented rules and procedures in place for ensuring settlement finality and for the management of participant default. Governance arrangements are transparent and promote the safety and efficiency of the system. Participation criteria are risk-based and publicly disclosed. In general, CBF is a well-respected and effective organization that serves a critical function and employs highly professional and knowledgeable staff. There are, however, some key areas where there are deficiencies or issues of concern that should be addressed.

[1] This Detailed Assessment Report was prepared by Argyris Kahros (IMF) and Dale Connock, IMF external expert.

A key concern is the concentration of responsibilities under a single Executive Board member, including over all internal control functions. CBF currently has four Executive Board members, one of whom—the CEO—is responsible for global operations, risk management, internal audit, and compliance, among others. The CEO is therefore concurrently the COO and CRO. While this does not appear to adversely affect the independence of critical functions in practice, a single Board member should not be responsible for internal audit in addition to functions subject to audit. As such, and in order to bring CBF governance arrangements in line with international best practices, the responsibility for internal audit should be separated from that of risk management and compliance at the level of the Executive Board. In addition, and in line with CSDR requirements, CBF should appoint an independent member as Chair of the Risk Committee. Finally, governance arrangements can be further improved with the periodic, independent review of the performance of CBF's Supervisory Board.

CBF should put in place the technical and operational capacity to increase its ability to identify and monitor the risks posed to it from the business of its indirect participants. CBF currently relies on direct participant disclosure to have visibility on the activity of underlying clients. To further manage and mitigate risks that could arise through the activity of an indirect participant, CBF should develop the capacity for direct monitoring. Furthermore, CBF has set thresholds that trigger the identification of underlying clients from direct customers, but these are only set with respect to the business of the direct participants through which clients access CBF services. CBF should additionally set system-level thresholds that would allow for the identification of underlying clients whose business is gauged in relation to total CBF activity.

While direct customers generally praise CBF for its efficient operations, professionalism, and transparency, many voice having issues with its complicated fee schedules. CBF's customers indicate having difficulties reconciling invoices due to complicated fee schedules. As such, CBF should work closely with its customers to ease this burden and find a mutually acceptable solution to ease the process of invoice reconciliation.

INTRODUCTION

A. Assessors and Objectives

1. **This report contains the assessment of Clearstream Banking Frankfurt (CBF), which was conducted in the context of the IMF's Financial Sector Assessment Program (FSAP) for Germany in February 2022.** The assessors were Argyris Kahros of the IMF's Monetary and Capital Markets Department, and Dale Connock, an external expert. The assessors would like to thank the Federal Financial Supervisory Authority (BaFin, Bundesanstalt für Finanzdienstleistungsaufsicht), the Deutsche Bundesbank (DBB), CBF and other financial institutions for the excellent cooperation and hospitality.

2. **The objective of the assessment was to identify potential risks related to CBF that may have implications for financial stability.** While CBF plays a crucial role in the functioning of financial markets and contributes to financial stability, it may also concentrate risk as a consequence

of its central position in local and global financial markets. An appropriate risk management framework is therefore essential if CBF is to effectively manage its credit, settlement, operational and other risks, as its failure could precipitate financial shocks or act as a major channel through which shocks are transmitted across domestic, as well as international financial markets and institutions.

B. Scope of the Assessment

3. CBF is assessed against the CPSS-IOSCO[2] Principles for Financial Market Infrastructures (PFMI). CBF is assessed against all relevant principles of the PFMI that relate to a central securities depository (CSD), as well as CBF's integration with the two securities settlement systems (SSS) operated by the Clearstream Group, namely CASCADE/T2S and Creation.[3] This assessment has been approached on a holistic basis and covers all the relevant principles for these three FMIs. In the context of CBF this includes Principles 1–5, 7–13, and 15–23. The responsibilities of BaFin and DBB, as a supervisor and overseer, are not covered in this assessment.

C. Methodology and Information Used for the Assessment

4. This assessment is based on different sources of information. This assessment is based on the self-assessment report, prepared by CBF, and reviewed and complemented by BaFin and DBB. In addition, the assessors took into account and reviewed relevant documentation, including information published by CBF, national laws, regulations, rules and procedures governing CBF's systems and operations, and other available material. The assessors also benefited from detailed discussions with the authorities (BaFin, the DBB, representatives from the ECB and ESMA), representatives from CBF and CBL as well asrelevant market participants, which took place both virtually and in-person.

5. Ratings are based on the CPSS-IOSCO Disclosure Framework and Assessment Methodology. This methodology prescribes ratings that are built on the gravity and urgency of the need to remedy issues of concern identified during the assessment. The ratings reflect the assessors' judgment regarding the type or impact of the risks and other issues associated with each identified gap or shortcoming. The ratings are assigned to reflect conditions at the time of the assessment, while plans for improvements are noted in the assessment report, where appropriate.

OVERVIEW OF THE PAYMENT, CLEARING AND SETTLEMENT LANDSCAPE

A. Overview of Clearstream Banking Frankfurt

[2] As of September 1, 2014, the Committee on Payment and Settlement Systems (CPSS) was renamed under a revised mandate to the Committee on Payments and Market Infrastructures (CPMI).

[3] It should be noted that CBF is the operator of two SSSs from a legal and supervisory perspective (i.e., CASCADE/T2S and CBF-Creation). In addition, CBF is a participant in the CBL-Creation SSS as operated by Clearstream Banking Luxembourg.

6. CBF is the central securities depository (CSD) in Germany providing mainly custody and settlement services. It settles securities transactions for all German securities and futures markets as well as securities traded on various global trading platforms using both free of payment (FoP) and against payment (DvP) mechanisms. This is to ensure that cash and securities are delivered between the parties involved safely and efficiently. It also acts as a custodian for securities accepted in Germany and issued by German and international issuers in the form of collective or individual certificates, or registration rights.

7. CBF uses the TARGET2-Securities (T2S) platform of the Eurosystem to settle securities transactions in central bank money (CBM) in EUR. In addition, for non-EUR settlement, CBF settles in its books in commercial bank money (CoBM), mainly via the cash correspondent bank (CCB) network of CBL. CBF makes use of two SSSs:

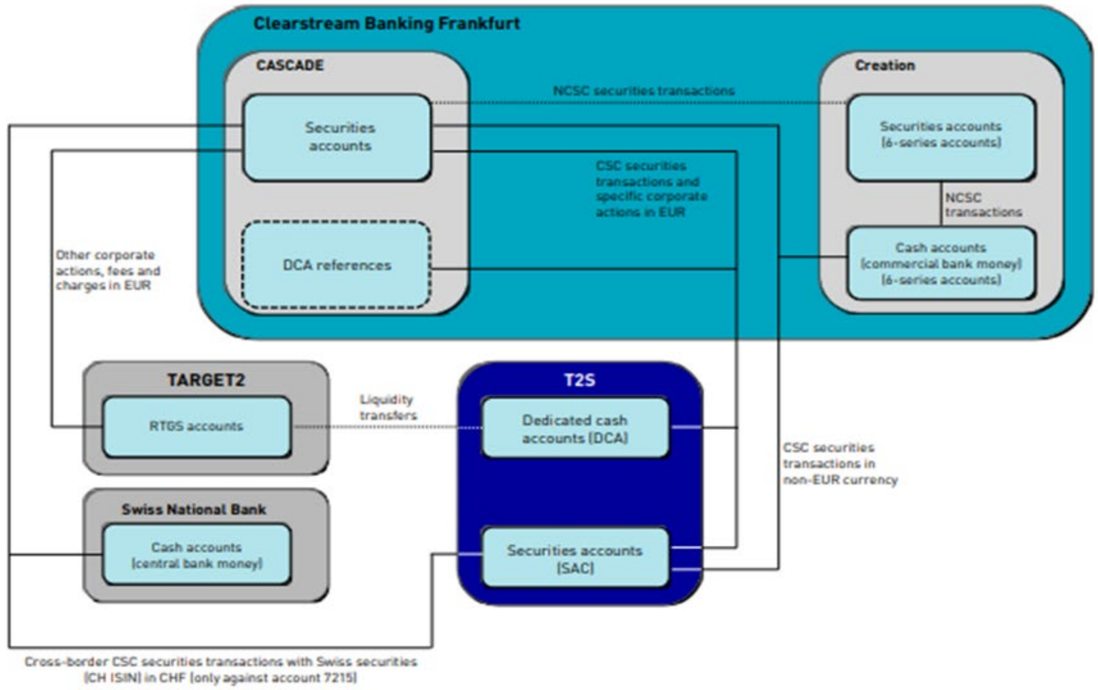
- *CASCADE / T2S* for the settlement of transactions in collective safe custody.
- *Creation* for the settlement of transactions in non-collective safe custody, as well as for non-T2S-eligible securities and non-EUR settlement resulting from a FoP process on CASCADE / T2S.

As indicated earlier, due to the fully integrated structure of CBF with these SSSs, it has been considered more appropriate to assess these FMIs holistically rather than separately.

8. CBF is licensed as a CSD within the meaning of Article 2 of the European Union Central Securities Depositories Regulation (CSDR). CBF received its CSD license pursuant to Article 16 of the CSDR in January 2020. CBF is also a CSD as defined by section 1 (3) of the Depotgesetz, the German Securities Deposit Act. In this capacity it is allowed to accept deposits and grant short-term loans to participants in its securities settlement systems. Furthermore, in August 2021, CBF was granted authorization to provide banking-type ancillary services pursuant to Article 54 of the CSDR. This authorization includes the ability to provide cash accounts to, and accept deposits from, participants in a securities settlement system; to provide cash credit for reimbursement by no later than the following business day; cash lending to pre-finance corporate actions and lending securities to holder of securities accounts, as well as payment services involving the processing of cash and foreign exchange transactions. CBF had previously been permitted to provide banking-type ancillary services in accordance with its license as a credit institution pursuant to Kreditwesengesetz, the German Banking Act.

9. CBF offers direct and indirect participation. In order to participate in securities settlement via CBF, market participants need either their own account with CBF or an account with a settlement bank, which is a direct member of CBF, as well as access to central bank money. For foreign securities eligible for collective safe custody, CBF maintains links with several foreign CSDs to serve foreign securities markets, so-called CSD links. Clearstream Banking Luxembourg's international links are additionally available to CBF's participants via the Creation platform. In this context, EUR cash settlement takes place in CBM via a T2S Dedicated Cash Account (DCA) while foreign currencies are settled in CoBM via CREATION CBF-i accounts.

Figure 1. Diagram of CBF SSSs and Connections to T2S and TARGET2



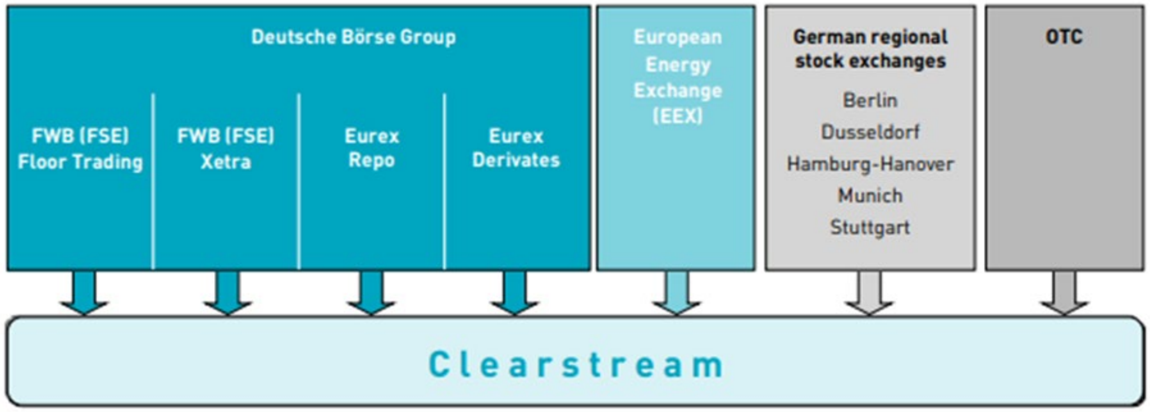
Source: CBF

10. CBF's participants are credit and financial services institutions based in Germany and abroad. CBF's participants include foreign depositories similar to CBF (foreign CSDs), central counterparties as well as national, international and supranational organizations that provide financial services.

11. CBF is considered to be a trusted and reliable financial market infrastructure according to key market players. Participants indicate a high level of satisfaction with the products, services, and operations of CBF. They applaud CBF's transparency, both in terms of the information publicly available on its website, as well as the information disseminated on relevant system, rule, and regulatory changes and/or developments during User Committee meetings or through relationship managers. Customers of CBF indicate that they receive ample time to adjust internal processes as a result of changes implemented by CBF and generally claim that CBF is attentive to their needs and concerns. Smaller market players—e.g., those that do not meet the membership eligibility criteria of the User Committees—are able to raise needs and concerns via designated Relationship Management personnel.

12. CBF settles transactions from various stock and derivative exchanges as well as multilateral trading platforms, operating in the German market. Stock exchange trades held in collective safe custody are primarily cleared through the Central Counterparty (CCP) owned by DBAG, Eurex Clearing AG.

Figure 2. Diagram of Platform, Exchange and Infrastructure Settlement Connections to CBF



Source: CBF

13. CBF outsources its settlement to the T2S platform operated by the Eurosystem and to Clearstream Banking Luxembourg's Creation platform. CBF completed the migration of the German securities market to T2S in February 2017. Securities are settled on a delivery versus payment (DVP) basis, where the cash leg is settled in CMB via TARGET2, the real-time gross settlement (RTGS) system owned and operated by the Eurosystem. For non-T2S-eligible securities as well as for non-Euro settlement, CBF has outsourced its settlement to the Creation platform operated by Clearstream Banking Luxembourg (CBL). CBF also offers free of payment (FOP) settlement functionality.

14. CBF's activities have increased significantly. The market value of outstanding securities held in *collective safe custody* increased by 7.9 percent from €7,951 billion as of the end of 2019 to €8,580 billion as of 31 December 2020. The value of bonds in safe custody was 14.9 per cent higher than in the previous year, and the value of equities, certificates and options in safe custody rose by 2.2 per cent. The volume of transactions processed also increased to 180.1 million transactions, corresponding to a 50.6 percent increase compared with 2019. Of the total number, 78.6 million can be attributed to on-exchange transactions (compared to 44.0 million in 2019), 21.0 million to CCP settlement (15.9 million in 2019), and 80.5 million to OTC transactions (59.6 million in 2019). Furthermore, the number of security issues increased significantly in 2020 (due to increased certificates issuance), up by 28.0 percent compared with 2019. At the end of 2020, CBF held a total of 3,444,677 different securities in custody for its participants across the following classes: 163,264 in bonds (compared to 164,513 in 2019), 20,586 in equities, investment shares and participation certificates (20,373 in 2019), and 3,260,827 in warrants and certificates (2,547,532 in 2019). The value of securities in *non-collective safe custody*, held by foreign depositories as of end-2020, increased marginally to €1,414 billion (compared to €1,316 billion at end-2019), while the number of executed transactions in foreign securities rose by a significant 95.6 percent to 35 million transactions. The total number of domestic participants decreased slightly from 155 in 2019 to 145 in 2020, while the number of foreign participants remained unchanged at 145.

Box 1. Target2-Securities (T2S)

As an integral part of the Eurosystem's TARGET Services, T2S was set up to support national and international CSDs to settle in CBM, and aims to facilitate post-trading integration by supporting core, neutral and borderless pan-European securities and cash settlement in CBM. It is a multicurrency (currently euro and Danish Krone) common platform that allows domestic CSDs to provide their participants with harmonized settlement procedures in an integrated technical environment with cross-border capabilities. It also allows banks to pool their collateral and liquidity rather than keep them in different locations. T2S offers a set of sophisticated technical features, including optimization algorithms to enhance settlement efficiency and a liquidity-saving auto-collateralization mechanism. At present, 21 CSDs from 20 European countries are connected to T2S. To access T2S, a CSD needs to meet eligibility criteria set out in the T2S Guideline and sign the Framework Agreement.

T2S is subject to continuous oversight by the Eurosystem with the ECB acting as the lead overseer. The oversight framework is based on the PFMI, encompassing all relevant requirements applicable to CSDs and the SSSs they operate, as well as requirements related to T2S cash settlement and other specific functionalities. Furthermore, the Eurosystem, as overseer, cooperates closely with relevant stakeholders that have an interest in the smooth functioning of T2S. For that purpose, an institutionalized framework, the T2S Cooperative Arrangement, was established in 2016 by means of a Memorandum of Understanding. Within this framework, the ECB, European Securities and Markets Authority (ESMA), the supervisory and oversight authorities of the participating CSDs, as well as the central banks of issue for non-euro currencies—currently only Danmark Nationalbank—deliberate and decide jointly on T2S matters.

Table 1. Germany: Overview of CBF Transaction Value/Volume, Revenue, and Number of Participants

Values are expressed in EUR	2017	2018	2019	2020	2021 (YTD)[1]
Number of transactions (millions)	118.5	129.26	136.15	215.5	120.78
Value of transactions (trillions)	85.842	88.004	102.706	198.684	97.176
Total Revenues (excl. NII, OCI, VRC[2]; in millions)	436.687	427.104	478.705	554.186	367.869
Average daily value of transactions (millions)	1.747	1.702	1.907	2.181	2.991
Peak value of transactions (by month; in millions)	33.628	44.773	50.792	52.415	66.942
Number of participants of which:	311	305	300	290	283
Foreign participants	145	144	145	145	142

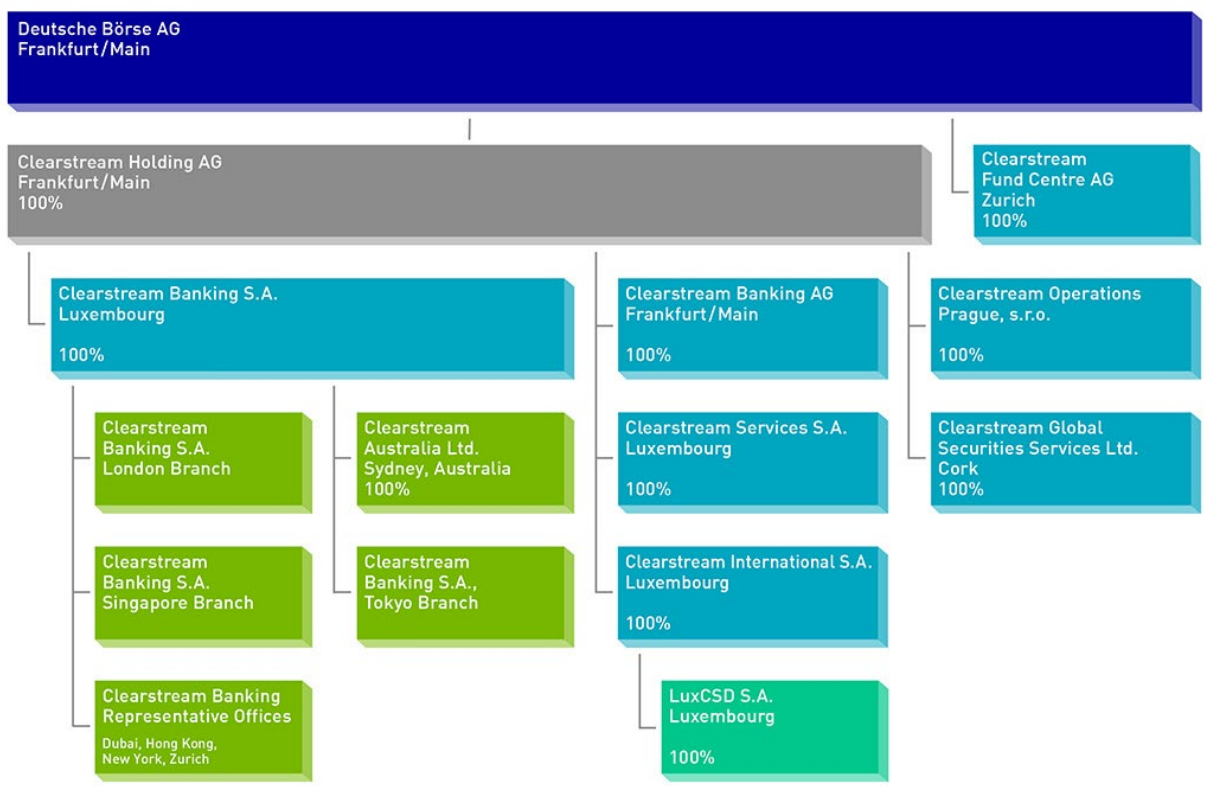
Source: CBF
[1] As of July 31, 2021.
[2] NII: Net Interest Income; OCI: Other Comprehensive Income; VRC: Volume Related Costs.

B. Governance

15. CBF is a for-profit entity, wholly owned by Clearstream Holding AG, which, in turn, is wholly owned by Deutsche Börse AG (DBAG). Clearstream Holding AG, a financial holding company as defined in the German Banking Act (Kreditwesengesetz), is the parent company of both CBF and Clearstream Banking Luxembourg, among others. DBAG is a publicly listed company and established Clearstream Holding AG in 2009, effectively ringfencing the Clearstream Group within the DBAG Group.

16. Several CBF's functionalities are integrated into Clearstream Group and DBAG. CBF has outsourced its IT and operations to Clearstream Services within the Clearstream Group, which is governed through service level agreements (SLAs). Furthermore, several critical functions are shared within the Clearstream Group, including credit and liquidity risk management, collateral management, as well as the Treasury function.

Figure 3. Ownership Structure of CBF



Source: CBF

C. Regulatory, Supervisory, and Oversight Framework

17. BaFin is the National Competent Authority (NCA) for the regulation and supervision of CBF, while the DBB is responsible for the oversight of the SSSs operated by CBF. BaFin is also the national resolution authority. Furthermore, the DBB represents the Eurosystem as the central bank of issue and the central bank on whose books settlement of the cash leg takes place. In

addition, the Federal Office for Information Security (BSI) is the German federal agency responsible for managing computer and communication security.

18. BaFin is designated as the NCA for the supervision of CBF in accordance with Article 11 of the CSDR. CBF obtained authorization as a CSD under Art. 16 of the CSDR in January 2020 , which was granted on the basis of compliance with CSDR requirements to provide core services of CSDs (see Section A of the CSDR Annex) and non-banking-type ancillary services of CSDs that do not entail credit or liquidity risk (see Section B of the CSDR Annex). In addition, the ECB and DBB, as relevant authorities pursuant to Article 12(1) of the CSDR, are involved in the authorization and supervision of CBF. The Governing Council of the ECB has adopted the PFMIs for the FMI and, consequently, the DBB applies them when carrying out its oversight responsibility.

19. ESMA is also involved in the regulation of CBF. It develops and implements regulatory technical standards (RTS), so-called Level 2 measures and supervisory convergence measures related to the CSDR. Furthermore, it provides information to the market under the Settlement Finality Directive (SFD) and co-ordinates authorities involved in the supervision of CSDs that use the Target2-Securities platform via its role as co-chair of the T2S Cooperative Arrangement (cf. Box 1). Moreover, ESMA facilitates a technical platform for reporting requirements pursuant to Article 7 (settlement fails) and Article 9 (settlement internalize) of the CSDR.

20. Since CBF is also authorized as a credit institution pursuant to Section 32 of the German Banking Act, the banking supervision function is jointly conducted by BaFin and the DBB. Status as a credit institution is a prerequisite to authorization to provide banking-type ancillary services under the CSDR (see Article 54 of the CSDR). This authorization does not, however, permit CBF to carry out any banking activities not listed in Section C of the CSDR Annex. In accordance with the German Banking Act, the DBB shall, as part of the ongoing supervision of credit institutions, conduct off-site and on-site inspections of CBF.

21. As a credit institution, CBF is considered a "Less Significant Institution" pursuant to the Single Supervisory Mechanism (SSM). In this respect, it is subject to indirect prudential supervision by the ECB. In this context, the ECB is responsible for the effective and consistent functioning of the SSM and ensures that the supervisory methodologies applied by the NCA are of high quality. Therefore, the NCA in Germany is subject to specific reporting requirements and final decision making of the ECB in so-called "common procedures" following the SSM framework.

22. CBF as a credit institution is also governed by the Recovery and Resolution Act. This Act transposes the EU Bank Recovery and Resolution Directive (Directive 2014/59/EU, BRRD) into German national law, and obliges credit institutions to perform recovery planning. It also empowers BaFin with early intervention. BaFin is made responsible for resolution planning and measures to remedy resolution impediments. Tasks performed by BaFin as competent resolution authority are, however, separate from its supervisory functions.

D. Major Reforms and Other Initiatives

Fintech

23. CBF's Fintech initiatives take place within the broader context of Deutsche Börse Group (DBG) efforts. DBG centrally manages a number of external input channels for Fintech activities, such as participation in start-up incubators and innovation funds. This centralized and integrated approach enables CBF to access resources far in excess to what would be possible as a stand-alone entity. In particular, Clearstream has undertaken a significant project to create a decentralized platform for Digital Financial Instruments, based on distributed-ledger technology (DLT). An overview of the main initiatives are described below:

- D7: A digital post-trade platform (using enterprise DLT solutions, and potentially CBDC and/or cryptocurrencies) for digital financial instruments capable of servicing multiple asset classes based on both centralized and decentralized networks. The development itself has been enabled by the Electronic Securities Act (eWpG) promulgated in late 2021. The Act provides a reliable legal framework for the issuance, trading and custody of electronic securities (including a new central register) that will allow CBF to digitize more than 80 percent of the securities currently held in its systems.

- HQLA^x: DBG has partnered with HQLA^x, a Fintech company specialized in delivering liquidity and collateral management solutions for institutional participants in the global securities lending and repo markets. HQLA^x is developing an innovative model based on DLT for collateral swaps in securities lending. Unlike conventional settlement, tokens instead of securities are transferred between the custody accounts on the new platform. This model potentially offers market participants more efficient liquidity management, thanks to the increased mobility of collateral between different systems and locations.

- Trigger Chain: DBG is cooperating with the DBB and Germany's Finance Agency to develop a settlement interface for electronic securities based on DLT. The partners have, with a range of participants, successfully tested a transaction performed with the aid of a "trigger" solution and a transaction coordinator in TARGET2. The successful settlement proves the technical feasibility of establishing a bridge between blockchain technology and conventional payment systems to settle securities in CBM.

- FundsDLT: A decentralized platform based on DLT that would enable asset managers to sell funds through a new distribution channel. FundsDLT is being developed to enable asset managers, distributors, and their service providers to mutualize operational costs, reduce time to process transactions, share client knowledge amongst themselves, improve client experience, and develop new distribution outlets.

Cyber Resilience

24. CBF cyber resilience is crucial if financial markets are to continue functioning as expected. As an important player in the securities services industry it behooves CBF to be able to anticipate and withstand cyber-related operational disruptions or failures that would otherwise impact financial markets. CBF's objectives are based on the Eurosystem's five "Cyber resilience oversight expectations for financial market infrastructures" (CROE) risk management categories—governance, identification, protection, detection, response/recovery—and the three CROE overarching components—testing, situational awareness, learning/evolving. The CROE are based on the global guidance on cyber resilience for Financial Market Infrastructures issued by the CPMI IOSCO and define the Eurosystem's expectations in terms of cyber resilience.

25. Concrete actions taken, or being taken, by CBF as part of its cyber resilience strategy span the range of risk management categories set out in CROE. CBF fosters a culture of cyber resilience with dedicated trainings for staff, and is adopting a cyber resilience maturity model, through which it will assess the adequacy of its cyber resilience measures and track progress in its resilience capabilities. In order to reduce the likelihood and/or limit the impact of potential cyber security events, CBF has implemented identity and access management systems, as well as other industry leading practices, such as network segmentation and network access controls. Furthermore, CBF engages in comprehensive penetration testing and simulation exercises in an effort to measure the effectiveness of its defenses and identify any potential security vulnerabilities. It does so by leveraging frameworks, such as TIBER-DE (Threat Intelligence-Based Ethical Red Teaming), the national German implementation of the European-wide analog TIBER-EU. CBF continuously reviews its testing methodology in order to improve the effectiveness of the cyber security exercises it conducts.

26. CBF's cyber resilience strategy is part of what encompasses its Information Security Framework and fits into the broader business and security strategy of the DBAG group. CBF's Executive Board (EB) has clearly defined its information risk appetite and reviews this regularly in light of the ever-changing information security and cyber threat landscape. The defined risk appetite is then used as the basis for any risk decisions taken. Risk appetite determination is based on the ability of CBF to enable and support its various operations, technologies, tools and products, even under adverse or stress conditions. CBF focuses on ensuring that this risk exposure is kept low and that threats are constantly monitored. The risks are reported to, and the responding measure is decided by, the so-called Information Owner, who is appointed by the EB of CBF. The Information Owner is also in charge of the continuous review of the implementation of Risk Remediation Plans. The status is regularly reported by the CBF Information Security team / CBF Chief Information Security Officer (CISO) to the EB.

27. CBF conducts regular assessments of its approach to information security. Regular assessments of implemented controls are conducted to assess compliance with Information Security requirements for all IT and Non-IT Assets. These include management and independent reviews, including those of internal audit. Beside regular assessments, ad-hoc risk assessments are conducted based on external triggers, such as regulatory and environmental changes. An assurance assessment is carried out twice a year. The recently finalized biannual assurance report on measures to be

implemented by critical infrastructure (KRITIS) operators confirmed overall compliance with only very few minor issues. The outcome is shared with the Federal Office for Information Security (BSI), the German federal agency responsible for managing computer and communication security.

28. CBF has regularly participated in the Eurosystem's Cyber Resilience Survey exercise. This survey is derived from internationally agreed-upon frameworks, including the G7 *Fundamental Elements of Cyber Security for the Financial Sector*, and the CPMI-IOSCO *Guidance on cyber resilience for financial market infrastructures*. The survey allows for a structured comparison of relevant aspects from a cyber resilience perspective across FMIs in the euro area.

Other

29. On European Union level, the Commission published in September 2020 a proposal for a Regulation on a pilot regime for FMIs based on DLT. This proposal is part of a regulatory package—the Digital Finance package—aiming to further enable and support innovation and competition in digital finance, while mitigating associated risks. In particular, the DLT pilot regime aims to allow a CSD to operate a DLT-based SSS. The DLT pilot regime only covers specific types of financial instruments and shall apply for a pre-defined period to allow market participants to examine the use of DLT in FMI functions.

30. On national level, the Federal Republic of Germany introduced the Electronic Securities Act (eWpG, Gesetz über elektronische Wertpapiere) for the issuance of bearer bonds governed by German Civil law in electronic form in June 2021. This Act is part of Germany's digitisation strategy, and allows an authorized CSD—or a custodian authorized as a credit institution to provide deposit business—to operate an electronic register for the initial recording of bearer bonds and for the transfer of ownership among investors. In accordance with the Act, CBF launched its D7 initiative in November 2021 when the first e-securities were issued in conjunction with a number of cooperating market participants. Further progress is expected in phases during 2022.

31. Following postponement due to the COVID-19 pandemic and to stakeholder requests to have more time to implement changes needed for compliance, the Settlement Discipline Regime (SDR) under Regulation (EU) N° 2018/1229 entered into force on February 1, 2022. The SDR introduces regulatory technical standards for the purpose of increasing settlement efficiency, monitoring settlement discipline and addressing settlement fails. Under the SDR, CSDs are currently required to apply late settlement cash penalties, and are obliged to send monthly and annual settlement fail reports to their competent and relevant authorities.

SUMMARY ASSESSMENT

General Organization (Principle 1–3)

32. CBF has a sound, transparent, and enforceable legal basis for its settlement, custody and banking activities. CBF's rules, procedures, and contracts are clear and consistent with German

and European laws and regulations. The legal framework supports the enforcement of its settlement, custody, and banking activities. The implementation of European directives provides a firm statutory foundation for finality, netting, securities lending, and collateral arrangements. The finality of both securities and payment transfers are protected against unwinding or reversal under German insolvency law implementing the European Settlement Finality Directive. Legal opinions are obtained to identify and mitigate risks arising from links' activities in various jurisdictions, and are regularly reviewed.

33. Governance arrangements are transparent, and promote safety and efficiency—with all the requisite skills necessary for CBF to function effectively—but the independence of internal control functions at the level of the Executive Board can be improved. CBF has comprehensive and adequate governance arrangements. The infrastructure is managed by highly-skilled professionals, and its EB ensures that major decisions appropriately reflect the interests of its participants, relevant stakeholders, and the general public. The roles and responsibilities of its supervisory and executive boards are well defined, clearly described and publicly disclosed. The Supervisory Board is composed of six members, two of whom are independent and another two are staff delegates. CBF, as per the CSDR, has established several key committees for audit, risk, and remuneration. The independence of internal control functions at the level of the EB, however, can be improved. CBF currently has four EB members,[4] one of whom—the CEO—is responsible for global operations, internal audit, risk management, credit, and compliance, among others. As such, there is a high degree of concentration in the responsibilities of critical functions under a single member who retains the titles of CEO, COO, and CRO. While the current set-up does not place CBF's governance arrangements in violation of German or European laws or regulations, they are not in accordance with international best practices, which call for a separation across the three lines of defense. For example, EBA Guidelines on internal governance state that, in order for internal control functions to be regarded as independent, "the head of an internal control function should not be subordinate to a person who has responsibility for managing the activities the internal control function monitors and controls."[5] As a result, and at a minimum, CBF should separate the responsibilities for internal audit from those of risk management and compliance at the level of the EB. In addition, and as called for in the CSDR and PFMI, CBF should appoint an independent member as Chair of the Risk Committee as the current Chair is the CRO of the Deutsche Börse Group.[6] Finally, and as supported by the PFMI, CBF can further improve its governance by conducting periodic, independent reviews of the performance of its SB.[7]

[4] It is important to note that CBF's EB is composed of four members only temporarily. Up until recently, the EB was composed of five members and CBF, subject to regulatory approval, plans to soon onboard a fifth member. However, the planned division of responsibilities upon onboarding the fifth EB member, as shared by CBF staff with the assessors, retains the lack of separation between risk management and internal audit as described in the context of the current set-up.

[5] See paragraph 158(c) of EBA/GL/2017/11.

[6] See paragraph 3.2.14 of the PFMI, as well as Article 48(2) of CSDR RTS, Regulation (EU) 2017/392.

[7] See paragraph 3.2.9 of the PFMI.

34. CBF has a robust and comprehensive risk management framework. It has adequate risk management policies, procedures, and systems that enable it to identify, monitor, mitigate and report risks to which CBF is exposed. The framework in place ensures that issues are escalated when risks materialize and appropriate measures are taken to avoid and reduce risks without delay. The framework is validated regularly by the CBF EB. In particular, CBF has an effective risk management framework through the use of Key Risk Indicators (KRIs) for the management of operational and business risks. The risk management function is also involved in the calculation of financial buffers in line with Basel capital model requirements. Furthermore, CBF has identified—and monitors—interdependencies and related risks from counterparts that perform multiple roles. CBF also has a comprehensive recovery plan. CBF's risk management framework sits under the broader umbrella of DBG's risk management strategy, and while the management of some types of risk are outsourced (e.g., credit and liquidity) and shared within the Clearstream Group, adequate attention is paid to the identification, monitoring, and mitigation of risks unique to CBF.

35. CBF distinguishes between the 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 and restructuring/wind-down plans are drawn up and maintained by CBF while the resolution plan is owned and drawn up by the National Resolution Authority. A Recovery and Resolution Planning unit (part of Clearstream Risk Management) is responsible for the regular update and continuous improvement of the various plans. These are subject to approval by the CBF EB prior to submission to the regulators.

Credit and Liquidity Risk Management: (Principles 4–5 and 7)

36. CBF has an adequate framework to manage and monitor its credit risk. All CBF credit services have been outsourced to Clearstream Services, a sister company, and to Clearstream Banking Singapore, a branch of Clearstream Banking Luxembourg. In addition, DBG's Group Credit is responsible for implementing the group's credit strategy and developing policies and procedures aimed at identifying, measuring, monitoring, controlling and reporting credit risk for all of CBF's activities. Group Credit also provides independent credit assessments and credit ratings. CBF's individual credit risk appetite is approved and regularly reviewed by its EB. The credit risk borne by CBF results mainly from fully collateralized loans granted to participants in connection with its settlement and custody activities. Such risk is monitored at near real time by the so-called Credit Exposure Monitoring Tool, which computes aggregate exposures to relevant counterparts. CBF provides two types of credit facilities to its customers in order to increase settlement efficiency. These credit facilities are granted exclusively on a collateralized basis to commercial entities, in line with Article 59(3)(c) of the CSDR. According to the Clearstream Credit Strategy, the CBF EB can only make exceptions and grant—on a case-by-case basis—uncollateralized credit facilities to non-commercial entities, where zero risk weight is applied according to EU Regulation No 575/2013 on prudential requirements for credit institutions and investment firms.

37. CBF has established a solid and comprehensive collateral management framework. It is based on stringent eligibility criteria, including high credit quality, minimum market risk, high liquidity, immediate accessibility and valuation. The framework and principles that underpin CBF's

collateral acceptance criteria are clearly documented in the Clearstream Credit Policy and Clearstream Credit Strategy, both of which are reviewed and approved annually by the CBF EB. CBF has risk management procedures to reduce wrong-way risk and has set out clear, well-defined, and comprehensive concentration limits. It evaluates its collateral in an automated fashion and on a near to real-time basis with a sophisticated collateral management system by marking-to-market for collateral valuation, setting conservative haircuts, while also attempting to limit procyclicality, and monitoring adherence to concentration limits at both participant- and CSD-level. While CBF has in place a process for the ex ante non-acceptance of ineligible collateral, it monitors breaches in concentration limits on a daily basis but only takes action ex post in case a breach has been detected. In order to maintain the integrity of the set concentration limits, CBF should put in place processes for the ex ante evaluation of collateral concentration limit breaches.

38. CBF has a robust framework to measure, monitor, and manage its liquidity risk. The framework is designed to cover all payment obligations at any time in order to avoid a potential liquidity shortfall arising from its participants, cash correspondent banks, liquidity providers, and deposit-keeping banks. CBF holds sufficient qualifying liquid resources in euro and is also able to obtain euro liquidity from the DBB and has access to ECB standing facilities. In addition, CBF maintains cash balances in USD and GBP with two CCBs, and a committed, secured liquidity FX swap facilities with two credit institutions, allowing access to a wide variety of currencies. CBF also has uncommitted overdraft facilities with its CCBs and a secure, intraday USD credit line with CBL based on its participation in the SSS operated by Clearstream Banking Luxembourg. CBF conducts real-time liquidity monitoring and calculations of expected cash flows via an intraday liquidity monitoring tool, a function which has been outsourced to CBL. Regular liquidity and reverse stress tests are conducted at both Clearstream Holding and CBF level to assess the liquidity impact of several scenarios, including the default of the two participants with the largest exposures. The results of the stress tests are compared with the available liquid resources. While CBF's liquidity risk framework is robust and comprehensive, CBF is encouraged to broaden its CCB base for the purpose of risk diversification and hold overdraft cash accounts in USD and GBP with more than a single credit institution, in addition to assessing the appropriateness of holding overdraft cash accounts for other currencies.

Settlement (Principles 8–10)

39. Settlement finality at CBF is achieved through clearly defined rules and procedures. Settlement within CBF takes place on either a Free of Payment (FoP) or against payment—meaning a Delivery vs Payment (DvP)—basis through one of two securities settlement systems, namely CASCADE or Creation (the latter also referred to as CBF-i). The moment of irrevocability for both instructions and settlement are clearly defined in Article 39(1), (2), and (5) of the CSDR, as well as Section 14 of the German Securities Deposit Act (Depotgesetz), and supported by the CBF General Terms and Conditions (GTC) for participants. For external settlements, finality is achieved in accordance with the local market rules and practices.

40. Money settlement takes place in either CBM (mainly through Target2-securities) or CoBM (at CBF). In line with Art. 40(1) of the CSDR, the cash payment legs of all CASCADE

settlements that take place via the T2S platform against payment in EUR are executed in CBM. In case of settlement against payment in CHF for Swiss securities, the settlement is also executed in CBM via a link to the Swiss National Bank. In case of settlement through the Creation platform, the cash payment leg is executed in CoBM, via a network of CCBs that have contractual relationships with CBL. In accordance with Art. 54(2)(a) of the CSDR, CBF holds a limited purpose banking licence that allows it to provide banking services in relation to settlement services. Robust mechanisms are in place to manage credit and liquidity risks in respect of these CoBM settlements. However, CBF is reliant on CBL's network of CCBs for effecting money settlement through the Creation platform. To minimize CBF's reliance on CBL for access to the network of CCBs required for money settlement, CBF is encouraged to work with CBL and establish, at minimum, a subordinate, but definite, role in the contractual relationships that exist between CBL and its network of CCBs, as well as diversify the network for currencies to which it does not have access to CBM.

41. CBF obligations in respect of physical instruments are clearly defined. The safe custody of physical securities by CBF is regulated under the German Securities Deposit Act. Clear rules have been defined to ensure the appropriate segregation of own and third party assets. Regular and comprehensive reconciliations are performed. The initiation of digitization initiatives in the German market are, however, to be welcomed as a mechanism to further reduce the risks associated with the storage and delivery of physical securities.

CSD and Exchange of Value Settlement System (Principles 11–12)

42. Appropriate mechanisms are in place at CBF to safeguard the rights of issuers and holders of securities. Customers of CBF have the option of holding their securities in either segregated or omnibus account structures. CBF does, however, require that no single interest in a client omnibus account should exceed 25% of the total value of assets deposited into that account. When a single interest does breach that threshold, CBF requires the direct customer to segregate the corresponding assets onto a client segregated account. All underlying client assets are thus segregated from the proprietary assets of the direct customer, and the latter's assets segregated from those of the CSD. In addition, participants' securities are protected under German Insolvency Law from forming part of the bankruptcy estate of CBF.

43. CBF has appropriate rules, procedures and controls in place to prevent the unauthorized creation or deletion of securities. In accordance with Art. 37 of the CSDR, negative securities balances are not permitted in participant accounts maintained by CBF. "Provision checks" are conducted prior to settlement to ensure that sufficient securities are in place to execute a delivery instruction thereby preventing debit balances in securities accounts – even on an intra-day basis. In addition, the majority of securities in the CBF environment are held in immobilized form with transfer by book entry. While appropriate mechanisms are in place to ensure effective reconciliation between the physical and electronic records, the newly adopted Electronic Securities Act (eWpG) makes the welcome provision for the issuance, trading and custody of electronic securities and represents a meaningful step forward in the modernization of the legislative framework for German securities.

44. CBF employs effective Delivery versus Payment mechanisms to mitigate against principal risk. All CBF transactions that involve the settlement of two linked obligations are conducted using the irrevocable and simultaneous exchange of securities for cash, whether conducted on the T2S or Creation platforms. Securities are matched and provisioned prior to settlement and are only moved on confirmation of the successful payment of the cash consideration.

Participant-Default Rules and Procedures (Principle 13)

45. Default Management rules and procedures are in place to effectively manage the default of a CBF participant. CBF has defined two types of default, namely general and contractual default and has developed a comprehensive Early Warning Framework that makes use of indicators and appropriate monitoring thresholds across the various activities of individual participants to identify irregularities in their behaviour that could indicate impending deterioration or default. The Default Management Process is designed to minimize the potential financial impact of a default to CBF. The prompt suspension of credit limits and the timely liquidation of collateral held to cover the positions of a defaulting party help reduce the impact of such an event on the resources of CBF itself while also helping to limit the possible disruption to the market.

General Business and Operational Risk Management (Principles 15–17)

46. General business risks are well managed in the CBF environment. CBF has developed an early warning system that uses detailed information relating to such things as CBF profitability, operational expenses, cash flows and project expenses to monitor the performance of the organization. Stress testing compares several stress situations against projected Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) and statistical models are designed to validate the sufficiency of the risk-bearing capacity within the company. In addition, recovery, restructuring and wind-down plans have been drawn up and are maintained by CBF. A range of identified recovery options ensure that CBF is able to raise sufficient capital or funding to withstand severe stress affecting its capital and liquidity profile. CBF currently holds liquid net assets funded by equity equal to at least 8 months of current operating expenses. These assets are in addition to resources held to cover participant defaults and other financial risks. This ensures that CBF is able to continue to provide services as a going concern.

47. CBF has well-defined custody and investment policies in place. CBF's investment portfolio comprises exclusively EUR-denominated, ECB eligible, L1 HQLA assets, which remain unencumbered and are under the direct control of the treasury, a function outsourced to CBL. The assets are directly transferrable to the Bundesbank to generate intraday liquidity under stress circumstances. CBF has immediate access to its own and customer assets. No liens or pledges can affect access to these assets – even under default circumstances. Legal opinion is obtained for each linked jurisdiction to ensure that this principle protects CBF client assets that might be held in a CSD where CBF is a direct participant. CBF does not engage in proprietary trading activities as the primary objective of its investment strategy includes capital preservation and appropriate access to liquidity.

48. CBF has established a comprehensive operational risk management framework which identifies four main operational risk classes. These are: availability, service deficiencies, damage to physical assets and legal (and other) risks associated with business practices. The BCM framework, and associated BCPs are designed to be comprehensive and deal with the direct effects of an event (e.g., workspace unavailability, staff unavailability, etc.) rather than the specific root cause (e.g., natural disaster, pandemic, physical attacks, intrusions, terrorist attacks, etc.)

49. Within the design of BCM, CBF considers the appropriateness, feasibility and effectiveness of the solutions to meet both internal and external needs. IT tools support the identification, monitoring and management of operational risks and ensure that the technical infrastructure maintained by CBF remains stable. CBF also maintains stringent Change and Project management protocols which are complemented by robust system, technical acceptance and business readiness testing regimes that involve users / participants whenever necessary to ensure seamless deployment of new or changed systems and functionality. CBF aims to ensure the highest possible levels of system availability for all core systems. KPIs based on qualitative and quantitative measures are used to support comprehensive BCM that incorporates a dual data center strategy with a Recovery Time objective of 2 hours for all critical systems. Business Continuity plans are designed to address the unavailability of systems, workspace, staff and suppliers and are subject to a comprehensive testing on an ongoing basis. Tests are conducted on a regular basis, at least annually, either announced or unannounced. These tests take place during normal business hours, in live production environments. All BCPs are reviewed at least every 6 months with all test outputs being measured against functional effectiveness, execution ability and recovery time objectives.

50. CBF uses TSI.STANDARD 4.2 to assess the quality of all its data centres. Although the two current data centers for CBF are located within 8km of one another, they have been assessed according to the Trusted Site Infrastructure (TSI) method to ensure that they do not share any single points of failure and that they have distinct risk profiles. Careful consideration has also been given to the negative impact that further increases in distance between the two sites might have on latency for real-time data mirroring.

51. A new Data Centre Setup and Strategy initiative is currently underway. Phase 1 involves the upgrading of the older Data Center to newer, state-of-the-art, technology that will further enhance operational stability. The second phase involves an assessment of the potential benefits of establishing an out-of-region Data Center that would provide a cold infrastructure set-up capable of supporting mission critical applications with asynchronous data replication. This third data center could either be a dedicated physical site or, alternatively, a cloud-based solution if all regulatory conditions are met. Considering the critical nature of CBF's operations to financial markets, and notwithstanding the planned assessment in this respect, the mission recommends that CBF strongly consider the feasibility and business case for such a third data site.

Access (Principles 18–20)

52. CBF employs risk-based and publicly disclosed criteria for participation. Acting within the parameters set out in Art. 33 of the CSDR, CBF has developed and approved participation criteria that are geared towards avoiding the introduction of undue legal, financial and operational risk by a prospective participant. The authority to approve (or reject) an applicant lies with the EB of CBF, which also has the power to terminate a participant relationship under defined circumstances (as further explained in numbers VI and XXII of the CBF GTCs).

53. CBF maintains contractual relationships with only its direct participants, on whom it is reliant for the identification and management of the activities of indirect clients. CBF obliges its direct participants to disclose the identity of underlying clients who maintain assets in a client segregated account (segregated accounts are furthermore required in case an underlying client's assets in an omnibus account exceed 25% of the total value of assets in that account). In addition, and in line with the CSDR, CBF identifies key participants, who are requested to disclose the identity of underlying clients who make up equal to or greater than 10% of the key participant's settlement activity. The identification and monitoring of indirect participant activity is therefore dependent on direct participant disclosure, and there is no identification of indirect participants based on activity with respect to total CBF activity. CBF should develop capacity for increasing the transparency with respect to the business of its direct participants' clients and broaden its explicit identification criteria for clients of direct participants to include system-level thresholds.

54. All link arrangements are contractually documented between CBF and the linking entity. CBF customers can currently avail themselves of a wide variety of CSD links that exist directly with CBF, as well as international links via CBL's Creation platform. These link agreements set out the contractual obligations of both parties and identify the specific services that are provided via the link. The CBF EB is, ultimately, responsible for the approval of new Link requests. A comprehensive assessment process has been developed to assess technical, operational, legal and credit risks that might be introduced as a consequence of a new link being introduced. A process of continuous monitoring has also been implemented with a review of the legal framework being done, at least, annually. The operational performance of each link is monitored on an ongoing basis.

Efficiency (Principles 21–22)

55. CBF is recognized for the efficient and effective manner in which it meets the needs of its clients. The establishment of Working Committees provides effective channels for interaction between CBF and its clients/users. These forums are used to address a variety of topics, including market and system developments, regulatory changes and the management of technical and/or operational disruptions. Smaller clients/users are catered for through a network of Relationship Management personnel that provide the user with a single point of contact to CBF and clear escalation procedures.

56. The CBF systems are designed to maintain a high standard of operational resilience. A comprehensive KPI framework is used by CBF to monitor and measure the effectiveness of operational service delivery, outsourced and offshored business activities and a variety of risk elements. Various IT operational measures are also in place to monitor application availability,

response times as well as adherence to contracted internal and external obligations. These metrics are shared with the market on an ongoing basis.

57. CBF is fully compliant with the appropriate ISO (15022 and 20022) standards as well as IP based and EPTF communication protocols. All CBF settlement services are fully STP compliant and CBF is an active participant in a variety of standards bodies and market user groups to ensure that it remains abreast of developments in the market.

Transparency (Principle 23)

58. CBF publicly discloses rules, key procedures and market data. CBF makes extensive use of its website (www.clearstream.com) to communicate with its user base. Most information is freely available with a secure portal available for more sensitive data. In addition, CBF has completed the CPSS-IOSCO Disclosure framework for FMIs with the 2021 edition being made available on Clearstream's website.[8] Although fee schedules are published, some concerns have been raised with regard to their complexity and the ability to reconcile invoices. It is therefore recommended that CBF work more closely with its customers to decrease the burden of invoice reconciliation.

Table 2. Germany: Rating Summary for Principles

Assessment Category	Principle
Observed	1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, and 23
Broadly Observed	2
Partly Observed	-
Not Observed	-
Not Applicable	6, 14, and 24

[8] See cpmi-iosco-cbf-2021-data.pdf (clearstream.com)

Table 3. Germany: Prioritized List of Recommendations for CBF				
Principles	**Issue of concern or other gap or shortcoming**	**Recommended action and comments**	**Relevant Parties**	**Timeframe for Action[1]**
2	The independence of internal control functions at the EB level can be improved	At the level of the EB, the responsibility for internal audit should be separated from that of risk management and compliance.	CBF, BaFin	NT
2	The current Chair of the Risk Committee is not independent	CBF should appoint an independent member as Chair of the Risk Committee since the current Chair is the CRO of Deutsche Börse, CBF's ultimate parent.	CBF, BaFin	NT
2	Lack of independent reviews of the performance of the SB	CBF should have periodic independent assessments of the performance of its Supervisory Board.	CBF, BaFin	LT
5	There is no automatic prevention of participants breaching collateral concentration limits	CBF is encouraged to put in place the capacity for ex ante evaluation of collateral concentration limit breaches.	CBF, BaFin	MT
7	CBF maintains cash overdraft accounts with only one bank in USD and one bank in GBP	CBF is encouraged to broaden its CCB base for the purposes of risk diversification and hold overdraft accounts in USD and GBP with more than a single institution, in addition to assessing the appropriateness of holding overdraft cash accounts for other currencies.	CBF, BaFin	NT

Table 3. Germany: Prioritized List of Recommendations for CBF (Continued)				
Principles	**Issue of concern or other gap or shortcoming**	**Recommended action and comments**	**Relevant Parties**	**Timeframe for Action**
9	CBF effects money settlement via CBL's network of CCBs in the Creation platform	To minimize CBF's reliance on CBL for access to the network of CCBs required for money settlement, CBF is encouraged to work with CBL and establish, at minimum, a subordinate, but definite, role in the contractual relationships that exist between CBL and its network of CCBs, as well as diversify the network for currencies to which it does not have access to CBM.	CBF, BaFin	LT
17	CBF maintains two hot secondary data sites in the general vicinity of Frankfurt with no site at a greater distance	Due to the critical function CBF provides, CBF should assess the feasibility and business case for a third, cold data site at a sufficient distance from Frankfurt.	CBF, BaFin	MT
19	CBF relies on direct participant disclosure to identify and manage the risks posed to the system from the customers of its direct participants	Beyond relying on direct participant disclosure, CBF should develop the technical and operational capacity for increasing the transparency with respect to the business of its direct participants' clients.	CBF, BaFin	MT
19	For the disclosure of the identity of the underlying clients of direct participants, CBF has only set thresholds of client activity with respect to the activity of the direct participants through which it accesses CBF services, and not with respect to the total activity of CBF	CBF should broaden its explicit identification criteria for the clients of its direct participants to include system-level thresholds.	CBF, BaFin	NT

Table 3. Germany: Prioritized List of Recommendations for CBF (Concluded)

Principles	Issue of concern or other gap or shortcoming	Recommended action and comments	Relevant Parties	Timeframe for Action
23	CBF participants have difficulties reconciling invoices due to complicated fee schedules	CBF should work with its customers to find a mutually acceptable solution to simplifying the process of reconciling invoices.	CBF, BaFin	MT

[1] Near Term (NT): < 12 months; Medium Term (MT): 12 to 24 months; Long Term (LT): > 24 months.

AUTHORITIES' RESPONSE

59. The German authorities BaFin as National Competent Authority for the regulation and supervision of CBF as CSD and Deutsche Bundesbank in its capacity as joint supervisor for CBF as authorized credit institution as well as relevant member of the ESCB being responsible for the oversight of the SSSs operated by CBF thank the IMF assessment team for their valuable work and detailed study on the observance of the CPSS-IOSCO Principles for Financial Market Infrastructures regarding the German CSD Clearstream Banking AG ('CBF').

60. The German authorities acknowledge the recommendations where room for improvements has been identified.

61. In particular, the German authorities understand the rationale of the recommendations regarding Principle 2. Therefore, the German authorities support the recommended actions to ensure that responsibility at the level of the EB for internal audit should be separated from that of risk management and compliance. In this context, BaFin and Deutsche Bundesbank will also take into account the Minimum requirements for risk management ('MaRisk) further specifiying the requirements of the German Banking Act ('KWG') with regard to the proper business organization of an institution recommending responsibility of the internal audit function by the CEO. Based on the current concentration in the responsibilities of critical functions under a single member (CEO) BaFin will not prevent a shift of responsibility for the internal audit function within the EB of CBF to ensure a reasonable separation across the three lines of defense. Furthermore, BaFin will ensure that CBF appoints an independent member as Chair of the Risk Committee to avoid any potential conflict of interest resulting from different mandates or responsibilities.

62. Additionally, BaFin would like to highlight that the possibilities of CBF to conduct independent reviews of the performance of its SB may be limited by law. The relationship between the EB and SB of CBF as German stock company is governed by the German Stock Corporation Act (Aktiengesetz, 'AktG'). In this context, the members of the EB and the SB will be among others unburdend regularly by the annual shareholders' meeting in line with the AktG. Thereby, the shareholders' meeting acts as third body of a German stock company by making use of its rights in accordance with Article 119 AktG . Therefore, BaFin is of the view that a periodic, independent review of the SB already takes place in line with legal provisions applicable to German stock companies.

63. With regard to the recommendations addressing money settlement in CoBM and the available CCB network BaFin would like to highlight the interaction of settlement activities of CBF which will be settled on an aggregated basis in the account of CBF in the SSS of CBL whereby CBF is a participant of CBL. Taking into account the group structure of Clearstream and the corresponding outsourcing arrangements between CBF and CBL regarding treasury and default management of CBF BaFin suggests that any measure to be taken by CBF to improve the CCB network or availability of relevant currencies may keep an appropriate balance to reflect availability of CoBM settlement in relevant currencies through the settlement in the SSS operated by CBL. This approach would also

consider the (indirect) access and availability of CBL's CCB network for CBF in terms of both, ultimate settlement in the SSS of CBL on an aggregated basis in the account of CBF and the outsourced treasury function.

DETAILED ASSESSMENT OF CLEARSTREAM BANKING FRANKFURT

A. Detailed Assessment of Observance of Principles

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 and relevant jurisdictions** CBF is authorized as a CSD by BaFin under Art. 16 of the EU Regulation 909/2014 of 23 July 2014. CBF is also authorized as a credit institution according to the provisions of the German Banking Act (Kreditwesengesetz) and is allowed to provide inter alia deposit business and lending operations. Therefore, CBF is subject to banking supervision, which is carried out by BaFin in close cooperation with DBB. As an operator of an SSS, CBF is also subject to the DBB's oversight function. The existing authorizations for its activities are described in the database of companies of BaFin https://portal.mvp.bafin.de/database/InstInfo/institutDetails.do?cmd=loadInstitutAction&institutId=105564. CBF's contractual documentation is based on and reflects the requirements of German and EU law, including notably the German Securities Deposit Act (Depotgesetz, DepotG), the German Civil Law Code (Bürgerliches Gesetzbuch, BGB) and CSDR. Securities can be held in custody with CBF under the following main structures: • Collective Safe Custody (CSC): 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 paragraph 1 DepotG. 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 paragraph 4 DepotG. • Vault Services for third party insourcing of the depository function from custodian banks. • 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. • Bond issues of the German Federal State (Bundesanleihen) and of the German States (Länderanleihen), jointly referred to as "German Treasury Bonds" are eligible for CSC, although fully dematerialized and held by entry in the respective debt registers of the Federal Republic or State. Upon the registration of CBF as holder of a collective registered claim, German Treasury Bonds are deemed by law to be a collective holding of bonds eligible for settlement under the rules of the DepotG. • Non-Collective Safe Custody (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 the 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. CBF settles securities transactions free of payment (FoP) or delivery-versus-payment (DVP). CBF also provides 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. The non-banking-type ancillary services offered by CBF include supporting the processing of corporate actions (for example, in relation to distribution of dividends and interest payments, share splits, spin-offs) deriving from the securities that it holds in custody for its

	participants. In addition, CBF also performs securities lending and borrowing and collateral management services. The business relationships between CBF and its participants are subject to terms and conditions applicable to each material aspect. Material legal documentation of CBF includes: • The General Terms and Conditions (GTC) of CBF. • Securities Lending and Borrowing Rules of Clearstream Banking AG. • Special Conditions for Collateral Management. • Special Conditions for services that Clearstream Banking AG performs for its participants in relation to reporting and payment obligations arising from the French Financial Transaction Tax. • Special Conditions for the re-entry of internal instructions on CBF-i Accounts. • Special Conditions of Vestima Service of Clearstream Banking AG. The GTC and Special Conditions can be downloaded from: https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/general-terms-and-conditions The GTC and the Special Conditions are accompanied by Technical Rules, including but not limited to the Participant Handbooks, which contain a description of the services and the procedures and various technical aspects. All services of CBF which are regulated under its CSDR authorization, are considered material that require a high level of legal certainty.
	The legal basis for each material aspect The main legal provisions relevant for the establishment and the operation of CBF are :

	• The German Banking Act (Kreditwesengesetz), section 1, paragraph 1 and 17. • The Securities Deposit Act (Depotgesetz), on the safe custody and acquisition of securities: – section 1, paragraph 3, definition of "Wertpapiersammelbank"; – section 3, paragraph 1, custody of securities by third parties; – section 5, paragraphs 1 and 4, CSC activity; – sections 6-9, rights of depositor, co-ownership in CSC; – section 9a, global securities certificates; • The German Civil Code (Bürgerliches Gesetzbuch, BGB): – section 280 and following on liability; – section 929 and following regarding ownership and transfer of ownership; – section 1204 and following in relation to pledges; • Federal Government Debt Act (Bundesschuldenwesengesetz), section 6 (entry of CSD into debt ledger equaling the existence of a pool of certificates (Wertpapiersammelbestand)) and the respective acts of the federal states; • Law on the Restructuring of Bonds (Schuldverschreibungsgesetz), section 21; • Stock Corporation Act (Aktiengesetz), Commercial Code general rules (including on company law aspects as well as on vindication, transfer of (co-)ownership, regular custody contract, good faith acquisition, mandate, and agency etc.); • Insolvency Code (Insolvenzordnung) in relation to the segregation of assets in the case of CBF's insolvency; • Regulation (EU) No 909/2014 of 23 July 2014 on improving securities settlement in the CSDR; • 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 (CRR);

	• Default and resolution procedures (German Banking Resolution Act (Sanierungs- und Abwicklungsgesetz)); • 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. For the services that are not governed by German law, the assistance of foreign external law firms may also be requested, in order to determine the nature of the rights and duties of the parties to the agreement, its enforceability and to identify the potential conflict of laws.
Key Consideration 2 An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.	The implementation of clear and understandable rules, procedures and contracts is addressed in Art. 43 of the CSDR and was described to BaFin with regards to CBF in the CSDR application. CBF will notify its participants in writing by e-mail and via 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. CBF publishes on its website announcements in relation to participant information and specific services on a regular basis. Announcements are generally made in German with an English translation or vice versa. All laws and regulations governing the establishment and the operation of CBF are publicly available.
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 basis for CBF's activities is made transparent to the public in CBF's documentation (i.e., GTC, Customer Handbook), which is made available on the Clearstream website. Furthermore, it should be noted that CBF takes into consideration comments from its Client Services to enhance, where necessary, the published documents and to ensure they are written in a clear and understandable way.

	CBF undertakes regular internal and external reviews of the documentation to ensure that its rules, procedures, and contracts are clear and understandable. The review of the Governing Documents and the Specific Agreements involves, internally, the legal department and internal auditors, and, for several aspects, externally independent external law firms. The updated versions are accessible for participants on CBF's website in German and English.
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** The enforceability of the rights and interests in financial instruments under deposit with CBF by the participants and their entitlements are mainly governed by German law. In the performance of the internal and, where needed, external reviews CBF undertakes of its rules, procedures and contracts, attention is also paid to ensure that they are enforceable in all relevant jurisdictions, including in the case of the default of a participant (as defined in Art. 2 para. 1 No. 26 of the CSDR). Besides the legal relationship between CBF and its participants being governed by German law, there are also foreign law aspects relevant for CBF's services: Third country laws and regulations are generally applicable to custody and settlement of securities held 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. 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, inter alia, the following main topics: • the validity and enforceability of the relevant link agreement; • description of the nature of entitlement (i.e., detailing the rights and interest of CBF in respect of the financial instruments sub-deposited); • liability questions;

	• no lien, right of redemption, etc. in relation to participant assets other than for such claims as may arise from the purchase, administration, or safe custody of these securities; • asset segregation; • no upper-tier attachment; • a description of the relevant settlement finality rules; • a description of the relevant insolvency law proceedings. Furthermore, it is CBF's practice to require from its CSD, depository and agent bank information on any pertinent changes in domestic laws and regulations pertaining to securities, cash, exchange controls or tax issues. In addition to the legal opinions, a three-point declaration of the relevant CSD, depository, and agent bank, where applicable and required under German law for investor protection purposes, is requested in relation to each link. Under such declaration it is acknowledged that the securities held within the account of CBF are participant 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. Avoidance, reversal 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 standard 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 (i) the default of a counterparty (such as in case of insolvency, liquidation) or (ii) court order. **Degree of certainty for rules and procedures** CBF articulates the legal basis for material aspects of its activities by obtaining a well-reasoned legal opinion or analyses, inter alia – where reasonably required – with the support from an independent law firm of good reputation. To the extent

	practicable, the assessments/ opinions confirm the enforceability of CBF's rules and procedures.
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 Consideration 1 and 4, the legal relationship between CBF and its participants is governed by German law, which includes inter alia, the Governing Documents such as the CBF GTC, and in particular, 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 documentation governing its activities clearly outline the law that is intended to apply to each aspect of CBF's operations. When CBF concludes non-German law governed contracts, the contractual documentation is reviewed internally and submitted to the assessment of a local external 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. Should, despite all precautions ensured by CBF in its contractual documentation, a dispute regarding conflict of law arise, such dispute would generally be handled by the in-house legal counsels of CBF who may obtain certainty via a reasoned and independent legal opinion and analysis.
Key Conclusions for Principle 1	CBF has a solid, clear, and enforceable legal basis for each material aspect of its activities. In particular, settlement activities are governed by a consistent set of laws, regulations, and contractual arrangements. The implementation of European directives provides a firm statutory foundation for finality, netting, securities lending, and collateral arrangements. The finality of both securities and payment transfers are protected against unwinding or reversal under German insolvency law. Legal opinions are obtained to identify and mitigate risks arising from links' activities in various jurisdictions with continuous monitoring and regular reviews in place.
Assessment of Principle 1	Observed

Recommendations and comments	None
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.	CBF objectives are to contribute to enhancing the safety, efficiency, and transparency of the securities markets, safeguarding financial markets, and creating confidence that securities transactions are executed properly and in a timely manner, including during periods of extreme stress. This is the case both to support the goal of delivering the best services to participants and thus ensure a growing customer base and also to ensure as neutral market infrastructure the continuation of market stability. Pursuant to its updated version of the articles of association (the "Articles"), the main objectives of the CBF are: a. 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; b. a central accountancy and clearing office in order to facilitate the international securities clearing system; c. a system for collateral provision and management (Collateral Management); CBF is part of DBG's "Compass 2023" medium-term strategic plan. The compass points to further growth. • ESG is a topic of historic dimension. Other trends we turn into opportunities: OTC to on-exchange, the increasing importance of the buy-side, the shift to passive investing and digitization of the financial sector. • With our M&A agenda, we are aiming at asset class expansion rather than stock exchange consolidation. • The adoption of new technologies creates additional growth opportunities, fosters operating efficiency, and enhances participant experience.

	• We will grasp the opportunities, Brexit and other regulatory changes offer such as OTC to on-exchange, bilateral to clearing as well as the regulatory trend towards transparency and integrity. • Key growth drivers are capital market trends, which are addressed through the broad and diversified business model. In addition to continued secular net revenue growth, we plan to increase the net revenue contribution from M&A opportunities going forward. The strategy of the Clearstream group aligns with these goals and will build on these pillars, with implementation taking place through five key strategic actions: • Strengthen product areas. • Ensure regulatory compliance. • Promote internal efficiency. • Mobilize growth potential. • Foster effectiveness in sales and client services. The safety of the infrastructure is supported by the actions 1 through 3, while the efficiency is primarily action 4 and is supported by 4 and 5 in terms of delivering efficiency to participants. Furthermore, CBF plays a leading role in building a critical component of the European market infrastructure with TARGET2 Securities ("T2S"), and to expand collateral management and investment fund services. Leveraging on CBL, as an ICSD, CBF delivers forward-looking services to an international customer base that comprises supranational institutions, central banks, banks, and broker/dealers.
Key Consideration 2 An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability.	**Governance arrangements** CBF is wholly owned by DBAG through two layers of ownership structure; DBAG owns Clearstream Holding AG \, which in turn owns CBF (see Figure 3). In September 2016, Clearstream Group changed its governance structure from one-tier to two-tier structure. As part

These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.	of this change the Group Executive Management was transformed to an Executive Board (EB) and the Board of Directors to a Supervisory Board (SB) appointed by the shareholders. The annual accounts are approved during the Annual General Meeting (AGM) of CBF via a resolution of its sole shareholder, which is Clearstream International S.A. In line with the mandatory board structure of a German Stock Corporation (Aktiengesellschaft, AG), CBF follows the two-tier system. The EB is the corporate body managing and representing CBF in accordance with section 76 of the German Stock Corporation Act (Aktiengesetz, "AktG"). The SB is supervising and advising the EB in accordance with section 111 of the AktG. As a public limited liability company, control over the company is exercised by the shareholders, the roles and the responsibilities of the EB and SB are defined by the AktG, the Articles of Association of the Company and the Rules of Procedures for the respective bodies. In line with the CSDR, CBF has set up the following committees: Audit Committee, Risk Committee, Remuneration Committee, and User Committee acting as advisor to the EB. **Disclosure of governance arrangements** CBF discloses information about its governance structure publicly via the Company Governance section of its website at https://www.clearstream.com/clearstream-en/about-clearstream/company-governance In addition, CBF also publishes the Articles and Banking License on its website in the "Regulation" section at https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/banking-license The tasks and responsibilities of the committees are described at: https://www.clearstream.com/clearstream-en/about-clearstream/company-governance/group-committees/cbf-committees Moreover, CBF publishes annually its Association of Global Custodians Questionnaire disclosure response. The current version is available at: https://www.clearstream.com/clearstream-

	en/about-clearstream/due-diligence/agcquestionnaire
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.	**Roles and responsibilities of the boards** The roles and responsibilities arrangements are the following: • The SB, which is appointed by the general meeting, is bound to advise and supervise the EB while strictly maintaining business confidential information. The SB may choose which of the EB's transactions needs their previous consent without violating the EB's representation rights concerning business correspondence. • The EB is mandated to realize the corporate objective and reports to the SB. It represents CBF towards third parties and in legal proceedings, either as plaintiff or as defendant. There is no limitation in the Articles to the powers of the EB, but the Rules of Procedures stipulate that the approval of the SB must be obtained prior to entering into certain measures or transactions by the EB. The annual financial statements prepared by the EB must be approved by the SB. The EB determines and co-ordinates the various departments of CBF and also represents CBF. The EB members are elected by the general meeting of shareholders for a period of four years, provided however, that any director may be removed at any time by a resolution approved by a simple majority taken at a general meeting of shareholders. Every member is re-eligible for a further term of four years. CBF is accountable to (i) its shareholder(s); (ii) the German authorities in accordance with the German Banking Act, relevant EU Regulations - notably the CSDR; and (iii) its participants pursuant to the provisions of its GTC. **Conflicts of interests for board members** A policy on conflicts of interest as well as 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 that may create any conflicts of interest. It aims tosupport the EB and SB as well as employees in

	identifying and avoiding conflicts of interest . With regards to conflicts of interest, according to the respective Record of Procedures of the EB and SB, any member having a conflict of interest or an interest opposed to that of the company or a major subsidiary in respect of any matter to be put to a vote at a meeting of the board must declare such an interest. The existence of such an interest must be noted and the member shall not participate in the deliberations relating to the issue put to the meeting. A record of all such member's opposing interests shall be presented to the next following general meeting of shareholders. **Review of performance** The overall performance and the performance of its individual board members is done through the annual Suitability Assessment for the EB and the SB. The performance of the SB of CBF is assessed each year at the time when the shareholder(s) approve(s) the annual financial statements of CBF and relief is granted to the directors.
Key Consideration 4 The board should contain suitable members with the appropriate skills and incentives to fulfill its multiple roles. This typically requires the inclusion of non-EB member(s).	As required for companies with a two-tier board structure, none of the members of the SB of CBF has an executive function within CBF. In addition, one third of the members of the SB (two members) are fully independent of the company in accordance with art. 27(2) CSDR. CBF adopted the policy for the assessment of the suitability of members of the management bodies of SB and EB, and key function holders. The objective is to ensure that members are suitable in terms of reputation, honesty, and integrity, knowledge, skills, and experience time commitment and independence as stipulated in the Joint ESMA and European Banking Authority (EBA) guidelines on the assessment of the suitability of members of the management body and key function holders. Any member of the EB or the SB is required to fulfil certain criteria, including sufficiently good repute, appropriate skills, knowledge and experience. In order to be compliant with regulatory requirements, candidates and members of the EB and the SB individually and collectively, have to undergo an annual suitability assessment, which is initiated by the Chairperson according to the provisions of the German Banking Act and the respective Suitability

	Assessment Policy of the Company but also on an ad-hoc basis throughout the year when changes in the EB or the SB occur. Once a year, the SB conducts an assessment of the individual and collective suitability of the members of the SB and members of the EB based on the following criteria: time commitment, knowledge, skills and experience, reputation, honesty, and integrity, independence of mind, diversity, independence (for SB members). Final approval of the SB is required. Furthermore, CBF organizes appropriate quarterly training initiatives focusing on the requirements for SB and EB members as well as any proposals that members have made during the assessment of training requests from the SB and the EB. The following qualifications/skills are required (EB): • University degree, preferably in banking and finance, economics, law, administration, financial regulation, quantitative methods and / or a comparable training; • Experience in the post-trade industry; • Sufficient practical and professional experience from a managerial position with regard to length of service, nature and complexity of the business, scope of competencies, technical knowledge, and number of subordinates; • Experience in strategic planning and understanding of a financial institution's business strategy or business plan and the accomplishment thereof; • Experience in assessing the effectiveness of a credit institution's arrangements, creating effective governance, oversight, and controls; • Experience in the area of Board or daily management liability.
Key Consideration 5 The roles and responsibilities of management should be clearly specified. An FMI's management	**Roles and responsibilities of management** Please refer to replies to key considerations 2, 3 and 4 above as well as key consideration 6 below.

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.	**Experience, skills and integrity** The EB members act as senior managers responsible to manage various departments. The department are defined in the schedule of responsibilities. Each EB 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 EB. Without prejudice to the division of responsibilities, each EB member is responsible for management as a whole. For managers to be promoted to high-level management positions, Clearstream' s HR department will conduct a structured leadership interview and pass a Hogan personality inventory to assess the candidate's suitability for the job. Enactment, modification and revocation of the schedule of responsibilities requires unanimous resolution of the joint EB. If a unanimous resolution does not pass, the chairman of the EB must petition the SB to regulate the assignment of duties. The CBF has a remunerations policy where payments are executed only if a certain number of performance criteria are met, including the risk appetite. The determination of the total amount of the variable remuneration "(i) shall take due account the risk-bearing capacity, the multi-year capital planning and the profitability (ensuring the long-term achievement of the financial objectives of the FMI), (ii) must ensure the Group's ability to maintain or recover appropriate own funds and liquidity and (iii) must ensure the Group's ability to meet or recover the combined capital buffer requirements".
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	**Risk management framework** The DBG Risk Management Policy is applicable to CBF. It describes the risk management framework in terms of processes and roles and responsibilities applicable to all staff and organizations within all of Clearstream's legal entities. The overall objective of the risk management framework is to enable the EB of CBF to monitor the overall risk profile of CBF, as well as specific material risks, so that developments that could jeopardize the interests of CBF can be identified at an early stage and mitigated. This is achieved through periodic and ad hoc reporting on all significant risk developments to the EB. The

internal control functions have sufficient authority, independence, resources, and access to the board.	process of reporting is further described in the risk type specific handbooks, for example Operational Risk reporting is documented in the Operational Risk Handbook. Furthermore, CBF has been included throughout the development of the DBG corporate risk taxonomy. The taxonomy distinguishes between five aggregated risk types; Operational Risk, Financial Risk, Business Risk, Pension Risk, and Winding-down and Restructuring Risk. CBF's risk strategy is based on its business strategy and sets limits specifying the maximum risk permitted for the defined risk types as well as the overall risk of the bank. This is done by laying down respective requirements for risk management, risk control and risk limitation. CBF ensures that appropriate measures are taken to avoid, reduce and transfer, or intentionally accept, risk. Further details are described in Principle 3. The risk mitigation approach is described in detail in the Pillar III report, available Clearstream website: https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/pillar-iii-disclosure-report/pillar-iii-disclosure-report-1278114 The Risk Committee is responsible for advising the SB on the CSD's overall current and future risk tolerance and strategy. Its tasks and responsibilities are to: • Advise the SB on the institution's overall current and future risk appetite, risk tolerance and risk strategy and assists the SB in overseeing the implementation of that strategy; • Submit proposals to the EB, within the Audit Committee, on how the conditions applied to participants in accordance with the business model and the risk structure could be created; and • 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;

	• 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 EB with regard to strategy and risk. The Clearstream Group also has a Clearstream Risk Committee (CRC) that deals with all relevant risk and compliance related topics of the Clearstream group. The CRC is a sub-committee of the EB of Clearstream Holding AG. CBF follows the DBG group-wide framework and approach to implement an effective Internal Control System. This approach comprises completing an annual internal control cycle which again includes explicitly the control validation and effectiveness confirmation (final sign-off by the responsible owners (board level) and operators). Results of the sign-off are disclosed in various reports including an annual internal control system effectiveness reporting issued to the Clearstream Banking AG SB. CBF has developed and implemented a strategy to identify, measure, monitor and report different risk categories, including Operational Risk. CBF's goals, as a private company, are achieved through the provision of services its participants, taking into consideration risk mitigation, efficiency and stability. The risk management processes and measurement systems are subject to regular reviews performed by Internal Audit, as well as External Audit. The role of Internal Audit is to assist CBF in achieving its objectives by supporting a standard of excellence in all of the organization's business, information technology and regulated functions. Internal Audit is a permanent function that, as the third line of defence, delivers independent, objective assurance and consulting services designed to add value and improve CBF's operations. It helps CBF to accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control and governance processes. Internal Audit also provides an independent, objective and critical review of the

	first two lines of defence. The CBF Head of Internal Audit (Chief Internal Auditor) reports to the EB, the SB and to the Audit Committee with an administrative reporting line to the CEO of CBF and a functional reporting line to the Head of Internal Audit DBAG. The CBF Head of Internal Audit maintains direct lines of communication with the Chairperson of the SB, the Audit Committee, the external auditor as well as, where required, with the relevant regulators. Furthermore, it has unrestricted access to all levels of relevant staff and management at any time. Internal Audit is a properly staffed independent function and maintain sufficient independence and objectivity to allow internal auditors to render impartial and unbiased judgements essential to the proper conduct of audits. In order to accomplish its mission, Internal Audit has unrestricted access to all CBF activities, records, property and employees to the extent such an access is in compliance with applicable law. All employees (staff and management) are requested to assist the Internal Audit function in fulfilling their assignment within a reasonable period of time. Internal audit staff are required to behave with integrity and objectivity, apply the knowledge, skills and experience needed to perform audit services and comply with confidentiality requirements, e.g., not use confidential information for any personal gain or in any manner which would be contrary to law or detrimental to the interests of the company. **Authority and independence of risk management and audit functions** The Risk Management function includes the Group Risk Management (GRM), Clearstream Risk Management (CRM) and Enterprise Risk Management (ERM). Roles and responsibilities for all risk management processes and instruments in DBG are defined in the Group Risk Management Policy and Procedure, which are both applicable to CBF.

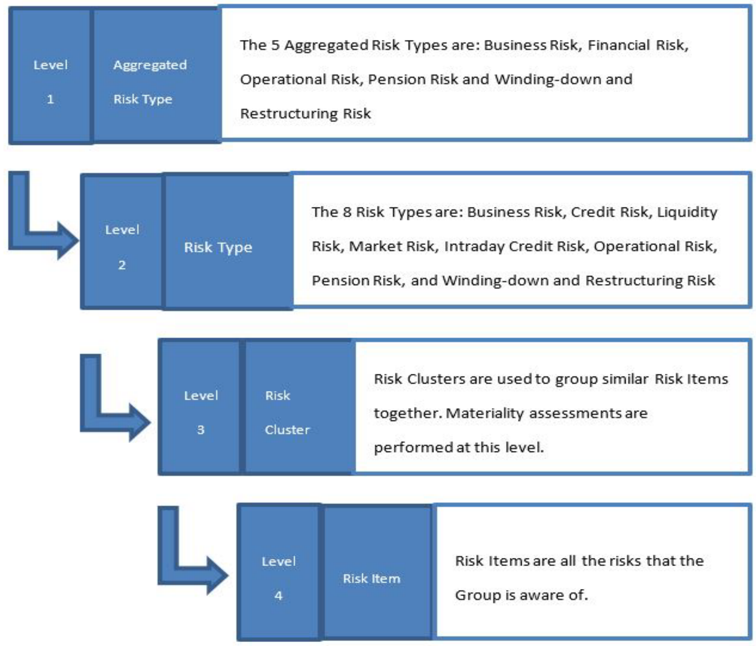
	From an overall perspective, the risk management function is responsible to develop strategies, policies, procedures and handbooks to identify, measure, monitor and report risks. The 1st Line of Defence (the business) is responsible to control the risks according the established Risk Management Framework. The proper implementation of the Risk Management Framework in the 1st Line of Defence is reviewed and audited by the 3rd Line of Defence (Internal Audit functions) as well as by the annual auditors and supervisory authorities. The timely implementation of agreed actions to solve the identified deficiencies, gaps or failures in the application of certain instruments in the Risk Management System is tracked and reviewed by the mentioned auditors and authorities. The Chief Risk Officer (CRO), the Chief Compliance Officer (CCO), the Chief Technology Officer (CTO) and the Chief Internal Auditor (CIA) have direct access to the SB. The risk management framework should ensure that all risks are recorded, assessed and mitigated, and that a consolidated report on these risks is submitted to the CBF EB. The risk management process follows the stages of identification, notification, assessment, mitigation and reporting of risks. The CBF risk management function is organizationally independent from the rest of the business units it controls and does not report hierarchically to them. The remuneration of CBF Risk Management staff is not linked to the performance of the activities they control and is not determined according to other criteria, which compromise the objectivity of the work carried out by the internal control function. To fulfil its mission, the CRO of Clearstream has unrestricted access to: • CBF's units and committees, and SB. • External auditors and regulatory authorities. • External and internal data and information (in all business units of CBF).
Key Consideration 7 The board should ensure that the FMI's design, rules, overall strategy, and major decisions	**Identification and consideration of stakeholder interests** The stakeholders of CBF can be broadly categorized into four groups.

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.	• Stakeholders to whom CBF provides a service: The Clearstream group support and advise issuers and issuer agents to make their securities eligible on its platform either via direct contact or the participation in various market associations operating in Germany and internationally. According to the CSD Regulation, a CSD is required to establish a User Committee for each security settlement system it operates. CBF operates CASCADE and Creation and offers services through both systems. Consequently, CBF established two user committees. The CBF strives to achieve a balanced composition of representatives of both issuers and participants. The Committees advise the EB on key arrangements that impact on its members, including the criteria for accepting issuers or participants in CASCADE and Creation as well as on service level. The Committee may submit non-binding opinions to the EB, containing detailed reasons regarding the pricing structures. • Stakeholders who provide a service to CBF: Existing relationships with CSDs, depositories, agent banks, and, CCBs are reviewed on an ongoing basis, based on CBF's continuous oversight of market developments. 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. The service level agreement contracts with its suppliers are updated regularly or when necessary. Institutions supporting the links to domestic markets abroad update CBF of any changes to market practice and regulation. 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. • Stakeholders involved in the formation of the legislative and regulatory framework for Clearstream activities: The Clearstream Group maintains a strong network across several domestic market's representatives. For instance, in Germany CBF is a member of the Federal Association of German Banks. CBF additionally consults and obtains approval from its regulators

	before making significant changes to its design, rules and procedures. Within Europe, the Clearstream group plays a leading role in various working groups and associations, including T2S Governance Bodies, European Central Securities Depositories Association (ECSDA), ECB's Advisory Group on Market Infrastructure for Securities and Collateral (AMI-SeCo), and ESMA Post-Trading Standing Committee. At the international level, Clearstream entities are represented in more than 35 markets globally, through which it is able to identify and take into consideration a wide range of stakeholders' interests in the design of its processes and procedures, rules and strategy of the company. • Stakeholders with a direct influence on CBF's equity As Clearstream Holding is the sole shareholder of CBF that assumes all powers conferred to the general meeting of shareholders. The sole shareholder's decisions are recorded in a minutes-register held at the registered office. Regarding the strategy the CBF, EB informs the SB on a quarterly basis on the following topic "Business Strategy, Strategic Roadmap and Business Development". CBF's Annual Accounts and Management Report are sent to its regulators and made available to its participants publicly via the website. **Disclosure** The description and Terms of Reference of the User Committees are published on: https://www.clearstream.com/clearstream-en/about-clearstream/company-governance/group-committees/cbf-committees/user-committee-cbf Furthermore, any major changes to the SSS's operations and its rules are communicated to participants; normally via announcements before they are being integrated into the normal participant documentation, like General Terms and Conditions, the Participant Handbook and other.

Key conclusions for Principle 2	CBF has comprehensive and adequate governance arrangements. The roles and responsibilities of its supervisory and executive boards are well defined and clearly described and publicly disclosed. CFB has established several crucial committees for audit and risk management, which are chaired by an independent board member. However, the independence of internal control functions at the level of the EB can be improved. CBF currently has four EB members, one of whom—the CEO—is responsible for global operations, internal audit, risk management, credit, and compliance, among others. As such, there is a high degree of concentration in the responsibilities of critical functions under a single member who retains the titles of CEO, COO, and CRO. In addition, the current Chair of CBF's Risk Committee is the CRO of CBF's ultimate parent, Deutsche Börse, and is thus not independent.
Assessment of Principle 2	Broadly Observed
Recommendations and comments	To bring CBF's governance arrangement more in line with international best practice, CBF should, at a minimum, separate the responsibilities for internal audit from those of risk management and compliance at the level of the EB. In addition, CBF should appoint an independent Chair for its Risk Committee. Finally, and as supported by the PFMI, CBF can further improve its governance by conducting periodic, independent reviews of the performance of its SB.
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	**Risks that arise in or are borne by the FMI** The Clearstream Risk Management function is responsible to develop strategies, policies, procedures, process, and handbooks to identify, measure, mitigate and report risks. Clearstream Risk Management comprises coverage of the three CSDs being CBF, CBL and LuxCSD. CBF Risk Management is the independent second line risk control function of CBF and is headed by the Head of Risk Management CBF. As CBF Risk Management is part of the overall Clearstream Risk Management function, it closely collaborates with CBL Risk Management as agreed in formal service definition

frameworks should be subject to periodic review.	agreements and further receives support services from DBAG as also agreed in formal service definition agreements. The service definition agreement defines qualitative requirements (e.g., service features, quality and performance standards, escalation mechanisms, etc.) and also contains Key Performance Indicators (KPIs) to measure the quality of the respective service. **Risk Management Policies and Procedures** The 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 organizational units and levels. The GRM Procedure, as applicable to CBF, outlines that CBF applies a five-step process for risk management. DBG Risk Inventory (included within the GRM Procedure) gives the DBG risk taxonomy, applicable to CBF. The Risk Inventory (following an alignment process with all affected banking-regulated entities within DBG including CBF) 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 Risk Inventory Taxonomy can be summarized across four levels. They include the five aggregated key risk types: Business Risk, Financial Risk, Operational Risk, Pension Risk and Winding-down and Restructuring Risk. The Risk Taxonomy is illustrated in the following figure:



1. Aggregated Risk Types: These types are chosen by DBG and CBF's Executive Management for reporting and management and are the aggregate of the eight Risk Types. These are the Risks (if material) that are reported in internal and external risk reports.

2. Risk Types: these risks are more manageable and provide the split of Financial Risk. Credit, Liquidity, Market and Operational Risks are always material, by definition.

3. Risk Clusters: Like Risk Items are grouped together for the purposes of the materiality assessment. When new risk items are identified, new clusters can be proposed.

4. Risk Items: The potential risk items that the Group may be exposed to due to its current and future business operations. Some risk items may overlap.

The annual Risk Inventory Process follows the Risk Management stages of Identification and Notification, Assessment and Review and Approval.

- The purpose of the identification stage is to review the current Risk Inventory and include any new risks that could potentially have impact upon the risk, financial (net asset), finance,

	earnings and liquidity situations of the entity. A variety of internal and external sources are used to identify a wide range of potential risk items applicable to the entity's business activities and environment. • The assessment stage covers three key activities; determination of the materiality of each risk item on the entity level, assessment of the risk concentrations, and the review of the appropriateness of the materiality thresholds. The materiality of the Risk Types can then be inferred from the results of the assessment of the clustered risk items. As part of this materiality assessment, the potential impact of ESG figures on each risk cluster is also considered, with additional input from the DBG Sustainability Team. • The Risk Inventory Process is reviewed annually by Risk Management and approved by CBF's EB. In addition to the annual DBG-wide Risk Inventory Process, risk type specific risk items and drivers may be identified. **Identification of Various Risks** Systems, databases and reports automatically collect and use information on internal and external loss, scenarios established, and KRIs defined. The risk management function receives internal Production Issue Logs on a weekly basis and Production Error Log reports from the operational departments upon occurrence of operational risk relevant events. In addition, the Credit Exposure Monitoring Tool enables Clearstream International to obtain an aggregate of exposures arising from sources such as cash and securities financing as well as treasury activities, throughout the day. **Risk Management Handbooks** CBF has developed dedicated handbooks for most risks. Each Handbook describes objectives, overall approach and scope of the relevant risk. It includes topics such as: definition of specific risk, root cause definition, organizational structure, roles and responsibilities, risk instruments and methods used as well as the respective reporting. Also, the most adequate treatment is applied to the identified risk in order to mitigate them or actively control them.

	Risk Measurement CBF has installed a standardized approach for measuring and reporting all operational, financial and business risks across its organization: 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 prioritization of risk management actions. Furthermore, the risk reporting consolidates all risk measures across the company (operational, financial and business risks), except for liquidity risk, which is covered in the CBF 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 materialize 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 and correlations between individual risk estimates are recognized 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. **Risk management systems** The Risk management system is defined as the implementation of the risk management framework in terms of processes, roles and responsibilities according to the established Risk Strategies. To be able to duly identify, measure, monitor, manage and enable reporting on the risks CBF faces or poses to other entities a number of systems and data sources are used for the different risk categories. The internal processes for operational, financial and business risk are based upon several IT systems and data sources. These systems and data sources are used to support the risk processes driven by Clearstream Risk Management throughout. In addition, CBF has put in place a wide range of IT tools, controls and procedures to minimize the impact of sources of operational risks for the settlement systems. IT tools support the monitoring and reduction of operational risks and ensure the technical environment of CBF remains stable (e.g., ensure processing, monitoring of the

	infrastructure, etc.). The control environment includes IT controls themselves but also covers several different other types of controls (e.g., cybersecurity, local access management, physical access management, stress testing/VaR, BCM, project management process, four-eye principle, etc.).
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.	The aim of the Clearstream risk management framework is to set adequate and comprehensive risk management standards to ensure the sustainability of CBF's CSD operations, including security, technical and operational organizational arrangements, and risk control measures. This is to ensure they protect both the CSDs themselves, and the interests of the external stakeholders, including users and their respective clients, the respective CSD links, CCPs, trading venues, payment systems, settlement banks, liquidity providers and investors. Furthermore, CBF runs processes and controls ensuring that both CBF and its participants demonstrate their continuing compliance with existing laws and adherence to market standards and sound business practices. Moreover, to limit risks posed to itself, CBF ensures adherence to an appropriate code of business conduct measures when dealing with its participants, counterparties, and third-party relations through the provision of clear, correct, fair information regarding the specific business objectives, services, and activities of the CSD. Comprehensive on-boarding reviews, regular, and ongoing reviews processes are performed to manage operational risks that may be posed to CBF. These have a specific focus on fraud, legal offences and governing regulatory compliance aspects which set high standards for the acceptance and eligibility criteria applied in the acceptance process of potential participants and deferment of existing participants. CBF also provides various reports that aim at enabling participants to better manage the risks they pose to it. In addition, participants are able to make online queries on security and cash transactions and balances and tailor these to their needs. Safeguard measures related to participant connectivity, validation and monitoring are also applied to assure that participant access and account creation in CBF's online web-based applications and interfaces can only be activated through (i) authenticated means (SWIFT/authorized letters and faxes); and (ii) in conformity to the laid out respective CSD conditions foreseen in the governing

	participant documentation. In addition, CBF regularly participates in SWIFT disaster recovery testing, which is performed twice a year. This allows CBF to derive first-hand information on the relevant business continuity measures foreseen by the Critical Service Provider (CSP) to assure the reliability and resilience of the service. CBF performs reconciliation and reporting measures for participant-related settlement activities, which aim to improve (i) settlement efficiency processes; (ii) minimize potential settlement fails; and (iii) identify all related settlement issues to ensure that the participants can properly manage and address the risks they pose to CBF.
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 has a comprehensive risk management framework to identify and mitigate material risks, as well as the risks to relevant parties through appropriate governance and risk control measures. It also assures a 3 line of Defence approach across the business operational and organizational units of the respective CSDs: CBF, CBL and LuxCSD. These 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 critical outsourcing & third party governed services, CSD market links and supplier network providers; and (iii) the operational risks that may be posed by CBF key participants as well as credit risks related to participants in default all of which can potentially impact the smooth running of business services and the soundness and stability of the financial markets and system as a whole. Material risks are related to changes in existing or new business activities and services. CBF discloses to its users extensive information in various documentation that allows users to assess the risks associated with the products and services provided. Users and, indirectly, their clients are informed of the types of risks they face when contracting with CBF. Other material risks are associated with market link arrangements, which are identified as part of the creation of a CBF link, or its

	maintenance in the course of yearly (i) DDVs to supplier / link arrangements reviews of CBF or (ii) through ongoing monitoring of suppliers and markets where a CBF link has been established. To identify and measure risks, Clearstream Network Management (CNM) collects information together with relevant stakeholders in order to perform assessment reviews. Different risk aspects are covered and include Credit, Compliance, Legal, service deficiency and availability. As for critical service provider risks, such as those from SWIFT, CBF has defined and implemented a critical service provider governance framework procedure based on the CPMI IOSCO Financial Market Infrastructure assessment methodology. **Risk management tools** A number of systems and data sources are used for the different risk categories. The internal processes for operational, financial and business risk are based upon several IT application systems and data sources used. These mentioned systems and data sources are used to support the risk processes driven by Clearstream Risk Management. These include: *IT Systems supporting the "Operational Risk" type* used for the storage of (i) internal loss data and key risk indicators; (ii) external loss data; (iii) Operational risk scenario documentation; (iv) Process controls; and (v) an Incident notification mailbox for internal incident reports; *IT Systems supporting the "Business Risk" type* through the usage of controlling figures for the KRIs and Risk IT Architecture (RITA) as main IT tools with data collection into (RITA), data export in the respective excel input workbooks, and finally the calculation process performed by RITA using SIAM model (Simulation, Insurance, Allocation and Measuring of risks) and the MATLAB function library for risk management purposes. SIAM is one of the four components of the Risk IT Architecture (RITA) in Clearstream, which is used for the automated data collection for the integrated model used to determine the VaR on different confidence levels for financial risk (as well as business and operational risk) by using a Monte Carlo simulation via MATLAB.

	IT systems supporting the "Operational, Business and Financial Risk" types using SIAM and the MATLAB function library for risk management purposes.
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 an FMI from providing critical operations and services** Based on the Technical Advice of the EBA, CBF has identified the business lines considered critical. 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, i.e., other market participants are not able or willing to take over the functions provided by CBF in an adequate timeframe. These critical business lines are custody, settlement, global securities financing, investment fund services, treasury and IT. The assessment was based on qualitative and quantitative parameters, including strategic importance, net revenue, contribution to total net revenue, earnings before Interest and tax (EBIT), and contribution to total EBIT. CBF has identified several scenarios, which could potentially prevent it from being able to provide its critical operations and services. These scenarios are included in the CBF recovery plan and are based on plausible near-default scenarios, with two idiosyncratic scenarios, two systemic scenarios and two scenarios combining idiosyncratic and systemic scenarios, with one of each fast-moving and the other slow-moving. The scenarios test the adequacy of a number of recovery measures available to CBF, each with an execution plan identifying key processes and potential barriers to implementation. Different idiosyncratic scenarios affecting the operational capacity as well as capital and liquidity profile of CBF include: • Different market-wide scenarios affecting mainly the liquidity and capital profile. • 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 the viability of CBF and 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 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 the BRRD). CBF provides continuous support to the NRA for the preparation and maintenance of the resolution plan. CBF has identified a number of viable recovery options and evaluates them on 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 and Resolution Planning unit, which is part of Clearstream Risk Management, is responsible for the regular update and continuous improvement of the recovery plan as well as restructuring and wind-down plans. The plans are updated at least annually. They are subject to CBF EB approval before being submitted to the regulators.
Key Conclusions for Principle 3	CBF has adequate risk management policies, procedures, and systems in place that enable it to identify, monitor, mitigate and report risks to which it is exposed. The corresponding framework ensures that issues are escalated when risks materialize and appropriate measures are taken to avoid and reduce risks without

	delay. The framework is validated regularly by the CBF EB. CBF has an effective risk management framework through the use of KRIs for the management of operational and business risks. The risk management function is also involved in the calculation of financial buffers in line with Basel capital model requirements. Furthermore, CBF identifies and monitors interdependencies and related risks from counterparts that perform multiple roles. CBF also has comprehensive recovery and restructuring and orderly wind-down plans, which set out CBF's available tools to overcome severe financial and operational shocks that could potentially undermine the viability of CBF and the sustainability of its business.
Assessment of Principle 3	Observed
Recommendations and comments	None
Principle 4. Credit Risk An FMI should effectively measure, monitor, and manage its credit exposures 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 participants and their affiliates that would potentially cause the largest aggregate credit exposure to 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 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.	As a CSD, for assets in Collective Safe Custody), CBF does not, in principle, provide credit extensions or advance funds to its participants, while it provides credit for Non-Collective Safe Custody (NCSC), which applies to fungible securities kept abroad. It provides two complementary sets of credit facilities to allow 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 credit worthiness/rating of the participant, as well as the availability of appropriate collateral and/or bank guarantees. CBF is exposed to credit risk arising from a number of different sources but mainly from settlement and custody activities. CBF's

	credit appetite is defined as its non-binding tolerance for accepting credit risk. It is approved by the CBF EB, considering CBF's business strategy, its role as an operator of a SSS, as well as the target risk profile of its credit portfolio. Credit appetite is expressed numerically as the maximum amount of all credit limits available to participants and counterparts. The Clearstream Credit Strategy articulates the 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. Members of the CBF EB review / approve the Credit Strategy on an annual basis. The Credit Strategy establishes the objectives guiding CBF's credit activities that include all business activities that give rise to credit risk. The strategy aims to ensure: • 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; • Regular public disclosure to the market on aspects of credit risk measurement, monitoring, and management. Group Credit of DBG provides independent credit assessments, internal credit ratings and credit monitoring on all credit risk-related activities. These services are offered to several DBG subsidiaries including CBF under the existing outsourcing agreements. All CBF credit services have been outsourced to

	Clearstream Services, a sister company, and to Clearstream Banking Singapore, a branch of CBL Luxembourg. Group Credit 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. Group Credit is responsible for performing independent assessments of the creditworthiness of CBF's counterparts. It maintains systems and operating procedures for early warning and remedial action with respect to credit deterioration. It is also responsible for ensuring credit exposures remain within levels consistent with prudential standards and therefore within predefined limits (internal / external). It ensures that exceptions to credit policies, procedures and limits are reported on a timely basis to the CBF EB, the Clearstream Risk Committee, the CBF SB and its Risk Committee. For compliance with Art. 59 of the CSDR, the credit strategy, the credit policy and the credit handbook which form the CBF Credit Risk Framework have 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.	CBF's credit risk arises from the loans granted to participants within the scope of custody and settlement activities. Participant financing is extended on an intraday basis and solely for the purposes of increasing the efficiency of securities settlement. They are only granted on a secured basis and are fully collateralized. The only exception to the "full collateralization" requirement is when the credit limit is granted to a non-commercial entity where zero risk weight is applied according to EU Regulation No 575/2013 on prudential requirements for credit institutions and investment firms. Credit is granted only to participants that can satisfy a stringent set of credit standards – key determinants include capital adequacy, asset quality, profitability and liquidity. The creditworthiness of potential participants is assessed before entering into a business relationship. CBF establishes participant-specific credit lines based on regular reviews of the participant's creditworthiness and ad hoc analysis as required. Technical Overdraft Facilities (TOF) are intraday credit facilities that are used to facilitate the settlement of securities transactions in the securities settlement system Creation. TOFs enable participants to

	borrow funds to purchase securities and to facilitate FX trades. They may also exceptionally facilitate the provisioning of cash withdrawals upon approval of the EB of CBF. TOFs are always granted on the basis of corresponding credit exposures being fully collateralized. This overdraft facility is an intraday credit arrangement to facilitate the settlement of securities transactions even when cash balances in the relevant currency are unavailable. Unconfirmed Funds Facilities (UCFs) are intra-day credit facilities, contractually they form part of the "TOF & UCF agreement" described below. Unconfirmed Funds Facilities (UCFs) are designed to facilitate the settlement of securities transactions based on incoming funds (pre advices, income or sales), withdrawal of funds linked to "Available for Cash Loan (ACL) income events and related FX services. They also enable participants to purchase securities based on an anticipated receipt of funds from a pre-advice, a sale over a domestic market link. If, by the end of the day, the incoming funds are not confirmed, the participant incurs interest and a penalty fee. CBF's rules with respect to the granting of intraday credit facilities to participants (TOFs) and (UCF) expressly 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 "TOF & UCF agreement". Group Credit measures and monitors that: • 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 measured, monitored, and managed; • Collateral and other equivalent financial resources used to fully cover corresponding credit exposures are measured, monitored, and managed; • The management of potential residual credit exposures are measured, monitored, and managed; **Risk management tools to control credit risks**

	The following risk management tools are used at CBF to control / mitigate credit risk. • The Credit Exposure Monitoring Tool (CEMT) allows CBF to aggregate exposures. The system updates at regular intervals and provides a consolidated view of credit exposures arising from securities settlement-related credit exposures, calculated close to real time. • Daily, Monthly and Annual Reporting is performed by the Credit Monitoring Team.
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.	**Coverage of exposures to each participant** CBF applies a conservative approach for granting credit and for collateral eligibility criteria. CBF mitigates credit risk on counterparts by granting credit on a fully collateralized basis. CBF accepts securities as collateral and applies conservative haircuts. 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. 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. CBF subscribes to the data services of several information providers. Where no price is available by eligible information providers or by other market infrastructures (e.g., depositories) the price of a security will be the issue price. Where a price does not list on a stock exchange, acceptance of such security is determined according to the market maker's price. For equity instruments, the issue price is required at the initial set-up of the security. CBF will apply additional haircuts to the latest available price in the event that no new price becomes available. For periods beyond 2 days, a haircut of 100 percent will be applied. To comply with Commission Delegated Regulation (EU) 2017/390

	where collateral is eligible at the ECB, the haircuts applied to that type of collateral by the ECB may be considered as the minimum haircut floor. The haircut of the ECB is used as a floor by the Collateral Management System when assigning haircuts for collateral securities that are eligible at the ECB.
Key consideration 4	Not applicable as CBF does not act as a CCP.
Key consideration 5	Not applicable as CBF does not act as a CCP
Key Consideration 6	Not applicable as CBF does not act as a CCP
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.	**Allocation of credit losses** The "TOF & UCF agreement" and the GTC provide in particular that further to the enforcement of the first ranking security interest granted over the assets held in pledged accounts in favor of CBF, CBF shall "apply any amount of proceeds of such enforcement to payment of the Secured Obligations and, as soon as reasonably practicable thereafter, transfer to those pledgor, whose pledge has been enforced any amount of proceeds in excess of the Secured Obligations on a pro-rata basis, determined by the proportion of the collateral they owed prior to the enforcement event to the aggregate value," as defined in the TOF agreement. The allocation of potentially uncovered credit losses according to the Clearstream Liquidation Framework means CBF will carry the loss. There is no mutualization of the loss with other participants. Furthermore, CBF has a recovery plan to ensure the continuity of its critical functions in case its capital, liquidity or operational capacity are adversely affected. As outlined in Principle 3, Key Consideration 4, CBF has numerous recovery options at its disposal to restore the capital situation and ensure the resolvability of CBF. For details on replenishment of financial resources, please refer to Principle 7 Liquidity risks, Key Consideration 10.
Key Conclusions for Principle 4	CBF has an adequate and comprehensive framework to identify, monitor and manage its credit risk arising from its settlement and custody activities. It does so based on credit limits, collateralization, credit ratings and stress tests. CBF grants credit and securities lending to its participants on an intraday basis and solely for the purposes of increasing the efficiency of securities settlement. CBF maintains and holds sufficient resources to offset both current and

	potential future exposure through sound collateral eligibility criteria for credit risk, conservative haircuts to cover market risk, and active monitoring for credit deterioration (at the individual participant level and on participant group level). The CBF EB approves and regularly reviews CBF's credit risk appetite, but all credit services have been outsourced to Clearstream Services and Clearstream Banking Singapore.
Assessment of Principle 4	Observed
Recommendations and Comments	None
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 financial assets are considered acceptable for the collateralization of credit limits are documented within the Clearstream Credit Policy and the Clearstream Credit Strategy, which are reviewed and approved annually by the CBF EB. The Credit Policy defines the term "acceptable collateral" as well as the collateral eligibility criteria. Eligible collateral are 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 and low liquidity risk may qualify. CBF does not accept collateral provided by an entity belonging to the same group as the borrower. It does not grant collateral value to correlated entities and negates the collateral value from correlated securities.
Key Consideration 2 An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.	**Valuation practices** CBF has a collateral valuation system in place to set haircuts and concentration limits for collateral which take into account the criteria such as the instrument type, maturity, credit risk, the country of issuance, industry and denomination currency. When the collateral is considered eligible at the central bank, CBF bears in mind that the haircuts applied are and should not be lower than

	haircuts applied by the central bank to that type of collateral. Stressed market conditions are considered within the price volatility risk factor of the collateral valuation system and haircut are assigned accordingly. Regular haircut back testing is conducted in order to assess the robustness of the collateral haircuts. CBF´s collateral management system is deemed appropriate to its core activity of custodian and securities settlement system and flexible enough to accommodate potential changes to current collateral management practices and procedures. The main features of the collateral management systems are: • Automatic collateral haircut calculation • Flexible maintenance of haircut parameters • Reporting functionality allowing for detailed analysis of collateral pool • Collateral concentration threshold monitoring • Automatic exclusion of correlated collateral The collateral management system is fully automated and collateral valuation and provision processes are embedded in the securities settlement engine and do not require any manual intervention. Changes in collateral haircut due to changes in the value of one of the risk parameters are reflected and applied within CBF's settlement systems at each ARM (Asset Reevaluation Manager). CBF monitors on a near-to real-time basis values collateral with credit and market risk. CBF performs its collateral valuation and monitoring on mark to market model. **Haircutting practices** CBF has a collateral valuation system in place to set haircuts and concentration limits for collateral which take into account the criteria such as the instrument type, maturity, credit risk, the country of issuance, industry and denomination currency. When the collateral is considered eligible at the central bank, CBF bears in

	mind that the haircuts applied are and should not be lower than haircuts applied by the central bank to that type of collateral.
Key Consideration 3 In order to reduce the need for pro-cyclical 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.	**Collateral haircuts** 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 due to adverse price moves over the liquidation period (i.e., the period between the default of the counterpart 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 their amount reflects the characteristics of the security and not the participant's creditworthiness. CBF ensures that its policies and procedures on collateral haircut determination take into account the fact that the collateral may need to be liquidated under a set of stressed market conditions. The haircuts take into consideration the maximum five-day time to liquidate period. CBF ensures that the haircuts are calculated in a conservative manner to limit pro-cyclicality as far 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. The annual review of the collateral policies and procedures is another measure to limit the effects pro-cyclicality. In case the collateral haircuts are deemed too low as a result of ensuing macro-economic developments, CBF can increase the haircuts if necessary. CBF's internal credit rating, which is also used to rate the collateral issuer helps to balance any pro-cyclicality that may arise from the external rating agencies ratings. Sufficiency of haircuts and validation of haircut procedures 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 from changes in either risk factors or parameters will automatically, triggers a recalculation of the haircut applied to the collateral valuation of securities.

Key Consideration 4	**Collateral concentration limits**
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 a bank's financial condition. CBF actively monitors concentration and correlation risks in its collateral pool. Collateral concentration limits are monitored at both the level of CBF, and participant institution level. Collateral concentration limits are monitored for the below limit types: • Issuer: Maximum 25 percent of securities issued by entities belonging to same group. • Country: Maximum 25 percent on any single country rated BBB- (Standard & Poor's /Fitch) or Baa3 (Moody's). • Wrong Way Risk - Issuer Type: Maximum 20 percent on securities issued by Financial institutions rated BBB- (Standard & Poor's /Fitch) or Baa3 (Moody's). No concentration limit on securities issued by financial institutions rated BBB (Standard & Poor's /Fitch) and above or Baa2 (Moody's) and above. • Wrong Way Risk - Same Country: Maximum 10 percent on securities issued by an entity of the same country as that of the participant if country is rated BBB- (Standard & Poor's /Fitch) or Baa3 (Moody's). No concentration limit applies if the country is rated BBB (Standard & Poor's /Fitch) and above or Baa2 (Moody's) and above • Instrument type: Maximum 50 percent concentration on Equities, Certificates of Deposit, Commercial Paper and Convertible bonds (No concentration limit on straight bonds) • Settlement currency: No concentration limit applies on securities issued in EUR, USD, GBP, CHF, JPY, AUD, CAD, NZD, NOK, DKK and SEK. Maximum 30 percent on securities issued in currencies not TOF eligible. • Credit rating: Maximum 20 percent on securities rated BBB- (Standard & Poor's /Fitch) or Baa3 (Moody's. No concentration limit on instruments rated BBB (Standard & Poor's / Fitch) and above or Baa2 (Moody's) and above

	• ECB Eligibility: Maximum 70 percent on securities not eligible at the ECB. • Liquidity: Max 25 percent on securities with low liquidity score • Price Volatility: Maximum 25 percent on securities with high volatility score. Participant breaches any of the above-listed concentration limits are monitored, analyzed and notified to participants accordingly. Participants will be granted time to accommodate to the new collateral concentration limits criteria.
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.	**Cross border collateral mitigation** 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 following the implementation of the Financial Collateral Directive 2002/47/EC of 06.06.2002. BCF's standard Technical Overdraft Facility Contracts contain rules on the enforcement of pledged securities. 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. CBF's participants are mainly located in Germany and if not, principally in another Member State of the European Union. The validity, enforceability and recognition of the German law governed pledge. As mentioned in Principle 1, 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, are pledged in CBF favor to secure the entire present or future obligations that the participants have, or may subsequently have, towards CBF in consequence of any services provided by CBF to the participants. 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, it is authorized 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 by: • 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 (please refer to Principle 16); • Maintaining updated default management and collateral realization procedures (please refer to Principle 13); • 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.	**Collateral management system design** CBF collateral management system (NCMS) is designed by internal IT which offers full onsite support and maintenance. NCMS is fully automated and has the main features: • 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 collateral management system is fully automated and collateral valuation and provision processes are embedded in the securities settlement engine and do not require any manual intervention. Changes in collateral haircut due to changes in the value of one of the risk parameters are reflected and applied within the settlement system at each ARM (Asset Reevaluation Manager). **Operational flexibility**

	Operational flexibility of NCMS include for example: flexible maintenance of haircut parameters, flexible collateral percentage override function for example for negating collateral value from securities that are issued by issuers that are facing financial or legal troubles, flexible collateral tier override function.
Key Conclusions for Principle 5	CBF has established a solid and comprehensive collateral management framework with stringent eligibility criteria, including high credit quality, minimum market risk, high liquidity, immediate accessibility and valuation. CBF has risk management procedures to reduce wrong-way risk and has set out clear, well-defined, and comprehensive concentration limits. It evaluates its collateral in an automated fashion and on a near to real-time basis with a sophisticated collateral management system by marking-to-market for collateral valuation, setting conservative haircuts—while also attempting to limit procyclicality—and monitoring concentration limits on participant-level.
Assessment of Principle 5	Observed
Recommendations and Comments	While CBF has in place a process for the ex ante non-acceptance of ineligible collateral, it monitors breaches in concentration limits actively but only takes action ex post. In order to maintain the integrity of the set concentration limits, CBF should put in place processes for the ex ante evaluation of collateral concentration limit breaches.
Principle 6. Margin A CCP should cover its exposure to its participants for all products through an effective margin system that is risk-based and regularly reviewed.	
Key Consideration 1	Not applicable
Key Consideration 2	Not applicable
Key consideration 3	Not applicable
Key consideration 4	Not applicable
Key consideration 5	Not applicable
Key consideration 6	Not applicable

Key consideration 7	Not applicable.
Key Conclusions for Principle 6	Not applicable.
Assessment of Principle 6	Not applicable.
Recommendations and Comments	Not applicable.
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, intraday 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 robust frameworks 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. This framework consists of: • Clearstream Banking Treasury Investment Policy. • Clearstream Banking Treasury Liquidity Management Policy, including, qualifying liquid resources (QLR) Handbook and CBF Contingency Liquidity Funding Plan. • Treasury Intraday Liquidity Controls. • CBF Liquidity Stress Testing Model. Policies are reviewed, updated and approved, at least annually but also ad hoc by the CBF EB. For CBF and for each currency, the target for the liquidity management is the ability to: • Manage CBF's varying cash positions as a result of participant and own activity with the aim to have sufficient liquidity available in all currencies for a timely provision of settlement and payment services as they fall due.

	• 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 intraday and overnight. A 5-year bond maturing in 2025 has, however, been issued with the unique purpose of purchasing securities and pledging these purchased securities to Clearstream Banking S.A. (CBL) to cover the credit line CBL grants to CBF, as a customer of CBL, which may only be used for services in relation to CBL's own core services as per Art. 16 of the CSDR (in relation to securities on the omnibus account CBF holds at CBL). CBF achieves its liquidity management objectives through permanent measurement, monitoring and management of its liquidity requirements and liquid resources. For this, CBF has in place a range of ex ante and ex post measures. *Ex ante measures:* • Setup of a permanent liquidity buffer in its top 3 currencies in accordance with EBA guidelines at Clearstream Holding's level covering CBF liquidity requirement. CHAG is CBF's direct holding company. • Committed secured liquidity (FX swap) facilities with two creditworthy financial institutions. • Uncommitted overdraft facilities with its CCBs • An intraday secure credit line of USD 350 million with Clearstream Banking S.A. • Real-time liquidity monitoring and calculation of expected cash flows via an intraday liquidity management tool. • Liquidity savings measures such as the maintenance of sufficient qualifying liquid resources to be able to cope with a Cover 2 or similar stress scenario. *Ex post measures:*

	• Escalation of any pending payment due to insufficient cash balance. • Regular stress testing. As a result of the ex-post measures, Clearstream Risk Management and Clearstream Treasury jointly review and adjust the adequacy of the liquidity risk management framework, the liquidity providers, and the liquidity contingency plans. *Intraday objectives* • All due payments need to be settled on their due date. • Treasury-related payments shall be settled within 2 hours of trade conclusion. • RvP-related payments shall be settled prior to the respective settlement deadline. • Participant payments shall be settled by end of day. 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 below 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 intraday liquidity.	*Intraday liquidity measurement, monitoring and management* All sources of liquidity risk are considered for the measurement, monitoring and management of CBF's intraday liquidity management (ILM), which includes its relations to the entities and linked FMIs or other entities that may pose liquidity risk to its intraday liquidity flows. These include: • Treasury mismatches. • Non-repayment of Treasury investments. • Adverse Financial or operational events impacting correspondent banks and depositories.

	• Non-repayment of cash credit for reimbursement no later than the following business day. The "Treasury Intraday Liquidity Controls" procedures define the intraday liquidity management processes, the timelines and the 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 Clearstream Treasury 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 EB level which can decide in view of the liquidity crisis event to activate exceptional liquidity generation measures listed in the Clearstream Treasury Liquidity Management Policy and detailed in the Clearstream Recovery Plan. To monitor its actual cash balances held with its two CCBs and central banks resulting from its settlement and funding flows and as a consequence of its intraday and overnight exposures, CBF captures credit and debit advices received from its agent and intermediaries and compiles intraday on a near to real-time basis the current actual available cash balance in its ILM tool. CBF also matches in ILM its expected flows (participants' cash & securities settlement instructions and Clearstream's Treasury activities) against incoming and outgoing funds to ensure that an expected balance is available and pending entries can be investigated. The operational and analytical ILM tool allows on an ongoing basis liquidity monitoring at CBF's cash correspondent level and monitoring of CBF's cash position at CBL. The tool produces management reports that support the liquidity management process.
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 intraday or multiday	For its intraday liquidity management, the treasury management function has been outsourced to CBL. CBF relies on its own funds, participants residual cash balances, two multicurrency committed FX swap facilities (for in total EUR equivalent 200 million) and an intraday credit line of USD 350 million with CBL. CBF funds its qualifying liquid resources with its own funds and own debts. CBF invests its own resources into high-quality liquid assets (HQLA) bonds issued or guaranteed by top rated

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.	governments or Supranational issuers. The uninvested part of its own resources is held in an account at the DBB. A separate account is in the progress of being opened at DBB to segregate own funds from participants' cash. Both bonds and uninvested own funds left at the DBB are under the direct management of Clearstream Treasury in its liquidity management function and may only be used as a source of contingent funds during stress periods. *Intraday liquidity generation* Each uncommitted intraday funding source (bilateral repo agreements with creditworthy financial institutions are in the process of being set up) will be tested on a regular basis once in place. Likewise, the capacity of the liquidity providers to perform on their commitments is also regularly tested for the intraday committed FX swap lines in place. Clearstream Treasury executes transfers intraday in EUR, USD and GBP in case CBF intraday concentration limits with CBL are exceeded. Limit utilization is monitored via ILM and Clearstream Treasury is informed about any limit breaches through online alerts. In EUR, Clearstream Treasury initiates up to 6 transfers per day between CBL and CBF and vice versa. USD and GBP limits have never been exceeded and therefore no transfers have had to be executed but the functionality has been tested. In currencies other than EUR, USD and GBP, Clearstream Treasury invests 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. In case participant(s) with a large usage of its/their intraday credit facility in one or several currencies would default, the potential actions Treasury would take to manage the liquidity gap are: • Secured borrowing using the collateral received via reverse repo or proprietary assets. • CBL provides an intraday credit line to CBF for USD 350 million. • Committed FX swaps transactions to use liquidity in one currency (EUR and/or USD) depending on the time zone, while CBF does currently not have any own QLR in USD to fund the currency with a liquidity gap.

	• Use available uncommitted CCBs overdraft lines. • Use Deutsche Bundesbank credit line (EUR currency) and/or generate liquidity through ECB standing facilities (EUR currency). To act as source of backstop liquidity to mitigate the risk caused by the default of at least two participants and the knock-on effects of such default, the minimum amount of required QLR is derived from the Cover 2 requirement. The minimum requirement shall be met which ensures that sufficient QLR is available to cover the liquidity impact caused by the default of the two participants including their parent undertaking and subsidiaries against whom CBF has the largest intraday liquidity exposure. The granting of credit limits to CBF's participants cannot exceed the credit limit CBF has with CBL, corresponding to the limit of the amount of CBF's own collateral pledged with CBL. As CBF obtains a sufficiently high amount of own QLR (own funds and committed facilities) to meet the requirements resulting from the Cover 2 liquidity stress test, CBF does not depend on available participant collateral eligible as QLR. A liquidity stress test with a number of scenarios including Cover 2 is in place to ensure all liquidity requirements in case of market stress are able to be met with the available sources of liquidity.
Key Consideration 4	Not applicable as CBF does not act as CCP.
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	**Size and composition of qualifying liquid resources** The minimum amount of CBF's available QLR (Cover 2 requirement – minimum requirement) 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 exposures. CBF is a customer of CBL and its QLR is enough to cover the default of its two largest participants per currency and is composed of: • Own funds (cash and securities). • Central bank facility with DBB. • Committed swap facilities

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.	– Toronto-Dominion Bank: EUR 100 million can be converted into the currencies USD, GBP, AUD, CAD, CHF, DKK, JPY, NOK, SEK, HKD and SGD. – Standard Chartered Bank: EUR 100 million can be converted into the currencies USD, GBP, AUD, CAD, CHF, DKK, JPY, NOK, SEK, HKD and SGD. **Availability and coverage of qualifying liquid resources** CBF has routine credit access at the DBB and is able to pledge its ECB eligible securities from its investment portfolio to generate intraday liquidity in EUR whenever it would be required. All QLR mentioned above fulfilling the defined conditions are kept in separate accounts under the direct management of Clearstream Treasury 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.	**Size and composition of supplemental liquid resources** Additional liquidity sources to fulfill requirements are: • The residual cash of CBF participants not used for other purposes on CBF's omnibus account in CBL • CBL provides an intraday credit line to CBF for USD 350 million against pledged collateral. In case CBF defaults, CBL can liquidate CBF collateral in order to cover any credit exposure. Furthermore, CBF has uncommitted and undisclosed overdraft lines with its two CCBs: JP Morgan (USD) and Barclays (GBP).

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.	**Use of liquidity providers** A Due Diligence questionnaire (DDQ) has been set up and is completed by each facility provider and or good candidates for providing a committed facility. This assessment allows Treasury to reassess the providers' profile. Dependent on the outcome of the assessment the contract may be rolled over/ renewed or not. Clearstream Treasury in particular reviews if the counterparty meets internal and regulatory criteria. Minimum criteria are: • minimum internal credit rating of 'D' (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. Clearstream Treasury in its liquidity management function tests its operational procedures by performing regular liquidity generation tests. The results of the tests are 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 DBB. Liquidity available on this account can be directly accessed via SWIFT payment message without any restrictions and unconditional access is guaranteed as funds are held under the sole responsibility of Clearstream Treasury and are unencumbered. The nostro transfer functionality in the Clearstream Treasury trade entry system allows the transfer of funds from CBF's account at DBB to another cash correspondent bank or to CBL intraday within the RTGS opening time. Through its account at DBB, CBF has access to the following ECB standing facilities: • Marginal lending facility in order to obtain overnight liquidity from the central bank, against the presentation of sufficient eligible assets

	• Deposit facility in order to make overnight deposits with the central bank to reduce unsecured positions on commercial banks. .
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	**Stress test program** Pre the CSDR authorization (Art. 54 banking-type services) Liquidity stress test & reverse stress testing is currently performed at CH level. Clearstream Risk Management performs liquidity stress tests. The stress test framework includes clearly defined objectives and scenarios tailored to CBF's liquidity risk profile including well-documented assumptions, informative management reports, ongoing and effective review of the stress testing processes, and recommended actions based on stress test results. The general scope of these tests is to help Clearstream Treasury determine whether it has a sufficient liquidity buffer to meet various types of future liquidity demands under stressful conditions. The stress testing considers idiosyncratic, market disruption and combined scenarios. Stress testing results are used for calibrating respective limits. Liquidity resources are stress tested on a regular basis (daily and quarterly/ad-hoc) using a wide range of scenarios which are listed above. The stress tests results show the potential impact that a stress event has on the intraday and end of day liquidity resources in each currency. This is done by assessing the impact of participant defaults in each currency as well as stressing the liquidity sources (i.e., participant cash, money market limits, and CCB limits). As for the classic stress tests, they consider the lowest available funds per currency in the previous 5 years at a 99 percent confidence interval. The results of the various liquidity stress tests are reported to the CBF Head of Risk Management, the Treasury Front Office, and the EB of CBF, together with a recommendation from Risk Management, if applicable. Based on the results, Risk Management may recommend taking measures concerning CBF's liquidity resources. The stress test assumptions and parameters are reviewed regularly. The review process can be either triggered by Risk Management

supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.	and/or Treasury triggered by one or several factors such as legal change of the entity, market development events, new regulatory requirements, feedback from internal audit, etc. Furthermore, a mandatory review is carried out annually. New regulatory requirements on stress testing Unlike a CCP, a CSD is under no legal obligation to guarantee the fulfillment of a defaulted participant's transactions except for settlement finality provision. In addition, there is no obligation to pre-finance participant settlement. All participant credit facilities are uncommitted and unconditionally revocable at any time. CBF designed a new Liquidity Stress Testing (LST) framework to comply with the CSDR requirements. The regulation ensures that systemically important securities infrastructures are subject to common EU rules. CBF CSDR LST will consider all entities and products that may pose a material liquidity risk to CBF and will be calculated on relevant currency level where the liquidity exposures will be tested against CBF's QLR. **Stress test scenarios** The CBF CSDR LST model is composed of five LST scenarios: • Scenario 1: Cover 2 • Scenario 2: Multiple defaults • Scenario 3: Temporary inability of CBL to provide liquidity in a relevant currency + economic slowdown + change in the reputation of the Clearstream group • Scenario 4: Temporary inability of CBL to provide liquidity in a relevant currency + economic slowdown + change in the reputation of the Clearstream group + stress in FX convertibility • Scenario 5: Temporary inability of CBL to provide liquidity in a relevant currency + economic slowdown + change in the reputation of the Clearstream group + stress in FX convertibility + missed receipt of participant payments The stress testing scenarios were also designed taking into consideration the Minimum Requirements for Risk Management. MaRisk compliance is already ensured via the existing quarterly Clearstream Holding classical liquidity stress tests, which cover both

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CBF and CBL. Clearstream Risk Management will continue to run these stress tests going forward, which are performed on a combined currency level.

In addition to the scenario-based stress tests, CBF will apply a reverse stress test methodology for scenario 5 (RST S5 - worst case scenario) whereby the key risk drivers are individually stressed until CBF becomes non-viable, including the point where the regulatory requirements for QLR are breached.

The liquidity risk appetite of CBF is focused on the QLR surplus. It is defined as the relevant key risk indicator, which is used to monitor the viability of CBF’s business model under stressed conditions. The aim is to ensure a sufficient buffer of QLR under consideration of available liquidity sources and available committed FX swap lines. The following indicator reflects CBF’s liquidity risk appetite:

<table>
<tr><th>Indicator</th><th>Description</th></tr>
<tr><td>Green</td><td>Cumulative liquidity gap ≥ 0 (in domestic</td></tr>
<tr><td>Amber</td><td>Cumulative liquidity gap < 0 (in domestic</td></tr>
<tr><td>Red</td><td>Cumulative liquidity gap < 0 (in domestic currency and within 30 days)</td></tr>
</table>
Each color code triggers a set of pre-defined actions and escalations as described by the CSDR.

Review and validation

CBF CSDR LST scenarios 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.
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Key consideration 10

An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined
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Same day settlement

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

Most of Treasury daily investment and funding activities can be categorized as same-day market transactions. Same-day market transactions are executed in Treasury’s day-to-day cash
</td>
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</table>

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.	management to meet its intraday objectives (refer to Principle 7, Key Consideration 1 above). Same-day transactions are also used to place funds overnight with a diversified panel of counterparties. All Treasury transactions must be entered in the Treasury trade entry system SAP CFM. After validation from Treasury Back Office (4-eyes principle), the payments and repayments are automatically generated at the defined payment/repayment date(s) (same-day or later) from the trade concluded by Clearstream Treasury. CBF may also execute same day transactions with its liquidity providers (committed and uncommitted) to deal with unexpected disruptions to its intraday liquidity flows. **Replenishment of liquidity resources** To reduce the risk of a liquidity squeeze to the maximum extent possible and to ensure that sufficient liquidity is available in all currencies to pay all financial obligations as they fall due at all times (even during a stress event), CBF only: • Invests liquidity with a tenor not exceeding one business day (except in currencies for which mismatch limits are established). • Invests liquidity secured in priority. • Diversifies liquidity investment with multiple counterparties whenever possible. • Restricts unsecured fixed-term deposits to currencies with no central bank access. • Continuously monitors expected flows against actual positions via Treasury ILM tool. • Continuously monitors and follows up potential liquidity issues that could potentially lead to large liquidity squeeze in view of the funding capacity in the currency. The following instruments are in place to generate sufficient liquidity in all currencies in case of unforeseen, and potentially uncovered, liquidity shortfalls Committed liquidity sources: CBF own funds, bond issuance.

	• Credit line at DBB. • Highly reliable liquidity sources: participant cash stable balances and cash correspondent uncommitted credit lines. • Committed FX lines (to generate liquidity in the currency with the liquidity gap.) • Appropriated participant collateral (in case of default).
Key Conclusions for Principle 7	CBF has a robust framework to measure, monitor, and manage its liquidity risk. The framework is designed to cover all payment obligations at any time in order to avoid a potential liquidity shortfall arising from its participants, cash correspondent banks, liquidity providers, and deposit-keeping banks. CBF holds sufficient qualifying liquid resources in euro and is also able to obtain euro liquidity from the DBB and has access to ECB standing facilities. In addition, CBF maintains cash balances in USD and GBP with two CCBs, and a committed, secured liquidity FX swap facilities with two credit institutions, allowing access to a wide variety of currencies. CBF also has uncommitted overdraft facilities with its two CCBs and a secure, intraday USD credit line with CBL. CBF conducts real-time liquidity monitoring and calculations of expected cash flows via an intraday liquidity monitoring tool, a function which has been outsourced to CBL. At the level of Clearstream Holding, a number of liquidity and reverse stress tests are conducted on a regular basis to assess the liquidity impact of several scenarios, including the default of the two participants with the largest exposures. The results of the stress tests are compared with the available liquid resources.
Assessment of Principle 7	Observed
Recommendations and Comments	While CBF's liquidity risk framework is robust and comprehensive, CBF is encouraged to broaden its CCB base for the purposes of risk diversification and hold overdraft cash accounts in USD and GBP with more than a single credit institution, in addition to assessing the appropriateness of holding overdraft cash accounts for other currencies.

<table>
<tr><th colspan="2">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 intraday or in real time.</th></tr>
<tr><td>Key Consideration 1

An FMI’s rules and procedures should clearly define the point at which settlement is final.</td><td>Point of settlement finality

CBF operates through two different securities settlement systems:

• CASCADE by use of Target2-Securities;

• Creation - CBF-i activity.

The EU Settlement Finality Directive, that ensures finality, has been transposed into national law, inter alia, via the German Banking Act. Settlement finality is – for both SSSs– defined in CBF’s GTC, published on the website of Clearstream.com.

Internal instructions - settlement in CASCADE/ T2S and Creation

A transfer order for settlement in T2S is considered to have been entered into the CBF system when T2S detects that the T2S validation rules have been met. A payment transfer order and delivery transaction are considered to have been entered into the CBF-system when Creation’s validation rules are met.

A transfer order, issued to CBF for settlement in T2S, is irrevocable when it is indicated as “matched” by T2S. With this binding booking the transfer order will then be processed in T2S for settlement. A payment order for settlement in Creation is irrevocable when it is indicated as “matched” by Creation. With this booking the transfer order will then be processed in Creation for settlement.

Moment of final settlement

Finality of the internal instructions is reached when those instructions have settled in T2S or Creation and the associated re-registering has taken place in the custody ledger.

The binding booking in T2S is achieved for DVP (Model 1), when the transfer of title of a security in T2S, as well as the respective cash payment in T2, have both been executed, i.e., once the securities are booked in the T2S accounts and the cash is booked on the TARGET2 dedicated account of the CBF participants. For FOP as well as against payment transactions in a non-T2S eligible currency, this</td></tr>
</table>

	is achieved once the transfer of title of a security in T2S has been executed. *The binding booking in Creation* is achieved for DVP (Model 1) when the transfer of a client'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. For FOP this is achieved when the transfer of a client'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. **Finality in the case of links** For links to foreign 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. CBF, for all such links to another FMI, will ensure that finality is achievable in a way that protects the activity of its participants and guarantees the asset protection. The moments of entry, of irrevocability and finality of external instructions are defined in accordance with the domestic rules applicable to the relevant local market. , The irrevocability and enforceability of the external instructions for transactions settling with a counterparty in a foreign market are achieved in the books of the relevant depository. Once the external instructions are final (that is, irrevocable and unconditional) within the depository and upon notice of credit/ debit of the relevant account of CBF 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.
Key Consideration 2 An FMI should complete final settlement no later than the end	**Final settlement on the value date** For CASCADE/ T2S and Creation internal settlement, RTGS settlement applies. Settlement on value date or same day

of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.	settlement can be completed in case that both counterparties fulfil their settlement obligations for processing on the intended settlement day. **Intraday 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 securities as well as from fees and charges are booked on the DCA. Settlement can take place in either NTS or RTS. T2S NTS is the first settlement cycle with final settlement on the next business day. All valid instructions that are due on the next day or that were already due at an earlier point in time but could not be successfully processed are included in NTS processing. 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 RTS at about 18:00 CET. After 16:00 CET, FoP and DVP 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 DCA when payments are made in EUR and through Creation when payments are made in other currencies. *Creation internal settlement* The settlement day consists of one main settlement processing, the real-time processing, followed by the end of day. 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.

	For external Creation settlement, 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) at any time. Matched internal instructions can only be cancelled with the consent of both participants. Participants cannot cancel their matched instructions unilaterally even if the requested settlement date has not been reached. If no matching cancellations are received by then, and the instruction has not settled by the end of day processing on settlement date, CBF will, on behalf of the participant, issue a renewed cancellation request for settlement to take place on the next settlement date; such new cancellation request must be matched by the participant's counterparty on the same day. . *External Creation settlement* Local market rules apply.These are described and publicly available in the respective Market Link Guides .
Key conclusions for Principle 8	Settlement finality at CBF is achieved through clearly defined rules and procedures. The moment of irrevocability for both instructions and settlement are clearly defined in Section 14 of the German Securities Deposit Act (Depotgesetz), supported by the CBF General Terms and Conditions (GTC) for participants. For external settlements (through established CSD-to-CSD links), finality is achieved in accordance with the local market rules and practices.
Assessment of Principle 8	Observed
Recommendations and Comments	None
Principle 9. Money Settlements 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 minimize and strictly control the credit and liquidity risks arising from the use of commercial bank money.	
Key Consideration 1	The settlement of transactions in CASCADE is conducted in CBM, via the T2S platform, through the CBF´s participants T2 DCA at the

An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.	central bank. The settlement of Swiss securities versus CHF currency for the CBF´s link to Switzerland is also executed in CBM For foreign markets, Clearstream Network Management assesses the availability and practicability of processing cash settlement in the local currency via an account held with the local central bank. When this is not available, CBF settles in CoBM, using a Cash Correspondent Bank. For EUR cash settlement on the T2S platform operated by the ECB, the CBF requires its participants to have DCAs which are linked to the 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, i.e., cash accounts that are opened in the books of one T2S participating Central Bank and are exclusively dedicated to the settlement of the cash leg of securities transactions initiated by CSD participants or 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 (i.e., to the DCAs) is necessary. For this purpose, T2S provides the technical means for its participants (CSD and central banks) to transfer funds from the RTGS' accounts to the technical platform, or from one T2S DCA to another. The holders of the DCAs have the responsibility to monitor the balance in their DCA(s) and must be able to issue liquidity transfer orders in T2S. 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 credit line on the DCA needs to be considered in a timely manner. Liquidity on the DCA not used during NTS can, later,be used for RTS. The funding of the DCA is therefore effective for all settlement cycles on the same business day. Furthermore, CBF offers its participants the option to transfer positive payments out of the DD1, DD2 and DD3 cycles via one standing order each to a DCA assigned to the same payment bank (same BIC8) as the respective RTGS main account. That way, liquidity from corporate actions is available for cash settlement in RTS in a timely manner.

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 (CoBM) settlement takes place in relation to the Creation activity, the settlement asset used is a claim on CBF itself. CBF is subject to CSDR Article 16 and holds a limited purpose banking license, allowing it to provide banking services in relation to settlement services only. CoBM settlement applies for: • Non-EUR T2S cash settlement (i.e., CBF´s international services, "CBF-i", using the SSS "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. • Cash settlement for internal, external and Bridge transactions 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. It offers securities settlement exclusively 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 CoBM activity and the respective cash settlement in most currencies outside of T2S eligible currencies (currently also including securities settlement versus payment in the T2S-eligible currency DKK) 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 must either be available on the participant's account or can be accessed through CBF's cash financing facilities. For its external Creation settlements (local markets), CBF settles in CoBM where feasible. Settlement in CoBM for more than 40 currencies are carried out for most links as:

	• DVP in CoBM is not practical considering that the processing of settlement instructions is technically arranged via the CBF-i account for both, cash and securities, while DVP in CoBM would mean separating the cash flow from the securities flow which is currently not possible in the design of the SSS Creation. The intermediary, on the other hand, settles on its account at the local Central Bank; • Market specific reasons apply, e.g., in many markets national legal restrictions apply for foreign institutions (e.g., Bulgaria, Hungary, Japan) as foreign entities are not allowed to open cash accounts at Central Banks of other countries as per the rules of those Central Banks or access to CBM is limited to direct participants of a CSD (e.g., Cyprus). For every eligible settlement currency, at least one CCB is appointed to handle the external payment and receipt of funds between the domestic banking system for the currency and Creation. Funds are transferable intraday 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. CBF immediately executes (upon receipt of a valid participant instruction and in near real-time) cash withdrawal instructions received before the currency deadline provided that the instructed account is fully funded for the amount of the requested transfer and the instruction is compliant with its conditional instruction rules.
Key Consideration 3	Not applicable as CBF settles the cash leg in its own books.
Key Consideration 4 If an FMI conducts money settlements on its own books, it should minimize and strictly control its credit and liquidity risks.	CBF has a limited banking license that allows it to 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 participant. CBF has a robust risk management framework that covers all key sources of risk including credit and liquidity risks.
Key Consideration 5	Not applicable as CBF settles the cash leg in its own books.
Key Conclusions for Principle 9	All money settlements in respect of transactions settled through the CBF "CASCADE" system are concluded in CBM via the T2S platform

	operated by the Eurosystem. Similarly, all transactions that are settled via the CBF link to Switzerland (Swiss securities in CHF currency) are also settled in CBM. Non-EUR T2S cash settlements and settlements outside T2S (i.e., CBF's international services that make use of the "Creation" SSS) are concluded using CoBM in the books of CBF and via CBL's network of CCBs. These settlements are subject to a robust risk management framework that covers all key sources of risk associated with such transactions.
Assessment of Principle 9	Observed
Recommendations and Comments	To minimize CBF's reliance on CBL for access to the network of CCBs required for money settlement, CBF is encouraged to work with CBL and establish, at minimum, a subordinate, but definite, role in the contractual relationships that exist between CBL and its network of CCBs, as well as diversify the network for currencies to which it does not have access to CBM.
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 and commodities are defined in accordance with German Law and the rules of the German Securities Deposit Act, transposed into CBF's 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; and • Securities in bearer or registered form issued by foreign issuers and not governed by German Law; For physical deliveries of commodities, CBF relies on bilateral agreements with the issuers or agents, e.g., in case of Xetra Gold, a custody and service agreement concluded between the issuer and CBF, which essentially provides for the safekeeping and certain aspects of the administration of the stock of gold in physical form serving as cover for the Notes. In the case of individual safe custody (also referred to as jacket

	custody), CBF must segregate the securities to be kept in safe custody from other securities, on the depositor's express request. 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. Under CSDR, CBF is entitled to refuse to accept certain assets for safekeeping. Therefore, the obligations and the responsibilities for safekeeping only start once the assets have physically been delivered to, and accepted by, CBF and terminate with the physical restitution of the assets to the participant. **Settlement process** The T2S platform and the relevant vault 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 and replacement certificates. The settlement takes place on DVP basis.
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 storage and delivery of physical instruments is the loss of certificates during the process and the receipt of fraudulent certificates. CBF has experienced staff responsible for regularly updating the 'operational risk scenario analysis', covering fraudulent destruction, theft, transportation issues, loss, etc. CBF performs daily vault reconciliations to avoid the loss of certificates. Physical certificates are reconciled on a three-year basis and Global Notes on two-year basis by controlling the positions booked in CASCADE/CARAD against the physical certification. As of 2022, this process will be replaced by a predominantly digital reconciliation

	process. This process will include an annual completeness check of the total packed and sealed inventory as well as a more detailed check within the scope of spot-checks on a predefined amount of the inventory. The main cost drivers are personnel costs, rent and security costs, which are relatively high. CBF monitors these cost drivers on a regular basis, with the aim to reduce cost but without jeopardising the security of the vaults and/or the services around physical securities and commodities. The fees for the delivery of physical securities and commodities are clearly stated in the CBF fee schedule, where the general rules for charging fees on the relevant deposit service are set out.
Key Conclusions for Principle 10	The GTC (applicable to all CBF customers) clearly define those securities that are eligible for physical delivery within CBF as well as the obligations assumed by CBF in accepting those securities for safe-keeping. CBF has robust operational processes and procedures (including appropriate vault reconciliations) in place to fulfil its obligations. Risks and costs associated with the storage and delivery of physical instruments are fully identified and taken into account.
Assessment of Principle 10	Observed
Recommendations and comments	None
Principle 11: Central Securities Depositories A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimize and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilized or dematerialized 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 unauthorized creation or deletion of securities, and conduct periodic and at	*Safeguarding the rights of securities issuers and holders* Securities can be held in custody with CBF under any of the following types: *Collective Safe Custody (CSC)* governed by the German Securities Deposit Act. The process for admission of securities to CSC by CBF is initiated by the applicant or the issuer. The applicant must be a credit institution and a participant of CBF. The admission and depositing of securities in CSC are regulated in number XI CBF

least daily reconciliation of securities issues it maintains.	GTC's. Securities to which numerous rights are attached and taken in CSC are frequently vested in global and deposited with a CSD for safe keeping. Fungible physical certificates that comprise the same investor rights may be deposited with a CSD. Certificates are stored in specific driving pallet racks and boxes which can be sealed as well. Classification criterion for securities is ISIN and payment / reconciliation date. For CSC, any credit is represented by a fractional co-ownership in that ISIN. CBF books an appropriate CSC balance to each customer, which enables the transfer of rights inherent to the securities by book entry system. *Individual Safe-Custody (Streifbandverwahrung)* of non-fungible certificates allows each participant to have an individual certificates with a particular serial number at its disposal. In the case of individual safe custody (also referred to as jacket custody), which is also regulated under the Deposit Act, 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. 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. *Non-collective safe custody* of securities that are not settled via the T2S platformallows CBF *to* keep 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 the purposes of custody. Depositories are under an obligation to obtain what is known as a "Three-Point Declaration" from the (first) custodian outside Germany. 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. In the case of German government bonds, securities held by CBF

	are recorded by book-entry at the registrar German Finance Agency on behalf of CBF in form of collective deposit. If requested, portions of the issue can be registered by book-entry in the name of an individual person. Such securities cannot be held with CBF but would need to be held with the registrar. If the collective holding is decreased due to a loss, for which CBF is not responsible, CBF will apportion such loss on a pro rata basis to the participants according to the fraction each participant (for its clients) holds in this collective holding at the moment that the loss occurred. CBF's liability (pursuant to section 7 paragraph 2 DepotG) 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 German Insolvency Code, the participants would be entitled to a right of segregation. If said securities are not sufficient to ensure the full restitution of the securities maintained on the account, they will be allocated between the account holders in proportion to their rights. In case CBF is responsible for the loss of securities, such a participant would have a senior claim in an insolvency proceeding. *Prevention of the unauthorized creation or deletion of securities* CBF has appropriate rules, procedures and controls to prevent unauthorized creation or deletion of securities: • Authorized 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. • Authorized removal of securities positions is generally performed upon final maturity or in the context of a corporate event. • Integrated securities provisions check before release of a settlement instruction does also prevent unauthorized creation of securities. Daily reconciliations are performed to ensure the correct application of the rules to prevent unauthorized creation or deletion of securities. The various reconciliation measures as well as the handling of differences are detailed below in "Periodic

	reconciliation of securities issues" of this same Key Consideration. *Periodic reconciliation of securities issues* The internal and external reconciliation procedures and controls are performed automatically by CBF's systems on a daily basis. Validations are performed in accordance with whether settlement data is received from T2S or Creation. The issuer or its agent has the obligation to perform, at least, daily reconciliations with the CSD in order to reflect that the total outstanding amount matches the outstanding amount of the issue at all times. Daily reconciliation of securities positions is also performed to validate the securities positions held or mirrored at external party e.g., registrars, CSDs. The issuer agent must reconcile the 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 on a daily basis. The reconciliation for securities held in CSC with the CSDs for which links exist (investor-CSD), is also performed on a daily basis. In line with the CSDR reconciliation requirements, any reconciliation break is immediately investigated by the CBF reconciliation team and the respective CBF business unit. Both the reconciliation team and impacted business unit will perform all necessary measures to remedy the break without undue delay, as required by the regulation. In order to allow its participants to perform their daily reconciliation obligations, CBF makes daily statements of holdings and transactions available to participants who subscribe to this service 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 also reviewed by the external auditor.
Key Consideration 2 A CSD should prohibit overdrafts and debit balances in securities accounts.	CBF systems do not allow securities account overdrafts. For the settlement activity of T2S, CBF would be unable to prevent potential negative securities' positions as it relies on T2S provision checks and settlement rules. The CSD merely reflects the T2S settlement results. Negative balances might be accepted 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. The settlement platforms also perform a "provision check" before executing a participant's instruction, ensuring that sufficient securities are available on the participant account to execute the delivery thereby preventing a debit balance on a securities account.
Key consideration 3 A CSD should maintain securities in an immobilized or dematerialized form for their transfer by book entry. Where appropriate, a CSD should provide incentives to immobilize or dematerialize securities.	The majority of issuances (roughly 99 percent) are already done in immobilized form. To simplify and shorten the admission process of issuing certificates, warrants and certain types of bearer bonds, CBF offers its participants the eMISSION Service, which allows issuers to electronically submit the terms and conditions of issue and the basic data for new issues of securities certificates etc. to CBF. In addition to government bonds (where dematerialized issuance has been possible for some time), dematerialized issuances have been enabled through the newly adopted Electronic Securities Act (eWpG), which entered into force on June 10, 2021. Issuers are now able to issue securities electronically in dematerialized form. The eWpG provides a reliable legal framework for the issuance, trading and custody of electronic securities. The new law is a welcome step in the direction of modernizing German securities law. CBF is setting up a solution together with the relevant market participants to make the most of the new opportunities provided by the eWpG. This solution will facilitate both the issuance process and the lifecycle management of securities.
Key Consideration 4 A CSD should protect assets against custody risk through appropriate rules and procedures consistent with its legal framework.	CBF obtains a third-party legal opinion in respect of the legal protection afforded to the securities deposited with CSDs or sub-custodians in each market pursuant to local laws (in particular insolvency protection). When appointing a CSD or sub-custodian, CBF reviews the custody risks associated with the decision to entrust the securities to the sub-custodian. CBF assesses and regularly reviews the custody risks associated with each CSD or sub-custodian with whom it has securities accounts. CBF publishes the main contents of the legal opinion in the "Legal arrangements" section of the Market Link Guide on the Clearstream website. CSDs and sub-custodians are requested to provide a Three-Point-Declaration in which the non-German custodian confirms that the

	securities delivered into safe custody by the depository are kept separate from the CSD's and sub-custodian's assets in the event of its insolvency and that, as a matter of principle, it will not assert any rights of lien or rights of retention in relation to these securities. The Three-Point-Declarations are also published on the Clearstream website under Company Governance / Regulation.
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.	CBF offers its participant consolidated as well as segregate accounts. The participant can maintain a consolidated account, in which the securities holdings of multiple underlying clients of the participant are booked together, corresponding to the omnibus client segregated account (OCS). The participant may choose to set up separate deposit accounts to segregate the securities of its individual clients from the holdings of the participant and of its other clients, corresponds to the individual client segregated account (ICS). Furthermore, the securities received as a deposit, or held in an account, are separated from CBF's own proprietary positions and are off-balance sheet. German law (section 2 DepotG) provides for the separate safe custody of securities in the case of individual safe custody. However, since most securities to which numerous rights are attached, are frequently vested in global certificates, (according to the Deposit Act) the participant accounts held by CBF are managed as a third-party deposit (in either ICS or OCS account type). This means that participants, as co-owners in the securities of the same type in deposit, benefit from a right in rem on these securities. This policy is available at https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/csdr-article-38-disclosure CBF's participant assets held at foreign CSD are booked in an omnibus account in CBF's name and segregated from the proprietary assets of the foreign CSD. The segregation makes the recovery of assets by participants easier in the event CBF becomes insolvent. CBF participants' assets deposited with CBF are governed and protected by the provisions of the DepotG and the German Insolvency Act.

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.	CBF has procedures to identify, measure, monitor and mitigate the risks from other activities. In addition to safekeeping and administration of securities and settlement, a variety of functions are performed for financial institutions across selected markets and financial instruments. CBF also performs cash management and FX services, as well as financing, lending and borrowing services. It also offers investment funds related services, including an order routing solution (Vestima). Comprehensive custody management includes withholding tax and proxy voting services. For collateral management agency services, credit and liquidity risks mainly relate to derived asset servicing and settlement activities. For securities lending services, a dedicated legal framework is put in place with each individual participant in addition to the CBF GTC. The foreign exchange services are delivered in accordance with key risk and credit principles: permanent monitoring to identifying large participant positions which may lead to unwanted nostro balances, regular daily reconciliation of cash balances and a contractual framework in place with each of the two CCBs. CBF has measures in place to protect participants against misappropriation, destruction and theft of securities as discussed above.
Key conclusions for Principle 11	Securities in CBF are kept in book-entry form with underlying client assets being fully segregated from those of direct participants and those of direct participants also beingfully segregated from those of CBF. Overdrafts in securities accounts are not permitted. Internal and external reconciliations are conducted on a daily basis to ensure the integrity of securities issues. All CBF transactions that involve the settlement of two linked obligations are conducted using the irrevocable and simultaneous exchange of securities for cash, whether conducted on the T2S or Creation platforms.
Assessment of Principle 11	Observed

Recommendations and Comments	None
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 when finality occurs.	CBF applies delivery versus payment (DVP) model 1 arrangement when settling two linked obligations; securities against cash. Principal risk is eliminated through the irrevocable and simultaneous exchange of securities and cash value during the settlement. From a technical perspective, the T2S/ CASCADE and Creation platforms process all instructions in real time ensuring a simultaneous exchange of delivery and payment. 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 ensured through regular system regression testing activities. CBF has outsourced the settlement of transactions in securities in collective safe custody (CSC) to the T2S platform. This includes transactions against CBM (with cash settling on T2) as well as transactions in foreign currencies (with securities settling free of payment in T2S, and cash settling on the Creation platform). A real-time interface between T2S and CBF ensures the exchange of settlement information as well as the consistency of the instructions in T2S and CBF.
Key conclusions for Principle 12	Principal risk is eliminated in CBF through the use of DVP model 1 mechanisms, i.e., the irrevocable and simultaneous exchange of securities and cash with the settlement of securities conditioned upon the settlement of the cash and vice versa.
Assessment of Principle 12	Observed
Recommendations and Comments	None

<table>
<tr><th colspan="2">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.</th></tr>
<tr><td>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.</td><td>Participant default rules and procedures

CBF has Default Management Process (DMP), rules and procedures, 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. CBF defines two types of default:

• General default, when a participant is unable to fulfil its contractual obligation according to an agreement with Clearstream where insolvency proceedings are opened against a participant.

• Contractual default, according to which a participant is unable or unwilling to fulfill, in a timely manner, one or more of its scheduled obligations according to an agreement with CBF.

In order to identify a default and classify it in accordance with the above-mentioned default types, CBF has established the Early Warning Framework which is based on early warning indicators and their monitoring thresholds, These indicators have been determined based on identified risks in the various business areas, such as custody, settlement, treasury, securities financing, etc.

The following chart describes different phases of the DMP, which consist of (i) monitoring (identifying participant's default at an early stage and taking some 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 the actions to be taken by the CSD (as per ESMA guidelines) to its competent authority and the defaulting participant. .</td></tr>
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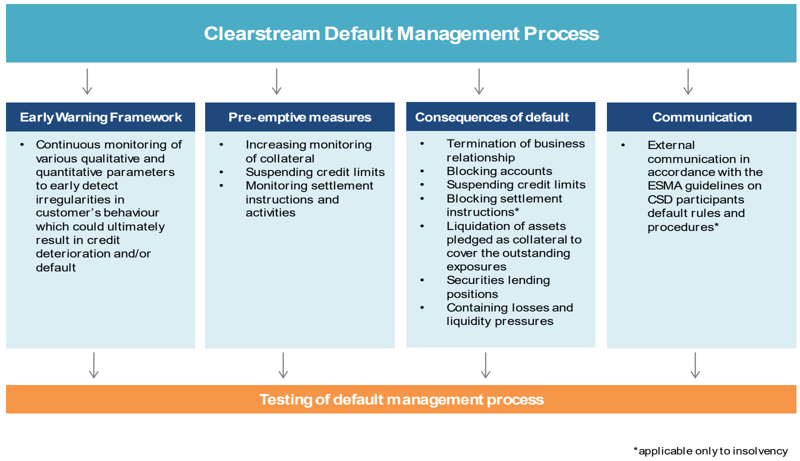

Use of financial resources

The Default Management Procedures define the defaulting participant's assets as being the first financial resource to be used in order to cover the outstanding exposures and therefore minimizing losses for CBF. The Recovery Plan lists other financial resources which are to be used to recover from a major potential loss. This includes the increase of equity by the parent company and/or third-party investor, intragroup funding and earnings retention.
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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.
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In case of a participant default, the Clearstream Default Management team (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 default management process. The key objectives of liquidation are to (i) minimize the losses for CBF; (ii) limit disruptions to the market by ensuring a smooth collateral liquidation and a timely completion of; and (iii) sell collateral in a prudent and orderly manner.
Only participant's proprietary assets are subject to liquidation in case of default. The underlying clients' assets are segregated in dedicated accounts and cannot be pledged under the pledge permitted by the CBF's GTC. Underlying client's assets are, therefore, not subject to liquidation or off-set in case of participant default (if not specially agreed otherwise).
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	CBF's GTC and its uncommitted intraday technical overdraft facility agreement (TOF agreement) govern the right of pledge over participant's proprietary assets and their enforcement of those assets in case of a participant's default. Based on this, the DMP of CBF defines the operational processes which enable CBF to promptly access the above-mentioned pledged assets in case of a participant default and liquidate them in order to cover the outstanding exposures of the defaulted participant. All default management processes and procedures are reviewed, tested, updated and approved by the CBF EB 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 Clearstream website https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/clearstream-default-management
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 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 default rules and procedures or upon the request from its competent authority. In accordance with the ESMA guidelines and depending on the type of test, CDM involves various stakeholders (including participants, relevant FMI and the competent authority) to take part in such tests. CDM tests the default management process to ensure that all relevant participants are familiar with their roles and responsibilities in the DMP. CDM also discloses the outcome of the performed tests and anycontemplated changes to its default rules and procedures, if needed, on Clearstream's website. Furthermore, CBF offers participants the opportunity to be involved in the Clearstream default management framework by going through Clearstream's default rules and procedures.
Key Conclusions for Principle 13	Clear Default Management rules and procedures are in place to effectively manage the default of a CBF participant. CBF has developed a comprehensive Early Warning Framework that

	makes use of indicators and appropriate monitoring thresholds to detect impending deterioration or default. Testing (and the ongoing revision) of Default Management procedures, involving selected participants, is conducted on a regular basis, the outcomes of which are disclosed on the Clearstream website.
Assessment of Principle 13	Observed
Recommendations and comments	None
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.	
Key Consideration 1	Not applicable
Key Consideration 2	Not applicable.
Key Consideration 3	Not applicable.
Key Consideration 4	Not applicable.
Key conclusions for Principle 14	Not applicable
Assessment of Principle 14	Not applicable
Recommendations and comments	Not applicable
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 materialize. 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	The business risk reflects the sensitivity of CBF to macroeconomic developments and its vulnerability to risks arising from other external threats. It is translated into EBITDA terms, reflecting both a potential revenue decrease and a potential increase of its cost base. CBF's financial performance is subject to the evolution of a number of macroeconomic as well as business related factors such as the level of interest rates, projected economic growth of business segments within CBF, new regulations, unforeseen

excessively large operating expenses.	mergers and acquisitions, poor execution of projects, non-achievement of strategic targets, rising competition levels, reputational risk, and also investors' confidence in the economic environment in the Euro zone. 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. Identification and management of business risk scenarios are performed by business experts within CBF with the support of risk management and are based on the group-wide scenario catalogue to ensure consistency. Each year new scenarios are identified by business experts. Details on responsibilities, process and procedures with regards to risk management are documented in Clearstream's Business Risk Handbook. The Handbook is reviewed annually and updated as needed. Clearstream Risk Management organizes joint workshops with business owners and performs scenario analysis workshops, along with capital model calculations. During a scenario analysis workshop, experts' opinions on the severity and frequency of business risk events are collected. Clearstream Risk Management documents and validates the results, challenges the underlying severity and frequency estimations and addresses all changes and deviations accordingly. The KRIs are used as an early warning system for business risk. Through the identification and measurement of leading indicators, e.g., deviation from projected revenues or costs, information on changing levels of risk is received at an early stage. This methodology relies on the monthly review of a defined set of KRIs. The KRIs and thresholds should be linked to existing risk scenarios and are reviewed with the business areas at least in the course of the scenario analysis process. All KRIs are collected and analyzed by Clearstream Risk Management on a monthly basis. KRI information is analyzed for trends and monthly breaches. The results of KRI analysis are used to proactively update the scenario database and/or trigger a re-assessment of the company business risk's estimations. Furthermore, as an additional level of assessment, Clearstream Risk Management performs stress testing. The stress testing approach compares several stress situations, such as materialization of a

	worst-case scenario and materialization of all scenarios at the same time with the projected annual EBITDA. In addition, reverse stress tests are performed where the impact on the available risk-bearing capacity is analyzed. Results of the stress tests indicate that potential losses arising from business risk are matched by adequate risk-bearing capacity. In order to ensure completeness and the timely update of the business risk framework, CBF regularly monitors the main business risk drivers, analyzing the information received by different organizational area.
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 achieving a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.	The reports received by Clearstream Risk Management include detailed information on CBF's profit & loss figures, operational expenses, cash flows, project controlling, etc. Through a regular monitoring and analysis of the information received, Clearstream Risk Management is able to identify trends and evolutionary changes related to CBF's internal/external business environment. In order to be compliant with Capital requirements under the CSDR, CBF applies all the following: • Estimates the capital necessary to cover losses resulting from business risk on reasonably foreseeable adverse scenarios relevant to its business model; • Documents the assumptions and the methodologies used to estimate the expected losses in the scenario documents; • Reviews and update the scenarios at least annually The capital requirements of a CSD for business risk shall be whichever of the following is higher: • the estimate resulting from the application of the scenario analysis, minus whichever of the following is the lowest: • the net income after tax of the last audited financial year; • the expected net income after tax for the current financial year; • the expected net income after tax for the previous financial year where audited results are not yet available; • 25 percent of the CSD's annual gross operational expenses.

Key Consideration 3	**Recovery or orderly wind-down plan**
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, 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 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 as given. A suitable number of viable recovery options has been identified for scenarios where 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, e.g., capital injection by parent company, retention of earnings, cost reduction, usage of several liquidity buffers, intragroup funding, revolving credit facilities, etc. In addition, there is a range of recovery measures aimed at restoring operational capacity or strengthening the risk profile. These options are outlined in further detail in the recovery plan. Both the risk and financial profiles of CBF have proven to be robust and only an extreme event would trigger a near-default situation. As mentioned, CBF has a number of recovery options, which would be implemented as an appropriate response to a 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. As such, CBF is able to respond very quickly to a crisis event and implement the necessary mitigating tools in a timely manner. In the restructuring and wind-down plan, several tools have been identified as being applicable in restructuring and wind-down scenarios. The differentiation of the scenarios is undertaken on the basis of the criteria and requirements stipulated by the CSDR and

	taking into account the applicable tools accordingly. These tools vary in their applicability and feasibility depending on the scenario. **Resources** According to the analysis in the restructuring and wind-down plan, CBF holds liquid net assets funded by equity equal to at least *eight 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. This ensures that CBF is adequately protected against operational, legal, custody, investment and business risks so that CBF can continue to provide services as a going concern.
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 10 years. These assets are exclusively EUR-denominated ECB eligible L1 HQLA assets (CBF's equity is only in EUR currency) and are kept unencumbered on a separate account under the direct management of the liquidity management function (Treasury), which may only be used as a source of contingent funds during stress periods. These assets are directly transferrable to the Bundesbank to generate intraday 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.	The recovery plan of CBF includes a range of measures that CBF could take to restore its equity profile or raise additional equity (e.g., recovery option 'equity injection by parent company') should it fall close to or below the amount needed to ensure a going concern. For instance, equity could be provided by DBAG or by a third-party investor. The amount of new equity depends on the available resources of DBAG or the amount a third-party investor is willing to invest in Clearstream Group. Should an equity increase be needed, CBF will activate recovery options such as (i) first retain earnings, (ii) then increase equity through the parent company and (iii) finally increase equity through selected third-party investors. As aforementioned, the recovery plan is subject to CBF EB approval. Furthermore, the plan is tested at least annually to ensure its effectiveness and a continuous improvement.
Key Conclusions for Principle 15	General business risks are well managed by CBF. CBF has developed an early warning system that uses detailed information relating to such things as CBF profitability, operational expenses,

	cash flows and project expenses to monitor the performance of the organization. Stress testing compares several stress situations against projected EBITDA and statistical models are designed to validate the sufficiency of the risk-bearing capacity within the company. In addition, recovery, restructuring and wind-down plans have been drawn up and are maintained by CBF. A range of identified recovery options ensure that CBF is able to raise sufficient capital or funding to withstand severe stress affecting its capital and liquidity profile. CBF currently holds liquid net assets funded by equity equal to at least eight months of current operating expenses. This is in addition to resources held to cover participant defaults and other financial risks and is considered sufficient to manage and control general business risks.
Assessment of Principle 15	Observed
Recommendations and Comments	None
Principle 16. Custody and Investment Risks An FMI should safeguard its own and its participants' assets and minimize 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.	*CBF's own assets* Prior to the acceptance of any new Treasury counterpart, CBF assesses the creditworthiness of the potential counterpart to ensure that only liquid and solvent institutions are accepted. Those counterparts are subject to credit review at least once a year. Furthermore, it follows market development and uses Watchlist as an early warning indicator, rating changes, etc. Institutions added to the Watchlist are subject to specific risk mitigating measures. *Assets held through links* Whenever possible, CBF holds its assets in accounts at the local CSD. For all types of links, CBF has specific internal procedures and requires external legal opinions to make sure they are compliant with CBF's obligations towards its participants such as the enforceability of the agreement with whom CBF holds its or its participants' assets.

	All depositories and agent banks, appointed by CBF, are contractually required to obtain and maintain all necessary permits, licenses and consents or authorizations required by the applicable law to enable them to fulfil their obligations under the agreement. The legal opinion from an external counsel mentioned above further confirms the relevant and competent regulators of the depositories. Each market is under the supervision of a dedicated Clearstream Network Relationship Manager and a back-up is also designated. Each Network Relationship Manager performs an "end-to-end" role, covering all suppliers and infrastructures for a given market. Moreover, due diligence visits are organized annually to each depository and agent banks, and link arrangement reviews with each CSD. These measures provide Network Management with valuable information about the market and the opportunity to discuss specific subjects such as regulatory changes, market developments, fee renegotiations or potential business developments, including new services and products. CBF maintains a close dialogue with its Operations staff, allowing to rank its suppliers on the basis of MIS data collected by the Network Managers and Operations teams. This is completed by periodic Depository Quality Assessments for suppliers across the network. CBF verifies the compliance of the depository and agent bank with the provisions of the agreement by collecting officer's certificate relating to the internal control system implemented by them on an annual basis; in the officer's certificate the supplier confirms compliance with the agreement; that effective internal controls are in place for the securities, that such controls are being reviewed at least annually by the supplier's 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. The CCBs are also subject to similar obligations compared to those of the depositories, as described above
Key Consideration 2 An FMI should have prompt access to its assets and the assets	CBF has immediate access to its own and participant´s assets. CBF own assets are held via CBL and immediate access is granted.

provided by participants, when required.	Immediate 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 lien and no pledge can affect the assets and the Legal Opinion as described in the previous Key Consideration verifies this as well. In case of a participant's default, Clearstream will ensure that all accounts holding pledged positions will immediately be 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 its or to its participant's assets, Clearstream monitors the quality of the service provided by its suppliers and their adherence to the standards defined in the contractual arrangements.
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.	The optimal reduction of exposure to depository and custodian banks is achieved by holding assets under custody directly with the respective CSD. Currently the vast majority of securities are held under this structure. CBF understands its exposures towards CSDs, depositories and investment banks and monitors its exposures on an aggregate basis. Since custodians can have different roles such as CCB, participant issuer of securities, CBL is defining limits for each role assumed. Furthermore, for institutions playing multiple roles, exposure is monitored on a consolidated basis in order to track any high concentration of risk exposure.
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, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.	**Investment strategy** The primary objectives are to manage own funds and participant cash in order to ensure: • Capital preservation, i.e., minimizing credit and market risk, and • Access to liquidity to ensure satisfying payment obligations at all times. CBF has outsourced its Treasury function to CBL. CBL's Treasury Front Office function is operated by Treasury Luxembourg/Singapore.

	CBF's investment strategy forms part of its liquidity risk management strategy and is initially described in Principle 7. Further details are available via the Pillar III report. The report is published on: https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/pillar-iii-disclosure-report/pillar-iii-disclosure-report-1278114 CBF is not involved 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, which might lead to interest rate risk in the banking book and remain unencumbered at all times to instruct an immediate sale or monetization if required. The investment Policy defines the limits set for securities purchase transactions. **Risk characteristics of investments** Treasury shall invest in highly liquid financial instruments with minimal market and credit risk. To minimize 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. The policy requires that 90 percent of available funds are placed on a secured basis, i.e., deposited with central banks or through arrangements that ensure the collateralization of cash with highly liquid assets. If no access to a central bank's deposit facility has been granted, or if no other alternative secured instrument is available, Treasury shall place uninvested funds among several commercial institutions to avoid concentration risk.
Key Conclusions for Principle 16	CBF has well-defined custody and investment policies in place. CBF's investment portfolio comprises exclusively EUR-denominated, HQLA assets, which remain unencumbered and are under the direct control of the treasury, a function outsourced to CBL. CBF has immediate access to its own and customer assets. No liens or pledges can affect access to these assets – even under default circumstances. Legal opinion is obtained for each linked

	jurisdiction to ensure that this principle protects CBF client assets that might be held in a CSD where CBF is a direct participant. As the primary objective of CBF's investment strategy includes capital preservation and appropriate access to liquidity, CBF does not engage in proprietary trading activities.
Assessment of Principle 16	Observed
Recommendations and Comments	None
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 fulfillment 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.	CBF established appropriate systems, policies, procedures and controls which are described within the adopted Risk Management framework. The Risk Management framework describes all its policies and procedures regarding operational risks in its Operational Risk Handbook. The operational risk management approach relies on several buildings' blocks, which include: • Organizational structure defining the central and local functions and assigning roles and responsibilities; • Definitions and types of operational risk and categorization into risk classes, including the identification of risk drivers and their mapping to event types and root causes; • Operational risk event data collection process; • Usage of external loss data; • Application of KRIs; • Scenario analysis; • Capital model applied for calculation of the regulatory capital requirements for operational risk using CBL's AMA model as well as the usage of economic capital model for

	determination of required economic capital and earnings at risk; • Reporting integrated information from all operational risk instruments; • IT support through the application of adequate IT infrastructure. **Identification of operational risk** Risk identification involves all operational risk issues relevant to CBF, as well as risk drivers. Risks may arise as a result of internal activities or external factors and the 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 CBF distinguishes between four main operational risk classes: • Availability risk: Losses arising from disruption of service delivery due to unavailability of technical or human resources, including those provided by Critical Service Providers. • Service deficiency: Losses arising from impaired processes or execution due to product, process or execution deficiencies, product flaw, or loss or destruction of participants' assets. • Damage to physical assets: Losses arising from damage to physical assets of CBF, due to natural hazards, accidents, terrorist attacks, or sabotage. • Legal risks and risks associated with business practices: Losses that could arise as a result of non-compliance or inappropriate compliance with new or existing laws, losses from inadequate contract terms or from court decisions not adequately observed in customary business practice, as well as risks from fraud. Single points of failure appear to be mainly related to the risk class 'availability', the most important ones being system outage

	and staff unavailability. This risk is documented in respective operational risk scenarios. CBF uses IT tools support for the identification, monitoring and management of operational risks and ensure the technical environment of CBF remains stable (e.g., ensure processing, monitoring of the infrastructure, etc.). **Management of operational risk** As described in Principle 3, Clearstream Risk Management applies a five-step process for risk management. It consists of the consecutive stages: • Notification stage: All risks are centrally recorded. All organizational units and individual employees must timely notify Risk Management on risks which they have identified and evaluated. • 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. • Controlling/management: Risk mitigation encompasses risk avoidance, risk reduction, risk transfer and intentional risk acceptance. All organizational units and employees must perform risk control, implement mitigating action, and monitor these actions according to the established processes. • Monitoring/reporting: all material risks and related risk control measures are reported at least on a quarterly basis and on ad hoc basis if necessary, to the EB of CBF. The EB 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. **Policies, processes and controls** CBF employs several policies, processes and controls that are designed to ensure that operational procedures are implemented appropriately:

	• Risk strategy: CBF's risk strategy serves as the main source of guidelines regarding the CBF risk principles. The document outlines key principles and strategy statements, which are linked to the overall CBF business strategy. The document further outlines risk appetite limits, regulatory capital and stress tests requirements. • 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. The Operational Risk Handbook covers topics such as the definition of operational risk, root causes, roles and responsibilities (including those outsourced to other Group companies or third parties), building blocks of operational risk management and instruments and methods used within operational risk management processes. • 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 defense governance concept for operational risk management - the Business as first line, the Risk Management function as second line and Internal Audit as third line. 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 sub processes: • 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 covers the management of a project against its approved project plans,

	the scope and costs, relationships with suppliers to the project, stakeholders and communications. • Project closure involves 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.
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.	**Roles, responsibilities and framework** The CBF EB is ultimately responsible for the risk strategy of CBF, and it has the ultimate responsibility to ensure a strong risk management culture. Four roles are recognized: • Executive management: it has been designated as ultimately responsible for risk management, including operational risk. The EB determines an appropriate level of aggregate risk tolerance and capacity and established a risk management framework that is consistent with risk tolerance and capacity. • Risk Owners: They are in charge of establishing a risk culture and raising awareness of operational risk within the organizational unit. They ensure that all individual employees under their responsibility identify potential risks and that Risk Management is timely notified. • Operational Risk representative: The OpRisk representative raises awareness for operational risk within his/her organizational unit. He/she represents the key contact for both the employees of their organizational unit as well as for Risk Management regarding any operational risk related matters and implements the risk management framework within the area of responsibility and coordinates mitigation activities.

	• Individual employees: they must understand the risks taken and perform or support collection of event data, KRIs, and provide expertise if needed. The EB is timely and consistently informed about material risks and the related risk control measures. The reporting is an essential part of Risk Management and is designed to give the EB and SB 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. **Review, audit and testing** CBF's operational risk management framework is approved and reviewed by the EB on an annual basis and is regularly reviewed by internal audit, external audit, and by regulators. The Internal Audit planning process takes into account operational risks within the audit universe. The three-year rolling plan and detailed annual plan are reviewed on an annual basis and approved by the EB, the ACRC, and SB. If considered beneficial, CBF also conducts internal or external reviews of its risk management framework to identify the necessity or possibilities for amendments and improvements.
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, the 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. From a system perspective, the operational reliability objectives are documented within service level agreements concluded between IT and Business Operations that cover business applications availability, response time and internal and external deadlines. Dedicated IT KPIs measure and report the adherence to the contracted service levels. On a monthly basis, the results of the KPIs are reported, reviewed, analyzed and commented by the business owners, the Controls function and the Operations Committee, a subcommittee to the

	EB. The service level agreements are reviewed on a regular basis and adapted to changes in the market environment, participant demands or internal focus.
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.	CBF ensures continuously highest levels of system availability for the core systems. The Creation and CASCADE platforms are designed to cope with settlement volume peaks 50 percent greater than average daily activity. Higher peaks can be directly handled by assigning further infrastructure capacity. So far, situations where operational capacity is neared or exceeded have not been encountered. CBF has capabilities in place to monitor business volumes and IT systems capacity . 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. If deviation is due to increasing volumes (changes of the market environment), capacity increases are performed immediately and backed by capacity on demand arrangements with infrastructure providers in order to ensure the performance. Business volume is monitored throughout the day and during nighttime batch operations. If there is a significant increase in business volume, systems are equipped with additional headroom of unallocated resources to accommodate higher workloads. This key internal indicator, known as "headroom", is the driver for performance improvements or upgrades necessary to sustain this capacity buffer. Each month, a capacity management report including volume trends analysis is produced. Specific thresholds have been defined as an indicator to upgrade IT systems. CBF practices a BCM risk mitigation and avoidance strategy by proactively preparing, identifying risks, assessing the risks and taking preventive precautionary measures to address and mitigate such adverse effects in infrastructure or data center services in the form of developing and upholding business continuity and disaster recovery procedures.
Key Consideration 5 An FMI should have comprehensive physical and information security policies that	**Physical Security** CBF's physical security objectives are defined in DBG's corporate security policy and Physical Security Standard, based on industry-level standards. All procedures relating to physical security are following different security standards, such as ISO 27000, and

address all potential vulnerabilities and threats.	industrial standards, DIN-EN rules. The effectiveness of the physical access control management is recognized through the ISAE 3402 issued by KPMG. 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, segregated in a general part and a location specific part. 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 include: • An access control system that is in place for all premises with access logs being kept. A card access system is in place for all areas, monitored 24/7. There are additionally armored 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 central and its fire detectors. Furthermore, the SMS is connected to an intrusion alert system. Surveillance of technical installations (temperature etc.) is also installed. **Information Security** CBF has implemented a comprehensive Information Security Framework (ISF) to achieve security objectives for confidentiality, integrity, availability and authenticity while also setting clear organizational roles and responsibilities. There is a dedicated Chief Information Security Officer, who reports to the EB and supports the colleagues in business, IT, and especially CBF 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. The ISF takes a risk-based approach to Information Security management and covers a wide range of Information Security related Information Security Management, Datal Leakage Prevention and Acceptable Use, Data Centre Security, Incident and Vulnerability Management, Application Security, Secure Software Development, Individual Data Processing, etc. In addition, Information Security and cyber resilience aspects are organized around several teams, including Information Security Engineering, Information Security Assurance, Computer Emergency Response, Information Security Governance and Risks, Identity and Access Management, and Information Security Architecture. Policies and standards are reviewed on a regular basis, at least annually.
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 business continuity plan** CBF strives to provide products and services with utmost reliability. It gives the highest importance to the resilience of its business to safeguard it against incidents and disasters. To achieve this 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 minimize 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 2 hours. In accordance with the policy, the business continuity plans define the processes and resources including systems and the associated RTO, thereby observing an RTO of 2 hours for mission critical functions. Further RTO classes have been defined for functions which can be suspended for up to 24 hours, up to 1 week or more than 1 week. The business continuity plans address the unavailability of systems, workspace, staff and suppliers/service providers in order to ensure the continuity and rapid resumption of the critical operations in cases of major or wide-scale scenarios. **Design of business continuity plan** CBF has developed Business Continuity Plans (BCPs) aims at addressing the unavailability of systems, workspace, staff and suppliers in order to ensure the continuity and rapid resumption of the critical operations even in cases of major or wide-scale scenarios. The incident and crisis management processes addressing the need for effective communications are outlined in the Crisis Management Guideline and is described in detail in the Alert Escalation Process. Each mission critical Function of CBF must establish, implement, develop and maintain a BCP to describe its time critical business activities, associated business recovery requirements and business recovery action plan. Within the design of BCM solutions, Clearstream considers numerous aspects relating to being most appropriate, feasible and effective to meet internal and external requirements. The following business continuity solutions have been implemented and are tested on a regular basis: • Physical Local Backup (Replication - Hot Standby). • Business transfer: Transfer of the processing of activities at the time of the incident to staff located in distant locations. • Dispersed operations (Diversification): pre-positioned dispersal of staff between distant locations on a day-to-day

	basis. • Remote Working. • Staff absence: staff on holidays to be called back to work. Given that IT is a fundamental resource that enables the effective and smooth operations of CBF critical operations, an interface to IT Disaster Recovery has been established. IT Disaster Recovery plans are established by the respective functions operating the different technology clusters. IT related infrastructure recovery, restoration and continuity plans are documented to respond to threats that significantly impact Information and Communication Technology. **Interface to Incident & Crisis Management** An Incident and Crisis Management process is in place to facilitate the coordinated and rapid reaction to an incident/crisis in a controlled and effective manner in order to contain and resolve the incident, minimize 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 EB and Executive Committee levels. An alert system classifies incidents and disruptions according to color 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, custodians, market participants, and regulators, as applicable. **Secondary Site – Business and IT Operations** As part of Clearstream Holding, CBF's operations are allocated across several processing sites around the world; Luxembourg, Frankfurt, Cork, Singapore and Prague. Geographical distance between the 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, Cork and Frankfurt backup facilities provide alternative office space for Clearstream mission critical units in the event their normal office location would become unavailable. As per the 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. The location of the local secondary site has been chosen in order to achieve the following: – Distant enough from the primary location not to be impacted by the same event at the same time (approx. 10 km). – Not too distant in order to ensure that the mission critical units which rely on "local back up" as recovery concept will always be able to reach the secondary location and recover the mission critical operations within the established RTO. **Secondary Site – Data Centers (DC)** The systems architecture is designed to satisfy high availability requirements. The systems infrastructure is duplicated between two distant DC. Components such as network communications, servers and storage are running in parallel in the two centers. Core systems are clustered and load-balanced between the two centers to allow quick take-over in case of failure. Production data is synchronously mirrored in real-time between the two centers, 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 DC. 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. DC capacities and normal load usage are designed and dimensioned to handle full-load operations alone.

	The primary and secondary locations do not share single points of failure. The applications are hosted in 2 DC in Frankfurt with a physical distance of about 8 km, providing an individual, independent and distinct risk profile which prevent impacts from the same disaster event. Specifically: • The DC setup and the application architecture ensure that in case of a failure in one DC or a local disaster causing the loss of one DC RPO=0 (Recovery point objective - no loss of data) and RTO<2h (Recovery time objective - lower than 2 hours) are kept: Full production capacity in each DC available, set up in identical clusters in each Data Centre; Synchronous data replication to meet the RPO target. • Two DCs in Frankfurt, each provides capacity for >100 percent of complete production workload. • Different vendors per DC with respective DBG staff onsite and close by. • Each DC provides emergency power supply and uninterruptible power supply; sufficient diesel supply for both DC is guaranteed. • Each DC is supplied with power from different voltage transformation substation and is connected via with different network carriers and separated house lead-in. • Interconnection between DC is based on different lines from different providers. • Both DC are not in flooding, earthquake or storm zones and not located in flight corridors. • Each DC is located at different priority roads / main traffic hubs. An increase in distance would have an impact on latency for real time data mirroring. To further mitigate risks in the context of an extremely unlikely, simultaneous, outage of both local DCs, the new Data Centre Setup and Strategy aims at providing the basis for solutions. On a first phase the older DC will be upgraded to a new, state of the art, DC to further enhance operational stability. Then, as a second phase, the feasibility of establishing an Out of

	Region (OOR) data center which would provide a cold infrastructure set up for mission critical applications with asynchronous data replication will be assessed **BCP Testing** CBF has 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 be comprehensive, in terms of coverage of critical resources, procedures and plans. BCP solution is tested or drilled regularly to ensure its effectiveness, functionality and to provide assurance that a real incident could be successfully managed. Business Continuity Plans 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 are taking 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 to the BCM tests. Examples of tests which are conducted are • the "workspace unavailability tests" which 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 unit recovery plans. • the "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 plans. The Incident & Crisis Management process is also tested as part of major/large-scale tests to ensure effectiveness of the end-to-end recovery process. Test results are consolidated as part of BCM test reports which are then provided to key stakeholders.

	The systems unavailability tests are planned by the respective IT department and simulate the loss of one data centre. The disaster is simulated by isolating one data centre from the network. All systems are restarted in the second data centre and the capacity and capability to run processing on just one date centre is validated. Participants, CSDs and/or depositories/agent banks as well as critical service providers (CSPs) are invited to participate in this test All BCPs are reviewed every 6 months the respective BCP owners or ad-hoc, when required. If room for improvement or weaknesses are identified by BCM during the execution of the test or reported by organizational units as part of the provided feedback forms, BCM issues test recommendations for remediation and/or risk mitigation. Such recommendations are followed up against agreed deadlines with an identified action owner and reported as part of BCM reports. Furthermore, CBF ensures business continuity preparedness of the linked FMIs (depositories/agent banks) by collecting annually information on their business continuity policies, planning and infrastructure including description of the incident and crisis management, training, awareness, testing and pandemic preparedness. The Business Continuity and disaster recovery plans of the CSDs and/or depositories/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 the FMI's own operations** CBF has identified and manages the main risks that participants, other FMI, and key service providers might posed to its operations. These risks include: • Risks relating to key participants which are mainly operational and may have an impact on CBF's counterparts and CBF's settlement efficiency. These risks are mitigated through continuous monitoring of system usage and global settlement efficiency level, detailed Market Guides documenting the established rules for participants. • Risks relating to other FMIs which are mainly due to service deficiencies, credit risk, legal offenses and business practices. Mitigation for these risks includes (i) BCP arrangements with other FMIs; (ii) ongoing monitoring of the performance and

	creditworthiness of the sub-custodian/agent; (iii) ongoing monitoring of the evolution of the market; (iv) legal agreements including the enforceability of the sub-custodian/agent's obligations and; and (v) legal opinions representing a confirmation of key legal requirements in respect to the market served through the link. • Risks relating to service and utility providers that result from a disruption of the service. These risks are mitigated thanks to (i) the possible choice of messaging provider between CBL proprietary messaging system and SWIFT, (ii) the automatic switch between established communication providers in case of line disruption, (iii) the existence of emergency power generators in case of electricity disruption and (iv) fully redundant IT systems and architecture with no single point of failure. **Outsourcing of critical operations** CBF uses intra-group outsourcing agreements, where all entities within the group are subject to the same requirements on reliability and contingency. The service delivery between two Clearstream's entities is subject to a framework agreement and a formal service definition agreement ("SDS"). The latter also defines qualitative requirements (e.g., service features, quality and performance standards, escalation mechanisms, etc.). The SDS also contain Key Performance Indicators (KPIs) to measure the quality of the respective service. Any outsourcing is 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 (i.e., being compliant with the existing regulation, ensuring banking secrecy, data protection requirements, etc.). 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.

	Relating to risks posed by CBF to others: CBF may also pose risk to other FMIs, in particular, through the links established to other CSDs. The interconnectedness to other FMIs creates some difficulty in being able to substitute CBF's function. These risks are mitigated through: • Due diligence reviews performed on the CBF by its participants and service providers to assess the risks and the risk control framework 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. • CBF has implemented many layers of precaution and protection of its processes and services (business continuity plans regularly tested) and operates a comprehensive risk management framework built on established standards and best practices. • On an annual basis, CBF Risk Management issues the Pillar III report where it discloses company's current risk situation to the public.
Key Conclusions for Principle 17	CBF has established a comprehensive risk management framework which identifies the main operational risks associated with its business practices. IT tools are designed to support the stability of the CBF IT infrastructure. Stringent Change and Project management protocols which include robust system, technical acceptance and business readiness testing regimes that involve users / participants ensure seamless deployment of new or changed systems and functionality. KPIs, based on qualitative and quantitative measures, are used to support comprehensive BCM that incorporates a dual data center strategy with a Recovery Time objective of 2 hours for all critical systems. Business Continuity plans are designed to address the unavailability of systems, workspace, staff and suppliers (including CSPs) and are subject to a comprehensive testing on an ongoing basis. Although the two data centers for CBF are located within 8km of one another, they do not share any single points of failure

Assessment of Principle 17	Observed
Recommendations and Comments	Considering the critical nature of CBF's operations to financial markets, and notwithstanding the planned assessment in this respect, the mission recommends that CBF strongly consider the feasibility and business case for such a third data site.
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** Accordingly, to EU regulation, CBF is required to have publicly disclosed criteria for participation that allow fair and open access for all legal persons that intend to become participants. Such criteria shall 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. According to the CSDR requirements, CBF can deny access to requesting party only when duly justified based on a comprehensive risk assessment. CBF is obliged to stipulate the criteria and risks on which basis it may refuse access. Accordingly, CBF shall only consider legal risk, financial risk, and operational risk when conducting the risk assessment of the requesting party. In addition, rules that prevent the use of the financial system for the purpose of money laundering, terrorist financing and financial sanctions are taken into account. For access to, and participation in, the settlement system, 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 settlement system. Furthermore, CBF has defined criteria for persons who are prohibited from participating in the settlement system (e.g., natural persons, persons from a country subject to a "call to action" by the FATF Task Force, participation by person causing CBF to breach sanction regulation). Lastly, CBF does not foresee

	indirect participation. The criteria and requirements are published on Clearstream's website: https://www.clearstream.com/clearstream-en/about-clearstream/becoming-a-clearstream-customer
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 risks for the safety and efficiency of settlement systems CBF operates. *Legal risks*, CBF considers (a) compliance with the legal requirements for participation in the securities settlement system, including any required legal opinions or legal arrangements; (b) assurance with the rules on the confidentiality of the information provided through the securities settlement system; (c) a counterparty in a third country, subject to a regulatory and supervisory framework comparable to that of the EU, and rules of the CSD concerning settlement finality are not enforceable in the jurisdiction of a party. *Financial risks*, CBF assesses whether a party holds sufficient financial resources to fulfil its contractual obligations towards CBF. The applicant's credit standing is reviewed, considering various qualitative and quantitative factors such as operating environment, liquidity, capitalization, asset quality, profitability, financial support by the parent, etc. *Operational risks,* CBF reviews (a) the operational capacity to participate in the settlement system, including connectivity, communication and cyber risk considerations; (b) compliance with the risk management rules; (c) existence of business continuity policies or disaster recovery plans; and (d) potential changes of its operations and risk management procedures in order to ensure the smooth functioning of the settlement system. 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's participant. CBF endeavors 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. **Least restrictive access** The implementation of the above-mentioned access criteria is 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; and (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. **Disclosure of criteria** Essential required information on CBF's products and services is publicly available in the Customer Handbook, at the following link: https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/customer-handbook Additional information is available on: https://www.clearstream.com/clearstream-en/about-clearstream/becoming-a-clearstream-customer
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	**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 of the German Anti-Money Laundering Act, CBF must continuously monitor the business relationship and the transactions carried out within this relationship. 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 Customer Due

breaches, or no longer meets, the participation requirements.	Diligence Requirements procedure. Such documents are also collected to review participation requirements and initial risk assessments (e.g., 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** In line with Article 56 of the GTCs, CBF reserves the right to terminate or suspend the provision of services to the participant with immediate effect, and without prior notice, if in CBF concludes that the participant is in material breach of any obligation incumbent upon it under the GTCs or any other agreement between CBF and the participant. For the purpose of the GTCs, a material breach shall be interpreted as a breach to an essential obligation of the participant under the GTCs. The termination of business relationship is stipulated in number VIII of the GTC of CBF in line with regulatory requirements. Possible suspension of the service to the participant is regulated by VI and XXII of the GTC, which is available on its website.
Key Conclusions for Principle 18	Access criteria for clients of CBF are designed to avoid undue legal, financial and operational risks thereby optimizing the safety and efficiency of the system as a whole, The criteria are geared towards providing "least restrictive" access to prospective participants and are publicly disclosed on the Clearstream website. The authority to approve (or reject) an applicant lies with the EB of CBF, which also has the power to terminate a participant relationship under defined circumstances.
Assessment of Principle 18	Observed
Recommendations and Comments	None
Principle 19. Tiered Participation Requirements An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.	
Key Consideration 1	**Tiered participation arrangements**

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.	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 recognizes any indirect or tiered participants. Hence, no material risks to CBF can arise due to the absence of any tiered participation arrangements. 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). The key feature of the arrangements governing the deposit of client assets is that each participant's account opened in CBF's system must be designated by its direct participant into one of three categories: 1. Proprietary 2. Client – Segregated 3. Client – Omnibus When a participant's account is segregated, the CBF direct participant is required to disclose to CBF the identity of its underlying client, i.e., 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. In the omnibus structure, CBF's direct participant aggregate the assets of several of its underlying clients. CBF requires that no single interest in a client's omnibus account should exceed 25 percent 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 participant to segregate the corresponding assets onto a dedicated client account. On specific occasions, CBF has a right to collect information on the participants' clients: • CBF can gather information from CBF key participants (as defined by Art. 67 DR 2017/392 (cf. number 4 GTC); • CBF can request declarations and representations from the participant's client as to the purpose of an intended transaction and compliance with legal regulations. The process is conducted by CBF's Relationship Management

	teams 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 Know Your Customer (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 the participant's accounts, in particular with regard to Anti-Money Laundering and Countering the Financing of Terrorism (AML/CFT) 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. In cases where the identity of the underlying client or information relating to the direct participant's client franchise in general triggers heightened AML/CFT, 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. Lastly, in respect of credit risk for the CBF's credit business, CBF 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 the FMI** 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 may cease or temporarily suspend execution of a client's instructions or the provision other services, without notifying the client in advance.
Key Consideration 2 An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.	As a CSD, CBF is obliged to identify, on an on-going basis, material dependencies between CBF's participants and their clients that might affect it and are responsible for a significant proportion of activities, in accordance with Article 67 of CSDR. Clearstream CSDs have thereby established a new Key Participant procedure applicable to the CBF to adequately fulfil the CSDR key participant requirements.
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.	Identification of CBF key participants and related material dependencies: • Underlying clients driven by volumes and values of their transactional trades settled in the CBF SSS, corresponding to 10 percent or more of their settlement transaction activity) is. • Once identified as a CBF key participant this status is reviewed on annual basis. • The CBF key participants are requested to disclose their underlying clients who constitute 10 percent or more of their overall settlement transaction activity. Clearstream Risk management runs, on an ongoing basis, a process to identify the CBF key participants and related material dependencies in the CBF SSS that it operates. The analysis to identify potential material dependencies of the indirect participation is performed at the level of all participants of CBF, taking into account all settled volumes and values for all participants. Upon identification of a key participant with material dependencies, Clearstream's Risk Management notifies the participant to duly inform them of their new CBF key participant status as well as to request them for the disclosure of their underlying participants (material dependencies). This disclosure targets, primarily, their client scope that represents a threshold of at least 10 percent 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

	these clients and confirm that appropriate measures have been imposed on their clients to ensure operational risks potentially stemming from the key participant's participants are adequately managed. In addition, an enhanced key participant due diligence review will be carried out. CBF is able to determine material dependencies between its key participants and its key participants' clients.
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, and the periodicity 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 being pursued and mitigating measures taken where appropriate. As an example, when it is detected that assets deposited by a direct participant, held in a client omnibus account, might expose CBF to the violation of financial sanctions, CBF can transfer the securities to a separate securities account opened for such client. Such detection also leads to an ad-hoc review of the client and its arrangements for compliance with regulations in the area of financial sanctions.
Key conclusions for Principle 19	Indirect participants are underlying clients of a direct participant and therefore only benefit from the services of CBF through their appointed direct participant. CBF is, however, reliant on its direct participants to identify and manage the activities of indirect clients who, by virtue of the volume and/or value of their transactions, are significant relative to the overall business of the direct participant. However, there is no identification of indirect participants based on activity with respect to total CBF activity. Although value / volume thresholds—only relative to direct participant settlement activity—have been set by CBF, CBF is unable to independently monitor adherence to these and it is

	beholden to its direct participants to identify such underlying clients.
Assessment of Principle 19	Observed
Recommendations and Comments	CBF should develop capacity for increasing the transparency with respect to the business of its direct participants' clients and broaden its explicit identification criteria for clients of direct participants to include system-level thresholds.
Principle 20. Financial Market Infrastructure 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 to identify relevant potential sources of risk arising from establishing new links. Before opening a link, CBF conducts a general assessment of the prospective link by Clearstream Material Change Working Group (MCWG). If it is decided that the change should be considered as material(as might be the case when entering into a new link arrangement) the file is presented to Clearstream Risk Committee (CRC). If the CRC supportsthe set-up of the link, a full risk assessment process is coordinated by Network Management with appropriate input from other departments, such as Legal, Credit, Treasury and Operations. Ultimately, CBF's EB is responsible for the approval of a link. The assessment covers several aspects such as: • criteria on securities registration, ownership restrictions, reporting obligations and disclosure requirements. • all agents, where appointed, are evaluated against criteria with regard to anti-money laundering, operational readiness, good reputation and financial soundness. • 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). In case the risk assessment identifies major risks in the local market that cannot be mitigated and/or no agent meets CBF's criteria, no link will be established with that market.

	Risks from existing direct links are also 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, CBF may also choose to visit the CSDs, depositories or custodians 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 above performance monitoring and reviews include: • Ongoing monitoring of the creditworthiness of Clearstream's network of agent banks which is performed by Clearstream's Credit department. • Ongoing review of the risk profile of every link with a special focus when there are operational, legal, creditworthiness or regulatory changes or changes that affect the appointed agent. • The relevant CPMI-IOSCO standards are used in the relevant assessments. • The risk assessment of a new market link, including questions on compliance with market standards.
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 linking CSD and generally include the following: *The Link Agreement:* • For direct links, the terms and conditions are set out in the CSD rules, which sets forth the contractual expectations and responsibilities between CBF and the CSD, local depository. It clarifies the choice of law and the rights and obligations of the parties. • 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 legal opinion:* The legal opinion is requested from an external counsel on an annual basis to represent independent and neutral confirmation of the ability of the CSD and depository to perform as required under the Link Agreement and the Service Level Agreement (SLA) without the risk of being superseded by local regulations or practices. In its contractual relationship with both the issuer CSDs and/or depositories/agent banks, the liabilities remain subject to the usual force majeure and indirect damages clauses. Intermediaries, 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: • Authorized 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. Further information on market practice for each of CBF's domestic links is available in comprehensive Market Profiles and Market Link Guides on the Clearstream website: www.clearstream.com
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	CBF performs annual full credit assessment of any depository and agent it has appointed. These assessments include 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 establishes an internal rating. Clearstream's Credit Department monitors the nostro balances of

fully with high quality collateral and be subject to limits.	all CCBs for the CBF's activity on a daily basis and sets thresholds for every nostro account. If a threshold is reached, it triggers reporting to management and CBF implements actions accordingly. The system is set up to identify large cash balances to be aware of possible credit risk.
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.	CBF does not, ordinarily, allow provisional transfers of securities and cash. Provisional transfers are possible under certain conditions in the context of a link where this is a market practice that cannot be avoided. In all cases, if CBF was faced to provisional transfers, it will 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 has strict procedures when setting up a new link, which include, risk, compliance, credit reviews, an external legal advice and a strong contractual framework. Each step of the new link set-up is reported and approved by senior management committees such as MCWG, CRC, CBF EB.
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 intermediaries that support the operation of a link, on an annual basis. This review consists of: • Review of the creditworthiness • Review and analysis of the AFME questionnaire and underlying documents. The analysis is based on a fixed evaluation grid to be applied in the same manner to all suppliers. • Review of the contractual framework • At least annual review of the custodian'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 supplier has reached again the level of agreed services. • At least annual or, if needed, more frequent Service Reviews.
Key Consideration 7	Not applicable, as CBF does not act as a CCP.

Key Consideration 8.	Not applicable, as CBF does not act as a CCP.
Key Consideration 9	Not applicable, as CBF does not act as a CCP.
Key Conclusions for Principle 20	All link arrangements are contractually documented between CBF and the linking entity. These link agreements set out the contractual obligations of both parties and identify the specific services that are provided via the link. The CBF EB is, ultimately, responsible for the approval of new Link requests. A comprehensive assessment process has been developed to assess technical, operational, legal and credit risks that might be introduced as a consequence of a new link being introduced. A process of continuous monitoring has also been implemented with a review of the legal framework being done, at least, annually. The operational performance of each link is monitored on an ongoing basis.
Assessment of Principle 20	Observed
Recommendations and Comments	None
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.	CBF follows a proactive approach towards its participants by structuring feedback and dialogue in a number of ways, including a series of industry surveys, organized senior executive sessions, specific participant validation during the product/service developmental cycle and one-to-one participant sessions during due diligence visits. Furthermore, CBF works closely with the members of the CSDR user committee. The Committee shall advise the EB on key arrangements that impact its member, including the products and services it offers to its participants in the SSS "CASCADE" and Creation as well as on service level. CBL ensures that the services provided are continuously meeting participants' expectations by having procedures in place to review operational reliability. In this respect, Key Performance Indicators are monitored and deviations are tackled. Furthermore, 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 (bespoke) participant needs. Furthermore, CBF launches a general survey once a year in addition to a transactional request for participant feedback based on day-to-day contact with Client Service.
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.	The business strategy, including objectives and goals, is reviewed on a continuous basis and adapted according to the business conditions CBF faces over time. CBF's strategic goals are encapsulated by the "Clearstream PRIME" strategy with implementation taking place through five key strategic actions: strengthening products, ensuring regulatory compliance, mobilization of growth potential, promote innovation and operational excellence, fostering effectiveness in sales and client services. CBF as a CSD defines and documents clear operational performance objectives and committed service-level targets for its SSS activities and services. The reports are provided on a quarterly basis to its participants via the website. CBF has established a very strict service level measurement discipline and measures KPIs including operational and service level indicators. These are regularly reported to the CBF EB and the most significant ones also to the User Committee and constitute the basis for the continuous improvement of the service. The risk appetite comprises group level aggregate risk, regulatory capital and stress tests. To ensure this objective, adequate measures (controls and mitigating actions etc.) must be in place, including: • Claims due to operational issues should be avoided. • Credit is only given to counterparties with a high credit rating. • Risk concentrations must be monitored and adequately limited. • Treasury placements must be secured against collateral where possible.

Key Consideration 3 An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.	CBF applies several tools to review its efficiency and effectiveness, including: • A Forum for structured, systematic and creative solution identification. This includes a post-claim analysis and identification of appropriate measures. • Key performance indicators (KPI): quantified, objective view on service delivery of Operations and outsourced business activities with indicators for e.g., effectiveness, efficiency, operational quality, and operational risk. • A KPI engine: Data warehouse, linked to major enabling automatic and accurate feed from Operations in order to provide standard and ad-hoc reporting and detailed data analysis. KPIs have been defined in order to measure adherence to the SLA specifications. CBF measures operational KPI STP 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 (e.g., error rates, degree of automation, turnaround times, etc.) including risk elements and capacity utilization. For some IT Operations, KPIs are also defined to measure business applications availability, response time and adherence to contracted internal and external deadlines. If the KPIs are risk related, they are the basis for KRIs, which will be monitored by Risk Management on a monthly basis. In a continuous process, KPIs and KRIs are measured, analyzed and reported to 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. 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 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 to operate under adverse conditions or in the face of unexpected events or

	disasters. 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 business continuity plans. In 2020, the average system availability was 100 percent. The last systems unavailability test, based on the scenario of the full loss of one data center, was conducted in October 2020. The availability of CBF's business critical applications was validated within the RTO period and the infrastructure's security was maintained at all times
Key Conclusions for Principle 21	CBF has put in place mechanisms (through effective and efficient working groups and client relationship management protocols) to ensure that it is able to meet the needs of its participants and the markets it services. The establishment of Working Committees provides effective channels for interaction between CBF and its clients/users. These forums are used to address a variety of topics, including market and system developments, regulatory changes and the management of technical and/or operational disruptions. Smaller clients/users are catered for through a network of Relationship Management personnel that provide the user with a single point of contact to CBF and clear escalation procedures.
Assessment of Principle 21	Observed
Recommendations and Comments	None
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 standardization and has been leading in standards implementations. All connectivity channels are fully ISO15022 (and ISO20022 for Investment Funds) compliant. CBF has also adopted all main reference data standards such as: • ISO 4217 – unique 3-digit currency code;

	• ISO 6166 – unique identifiers for securities (ISIN); • ISO 8109 – unique identifiers for Eurobonds; • ISO 9362 – Business Identifier Codes to identify Banks also known as BIC; • ISO 10962 – Standard for financial instrument classification codes (CFI). CBF is offering its participants access to its fully STP compliant settlement services via multiple connectivity channels all offering secure connections either via public internet, Virtual Private Network, SWIFT or web portal. The selection of the connectivity channel is guided by participant's transaction volume and the features of the in-house systems. CBF's settlement systems are 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, as CBF´s processing is fully straight through processing (STP). For file transfer, CFB also offers bi-directional high-volume data transfer, both ISO 15022 and 20022 messages as well as human readable messages. The CASCADE system is based on ISO 15022 and ISO 20022 message terminology. 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 ISO15022 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 is ISO20022. **Communication standards** For CBF participants acting in ICP (Indirect Connected Participant) mode or DCP (Direct Connected Participant) mode: • Online via CASCADE-Host and CASCADE-PC/HOB RD VPN; • 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 ISO20022 standards and terminology). • Xact via SWIFTNet FINplus (also supports Shareholders Identification Disclosure Requests seev.045 and seev.046 in ISO 20022 format). Additionally, for CBF participants acting in DCP mode: • Online via the web-based T2S GUI via SWIFT or SIA-Colt. • • ISO 20022 messages to T2S via SWIFT or SIA-Colt network.
Key Conclusions for Principle 22	CBF is fully compliant with the appropriate ISO (15022 and 20022) standards as well as IP based and EPTF communication protocols. All CBF settlement service are fully STP compliant and CBF is an active participant in a variety of standards bodies and market user groups to ensure that it remains abreast of developments in the market.
Assessment of Principle 22	Observed
Recommendations and comments	None
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 and fees and other material costs they incur by participant 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 described in Principle 1, that enable the participants to identify clearly and understand fully the risks and responsibilities as participant in CBF's system. These documents are written in comprehensive and clear manner to help the participants understanding: • the fees applied to the services (the fees are published in the Fee Schedule); • system design and operations (these are set out in the Participant Handbook, the Market Link Guides, Connectivity Manuals);

	• participants' rights and obligations (the GTC and Special Conditions); and • the risks of participating in the system (the Participant Handbook(s), the Market Link Guides). The documents are made available publicly to all current and prospective participants and updated regularly and can be found on Clearstream's 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. During these sessions and via direct access to Client Services, CBF collects the comments and takes the necessary steps to rectify any perceived lack of understanding by the participants. • German GTC law requires GTC to be clear and comprehensible. CBF GTC are the legal basis of the contractual relationship between CBF and its participants. • Operational information review is performed at least twice per year or whenever there is a major IT release. • CBF publishes webinars and videos on its website in order to provide punctual and specific information on CBF's products and services as well as CBF events. CBF has published an overview of its default rules and related procedures. The default management process is available at the following link: https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/clearstream-default-management CBF furthermore publishes some general information on its Business Continuity Framework in both the CPMI IOSCO Disclosure Framework and the Association of Global Custodians questionnaire; both documents are available on Clearstream's website. Links are: https://www.clearstream.com/clearstream-en/about-

	clearstream/regulation-1-/cpmi-iosco-disclosure-framework-1278124 https://www.clearstream.com/clearstream-en/products-and-services/association-of-global-custodians-disclosure-1277124
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 GTC and in the Customer Handbooks such as CASCADE Online Handbook, CASCADE-PC User Manual, Xemac® User Manual and Connectivity Handbook, which are publicly available via the CBF' website. These can be downloaded in German (binding version) or English (convenience translation) from the following web site: https://www.clearstream.com/clearstream-en/keydocuments-1-/CSD Furthermore, CBF uses Announcements that provide details of changes in custody and clearing and settlement information, changes in taxation, changes to fees and charges, and other information about changes in the markets and CBF's products and services. Finally, CBF discloses information on its governance (composition of the management bodies, articles of association and the shareholding structure, 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 the services, but also on CBF's legal, regulatory, corporate, commercial and operational environment.
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.	Within its world-wide client services structure, CBF maintains a proactive relationship model. Participants are constantly informed about any changes and enhancements to CBF systems via announcements on Clearstream's website. Participants can also subscribe to receive alerts via email of the publication of such announcements. The Client Services team is the general contact point for daily operational queries. The Client Services Officers – available on a 24-hour basis through Clearstream's global network of offices - provide a single, accessible 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 Relationship Managers meet with their

	participants in person on at least an annual basis. Participants are offered training on ad-hoc basis on subjects of their choice. Specific training is offered by the Client Connectivity to help participants understanding the technical setup in place and to ensure they are fully aware of the functionalities available and their limitations, contributing to establishing risk awareness on Clearstream's products.
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 Art. 34 of the CSDR – at the level of individual services in the Fee Schedule and are intended to help participants understanding the fees applied to the services: https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/fee-schedule/clearstream-banking-fee-schedule-1577174
Key Consideration 5 An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO Disclosure framework for FMIs. 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. CBF also publishes its monthly figures; please refer to the most recent publication at the following link on its website (www.cleastream.com): Clearstream's monthly figures
Key Conclusions for Principle 23	CBF makes extensive use of its website to communicate with its user base. Additional information is freely available with a secure portal available for more sensitive data. CBF has completed the CPSS-IOSCO Disclosure framework for FMIs. Although Fee schedules are published, customers have raised some concerns with regard to their complexity and the difficulties associated with reconciling invoices.
Assessment of Principle 23	Observed
Recommendations and Comments	It is recommended that CBF work more closely with its customer base to decrease the burden of invoice reconciliation.

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.	
Key Consideration 1	Not applicable.
Key Consideration 2	Not applicable.
Key Consideration 3	Not applicable
Key Conclusions for Principle 24	Not applicable
Assessment of Principle 24	Not applicable
Recommendations and Comments	Not applicable