# Pillar III Disclosure Report of Clearstream Banking S.A. 2021

Disclosures as of 31 December 2021

April 2022

# Pillar III Disclosure Report of Clearstream Banking S.A. 2021 - According to Part 8 of Regulation (EU) No. 876/2019 (Capital Requirements Regulation II, CRRII) and No. 575/2013 (Capital Requirement Regulation, CRR), in conjunction with § 26a German Banking Act (Kreditwesengesetz, KWG).

April 2022

Document number: 7244



Clearstream Banking S.A. is a Clearstream Holding AG company, which is a Deutsche Börse Group company.

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# Foreword

The purpose of this document is to meet regulatory disclosure requirements, based on the revised Basel banking framework, known as "Basel III". At the European Union (EU) level, the disclosure framework covers the Basel III requirements, and includes additional components as laid down by 2019/878 (CRD V), Regulation (EU) No. 575/2013 (Capital Requirements Regulation, CRR), and Regulation (EU) No. 876/2019 (Capital Requirements Regulation 2, CRR 2).

Clearstream Banking S.A. is a directly fully owned subsidiary of Clearstream Holding AG (CH), which is a financial holding company as defined in Art. 4 Paragraph 1.20 CRR 2. Together with its subordinated companies, CH forms a financial holding Group under German law.

# Impact of current events on Clearstream Banking S.A.

## COVID-19 (SARS-CoV-2)

The impact of COVID-19 has taken a toll on global financial services, and society.  To the degree of Clearstream Banking S.A.'s business, we implemented a sound work-from-home policy, that allowed our business to continue operating with little or no interruptions. Our risk exposures have been minimal from our clients given the institutional nature of our customers and has not impacted Clearstream Banking S.A.'s business.

## Russia-Ukraine War

On 24 February 2022, Russia began a military invasion of Ukraine. Following the invasion, NATO allies led by the United States of America, the European Commission (EC), and G7 members, financial and non-financial sanctions were implemented against the government of the Russian Federation, the Central Bank of Russia, and Russian oligarchs and government officials. These developments impacted Clearstream Banking S.A. operations on the links to the Russian Federation on instruments issued by targets of sanctions. The daily Assets Under Custody (AUC), linked to these exposures, decreased significantly from 31 December 2021.

Clearstream Banking remains vigilant to be compliance with the sanctions implemented in the EU and abroad, and Clearstream Banking S.A. remains well-capitalised in the event of a deterioration in the dynamic of the Russia-Ukraine war. In conclusion, no successful cyber-attacks stemming from the current situation have been observed against the Bank's infrastructure.

# 1. Introduction

## 1.1. Regulatory Framework

In 2004, the Basel Committee on Banking Supervision ("BCBS") published its standards governing the capital adequacy of internationally active banks ("Basel II"). The Basel framework consists of three mutually reinforcing pillars, as outlined below.

- Pillar I concerns the minimum quantitative (capital) requirements related to credit, operational and market risks
- Pillar II requires banks to integrate the risks of Pillar I and further significant and substantial risks into integrated capital management and risk management considerations. Additionally, the interaction between the banks' own assessments and the banking supervisors' review is prescribed
- Pillar III promotes market discipline through disclosure and thereby transparency to the public

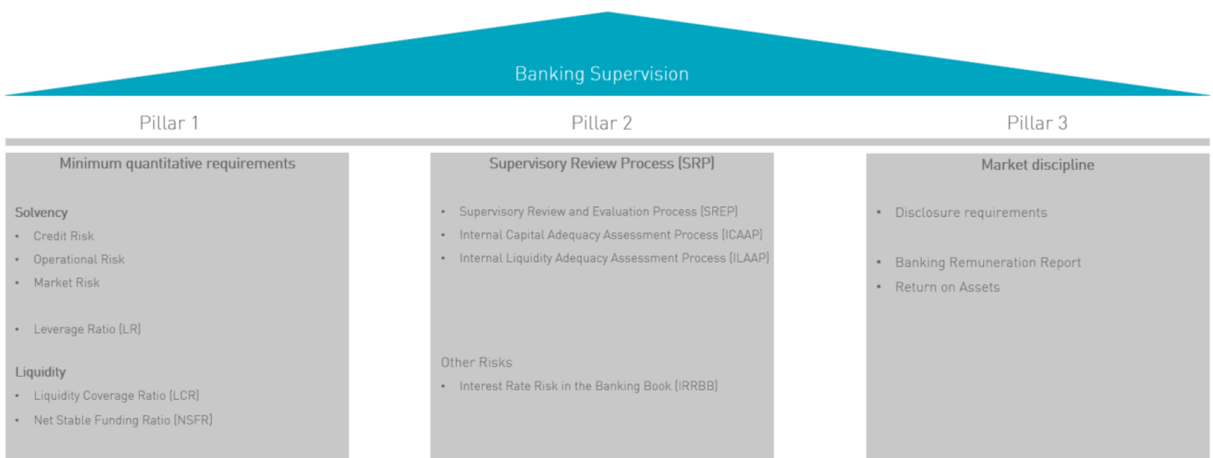


*Figure 1: Overview regulatory framework*

In December 2010, the Basel Committee on Banking supervision published the global regulatory framework on minimum capital and liquidity requirements for banks, commonly known as Basel III, a set of standards aiming at strengthening the stability and resilience of the banking system. The Basel III standards were further enhanced through, among others, the revision of existing frameworks for assessing risk weighted assets (RWA) most notably through publication of the "Basel III: Finalising post-crisis reforms" in December 2017.

The first elements of the Basel III standards were implemented in European law by the Capital Requirements Regulation (EU) No 575/2013 (CRR) and the Capital Requirements Directive 2013/36/EU (CRD), generally applying since 2014. In May 2019, a revised prudential regulation package was adopted, further transposing the Basel III standards into European law through amending the CRR (through Regulation (EU) 2019/876 or CRR 2) and the CRD (through Directive (EU) 2019/878 or CRD 5).

In addition, the EU banking package published in May 2019 also contained a revised Banking Recovery and Resolution Directive (BRRD, amended as per Directive (EU) 2019/879 – BRRD2), reflecting changes related to legislation on the Minimum Requirement for own funds and Eligible Liabilities (MREL) and the Total Loss-Absorbing Capacity (TLAC) for global systemically important institutions. Expect for dedicated exemptions, CRR 2 applies since 28 June 2021, whereas CRD 5 was transposed in Luxembourg law through the Law of 20 May 2021, which entered into force on 25 May 2021.

The key elements of the CRR 2 and CRD 5 that are relevant to Clearstream Banking S.A. (hereinafter "the Bank," "CBL," "Clearstream") include:

- The introduction of eligible liabilities as a new category alongside own funds;
- A binding leverage ratio of 3% of total exposure measure (unweighted) serving as backstop requirement (excluding CSD's banking type ancillary services from exposure measure);
- An amended Standardized Approach for Counterparty Credit Risk (SA-CCR);
- Changes to the large exposure regime;
- Extended reporting requirements;
- Extended disclosure requirements as CBL qualifies as a large institution; and
- Revised remuneration requirements, including the obligation to have a gender-neutral remuneration policy and the introduction of an extended deferral period for variable remuneration.

The EU rules deviate in some respects from the Basel III standards to take into account some European specificities. One key amendment is the introduction of the proportionality concept, which exempts small and non-complex institutions from certain obligations while subjecting large institutions to enhanced requirements. Furthermore, the adjustments consider specific activities and pass-through models not undertaking any significant maturity transformation, including activities conducted by CSDs. As such, CRR 2 contains important amendments from a CBL perspective.

According to Article 6 (4) point (b) CRR, institutions authorised as CSDs according to Article 16 and point (a) of Article 54 (2) CSDR are exempted from the Net Stable Funding Ratio (NSFR) on an individual basis. Similarly, exposures of CSDs authorized as credit institutions arising from banking type ancillary services offered to participants in a securities settlement system and holders of securities accounts, have been excluded from the total exposure measure of the Leverage Ratio according to point (o) of Article 429a (1) CRR, as those activities do not create a risk of excessive leverage.

With these exemptions, the impact of the new regulatory requirements on Clearstream Banking S.A. was significantly reduced.

The Basel III standards are not yet fully transposed into European Law. To provide banks with greater operational capacities to react to the ongoing COVID-19 crisis, the Basel Committee on Banking supervision deferred the implementation of the 2017 reforms, initially foreseen for 1 January 2022, by one year to 1 January 2023. With publication of three legislative proposals in October 2021 amending CRR, CRD as well as BRRD, the EU initiated the finalization of the implementation of Basel III.

While the proposed introduction of the Output Floor limiting minimum capital requirements calculated with internal models to 72.5% of minimum capital requirements calculated with standardised approaches, is not expected to affect CBL, proposed changes relating to the use of the credit risk standardised approach, the calculation of capital requirements for operational risk and identification, management and disclosure of ESG risk will be respectively monitored closely to ensure timely and appropriate implementation. The legislative proposals currently foresee application of the newly introduced and amended requirements as of 1 January 2025.

In addition to the previously mentioned regulation and directive, this report considers the following regulatory publications:

- Commission Implementing Regulation (EU) 2021/637 of 15 March 2021 laying down implementing technical standards with regard to public disclosures by institutions of the information referred to in Titles II and III of Part Eight of Regulation (EU) No 575/2013 of the European Parliament and of the Council and repealing Commission Implementing Regulation (EU) No 1423/2013, Commission Delegated Regulation (EU) 2015/1555, Commission Implementing Regulation (EU) 2016/200 and Commission Delegated Regulation (EU) 2017/2295
- EBA/GL/2014/14 of 23 December 2014: Guidelines on materiality, proprietary and confidentiality and on disclosure frequency under Article 432 (1), 432 (2) and 433 of Regulation (EU) No. 575/2013
- EBA/GL/2016/11 of 14 December 2016: Guidelines on disclosure requirements under Part Eight of Regulation (EU) No. 575/2013
- EBA/GL/2017/01 of 21 June 2017: Guidelines on LCR disclosure to complement the disclosure of liquidity risk management under Article 435 of Regulation (EU) No. 575/2013
- EBA/GL/2018/01 of 16 January 2018: Guidelines on uniform disclosures under Art. 473a of Regulation (EU) No. 575/2013 as regards the transitional period for mitigating the impact of the introduction of IFRS 9 on own funds
- EBA/GL/2017/11: Guidelines on internal governance under Directive 2013/36/EU, which have been repealed with effect as of 31 December 2021 and replaced by EBA/GL/2021/05 of 02 July 2021: Final Report on Guidelines on internal governance under Directive 2013/36/EU.
- EBA/GL/2015/22: Guidelines on sound remuneration policies under Articles 74(3) and 75(2) of Directive 2013/36/EU and disclosures under Article 450 of Regulation (EU) No 575/2013, which have been repealed with the effect as of 31 December 2021 and replaced by EBA/GL/2021/04 of 02 July 2021: Final Report on Guidelines on sound remuneration policies under Directive 2013/36/EU.
- EBA/GL/2017/12: Joint ESMA and EBA Guidelines on the assessment of the suitability of members of the management body and key function holders under Directive 2013/36/EU, which have been repealed with effect as of 31 December 2021 and replaced by Joint ESMA (ESMA/36-36-2319) and EBA (EBA/GL/2021/06) Guidelines on the assessment of the suitability of members of the management body and key function holders.

- CSSF Circular 17/673 referring to Guidelines on Disclosure Requirements under part eight of Regulation (EU) of 14 December 2016 as amended on 9 June 2017
- CSSF Circular 18/676 referring to Guidelines on LCR Disclosure to complement the disclosure of Liquidity Risk Management under Article 435 of Regulation (EU) No. 575/2013 and EBA/GL/2017/01 of 8 March 2017
- CSSF Circular 18/687 Adoption of the EBA Guidelines on uniform disclosures under Art. 473a of Regulation (EU) No. 575/2013 as regards the transitional period for mitigating the impact of the introduction of IFRS 9 on own funds (EBA/GL/2018/01

In the following, the respective laws and regulations in place as of 31 December 2021 are referred to, if not stated otherwise.

## 1.2. Objective of the report

The objective of this Disclosure Report is to fulfil the disclosure requirements detailed in Part 8 CRR and CRR 2 and Article 38 of the Luxembourg Law of 5 April 1993 ("Luxembourg Banking Act"), at the legal entity level of CBL. More specifically, the report intends to provide a detailed overview on the Bank's:

- Legal structure;
- Capital structure;
- Risk management framework including governance arrangements, risk management methodology and risk reporting; and,
- Risk management in terms of identified risk types.

## 1.3. Disclosure Policy and frequency

With exemption of disclosures laid down in point (c) of Articles 435 (2) and 437 CRR, disclosure content can be omitted according to Article 432 CRR and relating EBA Guideline 2014/14 if the information is non-material, proprietary or confidential. To ensure adequate application of the disclosure requirements a Disclosure Policy has been established, which is reviewed and adapted, where necessary, on a yearly basis. The Executive Board of CBL is ultimately responsible for the Disclosure Policy and must approve any material changes to the policy. Further, the Disclosure Policy defines disclosure content, allocates responsibilities, and defines processes.

In line with the Disclosure Policy, a dedicated process must be followed in case the Bank considers omitting certain disclosures due to these disclosures being immaterial, proprietary or confidential. Where the Bank classifies information as non-material in this this report, this has been stated accordingly in the related disclosures.

In accordance with Article 434 CRR, CBL publishes its Disclosure Report on its website:

Pillar III Disclosure Report (clearstream.com)

The report is updated once a year. In addition to the Pillar III report, the following documents are also made available:

- A remuneration report that fulfils the requirements according to Article 450 CRR. That report is disclosed by year on the website of Clearstream Group: www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/remuneration-information
- Information about the return on assets (RoA) according to Article 38-4 of the Luxembourg Banking Act is disclosed by CBL under Note 9.3 in the notes to its financial statements, which are published in the Luxembourg Trade and Companies Register ("Registre de Commerce et des Sociétés").

## 1.4. Scope of Application (Article 436 CRR 2)

Throughout the Pillar III Disclosure Report, CBL has four subsidiaries – Clearstream Banking Luxembourg (CLL), Clearstream Banking Japan (CBJ), REGIS-TR, and CFCL (investment funds services business) – and three branches: London, Singapore, and Japan. However, on grounds of non-materiality these are not consolidated for accounting purposes and CBL has also been exempted of consolidation for regulatory reporting purposes.

As such, this Disclosure Report covers Clearstream Banking S.A. with mention of the subsidiaries and branches described in 1.6. Business Operations.

All disclosed information is reported in CBL's accounting and reporting currency, Euro, if not otherwise specified.

### 1.4.1. Clearstream Banking S.A.

Clearstream Banking S.A. ("CBL") was founded in 1970 in Luxembourg and has its registered office at 42 Avenue J.F. Kennedy, L-1855 Luxembourg.

CBL is classified as a public limited company (Société Anonyme). It is governed by its Articles of Incorporation and Luxembourg company law.

## 1.5. Corporate Structure

As of 31 December 2021, the Bank was directly fully owned by Clearstream Holding AG ("CHAG"). CHAG is itself directly fully owned by Deutsche Börse AG, the ultimate parent company. The ownership structure of CBL as part of Deutsche Börse Group ("DBG") is shown below.

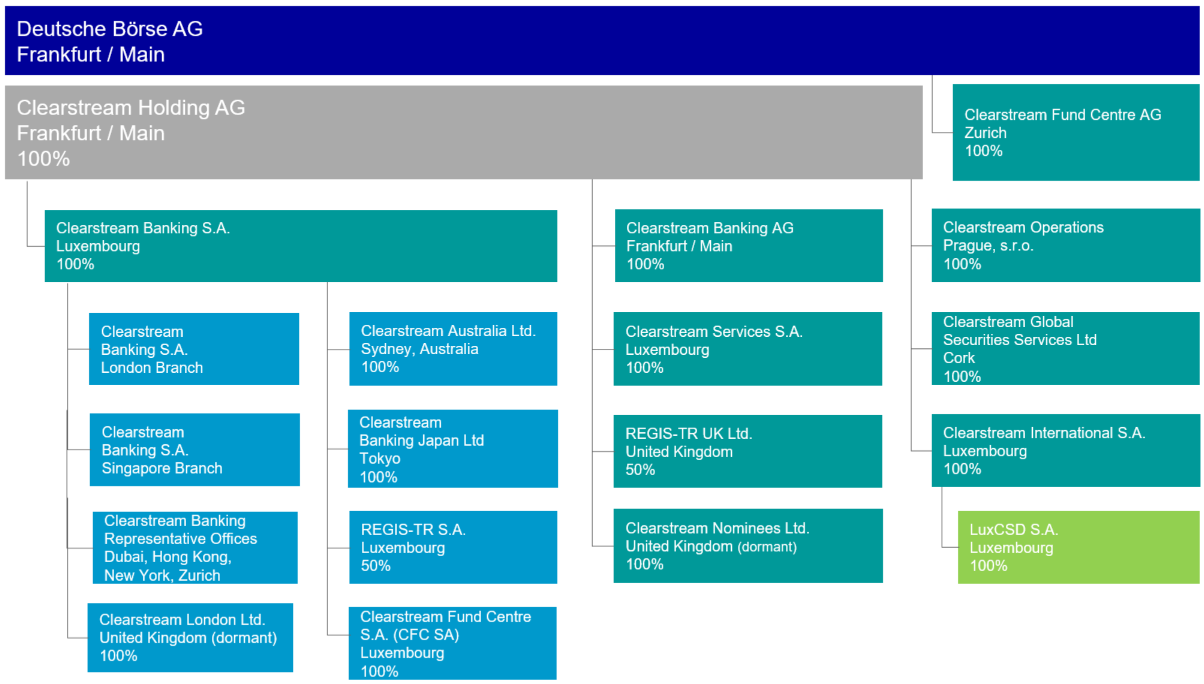


*Figure 2: Overview corporate structure*

## 1.6. Business Operations

CBL acts as an International Central Securities Depository (ICSD) which provides settlement and custody services for international securities.

These services include:

- Delivery versus payment and delivery free of payment settlement transactions;
- Comprehensive custody management;
- Value-added services, such as securities lending, collateral management etc.; and,
- Transactional information distribution.

Further services offered by the Bank include the issuance of securities, Investment Funds Services and Global Securities Financing, consisting of securities lending as well as collateral management services. In addition, CBL provides operative treasury services for Clearstream Banking AG ("CBF").

Additionally, CBL applied for authorisation as CSD according to Article 16 including providing banking-type ancillary services according to Article 54 Paragraph (2) lit. (a) of Regulation (EU) No. 909/2014 ("Central Securities Depositories Regulation", "CSDR"). The authorisation was granted to CBL in April 2021.

CBL holds the following branches/participations:

### CBL Singapore branch ("CBS")

CBS is a branch of CBL and its first operational centre outside Europe. In November 2009, CBL obtained a banking licence, which has been updated in October 2017. All of CBL's products and services, including Global Securities Financing, Investment Funds Services and Issuance and Distribution, are offered locally to customers in the Asia-Pacific region.

### CBL London branch

In January 2016, Clearstream transformed its representative office in London into a fully-fledged branch, which took over the activities of the representative office. In conjunction with the Brexit on December 2022, the CBL London branch began operating under FCA and PRA's Temporary Permissions Regime (TPR) meaning it has been able continue its pre-Brexit activities effectively under its existing license for a limited period of time.

### Clearstream London Limited ("CLL")

On 27 December 2018, CBL established a fully owned subsidiary called Clearstream London Limited ("CLL") in London, UK. CLL is a dormant entity that has submitted an application for an Arranger licence to the Financial Conduct Authority. CLL considers that the Arranger licence is sufficient to cover the full extent of its UK-based activity.

### Clearstream Banking Japan Ltd. ("CBJ"), Tokyo

In 2009, CBL established a fully owned subsidiary in Tokyo, Japan. The purpose of Clearstream Banking Japan Ltd is to engage in marketing, information provision and advertising; holding financial seminars and other education and training courses; support of existing customers of group companies and any other business activities relating to any of the preceding.

### Clearstream Banking Japan branch

At the beginning of 2022, a branch licence was granted to CBJ, thus becoming a branch fully owned by Clearstream Banking S.A. The purpose of establishing a branch is to further fortify the presence of the Bank and ensure a solid regulatory environment by enabling a transparent, long-term business position in Japan. However, the CBJ Ltd. company continues to operate.

### REGIS-TR S.A., Luxembourg ("REGIS-TR")

REGIS-TR is a European Trade Repository (TR) for reporting trades and transactions across multiple product classes and jurisdictions. The TR is open to financial and non-financial institutions, and services the major regulatory reporting obligations in Europe. REGIS-TR was registered by the European Markets and Securities Authority (ESMA) on 14 November 2013 in accordance with Regulation (EU) No. 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties, and trade repositories (European Market Infrastructure Regulation), for the provision of reporting services commonly referred to as "EMIR."

Moreover, REGIS-TR was registered by ESMA for a service extension enabling it to perform Trade Repository services pertaining to the Securities Finance Transaction Reporting regulation 2015/2365 of 25 November 2015 (SFTR).

Since 2010, REGIS-TR has been fully consolidated into the Deutsche Börse Group financial statements. With regard to the consolidation provisions set out in the CRR/KWG, REGIS-TR has been classified as an "other undertaking" and is therefore not included in regulatory consolidation.

In September 2021, Clearstream signed a transaction to sell its 50% stake in REGIS-TR to its joint venture partner Iberclear, part of SIX, who will take full control of the business as of 1 April 2022.

### Clearstream Fund Centre S.A. ("CFC SA")

Clearstream Fund Centre S.A. ("CFC SA") was established on 16 November 2021, and has its registered office at 42, Avenue John F. Kennedy, L-1855, Luxembourg, Luxembourg. CFC is directly 100% owned by the Bank. This business was established for future fund services business under Luxembourgish law.

### Clearstream Australia Limited, Sydney, Australia

CBL successfully completed the acquisition of Ausmaq Limited, Sydney, Australia, during the third quarter of 2019. With this acquisition, Clearstream is further expanding its offering in the investment funds space and has entered the Australian market. Ausmaq Limited has been a wholly owned subsidiary of Clearstream Banking Luxembourg since 31 July 2019. In June of 2020 it was renamed Clearstream Australia Limited. Due to the expansion of its geographical footprint, Clearstream expects the transaction to deliver revenue synergies.

In accordance with Article 22 (2) CRR, CBL is abstaining from sub-consolidating its subsidiaries in third countries.

## 1.7. Regulatory Supervision

Commission de Surveillance du Secteur Financier ("CSSF") is the competent authority for the supervision of CBL as i) a credit institution according to Article 42 and 43 of the Luxembourg Banking Act. Furthermore, Banque Centrale du Luxembourg ("BCL") has a shared responsibility for liquidity supervision on the basis of Article 2 (4) of the Law of 23 December 1998 concerning the monetary status.

Moreover, CBL is subject to regulatory supervision in relation to the securities settlement system ("SSS") according to Title V of the Luxembourg Law of 10 November 2009 relating to payment services. BCL is responsible for the oversight of SSSs, as per Article 110 of the Law of 10 November 2009. The oversight focuses on the operational and financial stability of each system individually, the participants in such systems as well as the stability of the financial system as a whole. Furthermore, specific regulations for SSSs must be considered (e.g. circulars BCL 2001/163 and 2001/168).

Additionally, being authorised in accordance with Article 16 and Article 54 Paragraph (2) lit. a of Regulation (EU) No. 909/2014 (CSDR), CSSF acts also as the designated competent authority carrying out the duties under CSDR for the supervision of CBL in accordance with Article 11 CSDR.

As of 1 January 2018, CBL is classified as Other Systemically Important Institution ("O-SII") as per CSSF Regulation N° 18-06 since the competent authorities comply with the EBA Guidelines 2014/10 on criteria to determine the conditions of application of Article 131 (3) of Directive 2013/36/EU (CRD) in relation to the assessment of other systemically important institutions. Due to its classification as an O-SII, CBL must produce a stand-alone Pillar III disclosure report. This classification was re-confirmed in January 2022.

CHAG as the superordinate company of the financial holding group according to §10a (1) of the German Banking Act (KWG) as well as being approved as financial holding company in accordance with Article 21 CRD, is responsible for fulfilling the regulatory obligations on a consolidated/Group level vis-à-vis the German supervisory authorities and presents a Pillar III report in compliance with the disclosure requirements pursuant to Part Eight CRR and § 26a KWG.

# 2. Key Metrics

As outlined in Art. 433c (2) (e), and Art. 447 of (EU) No. 876/2019, the Bank discloses its data on own funds, risk-weighted exposures, capital ratios, leverage ratios, and liquidity coverage. Additional information is provided in the subsequent respective chapters.

| (in 000s of €) | 2021 | 2020 | 2019 | 2018 |
|---|---|---|---|---|
| Available own funds (amounts) | | | | |
| Common Equity Tier 1 (CET1) capital | 1,214,206 | 1,209,868 | 1,149,360 | 1,111,991 |
| Tier 1 capital | 1,214,206 | 1,209,868 | 1,149,360 | 1,111,991 |
| Total capital | 1,214,206 | 1,209,868 | 1,149,360 | 1,111,991 |
| Risk-weighted exposure amounts | | | | |
| Total risk exposure amount | 4,037,268 | 4,548,991 | 4,720,932 | 5,074,928 |
| Capital ratios (as a percentage of risk-weighted exposure amount) | | | | |
| Common Equity Tier 1 ratio (%) | 30.07% | 26.60% | 24.35% | 21.91% |
| Tier 1 ratio (%) | 30.07% | 26.60% | 24.35% | 21.91% |
| Total capital ratio (%) | 30.07% | 26.60% | 24.35% | 21.91% |
| Additional own funds requirements to address risks other than the risk of excessive leverage (as a percentage of risk-weighted exposure amount) | | | | |
| Additional own funds requirements to address risks other than the risk of excess leverage (%) | 8.00% | 8.00% | 8.00% | 8.00% |
| of which: to be made up of CET1 capital (pp) | 4.50% | 4.50% | 4.50% | 4.50% |
| of which: to be made up of Tier 1 capital (pp) | 6.00% | 6.00% | 6.00% | 6.00% |
| Total SREP own funds requirements (%) | 9.00% | 9.00% | 9.00% | 8.00% |
| Combined buffer and overall capital requirement (as a percentage of risk-weighted exposure amount) | | | | |
| Capital conservation buffer (%) | 2.50% | 2.50% | 2.50% | 2.50% |
| Conservation buffer due to macro-prudential or systemic risk identified at the level of a Member State (%) | | | | |
| Institution specific countercyclical capital buffer (%) | 0.05% | 0.04% | 0.04% | 0.04% |
| Systemic risk buffer (%) | 0.00% | 0.00% | 0.00% | 0.00% |
| Global Systemically Important Institution buffer (%) | 0.00% | 0.00% | 0.00% | 0.00% |
| Other Systemically Important Institution buffer | 0.50% | 0.50% | 0.50% | 0.50% |
| Combined buffer requirement (%) | 3.05% | 3.04% | 3.04% | 3.04% |
| Overall capital requirements (%) | 12.05% | 12.04% | 12.04% | 11.04% |
| CET1 available after meeting the total SREP own funds requirements (%) | 25.57% | 14.56% | 12.31% | 10.99% |
| Leverage ratio | | | | |
| Leverage ratio total exposure measure | 4,037,268 | 15,110,166 | 15,826,142 | 18,830,858 |
| Leverage ratio (%) | 30.07% | 8.01% | 7.26% | 5.91% |
| Additional own funds requirements to address the risk of excessive leverage (as a percentage of total exposure measure) | | | | |
| Total SREP leverage ratio requirements (%) | 3.00% | n/a | n/a | n/a |
| Leverage ratio buffer and overall leverage ratio requirement (as a percentage of total exposure measure) | | | | |
| Leverage ratio buffer requirement (%) | | | | |
| Overall leverage ratio requirement (%) | 3.00% | 0.00% | 0.00% | 0.00% |
| Liquidity Coverage Ratio | | | | |
| Total high-quality liquid assets (HQLA) (Weighted value - average) | 15,235,190 | 14,000,208 | 14,493,357 | 1,375,298 |
| Cash outflows - Total weighted value | 14,030,281 | 13,618,700 | 13,664,401 | 13,780,138 |
| Cash inflows - Total weighted value | 1,351,657 | 1,920,068 | 1,457,752 | 2,552,619 |
| Total net cash outflows (adjusted value) | 12,678,624 | 11,699 | 12,207 | 11,228 |
| Liquidity coverage ratio (%) | 120.16% | 119.67% | 118.73% | 122.49% |

*Table 1: Key Metrics*

# 3. Governance Arrangements

## 3.1. General Arrangements

Clearstream Banking S.A. is incorporated in Luxembourg in the form of a public limited company (Société Anonyme). According to its Articles of Incorporation, Clearstream Banking S.A. has an Executive and a Supervisory Board. The members of the Executive Board and the Supervisory Board conduct the business of the Company in accordance with all applicable laws and regulations, notably the Law of 10 August 1915 on commercial companies, as amended, as well as the Law of 5 April 1993 on the financial sector, as amended, CSSF circulars, notably the CSSF Circular 12/552, as amended, the relevant EU framework, notably the Central Securities Depositories Regulation (CSDR) including its implementing acts, the Articles of Incorporation, the Rules of Procedure of the Supervisory Board, and the Rules of Procedure of the Executive Board.

Clearstream Banking S.A. maintains a comprehensive suitability assessment policy and a corresponding side-letter defining specific job descriptions of Supervisory Board and Executive Board members. The objective of this policy is to ensure that members of the Executive Board of CBL, the members of the Supervisory Board and key function holders of CBL are suitable in terms of reputation, experience and governance criteria, as stipulated in the joint ESMA and EBA "Guidelines on the assessment of the suitability of members of the management body and key function holders under Directive 2013/36/EU and Directive 2014/65/EU" (EBA/GL/2017/12/ESMA71-99-598) as well as in the Luxembourg Banking Act and Central Securities Depositories Regulation ("CSDR").

In addition to the suitability assessment policy, CBL has defined several diversity principles that govern the selection of Executive Board and Supervisory Board members. The principles, listed below in detail, refer to educational and professional background, gender, age and geographical provenance with the aim to achieve a variety of views and experiences and to facilitate independent opinions within the Executive Board and the Supervisory Board:

- CBL aims to achieve a balance representation of women and men;
- The age structure of the Boards should be of an appropriately broad range;
- An appropriately broad range of education and professional backgrounds should be present in the Boards; and,
- The composition of the Boards should reflect CBL's international profile.

The suitability assessment is initiated when it is intended to appoint or elect a new member of the Executive Board or the Supervisory Board, if a member resigns from the mandate causing material changes to the composition of the management body, in case of any material changes (e.g. reduction of work time, change regarding the scope or nature of the mandate or negative event with regard to the reputation) and on a regular basis, at least once a year.

To benefit from a balanced gender diversity and to fulfil the requirement of Art. 27 (4) of the Regulation (EU) No. 909/2014 the Supervisory Board of Clearstream Banking S.A. has approved the Gender Diversity Policy as published on Clearstream's website and decided on a target to increase the number of the under-represented gender in the management body.

The Supervisory Board of Clearstream Banking S.A. approved the Gender Diversity Policy on 25 September 2017. According to Article 4 of the Gender Diversity Policy, the "Supervisory Board shall discuss and agree at least every five years on measurable objectives for achieving gender diversity in the Boards and decide on implementation measures." On 29 June, 2022, the Supervisory Board of Clearstream Banking S.A. decided on a target of 20% target quota for the representation of the under-represented gender (currently female) by 31 December 2026. At the moment, 16.66 % of the Clearstream Banking S.A. Executive Board Member and 33.33 % of its Supervisory Board Member represent the under-represented gender.

From 2018, the rules of the limitation of mandates in accordance with Art. 38-2 of the Luxembourg Banking Act must be complied with. Under this definition, and in consideration of the legal permissibility of the aggregation of mandates, on 31 December 2020 all members of the Executive Board and the Supervisory Board of CBL complied with these rules.

In the following paragraphs, the composition of all boards and committees is reflected as at the end of the reporting period, being 31 December 2021.

## 3.2. Supervisory Board

According to the Articles of Incorporation of CBL, the Supervisory Board consists of at least three (3) members. The members of the Supervisory Board are required to fulfil certain criteria, as laid down in the Suitability Assessment Policy, and to comply with regulatory requirements, as set out in the section above. Furthermore, the Supervisory Board in its entirety must have the necessary skills, capabilities, and experience to supervise and control the Executive Board of CBL. This requires understanding of the business of a credit institution/central securities depository. Such criteria include but are not limited to: Members of the management body should have an up-to-date understanding of the business, of the Bank, and its risks. The assessment of a member's knowledge, skills and experience should consider both the theoretical experience attained through education and training and the practical experience gained in previous occupations.

A member of the management body should be considered to be of good repute, honesty, and integrity if there are no objective and demonstrable grounds to suggest otherwise, and no reason to have reasonable doubt about his or her good repute, honesty and integrity.

The Nomination Committee prepares a job description and a candidate profile for a specific position, which is resolved by the Supervisory Board. Subsequently, the Nomination Committee identifies and recommends suitable candidates, who are sent for approval to the General Meeting of Shareholders. Following selection and nomination, Boards and Committees Clearstream prepares the formal decision of the General Meeting of Shareholders to appoint the candidate as new member. The appointments of members to the Supervisory Board require prior express approval by the competent authority (CSSF).

On 31 December 2021, the Supervisory Board consisted of the persons displayed in Table 2, which also discloses the number of directorships held by each member as required by Art. 435 (2) of CRR 2.

In 2021, no new directorships were approved by the competent authorities.

The Supervisory Board typically meets four (4) times per year, with additional meetings possible at the discretion of the Chairman. In these meetings, it is informed about normal business activities as well as all substantial business events. In case of extraordinary incidents, the CBL Supervisory Board is informed immediately.

| Name – position | Number of directorships |
|---|---|
| Stephan Leithner – Chairman | 9 |
| Gregor Pottmeyer – Vice Chairman | 6 |
| Oliver Engels | 3 |
| Stephanie Eckermann | 3 |
| Wolfgang Gaertner | 2 |
| Marie-Jeanne Chevremont | 6 |

*Table 2: Supervisory Board Members*

## 3.3. Executive Board

According to CBL's Articles of Incorporation, the Executive Board shall be composed of at least three (3) members who are appointed by the Supervisory Board of CBL for a period of four (4) years. The Executive Board is chaired by the CEO.

The recruitment process of members of the Executive Board starts with the Nomination Committee to prepare the process, and the Supervisory Board to resolve on a job description and candidate profile for a specific position. Afterwards, the Nomination Committee identifies and recommends suitable members for the approval to the Supervisory Board. After the selection and nomination of a candidate, Boards & Committees Clearstream prepares a formal decision of the Supervisory Board. The appointment of new members of the Executive Board of CBL requires prior approval by the CSSF.

The Executive Board is responsible for managing CBL in accordance with the applicable laws, the Articles of Association, and its internal rules and regulations with the objective of creating sustainable value in the interest of the Company, and taking into consideration the interests of the shareholders, employees, and other stakeholders. The Executive Board is responsible for establishing a proper business organisation, encompassing appropriate and effective risk management.

The members of the Executive Board must be professionally suitable and reliable for the management of a credit institution and central securities depository, and they must be able to devote sufficient time to fulfil their tasks. Further, sufficient theoretical and practical knowledge of the business of a central securities depository/credit institution is required from all members of the Executive Board. In addition, the members of the Executive Board must have:

- An understanding of banking and financial markets, especially within the regulatory framework;
- An understanding of managing credit institutions; and,
- Sufficient experience in managerial positions.

The business distribution scheme regulates the allocation of tasks and responsibilities between the Board members. Nevertheless, the Executive Board remains collectively responsible for the fulfilment of the duties as defined by law and set out in the Articles of Incorporation (overall responsibility).

### 3.3.1. Frequency of Meetings

Meetings of the Executive Board are held monthly or more frequently if required.

On 31 December 2021, the Executive Board consisted of the persons displayed in Table X, which also discloses the number of directorships held by each member, as required by Art. 435 (2) CRR 2.

| Name – position | Number of directorships |
|---|---|
| Philippe Seyll – Chief Executive Officer | 8 |
| João Amaral | 1 |
| Alain Courbebaisse | 1 |
| Anne-Pascale Malréchauffé | 3 |
| Denis Schloremberg | 2 |
| Guido Wille | 2 |

*Table 3: Executive Board Members*

### 3.3.2. Committees

In 2021, the CBL Supervisory Board Committees comprised the Audit Committee, Risk Committee, Nomination Committee and Remuneration Committee. All four committees have three members each and the Audit Committee is chaired by an independent member of the Supervisory Board.

#### 3.3.2.1. Audit Committee

| Members | Tasks and responsibilities |
| --- | --- |
| ▪ Marie-Jeanne Chevremont – Chairperson<br>▪ Wolfgang Gaertner – Vice Chairperson<br>▪ Stephanie Eckermann | ▪ Monitors accounting and financial reporting processes;<br>▪ Monitors the effectiveness of the risk management process, in particular, the Internal Control System (ICS), the risk management system and internal audit;<br>▪ Monitors the execution of audits, in particular, in relation to the selection and independence of the auditor and the services provided by the auditor (for example, scope, frequency or reports); and,<br>▪ Submits recommendations to the Supervisory Board to ensure the integrity of the reporting and accounting processes. |

#### 3.3.2.2. Nomination Committee

| Members | Tasks and responsibilities |
| --- | --- |
| ▪ Wolfgang Gaertner – Chairperson<br>▪ Stephan Leithner<br>▪ Marie-Jeanne Chevremont | ▪ Identifies, recommends and promotes, for the approval of the Supervisory Board (SB) and General Meeting of Shareholders, candidates to fill vacancies in the Executive Board (EB) and SB, with the objective to reach a balance and diversity of knowledge, skills and experience, as well as gender diversity amongst the respective members;<br>▪ Periodically assesses the general structure and performance of EB and SB and provides related recommendations to the SB for improvements; and,<br>▪ Assesses the knowledge, skills, and experience of respective boards, on an individual and collective basis. |

### 3.3.2.3. Remuneration Committee

| Members | Tasks and responsibilities |
|---|---|
| ▪ Stephan Leithner – Chairperson<br>▪ Gregor Pottmeyer – Vice Chairperson<br>▪ Wolfgang Gaertner | ▪ Supervises the reasonableness of the remuneration system of executive management members. In particular, it supervises the appropriateness of the compensation of the Head of the risk function and of the compliance function as well as employees having a substantial influence on the overall risk profile of the institution. It also supports the Supervisory Board in monitoring the reasonableness of the remuneration system of employees as well as the institution. At the same time, it assesses the impacts of the remuneration system on the risk, capital, and liquidity management; and,<br>▪ Supports the Supervisory Board in overseeing the internal control system and all other relevant areas in the structuring of the remuneration system |

### 3.3.2.4. Risk Committee

| Members | Tasks and responsibilities |
|---|---|
| ▪ Oliver Engels – Chairman<br>▪ Stephan Leithner – Vice Chairman<br>▪ Stephanie Eckermann | ▪ Advises the Supervisory Board on the institution's overall current and future risk appetite, risk tolerance and risk strategy and assists the Supervisory Board in overseeing the implementation of that strategy;<br>▪ Reviews whether the conditions offered to customers take into account the institution's business model and risk structure. If this is not the case, the Risk Committee submits proposals to the Executive Board, about how the conditions applied to customers in accordance with the business model and the risk structure could be created;<br>▪ Examines 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; and,<br>▪ Takes advice from external experts, if necessary. It determines type, comprehensiveness, format, and frequency of information to be provided by the Executive Board with regard to strategy and risk. |

### 3.3.2.5. User committee

| Members | Tasks and responsibilities |
|---|---|
| ▪ European Investment Bank<br>▪ Bank of New York Mellon<br>▪ CitiBank<br>▪ BNP Paribas Securities Services<br>▪ Union Bank of Switzerland<br>▪ Barclays<br>▪ Northern Trust | ▪ Submits non-binding opinions to the management body; and,<br>▪ Advises the Executive Board on key arrangements that may affect its members, including the criteria for accepting issuers or customers in their respective securities settlement systems and at the service level and the pricing structure. |

# 4. Risk Management Overview

## 4.1. Concise Risk Statement

Please visit section 9.1 Concise Risk Statement for Clearstream's concise risk statement.

## 4.2. Risk Management Framework (Art. 435 (1) CRR 2)

Risk management is a fundamental component of the Bank's management and control framework. Effective and efficient risk management is vital to protect the Bank's interests and simultaneously enables Clearstream to achieve its corporate goals. Clearstream has therefore established a Group-wide risk management system comprising roles, processes, and responsibilities applicable to all employees and organisational units of Clearstream. This ensures that emerging risks are identified and managed as early as possible.

In addition, Clearstream's risk strategy is based upon the business strategy and regulates the extent of risks taken throughout the various business activities carried out. This is ensured by determining conditions for risk management, control, and limitation. As a result, Clearstream gives considerable attention to its risk mitigation process and ensures that appropriate measures are taken to avoid, reduce, and transfer risk or, to intentionally accept it. Thus, timely and adequate control of risk must be ensured.

Information required for controlling risk is assessed using structured and consistent methods and processes. The results are collated and incorporated into a reporting system enabling measurement and control of risks. Consequently, risk reporting is based on reliable information and carried out on a regular basis and ad hoc, if necessary.

All members of the Executive Board of Clearstream are ultimately responsible for the risk strategy, which reflects Clearstream's risk appetite defining the maximum loss the Executive Board is willing to assume in one year, the risk tolerance as well as desired performance levels. It is Clearstream's intention to maintain risk at an appropriate and acceptable level. Moreover, the members of the Executive Board ensure that the risk strategy is integrated into the business activities throughout the entire Group and that adequate measures are in place to implement the strategies, policies, and procedures. The risk strategy implementation is outlined below.

## 4.3. Risk Strategy

Based on its business strategy, Clearstream has adopted a corresponding risk strategy which describes the overall risk profile. The risk strategy includes statements concerning risk appetite and sets limits to the Risk-Bearing Capacity per risk type. Required Economic Capital is compared with the available Risk-Bearing Capacity which is defined as regulatory own funds (eligible regulatory capital) minus adjustments for unrealised losses driven mainly by ongoing litigations, for non-consolidated entities as well as for potential further reasons. The allocation of Risk-Bearing Capacity for 2021 for Clearstream was as follows: Operational Risk max 42%, Financial Risk max 52%, Business Risk max 6%, and Pension Risk max 1%.

The risk strategy was approved by the Executive Board of Clearstream in May 2021. The overall risk profile as defined, adopted, and approved via the risk strategy links to the business strategy outlined above. The main part consists of the risk strategy statement, the risk management approach, and risk types which are quantified in the risk appetite framework based on tools and concepts used to manage risk. Those tools and concepts include Risk-Bearing Capacity and Value at Risk.  Other tools, while critical and important, are in addition to these two concepts.

## 4.4. Adequacy of risk management arrangements (Art. 435 (1)(e) CRR 2)

For the purpose of the Article 435 CRR 2, in the Executive Board meeting on 18 March 2022 the Executive Board concluded that the Risk Management System is effective and adequate with regard to risk profile and strategy of the Bank.

## 4.5. Risk Culture

At Clearstream, a risk awareness and a corresponding risk-conscious culture is encouraged through appropriate organisational structures and responsibilities, adequate processes, and the knowledge of employees. The appropriateness of the Bank's risk management and controlling systems are regularly checked. Overall, Clearstream's risk culture is based on the Financial Stability Board's four indicators of a sound risk culture: Tone from the top, accountability, effective communication and challenge, and incentives, thereby striving for clear risk ownership and accountability.

## 4.6. Risk Management Process

Overall, the risk management process aims at ensuring that all threats, causes of loss, and potential disruptions are:

- Properly identified, as soon as possible;
- Centrally recorded;
- Assessed (that is, quantified in financial terms to the largest possible extent);
- Controlled; and,
- Reported in a timely and consistent manner, together with suitable recommendations to the respective Executive Board.

These five key elements, as well as adequate quality standards, are defined in the Group Risk Management Policy and reviewed on an ongoing basis by an independent audit function, which ensures the suitability and effectiveness of the risk management process.

Controlling the risks is performed in the decentralised business areas, that is, where the risks occur. Risk control in the Clearstream operational units is ensured by nominating "Operational Risk Representatives" who are responsible for identifying, notifying, and controlling any risk in their area. Clearstream Risk Management, a central function within Clearstream, assesses all existing and potential new risks and reports on a quarterly basis and, if necessary, ad hoc to the relevant Executive Board (see risk management process below).


*Figure 3: Risk management process*

## 4.7. Risk identification

As one of the main ways to processing risk management, risk identification consists of the identification of all threats to Clearstream, and causes of loss, and potential business disruptions. Risks may arise due to internal activities or external factors, and the risk examination must be performed on existing or new processes, when concluding new business or entering new service areas.

On the one hand, the risk identification process is proactive, based on regular reviews of processes in order to identify weak areas and points of failure (e.g., manual input required, process without double keying or 4-Eyes controls in place, specific procedures subject to high volumes or tight deadlines), based on scenarios of disruption, or failure to take into consideration all sources of issues (e.g., unavailability of systems, human error).

For the purposes of properly identifying potential risks to Clearstream, a risk inventory process has been established, for which a review is carried out at least on a yearly basis by Clearstream

Risk Management. Likewise, the risk identification process is reactive, following an incident and, where appropriate, learning from this event. Post-mortem assessments are usually performed by the business on request of Clearstream Risk Management.

The identification phase also includes the quantification of risks in the form of parameters based either on statistical data – in the case of actual process monitoring – or on subjective expert judgement when insufficient statistics are available.

All organisational units and individual employees are obliged to identify and quantify potential risks within their area of responsibility.

## 4.8. Risk notification

Given the importance in continuity of risk management, the process step of risk notification ensures that risks are centrally recorded. To do so, all organisational units and individual employees must notify Clearstream Risk Management in a timely manner of the risks that they have identified and have quantified.  This allows the Bank to respond in a prompt manner to risks that have been identified as potentially being disruptive to our business and the wider financial system.

## 4.9. Risk assessment

Following the notification of risk, the assessment of an incident or a potential risk development includes not only a quantification of risk using the "Value at Risk" ("VaR,") methodology but also a comparison of the result with the available Risk-Bearing Capacity. The purpose is to allow the overall quantitative risk appetite to be expressed in a comprehensive and easily understandable way while facilitating the prioritisation of risk management actions.

The VaR quantifies the risks to which a company is exposed to and indicates the maximum cumulative loss Clearstream could face if certain independent loss events materialise over a specific time horizon for a given likelihood. Clearstream's models are based on a one-year time horizon and correlations between individual risk estimates that are recognised when calculating the capital charge for operational risk. The VaR is calculated at a confidence level of, 99.90% (Regulatory VaR) as well as 99.90% (Economic Capital).

Clearstream also performs stress test calculations, which consider even more conservative parameters than the regular VaR calculations. Risk-wide stress tests, which incorporate the interaction of all material risk types, are also carried out and reported to the Executive Board on a quarterly basis.

In addition to traditional stress tests that analyze the impacts of predefined stress scenarios, Clearstream calculates so-called reverse stress tests.  These reverse stress-tests have the goal to identify the stress scenarios that would exceed the Available Risk-Bearing Capacity.  The findings of reverse stress tests can give rise to further analyses, and to implementation of additional measures to reduce risk(s).

Moreover, Clearstream calculates VaR at the 99.00% confidence level for the determination of the Earnings at Risk ("EaR"). This VaR is used for information purposes only at the Clearstream level. It is not expected to have impact on capital or capital requirements. Therefore, it is not used for capital management.

## 4.10. Risk control & mitigation

Risk control and mitigation involves the determination and implementation of the most appropriate treatment for the identified risk. It encompasses risk avoidance, risk reduction, risk transfer, and intentional risk acceptance, as outlined above.

All organisational units and employees must perform risk control and implement mitigating actions.

## 4.11. Risk monitoring & reporting

In the final risk management process, the organisational units and individual employees report to the Executive Board risks that pose a disruption to our business and the wider financial system. Risk reports are provided by Clearstream Risk Management to the Executive Board and Risk Committee on a regular basis.

These regular risk reports contain risk quantification results in comparison to the limits, risk-related qualitative information, information about stress tests, and capital adequacy of the Bank. Clearstream Risk Management may issue ad-hoc reports whenever a new risk situation arises. An alternative is through the development of an existing risk, which requires reporting to the Executive Board. This is the case when a risk has a material impact on the risk profile of the Bank.

Ultimately, the internal audit function acts as a third line of defence by providing further assurance via independent audits, which verify that risk control and risk management is performed adequately. The results of these audits are also part of the risk management system.

## 4.12. ICAAP Information

The Internal Capital Adequacy Assessment of Clearstream is defined centrally and calculated on a regular basis. The Executive Board of Clearstream and the Supervisory Board of Clearstream are ultimately responsible for the Risk Strategy of Clearstream and oversee the internal capital adequacy process. Clearstream Risk Management (CRM) prepares, updates, and reviews the ICAAP report, presents it to the relevant Executive Boards for approval and provides the report to the regulatory authorities. The ICAAP report is subject to a 4-eyes principle. The checks are performed using the EBA Readers Manual. The input to the report is prepared and collected by CRM team members including other relevant parties. The final report is reviewed by the Chief Chief Risk Officer of CBL.

The process includes the first and second line of defence. The ICAAP Report is also reviewed by CBL Compliance in line with CSSF requirements. The CBL Chief Compliance Officer issues recommendations after having reviewed the report which will be discussed with CRM during a meeting and incorporated into the report. Internal Audit, as the third line of defence, reviews the ICAAP regularly. Additionally, Clearstream follows clearly defined escalation procedures.

The Executive Board of CBL and the Supervisory Board of CBL are ultimately responsible for the Risk Strategy of Clearstream and the ICAAP with a focus on:

- Ensuring full compliance with the ICAAP objective concerning risk taking, mitigation and internal capital planning,
- Assuring adequate capitalisation of the company,
- Ensuring effective risk management structures including risk policies and procedures to address and mitigate all risks to which Clearstream is exposed to,
- Ensuring that the Risk Strategy is integrated into the business activities throughout the entire group and that adequate measures are in place to implement the strategies, policies and procedures,
- Approving capital planning,
- Overseeing the integration of internal capital adequacy statement and framework (ICAAP) into the company.

The Executive Board of CBL approves the capital adequacy statement and the Executive Boards of CH and CBL approve the ICAAP report and the key components of the ICAAP report which are defined as follows:

- Consistency between the business and risk strategies
- Integration within the overall risk management and risk appetite frameworks, including early warning indicators, limit structures, and escalation procedures
- Identification, measurement, assessment, and aggregation of material risks
- Assessment, planning and allocation of capital requirements for the normative and economic perspectives
- Derivation and monitoring of the Available Risk Bearing Capacity
- Stress testing and consistency with the recovery plan
- Overall governance and IT support
- Reporting
- Capital Adequacy Statement

The components are supported by objectives, assumptions and methodologies and are captured by clear, concise, and consistent documentation approved by Executive Management.

## 4.13. Risk Profile

Clearstream defines risk as a potential negative impact on its financial, revenue, and liquidity situation. Clearstream differentiates between three major risk types that are managed and controlled with distinct methods. These risk types are operational risk, financial risk, business risk, and pension risk. Project risk also exists but is not specifically quantified, as the impact is already reflected in the three major risk types. The risk types are illustrated in Figure X and are described in more detail in the following sections.

The risk profile of Clearstream differs fundamentally from those of other financial services providers. Operational risk is assessed as major risk type within Clearstream. Business risk and Pension Risk are considered non-material.  Financial risk is discussed in subsequent chapters.

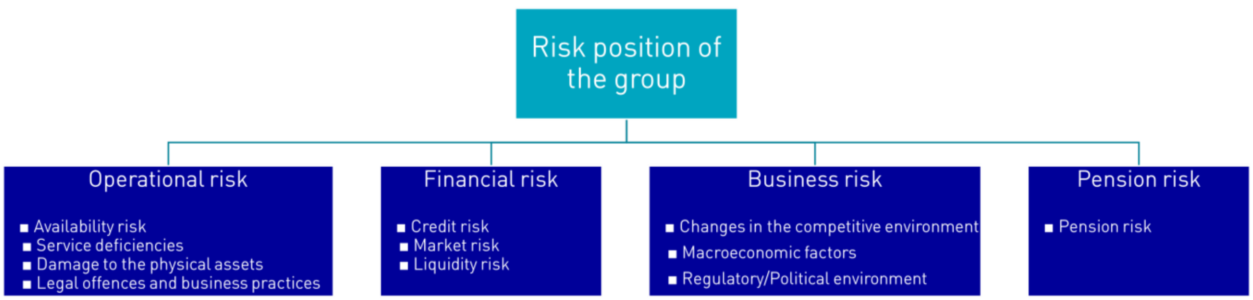


*Figure 4: Risk profile of Clearstream*

# 5. Financial Statement Linkages

## 5.1. Financial Statement Linkages Overview

This paragraph specifies the requirements included in Art. 436 of Part Eight CRR 2 regarding the scope of application of Part Eight. In the application of Art. 436 (b), institutions are required to disclose an outline of the differences in the basis of consolidation for accounting and prudential purposes. On 31 December 2021, Clearstream Banking S.A. had five subsidiaries and three branches. These were the direct subsidiaries:

- Clearstream Banking Japan, Ltd. (created in 2009). Registered office: 27F, Marunouchi Kitaguchi Building, 1-6-5, Marunouchi, Chiyoda-ku, Tokyo, Japan. Clearstream Banking Japan is directly 100% owned by the bank;
- REGIS-TR S.A. (created in 2010). Registered office: 42 Avenue J.F. Kennedy, L-1855 Luxembourg. The bank holds 50% of the subsidiary. Since the bank has the right to appoint the Chairman of the Board of directors, who in turn has a casting vote, there is a presumption of control;
- Clearstream London Limited, incorporated on 27 December 2018. Registered office: 11 Westferry Circus Canary Wharf, London E14 4HE, United Kingdom. Clearstream London Limited is directly 100% owned by the bank;
- Clearstream Australia Limited was incorporated in 1994. Registered office: Level 4, 107 Pitt St, Sydney, New South Wales 2000, Australia. Clearstream Australia Limited is directly 100% owned by the Bank.
- Clearstream Fund Centre S.A. (created in 2021). Registered office: 42, Avenue John F. Kennedy, L-1855 Luxembourg, Luxembourg, Clearstream Fund Center SA is directly 100% owned by the Bank.

The Bank has the following branches:

- Clearstream Banking S.A., Singapore branch (created in 2009). Registered office: 9 Raffles Place #55-01 Republic Plaza Singapore, 048619 Singapore;
- Clearstream Banking S.A., UK branch (opened on 4 January 2016), which took over the activities of the bank's former representative office. Registered office: Westferry House, 2nd Floor, 11 Westferry Circus, Canary Wharf, London E14 4HE, United Kingdom.
- Clearstream Banking S.A., Japan branch (created in 2021). Registered office: 27F, Marunouchi Kitaguchi Building, 1-6-5, Marunouchi, Chiyoda-ku, Tokyo, Japan.

As per Art. 83 of the Law of 17 June 1992, as amended, CBL does not prepare consolidated financial statements because Clearstream Banking S.A. only has subsidiary undertakings that are not material for the purpose of Art. 85(3) of the Law of 17 June 1992, as amended (consolidated accounts shall give a true and fair view of the assets, liabilities, financial position, and profit or loss of the undertakings included therein taken as a whole), both individually and as a whole.

The table below shows a breakdown of the differences in the scope of consolidation along accounting and regulatory lines and allocates the different amounts to the regulatory risk categories, namely, credit risk, counterparty credit risk and market risk, as well as the part that is not subject to capital requirements or subject to deduction from capital.

| (in 000s of €) | Carrying values as reported in published financial statements | Carrying values under scope of regulatory consolidation | Carrying values of items | | | | |
|---|---|---|---|---|---|---|---|
| | | | Subject to the credit risk framework | Subject to the CCR framework | Subject to the securitisation framework | Subject to the market risk framework | Not subject to own funds requirements or subject to deduction from own funds |
| Breakdown by asset clases according to the balance sheet in the published financial statements | | | | | | | |
| Cash, cash balances at central banks and other demand deposits | 10,622,518 | 8,187,153 | 8,187,153 | - | - | 8,187,153 | - |
| Financial assets held for trading | 91,323 | 88,941 | - | 88,941 | - | 88,941 | - |
| Financial assets at fair value through other comprehensive income | 6,943 | 6,943 | 6,943 | - | - | - | - |
| Financial assets at amortized cost | 3,734,964 | 6,164,470 | 6,164,470 | | - | 6,164,470 | - |
| *of which Debt securities* | *1,516,518* | *1,515,769* | | | | *1,515,769* | |
| *of which Loans and Advances* | *2,218,446* | *4,648,701* | | | | *4,648,701* | |
| Derivatives - hedge accounting | - | - | - | - | - | - | - |
| Investments in subsidiaries, joint ventures and associates | 31,690 | 31,690 | 31,690 | - | - | 31,690 | - |
| Tangible assets | 13,298 | 13,277 | 13,277 | - | - | - | - |
| Intangible assets | 30,978 | 34,458 | - | - | - | - | 34,458 |
| Tax assets | 1,217 | 1,212 | - | - | - | - | 1,212 |
| Other assets | 46,063 | 43,681 | 43,681 | - | - | - | - |
| *of which other assets* | *43,854* | | | | | | |
| *of which Prepayments and accrued income* | *2,209* | | | | | | |
| Total assets | 14,578,994 | 14,571,824 | 14,447,213 | 88,941 | - | 14,472,254 | 35,670 |
| Breakdown by liability classes according to the balance sheet in the published financial statements | | | | | | | |
| Financial liabilities held for trading | 2,860 | 3,133 | | | | 3,133 | 3,133 |
| Financial liabilities measured at amortised cost | 12,965,421 | 12,959,996 | | | | 12,959,996 | 12,959,996 |
| Derivatives - hedge accounting | 2,114 | 2,112 | | | | 2,112 | 2,112 |
| Provisions | 23,896 | 23,881 | | | | | 23,881 |
| Tax liabilities | 22,062 | 22,062 | | | | | 22,062 |
| Other liabilities | 63,460 | 57,886 | | | | 57,886 | 57,886 |
| *of which other liabilities* | *11,224* | | | | | | |
| *of which Accruals and deferred income* | *52,236* | | | | | | |
| Total liabilities | 13,079,813 | 13,069,069 | - | - | - | 13,023,126 | 13,069,069 |

*Table 4: Differences between accounting & regulatory scope of consolidation, mapping of financial statement categories with regulatory risk categories*

The main differences between the financial statement and the regulatory scope arise due to the following reasons:

- The difference in demand deposits and loans and advances is caused, in part, by a different classification of overnight repos, i.e., classification of overnight repos as demand deposits in the financial statement and classification as loans and advances in FINREP;
- A difference in demand deposits is due to a reclassification of interest from cash overdrafts between assets and liabilities;
- The difference in financial assets and liabilities held for trading is explained by the use of different foreign exchange rates, i.e., SAP uses Bloomberg rates whilst ECB rates are used for FINREP; and,
- Further minor causes of differences for financial assets at amortised costs and other assets between the financial statement and the regulatory scope arise from the reclassification of fee receivables from other assets to loans and advances, and the reclassification of debtor amounts with assets.

The following table provides information on the main sources of differences between the published financial statements and COREP reporting (other than those due to different scopes of consolidation):

| | | Items subject to | | | |
|---|---|---|---|---|---|
| (in 000s of €) | Total | Credit risk framework | Securitisation framework | CCR framework | Market risk framework |
| Assets carrying value amount under the scope of prudential consolidation (as per template LI1) | 14,536,154 | 14,447,213 | - | 88,941 | 14,472,254 |
| Liabilities carrying value amount under the scope of prudential consolidation (as per template LI1) | - | - | - | - | 13,023,126 |
| Total net amount under the scope of prudential consolidation | 14,536,154 | 14,447,213 | - | 88,941 | 1,449,128 |
| Off-balance-sheet amounts | 886,325 | 886,325 | - | | |
| *Differences in valuations* | | | | | |
| *Differences due to different netting rules, other than those already included in row 2* | | | | | |
| *Differences due to consideration of provisions* | | | | | |
| *Differences due to the use of credit risk mitigation techniques (CRMs)* | (45,623,106) | (45,623,106) | | | |
| *Differences due to credit conversion factors* | | | | | |
| *Differences due to Securitisation with risk transfer* | | | | | |
| *Other differences* | 41,122,268 | 40,890,329 | | 231,938 | |
| Exposure amounts considered for regulatory purposes | 10,921,640 | 10,600,761 | - | 320,880 | 21,474 |

*Table 5: Main sources of differences between carrying values in the published financial statements and regulatory exposure amounts*

The differences between the assets carrying amount under regulatory scope and the actual risk exposures used in COREP are caused by the following factors:

- Intangible assets are directly deducted from own funds; hence, they are included in the carrying amount under regulatory scope, but not in the credit risk exposure for risk reporting;

- The difference in the CCR framework is due to the different value in derivatives exposure, since the Original Exposure Method (OEM) in conjunction with the Basel Committee's standard on the *"standardised approach for measuring counterparty credit risk exposures"*[1] is used for risk reporting whereas the carrying value is recognised for the purpose of FINREP;
- The difference for the market risk framework exposure arises due to the netting of long and short positions for foreign exchange exposures in the risk reporting.
- Other differences include the amount of exposures arising from the ASLplus program (see 9.3.7. ASLplus). In addition, the difference between carrying amount of derivatives and exposure from derivatives is calculated using Original Exposure Method (OEM), and reported above.
- Differences due to the use of credit risk mitigation techniques (CRMs) correspond to the amount of collateral after volatility adjustments received for reverse repurchase agreements, ASL and ASLplus.

The information on the consolidation method applied for each entity within the accounting and regulatory scopes of consolidation is provided in the following table:

| Name of the entity | Method of accounting consolidation | Method of regulatory consolidation | | | | | Description of the entity |
|---|---|---|---|---|---|---|---|
| | | Full consolidation | Proportional consolidation | Equity method | Neither consolidated nor deducted | Deducted | |
| Clearstream Banking Japan Ltd. , Tokyo | Fair Value through other comprehensive income | | | | X | | *Ancillary Services Undertaking* |
| REGIS-TR S.A., Luxembourg | Fair Value through other comprehensive income | | | | X | | *"Other" Undertaking* |
| Clearstream London Limited | Fair Value through other comprehensive income | | | | X | | *Ancillary Services Undertaking* |
| Clearstream Australia Limited | Fair Value through other comprehensive income | | | | X | | *Ancillary Services Undertaking* |
| Clearstream Fund Centre | Fair Value through other comprehensive income | | | | X | | *Dormant* |

*Table 6: Outline of the differences in the scope of consolidation (entities part of the Bank)*

1 Basel Committee on Banking Supervision: "The standardised approach for measuring counterparty credit risk exposures": https://www.bis.org/publ/bcbs279.pdf

# 6. Own Funds and Capital

## 6.1. Composition of Capital

Following the disclosure requirements in Art. 437 CRR 2, as specified in the Implementing Regulation (EU) No. 1423/2013 of December 2013, institutions are required to provide information concerning the capital composition, including reconciliation with their balance sheet and the main features of the regulatory capital instruments.

Furthermore, Art. 438 of Part Eight CRR 2 requires disclosure of an overview of the total RWA and the related minimum capital requirements. Further breakdowns of RWAs are presented in subsequent parts of this report.

The total regulatory capital of Clearstream Banking S.A. consists of Common Equity Tier 1 (CET1) capital, which is comprised of subscribed capital, share premium, reserves, and retained earnings. Deductions of CET1 arise from intangible assets, deferred tax assets and regulatory adjustments.

Following Art. 438 (c) to (f) CRR 2, institutions should disclose an overview of total RWA forming the denominator of the risk-based capital requirements calculated per Art. 92 CRR 2 and summary of the institution's calculation approaches chosen. Select rows are not shown given no values to report at the Bank on 31 December 2021. Below is the composition of Own Funds on 31 December 2021 with accompanying ratios.

| (in 000s of €) | Amounts | Source based on reference numbers/letters of the balance sheet under the regulatory scope of consolidation |
|---|---|---|
| Common Equity Tier 1 (CET1) capital: instruments and reserves | | |
| Capital instruments and the related share premium accounts | 321,935 | 26(1), 27, 289, 29, EBA list 26 (3) |
| Retained earnings | 0 | 26(1) (c ) |
| Accumulated other comprehensive income (and other reserves) | 943,016 | 26 (1) |
| Funds for general banking risk | 0 | |
| Amount of qualifying items referred to in Article 484 (3) CRR and the related share premium accounts subject to phase out from CET1 | | |
| Minority interests (amount allowed in consolidated CET1) | | |
| Independently reviewed interim profits net of any foreseeable charge or dividend | | |
| Common Equity Tier 1 (CET1) capital before regulatory adjustments | 1,264,951 | |
| Common Equity Tier 1 (CET1) capital: regulatory adjustments | | |
| Additional value adjustments (negative amount) | | |
| Intangible assets (net of related tax liability) (negative amount) | -34,458 | 36 (1) (b), 37, 472, (4) |
| Not applicable | | |
| Deferred tax assets that rely on future profitability excluding those arising from temporary differences (net of related tax liability where the conditions in Article 38 (3) CRR are met) (negative amount) | -1,212 | 36 (1) (b), 37 |
| Other regulatory adjustments to CET1 capital *(including IFRS 9 transitional adjustments when relevant)* | -15,075 | 36 (1) (j) |
| Total regulatory adjustments to Common Equity Tier 1 (CET1) | -50,745 | |
| Common Equity Tier 1 (CET1) capital | 1,214,206 | |
| Additional Tier 1 (AT1) capital: instruments | | |
| Additional Tier 1 (AT1) capital before regulatory adjustments | | |
| Additional Tier 1 (AT1) capital: regulatory adjustments | | |
| Other regulatory adjustments to AT1 capital | 0 | |
| Total regulatory adjustments to Additional Tier 1 (AT1) capital | 0 | |
| Additional Tier 1 (AT1) capital | 0 | |
| Tier 1 capital (T1 = CET1 + AT1) | 1,214,206 | |
| Tier 2 (T2) capital: instruments | | |
| Tier 2 (T2) capital before regulatory adjustments | 0 | |
| Tier 2 (T2) capital: regulatory adjustments | | |
| Total regulatory adjustments to Tier 2 (T2) capital | 0 | |
| Tier 2 (T2) capital | 0 | |
| Total capital (TC = T1 + T2) | 1,214,206 | |
| Total Risk exposure amount | 4,037,268 | |
| Capital ratios and buffers | | |
| Common Equity Tier 1 (as a percentage of total risk exposure amount) | 30.07% | |
| Tier 1 (as a percentage of total risk exposure amount) | 30.07% | |
| Total capital (as a percentage of total risk exposure amount) | 30.07% | |
| Institution CET1 overall capital requirement (CET1 requirement in accordance with Article 92 (1) CRR, plus additional CET1 requirement which the institution is required to hold in accordance with point (a) of Article 104(1) CRD, plus combined buffer requirement in accordance with Article 128(6) CRD) expressed as a percentage of risk exposure amount) | 3.05% | |
| of which: capital conservation buffer requirement | 2.50% | |
| of which: countercyclical buffer requirement | 0.05% | |
| of which: Global Systemically Important Institution (G-SII) or Other Systemically Important Institution (O-SII) buffer | 0.50% | |
| Common Equity Tier 1 capital (as a percentage of risk exposure amount) available after meeting the minimum capital requirements | 25.57% | (minimum capital requirement of 4.5%) |
| Amounts below the thresholds for deduction (before risk weighting) | | |
| Direct and indirect holdings of own funds and eligible liabilities of financial sector entities where the institution does not have a significant investment in those entities (amount below 10% threshold and net of eligible short positions) | 6,007 | |
| Direct and indirect holdings by the institution of the CET1 instruments of financial sector entities where the institution has a significant investment in those entities (amount below | 31,690 | |

*Table 7: Composition of Own Funds*

### 6.1.1. Main features of own funds

Disclosure under point (b) of Art. 437 CRR 2 is shown in the next table, in line with the disclosure templates set out in the Implementing Regulation (EU) No. 1423/2013.

| (amounts in millions of €) | Quantitative/qualitative information |
|---|---|
| Issuer | Clearstream Banking S.A. |
| Unique identifier (e.g., CUSIP, ISIN or Bloomberg identifier for private placement) | NA |
| Governing law(s) of the instrument | Luxembourg Company Law: Law of 10th August 1915 on commercial companies |
| Transitional Basel III rules | Common Equity Tier 1 |
| Post-transitional Basel III rules | Common Equity Tier 1 |
| Eligible at solo/group/group and solo | Solo |
| Instrument type (types to be specified by each jurisdiction) | Ordinary Shares |
| Amount recognised in regulatory capital (currency in millions, as of most recent reporting date) | €229 |
| Par value of instrument | €92 |
| Accounting classification | Shareholders' equity |
| Original date of issuance | 1970 |
| Perpetual or dated | perpetual |
| Original maturity date | NA |
| Issuer call subject to prior supervisory approval | No |
| Optional call date, contingent call dates and redemption amount | NA |
| Subsequent call dates, if applicable | NA |
| *Coupons / dividends* | |
| Fixed or floating dividend/coupon | Floating |
| Coupon rate and any related index | NA |
| Existence of a dividend stopper | No |
| Fully discretionary, partially discretionary or mandatory | Fully discretionary |
| Existence of step-up or other incentive to redeem | No |
| Non-cumulative or cumulative | Non-cumulative |
| Convertible or non-convertible | Non-convertible |
| If convertible, conversion trigger(s) | NA |
| If convertible, fully or partially | NA |
| If convertible, conversion rate | NA |
| If convertible, mandatory or optional conversion | NA |
| If convertible, specify instrument type convertible into | NA |
| If convertible, specify issuer of instrument it converts into | NA |
| Writedown feature | No |
| If writedown, writedown trigger(s) | NA |
| If writedown, full or partial | NA |
| If writedown, permanent or temporary | NA |
| If temporary write-own, description of writeup mechanism | NA |
| Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument in the insolvency creditor hierarchy of the legal entity concerned). | NA |
| Non-compliant transitioned features | No |
| If yes, specify non-compliant features | NA |

## 6.2. Balance sheet reconciliation

| (in 000s of €) | Balance sheet as in published financial statements | Under regulatory scope of consolidation |
|---|---|---|
| | As at period end | As at period end |
| Assets - *Breakdown by asset clases according to the balance sheet in the published financial statements* | | |
| Cash, cash balances at central banks and other demand deposits | 10,622,518 | 8,187,153 |
| Financial assets held for trading | 91,323 | 88,941 |
| Financial assets at fair value through other comprehensive income | 6,943 | 6,943 |
| Financial assets at amortized cost | 3,734,964 | 6,164,470 |
| *of which Debt securities* | *1,516,518* | *1,515,769* |
| *of which Loans and Advances* | *2,218,446* | *4,648,701* |
| Derivatives - hedge accounting | - | - |
| Investments in subsidiaries, joint ventures and associates | 31,690 | 31,690 |
| Tangible assets | 13,298 | 13,277 |
| Intangible assets | 30,978 | 34,458 |
| Tax assets | 1,217 | 1,212 |
| Other assets | 43,854 | 43,681 |
| Prepayments and accrued income | 2,209 | |
| **Total assets** | **14,578,994** | **14,571,824** |
| Liabilities - *Breakdown by liability clases according to the balance sheet in the published financial statements* | | |
| Financial liabilities held for trading | 2,860 | 3,133 |
| Financial liabilities measured at amortised cost | 12,965,421 | 12,959,996 |
| Derivatives - hedge accounting | 2,114 | 2,112 |
| Provisions | 23,896 | 23,881 |
| Tax liabilities | 22,062 | 22,062 |
| Other liabilities | 63,460 | 57,886 |
| *of which other liabilities* | *11,224* | |
| *of which Accruals and deferred income* | *52,236* | |
| **Total liabilities** | **13,079,813** | **13,069,069** |
| | | |
| Issued capital | 92,000 | 92,000 |
| Share premium account | 229,935 | 229,935 |
| Reserves | 940,250 | 942,947 |
| Accumulated other comprehensive income | 69 | 69 |
| Profit for the financial year | 236,927 | 237,803 |
| Interim dividends | - | - |
| **Total shareholders' equity** | **1,499,181** | **1,502,755** |

*Table 8: Balance sheet reconciliation*

In compliance with Art. 437 (1)(a) CRR 2, a full reconciliation of own funds to financial statements is disclosed in the following table, as laid out in the Implementing Regulation (EU) No. 2021/637:

Balance Sheet Reconciliation

| Own Funds elements in the Annual Financial Statements | |
|---|---|
| Subscribed Capital | 92,000 |
| Share premium | 229,935 |
| Accumulated other comprehensive income | 69 |
| Capital Reserve | 0 |
| Legal Reserve | 9,200 |
| Other reserves and retained earnings | 931,050 |
| Profits for the financial year and accumulated profits | 236,927 |
| Total Own Funds Elements in Audited Financial Statements | 1,499,181 |
| Valuation differences allocated to other reserves with the approval of financial statements (i.e., after reporting of Own Funds) | 2,697 |
| Profits for the financial year and accumulated profits (i.e., after reporting of Own Funds) | -236,927 |
| Eligible Capital (CET1) before regulatory adjustments | 1,264,882 |
| Regulatory adjustments | |
| Goodwill | -12,282 |
| Deduction other intangible assets | -22,176 |
| Other CET 1 capital adjustments | -16,287 |
| Common Equity Tier 1 Capital/Total Eligible Own Funds | 1,214,206 |

From the above reconciliation, the own funds in the financial statements of Clearstream Banking S.A. considers profits allocated to retained earnings with the approval of the financial statement and year-end profits, neither of which qualify for the regulatory own funds on 31 December 2021. The profits allocated to retained earnings do not count as CET1 capital if the financial statements are not approved or if prior permission by the competent authority according to Art. 26 paragraph 2 CRR 2 is not granted.

## 6.3. Countercyclical capital buffer

The countercyclical capital buffer (CCyB) aims to ensure that banking sector capital requirements take account of the macro-financial environment in which banks operate, by building up capital to create buffers that strengthen the resilience of the institution. According to Delegated Regulation (EU) 2015/1555 on the disclosure of information concerning the compliance of institutions with the requirement for a countercyclical buffer, which implements Art. 440 CRR 2, where institutions are required to disclose their capital buffers. Please refer to Appendix A for country-specific/geographic distribution of credit exposures that are relevant for the countercyclical buffer, and the institution-specific countercyclical capital buffer (CCyB1 and CCyB2).

### 6.3.1. Risk-Weighted Capital

The following table summarises the capital requirements of Clearstream Banking S.A. for the different types of risks and the relevant calculation method:

| | Risk weighted exposure amounts (RWEAs) | | Total own funds requirements |
|---|---|---|---|
| | a | b | c |
| (in 000s of €) | 31.12.2021 | 31.12.2020 | 31.12.2021 |
| Credit risk (excluding CCR) | 838,768 | 681,123 | 67,101 |
| Of which the standardized approach | 838,768 | 681,123 | 67,101 |
| Of which the foundation IRB (FIRB) approach | - | - | - |
| Of which: slotting approach | - | - | - |
| Of which: equities under the simple risk-weighted approach | - | - | - |
| Of which the advanced IRB (AIRB) approach | - | - | - |
| Counterparty credit risk - CCR | 183,090 | 17,010 | 14,647 |
| Of which the standardized approach | - | - | - |
| Of which internal model method (IMM) | - | - | - |
| Of which exposures to a CCP | 2,046 | 1,103 | 164 |
| Of credit valuation adjustment - CVA | 53,436 | 3,826 | 4,275 |
| Of which other CCR | 127,608 | 12,081 | 10,209 |
| Position, foreign exchange and commodities risks (Market risk) | - | 7,897 | - |
| Of which the standardized approach | - | 7,897 | - |
| Of which IMA | - | - | - |
| Large exposures | - | - | - |
| Operational risk | 3,015,410 | 3,842,961 | 241,233 |
| Of which basic indicator approach | - | | - |
| Of which standardized approach | - | | - |
| Of which advanced measurement approach | 3,015,410 | 3,842,961 | 241,233 |
| Amounts below the thresholds for deduction (subject to 250% risk weight) | - | | - |
| Total | 4,037,268 | 4,548,991 | 322,981 |

*Table 9: Risk-weighted exposure amounts*

## 6.4. Asset Encumbrance

- The EBA specified the disclosure of information on asset encumbrance under Art. 443 CRR 2 with the EBA Guidelines on the disclosure of encumbered and unencumbered assets on 26 June 2014[2]. The disclosures described below are made on the basis of this guideline. The values are calculated as medians for quarterly values reported in 2021.

| | Carrying amount of encumbered assets | | Fair value of encumbered assets | | Carrying amount of unencumbered assets | | Fair value of unencumbered assets | |
|---|---|---|---|---|---|---|---|---|
| | | of which notionally eligible EHQLA and HQLA | | of which notionally eligible EHQLA and HQLA | | of which EHQLA and HQLA | | of which EHQLA and HQLA |
| (in 000s of €) | 010 | 030 | 040 | 050 | 060 | 080 | 090 | 100 |
| Assets of the reporting institution | 299,890 | - | | | 18,288,752 | 9,427,615 | | |
| Equity instruments | - | - | - | - | 6,007 | - | 6,007 | - |
| Debt securities | - | - | - | - | 1,475,701 | 1,475,701 | 1,475,903 | 1,475,903 |
| of which: covered bonds | - | - | - | - | - | - | - | - |
| of which: securitizations | - | - | - | - | - | - | - | - |
| of which: issued by general governments | - | - | - | - | 584,286 | 584,286 | 584,488 | 584,488 |
| of which: issued by financial corporations | - | - | - | - | 891,414 | 891,414 | 891,414 | 891,414 |
| of which: issued by non-financial corporations | - | - | - | - | - | - | - | - |
| Other assets | 299,890 | | | | 16,807,044 | 7,951,915 | | |

*Table 10: Assets of the reporting institution, encumbered and unencumbered*

The next table shows the fair value of encumbered or unencumbered collateral received:

| | Fair value of encumbered collateral received or own debt securities issued | | Unencumbered | |
|---|---|---|---|---|
| | | | Fair value of collateral received or own debt securities issued available for encumbrance | |
| | | of which notionally eligible EHQLA and HQLA | | of which EHQLA and HQLA |
| (in 000s of €) | 010 | 030 | 040 | 060 |
| Collateral received by the disclosing institution | 757,042 | 744,509 | 5,836,423 | 5,822,016 |
| Loans on demand | | | | |
| Equity instruments | | | | |
| Debt securities | 757,042 | 744,509 | 5,836,423 | 5,822,016 |
| of which: covered bonds | 25,067 | | 14,408 | |
| of which: securitisations | | | | |
| of which: issued by general governments | 531,079 | 531,079 | 4,821,776 | 4,821,776 |
| of which: issued by financial corporations | 225,770 | 213,237 | 860,708 | 848,302 |
| of which: issued by non-financial corporations | 193 | 193 | | |
| Loans and advances other than loans on demand | | | | |
| Other collateral received | | | | |
| Own debt securities issued other than own covered bonds or securitisations | | | | |
| Own covered bonds and securitisations issued and not yet pledged | | | | |
| TOTAL COLLATERAL RECEIVED AND OWN DEBT SECURITIES ISSUED | 1,056,932 | 744,509 | | |

*Table 11: Collateral Received and own debt securities issued*

[2] Guidelines on disclosure of encumbered and unencumbered assets: http://www.eba.europa.eu/documents/10180/741903/EBA-GL-2014-03+Guidelines+on+the+disclosure+of+asset+encumbrance.pdf/c65a7f66-9fa5-435b-b843-3476a8b58d66

The sources of encumbrance are shown in the following table:

| (in 000s of €) | Matching liabilities, contingent liabilities or securities lent | Assets, collateral received and own debt securities issued other than covered bonds and securitisations encumbered |
|---|---|---|
| | 010 | 030 |
| Carrying amount of selected financial liabilities | 719,563 | 1,056,932 |

*Table 12: Sources of encumbrance*

The primary sources of encumbrance are the following:

- Securities repledged in repurchase agreements mainly done with CBF account for 72% of total encumbered assets and collateral.  Such securities are received as collateral through reverse repurchase agreements, and are mostly eligible as HQLA;
- Accounts blocked for compliance purposes, representing 17% of total encumbered assets and collateral;
- The reverse amounts at the BCL and Monetary Authority of Singapore (MAS), representing 10% of encumbered assets and collateral; and,
- Cash margin posted for derivatives and reverse repurchase agreements.

However, as shown in the following tables, the overall encumbrance is low.  Furthermore, unencumbered assets are mainly related to the following positions:

- Loans on demand, representing 54%, and mainly consist of customer liquidity that is placed overnight with the BCL and CCBs;
- Other loans and advances, representing 36%, that are mainly made up of repurchase agreements as described in 9.3.5. Repurchase Agreements;
- Another 8% of unencumbered assets consist of debt securities, which are extremely high-quality liquid assets (EHQLA); and,
- The remaining amount is mainly other receivables and fixed assets.

# 7. Leverage Ratio

## 7.1. Leverage Ratio

The disclosure requirements concerning the leverage ratio are laid out in Art. 451 of the CRR 2 and specified in the Commission Implementing Regulation (EU) No. 2016/200 of 15 February 2016.

In the following table, Clearstream Banking S.A. shows the reconciliation of the leverage ratio total exposure with the relevant information in the published financial statements as on 31 December 2021, including any adjustments made in compliance with Art. (1) (b) CRR 2:

| | a |
|---|---|
| (in 000s of €) | Applicable amount |
| Total assets as per published financial statements | 14,578,994 |
| Adjustment for entities which are consolidated for accounting purposes but are outside the scope of regulatory consolidation | |
| (Adjustment for securitised exposures that meet the operational requirements for the recognition of risk transference) | |
| (Adjustment for temporary exemption of exposures to central bank (if applicable)) | |
| (Adjustment for fiduciary assets recognised on the balance sheet pursuant to the applicable accounting framework but excluded from the leverage ratio total exposure measure in accordance with point (i) of point (i) of Article 429a(1) CRR) | |
| Adjustment for regular-way purchases and sales of financial assets subject to trade date accounting | 0 |
| Adjustment for eligible cash pooling transactions | 0 |
| Adjustments for derivative financial instruments | 231,938 |
| Adjustment for securities financing transactions (SFTs) | 12,193 |
| Adjustment for off-balance sheet items (ie conversion to credit equivalent amounts of off-balance sheet exposures) | 918,388 |
| (Adjustment for prudent valuation adjustments and specific and general provisions which have reduced Tier 1 capital) | |
| (Adjustment for exposures excluded from the leverage ratio total exposure measure in accordance with point (c ) of Article 429a(1) CRR) | |
| (Adjustment for exposures excluded from the leverage ratio total exposure measure in accordance with point (j) of Article 429a(1) CRR) | |
| Other adjustments (CSD deduction and valuation differences) | -11,237,939 |
| **Leverage ratio total exposure measure** | **4,503,574** |

*Table 13: Summary reconciliation of accounting assets and leverage ratio exposures*

In the table below, the common disclosure of the leverage ratio - in accordance with Commission Implementing Regulation (EU) No. 575/2013, and No. 876/2019, which lays down implementation technical standards about disclosure of the leverage ratio for institutions ((EU) No. 637/2021) – is shown on 31 December 2021 and 31 December 2020. The on-balance sheet exposures are the biggest make-up for the exposure measure for the leverage ratio. In addition to the on-balance sheet items, the off-balance sheet items, and derivatives, and SFT exposures are considered to determine the leverage ratio exposure measure and the leverage ratio.

| | a | b |
|---|---|---|
| (in 000s of €) | 31.12.2021 | 31.12.2020 |
| **On-balance sheet exposures (excluding derivatives and SFTs)** | | |
| On-balance sheet items (excluding derivatives, SFTs, but including collateral) | 10,213,442 | 9,134,104 |
| (Asset amounts deducted in determining Tier 1 capital) | (35,845) | (37,828) |
| Total on-balance sheet exposures (excluding derivatives and SFTs) | 10,177,596 | 9,096,276 |
| **Derivative exposures** | | |
| Replacement cost associated with SA-CCR derivatives transactions (ie net of eligible cash variation margin) | 0 | 0 |
| Exposure determined under Original Exposure Method | 320,880 | 59,481 |
| Total derivatives exposures | 320,880 | 59,481 |
| **Securities financing transaction (SFT) exposures** | | |
| Gross SFT assets (with no recognition of netting), after adjustment for sales accounting transactions | 4,269,441 | 5,510,994 |
| (Netted amounts of cash payables and cash receivables of gross SFT assets) | | |
| Counterparty credit risk exposure for SFT assets | 12,193 | 7,610 |
| Derogation for SFTs: Counterparty credit risk exposure in accordance with Articles 429e(5) and 222 CRR | | |
| Agent transaction exposures | 32,063 | 7,745 |
| (Exempted CCP leg of client-cleared SFT exposure) | | |
| Total securities financing transaction exposures | 4,313,697 | 5,526,350 |

| | | |
|---|---|---|
| **Other off-balance sheet exposures** | | |
| Off-balance sheet exposures at gross notional amount | 886,325 | 428,059 |
| Off-balance sheet exposures | 886,325 | 428,059 |
| **Excluded exposures** | | |
| (Excluded CSD related services of CSD/institutions in accordance with point (o) of Article 429a(1 | (11,194,924) | |
| (Total exempted exposures) | (11,194,924) | - |
| **Capital and total exposure measure** | | |
| Tier 1 capital | 1,214,206 | 1,209,867 |
| Leverage ratio total exposure measure | 4,503,574 | 15,110,165 |
| **Leverage ratio** | | |
| Leverage ratio | 27% | 8% |
| Regulatory minimum leverage ratio requirement (%) | 3% | |
| **Disclosure of mean values** | | |
| Quarter-end value of gross SFT assets, after adjustment for sale accounting transactions and netted of amounts of associated cash payables and cash receivables | 6,465,408 | |

*Table 14: Leverage ratio*

Given the size of the on-balance sheet exposures, and in accordance with Art. 451 (1) (d) and (e) of CRR 2, in conjunction with Art. 6 of Regulation (EU) No. 2016/200, Clearstream Banking S.A. provides the following descriptions for processes used to manage the risk of excessive leverage:

- Clearstream processes large daily volumes of client transactions, which are collateralised by either cash or pledged securities. Cash collateral received is reinvested in short maturity transactions with low credit and market risk. This increases the total leverage exposure of Clearstream. The resulting leverage ratio therefore reflects both transaction volume at the reporting date and client use of cash (rather than pledged securities) as collateral. Clearstream is able to manage its leverage ratio relative to prudential norms through balance sheet and client collateral allocation strategies. CBL continues to monitor CRD V developments as part of its medium-term planning.

The leverage exposure and ratio are primarily influenced by the volume of client deposits, and the corresponding actions taken by Clearstream to place these funds in the market in as low risk a way as possible through on-balance sheet placements and securities financing transactions.

# 8. Risk Management

## 8.1. Operational risk

Clearstream's risk strategy, as described in 4. Risk management overview, also applies to the management of operational risk (hereinafter, "Operational risk," "OpRisk") and the two other risk categories: financial risk and business risk. Defined in this risk strategy is the risk capital dedicated to cover losses resulting from operational risk, setting a limit for this risk type.

Operational risk can be differentiated according to the severity and frequency of losses. As operational risk management depends on the risk position of Clearstream, the general principles are as follows:

- All main risks are identified and analyzed regarding the expected or real effect on frequency and severity.
- For risks with a low frequency but high severity, risk transfers are considered – for example, through insurance contracts.
- For risks with high frequency but low severity, risk reduction is considered – for example, by optimising processes.

The following chapter discloses the requirements laid down in Art. 446 CRR 2, concerning the approach for the assessment of own-funds requirements for operational risk and Art. 454 CRR 2 on the use of the Advanced Measurement Approach to operational risk. Approaches are disclosed in upcoming chapters.

Operational risk capital is intended to represent the required risk capital for unexpected operational risk losses. As part of the AMA within Clearstream, a model for calculating operational risk capital requirements has been developed, based on the individual risk profile of the institution. In line with the common practice in other risk areas, capital requirements are calculated using the Value at Risk (VaR) concept. Based on a statistical analysis of relevant data, a loss distribution is determined, which enables calculation of the required figures.

The model has been designed to have the following features:

- Capital requirements reflect the risk profile of Clearstream Banking S.A.
- Confidence levels can be adjusted according to the risk appetite of the bank.
- Incentives for proper risk management can be included in the model.
- Major risk drivers can be identified.
- Risk mitigation effects can be considered.
- Insurance policy is not considered as a risk mitigating affect in the Operational Risk capital model.

The model is explained in detail in subsequent chapters.

Insurance is an additional tool used by Clearstream to mitigate the impact of operational risk by transferring risks above a certain threshold to third parties through a comprehensive insurance program. To achieve the optimum risk/benefit versus premium ratio, insurance policies are negotiated either through insurance brokers or directly with highly rated insurers to purchase tailor-made policies reflecting the specificities of CBL's business. It is mentioned that risk mitigation effects are being considered within the AMA.

### 8.1.1. Governance

Operational risk represents a major risk class for the Bank, and one that is systemically managed and controlled. Clearstream follows an Advanced Measurement Approach (AMA) for calculating the regulatory capital requirement for operational risk. Thus, Clearstream established a comprehensive framework and set of instruments meeting the requirements from both a regulatory and a business perspective.

Since receiving regulatory approval in January 2008, CBL applies the AMA to calculate the capital requirements for operational risk.

Clearstream's risk strategy, as described in 4. Risk management overview, also applies to the management of operational risk and the other two risk categories, financial risk and business risk. Defined in this risk strategy is the risk capital dedicated to cover losses resulting from operational risk, setting a limit for this risk type.

Operational risk can be differentiated according to the severity and frequency of losses. As operational risk management depends on the risk position of Clearstream, the general principles are as follows:

- All main risks are identified and analyzed regarding the expected or real effect on frequency and severity.
- For risks with a low frequency but high severity, risk transfers are considered – for example, through insurance contracts.
- For risks with high frequency but low severity, risk reduction is considered – for example, by optimising processes.

The ultimate responsibility for operational risk management lies with the members of the Executive Board of Clearstream Banking S.A., who are supported by different units and functions. The five steps of the risk management process are key to the framework.

It is the responsibility of line management units to control operational risk within their area on a day-to-day basis. This includes the identification of suitable measures to mitigate operational risk, and to improve the effectiveness and efficiency of operational risk management. To achieve this target, the Executive Board appoints "operational risk representatives" for their respective area with a direct reporting line to the ultimate risk owner on the Executive Board.

The operational risk representative is the key contact for both the employees in the respective organisational unit as well as for Clearstream Risk Management. They also support their line management with all tasks regarding operational risk and are especially responsible for the collection of operational risk event data within their organisational unit. In addition, the operational risk representatives take an active role in further developing operational risk tools and instruments. They also coordinate operational risk training for their respective organisational unit.

It is the responsibility of the employees to support Clearstream Risk Management, line management, and the operational risk representative of their organisational unit regarding any operational risk matters. Every employee is required to participate in the collection of operational risk event data. Furthermore, individual employees may be asked by their line manager, their operational risk representative, or Clearstream Risk Management to take an active role in the operational risk management process, for example, as experts within the scenario analysis process.

### 8.1.2. Measurement

Operational risk capital is intended to represent the required risk capital for unexpected operational risk losses. As part of the AMA within Clearstream, a model for calculating operational risk capital requirements has been developed, based on the individual risk profile of the bank. For the year 2021, below is our operational risk own funds requirements, under the AMA.

| Banking activities | a | b | c | d | e |
|---|---|---|---|---|---|
| | Relevant indicator | | | Own funds requirements | Risk weighted exposure amount |
| | Year-3 | Year-2 | Last year | | |
| Banking activities subject to basic indicator approach (BIA) | | | | | |
| Banking activities subject to standardised (TSA) / alternative standardised (ASA) approaches | | | | | |
| *Subject to TSA:* | | | | | |
| *Subject to ASA:* | | | | | |
| Banking activities subject to advanced measurement approaches AMA | 96,997 | 102,060 | 104,699 | 241,233 | 3,015,410 |

*Table 15: Own funds requirements for operational risk under the AMA*

In line with the common practice in other risk areas, capital requirements are calculated using the Value at Risk (VaR) concept. Based on a statistical analysis of relevant data, a loss distribution is determined, which enables calculation of the required figures.

The model has been designed to have the following features:

- Capital requirements reflect the risk profile of the Bank;
- Confidence levels can be adjusted according to the risk appetite of the bank;
- Incentives for proper risk management can be included in the model;
- Major risk drivers can be identified; and,
- Risk mitigation effects can be considered.

Insurance policy is not considered as a risk mitigating affect in the Operational Risk capital model.

Input data for the model are results of a structured scenario analysis, as well as internal/external loss data, and KRIs. If loss data is sufficiently available, the application of a statistical model gives a reliable estimate of the underlying risk represented by the data.

However, some operational risk losses are not sufficiently available for all risk drivers. Additionally, internal loss data usually does not cover the extreme events apart from litigation with Office of Foreign Assets Control (OFAC) such cases have not occurred in the Bank so far. Internal loss data is used as input for the scenario analysis.

In addition, it is assumed that banks doing similar business also have similar risk profiles. If this assumption holds, publicly available losses or losses from a banking consortium could be used to fill the gap of missing internal loss information. However, Clearstream has a unique business model that, as of today, is not sufficiently represented in any bank consortium or public database. Therefore, Clearstream has decided to use external loss data only where appropriate. Furthermore, Clearstream decided to apply a statistical model to scenario losses that are created in a structured process by business experts. During this process, experts from all areas of the specific unit/Clearstream estimate the potential impact and the likelihood of a scenario loss.

The VaR model for the calculation of the operational risk capital uses internal and external loss data, Key Risk Indicators (KRIs), Risk Indicators (RIs) and scenarios as input. Internal and external loss data, as well as KRIs and RIs, enter the model indirectly by serving as the foundation of the Operational Risk scenario framework. The scenarios, which are subject to permanent validation, are the source of the parameters that determine the aggregate loss distribution generated by a Monte Carlo simulation. The quantile of that distribution represents the Value at Risk at the corresponding confidence level.

#### 8.1.2.1. Aggregate loss distribution

The overall objective of the operational risk model is to simulate a loss distribution for a given time frame, which is one year (for regulatory purposes referred to as holding period in regulatory publications).

Combining the loss distributions for all scenarios by Monte Carlo simulation gives the required aggregate loss distribution. From the aggregate loss distribution, the required risk figures are derived.

- Expected loss: The expected loss is generally defined as the actual monthly statistical mean of the aggregated loss distribution (it indicates which annual loss the Company has to face on average over a long period of time). With regard to Clearstream the expected loss (in the context of following calculations) is defined, in particular, as the minimum of a) the amount of provisions, booked in the budget at the beginning of the year, to cover expected losses resulting from claims (against Clearstream), and b) the actual monthly statistical mean of the aggregated loss distribution.
- Value at Risk: The Value at Risk (VaR) is defined as the amount that is not exceeded in q percentile cases of all years. For internal purposes, 99.90 percentile as well as the 99.00 percentile are calculated. Any other percentile can also be derived from the aggregate loss distribution.
- Unexpected loss: The unexpected loss is generally defined as the difference between the 99.90 percentile VaR and the expected loss. The unexpected loss determines the regulatory capital requirements of CBL for operational risk.

- Expected shortfall to the q-percentile: Defined as the statistical mean of the loss distribution above the q-percentile. It is used as a proxy for the loss amount the specific unit/entity could face if the q-percentile is exceeded.

For effective day-to-day management of OpRisk, the Bank differentiates OpRisk into four risk classes (known as "cells"), which have been found best suited for Clearstream's business model:

- Availability (AV)
- Service Deficiency (SD)
- Damage to Physical Assets (PA)
- Legal Offences and Business Practices (LOBP)

The distributions of all operational risk scenarios in a "cell" need to be combined to derive the aggregate loss distribution for a "cell" and, based on that, the total loss distribution for operational risk. Clearstream implemented a Monte Carlo simulation, which enables the highly precise numerical determination of the loss distribution.

Assume that there are n operational risk scenarios in a simulation "cell", where for each scenario i ($1 \leq i \leq n$):

- The frequency distribution follows a Poisson distribution with mean $\lambda_i$ (calculated as 1 / "frequency estimation") for generic scenarios and the majority of specific scenarios, or a Bernoulli distribution with probability $p_i$ (calculated as 1 / "Frequency estimation"), only for such specific scenarios which have the nature of only possibly occurring once within the next 12 months, never more often, and
- The severity distribution follows a continuous uniform distribution with boundaries $a_i \leftarrow b_i$ (which are a minimum and maximum loss of the scenario).

A single Monte Carlo simulation cycle is carried out in three steps:

- Generate for each operational risk scenario i ($1 \leq i \leq n$) a random number $L_i$ of events for this scenario from a Poisson distribution (or in above mentioned specific cases a Bernoulli) with mean $\lambda$ (or probability p);
- Generate for each operational risk scenario i ($1 \leq i \leq n$) loss amounts $l_{i,j}$ ($1 \leq j \leq L_i$) from a continuous uniform distribution with boundaries $a_i < b_i$. The loss amounts should be mutually independent; and,
- Sum all loss amounts $l_{i,j}$($1 \leq i \leq n$, $1 \leq j \leq L_i$) to calculate the total loss amount of one year.

Repeating the Monte Carlo cycles numerous times gives a loss distribution for a "cell" with the required accuracy. The current implementation of the model uses 25 million simulation trials.

#### 8.1.2.2. Monte Carlo simulation

The underlying assumption that justifies this procedure is the independence of events of distinct risk classes. The loss data collection and scenario analysis are focusing on assessing the risk arising from individual OpRisk events, for example, a system outage or money laundering. Although not limited to these examples, the severity of an event depends on its direct financial impact and on subsequent losses that are caused by this event. In principle, two reasons for dependence between individual events exist. First, events triggered by preceding events could be captured separately. These events depend on each other, which needs to be considered in the model. Second, different events could have the same underlying cause. Any change for the cause would affect all events, but not necessarily to the same extent. These two types of dependence need to be treated separately.

As part of the loss data collection and scenario analysis, the total impact of an event is considered, including the losses generated in other areas of the Bank because of the scenario event. These subsequent losses are estimated and documented within the risk scenario template as "related effects" and taken into consideration when estimating the severity of a risk scenario. During the scenario analysis process, the scenarios are not captured separately. Therefore, none of the scenarios depend on each other and can be treated in the model separately.

The risk classes that are the basis for the model are defined such that the allocation of events to these risk classes and the underlying main causes are mutually exclusive. Though, there could be events that cause subsequent losses or related effects that would relate to different risk classes. As an example, a terrorist attack leads to damage of physical assets (respective risk class is "damage to physical assets") and subsequently also causes a business interruption with consequential claims from customers and loss of revenues (respective risk class would be "availability"). Also, stress situations such as a long-lasting system interruption ("availability" risk) could cause human errors and omissions leading to additional subsequent losses. However, these cross-driver events are captured within a loss scenario belonging to only one risk class. This approach ensures that the individual risk classes are independent and is essential for the zero-correlation assumption amongst different risk classes.

This means, from a statistical point of view, that neither linear nor higher order dependencies exist. An appropriate model for this situation is a zero-correlation model, in which the occurrence and the size of losses belonging to different risk types are generated completely randomly. Risk management carries out a regular monthly check of the reasonability of the quantified required capital. Therefore, monthly and yearly safeguards have been defined as follows. Whenever the total 99.90% VaR moves up or down by:

- at least 3% of its previous month value or
- at least 10% of its previous year value.

The input data and the result must be examined to ensure the correctness of the figure. Explanation of any variation above the safeguards is included in the quarterly risk report.

### 8.1.3. Stress testing

To achieve a better understanding of the most significant risks and to adequately model capital requirements, Clearstream Risk Management runs stress tests every quarter. The stress testing aims to gauge the potential capital vulnerability to exceptional but plausible events. The stress test process is defined as follows:

- All scenarios agreed during the scenario analysis are generally considered when performing the stress test. When a stress test is not passed, it is repeated whilst excluding the scenario that caused the breach to identify all scenarios, which lead to a failure to pass the corresponding stress test. In general, quite unlikely scenarios with a frequency rarer than one loss in 1,000 years are disregarded.
- The risk scenario with the biggest maximum loss is benchmarked with 80% of the Available Risk-Bearing Capacity (ARBC) as defined in the Clearstream risk strategy.
- A combined occurrence of several risk scenarios within one year is considered. In principle, any combination of existing risk scenarios is possible. However, the focus is on plausible events, considering the respective frequency of occurrence per risk scenario. The approach is to combine the two extreme scenarios with the biggest maximum loss and a frequency not lower than one loss in 100 years and benchmark against 80% of the ARBC.
- In order not to focus only on extreme scenarios, the combination of non-extreme scenarios (frequency higher than one loss in 20 years) are also assessed. In this respect, three non-extreme risk scenarios with the biggest maximum loss are combined, and the total loss amount is benchmarked with 80% of the overall ARBC.

These stress tests are carried out when validating the outcome of the scenario analysis review. If the specific stress tests defined above exceed 85% of the available Risk-Bearing Capacity reporting threshold, the Executive Board is informed. In addition to the stress tests defined above, Clearstream Risk Management might test other combinations of scenarios to obtain a better understanding of the appropriateness of the calculated capital requirements.

If the outcome of the regular or the ad hoc scenario review changes the OpRisk landscape of the bank, ad hoc stress tests are performed. These changes involve altering a scenario already included in OpRisk stress tests or changing the composition of the stress tests, i.e. including a new scenario. The deletion of a scenario does not trigger an ad hoc stress test as the risk only can decreased and not increase.

A reverse stress test for operational risk is performed as well. It assumes the materialisation of several operational risk scenarios (frequency not rarer than one loss in 1,000 years). A sufficient number of operational risk scenarios are chosen so that the losses would exceed the total ARBC. Scenarios that already exceeded the ARBC in the first stress test are not considered.

### 8.1.4. Mitigation

As laid out in its risk strategy, Clearstream gives considerable attention to its risk mitigation process. The aim is to reduce the frequency and severity of potential operational risk events. The process comprises several quality and control initiatives whose objective is to ensure that Clearstream's operations have sufficient controls to prevent any fraud or operational service deficiency. If an event of this kind occurs in Clearstream's operations, a thorough analysis is performed to be in the position to define measures to reduce the probability of recurrence.

The key preventive measures of risk mitigation consist of robust internal control processes and ongoing initiatives to further reduce errors and omissions. This is supported by many measures that will take effect at the time or after an incident, such as Business Continuity Management (BCM) and insurance programs.

#### 8.1.4.1. Internal Controls

The Executive Board of CBL has implemented an internal control system, designed to ensure the effectiveness and profitability of the business operations, prevent, or detect financial loss and thus protect all its business assets. Clearstream's internal control system, an integral part of the risk management system, is continuously developed and adjusted to reflect changing conditions. It comprises both integrated and independent control and safety measures. In 2018, Clearstream established the Control Assurance & Monitoring (CAM) function to further enhance the documentation and monitoring of the internal control system. Internal Audit carries out risk-oriented and process-independent controls to assess the effectiveness and appropriateness of the internal control system.

#### 8.1.4.2. Business continuity management

Within the operational risk framework, business continuity management provides the Bank the comfort we have the capabilities of meeting disruptions to the business while providing market infrastructure. In the unlikely event we experience the unavailability of core processes and resources, this represents a substantial risk for Clearstream and potential systemic risk to financial markets, and as a result, Clearstream has implemented a comprehensive Business Continuity Management (BCM) approach as key mitigation of availability risk. Related tests are performed throughout the year.

##### 8.1.4.2.1. BCM organisation at Clearstream

The Executive Board is responsible for ensuring the continuity of business at Clearstream Banking S.A. This responsibility is delegated to the various organisational units, which are directly responsible for the operational resilience and disaster tolerance of their respective business areas. Reporting to executive management, the Business Continuity Management function is responsible for the overall coordination, monitoring, and assessment of Clearstream's preparedness to deal with incidents and crises.

The organisational roles and responsibilities and the guiding principles to ensure operational resilience are documented in a formal BCM policy.

##### 8.1.4.2.2. BCM arrangements

The implemented BCM arrangements aim to minimise the impact of the unavailability of key resources and address the unavailability of systems, workspace, staff, and suppliers to ensure the continuity of the most critical operations even in cases of catastrophic events. Clearstream also leverage on its operational locations in Cork, Eschborn, London, Luxembourg, Prague, and Singapore to maintain the continuity of its services.

#### 8.1.4.3. Systems unavailability

Data centres are geographically distributed to form active centres, acting as backups of each other. Data is mirrored in real time across the data centres. The infrastructure is designed to ensure the online availability and integrity of all transactions to limit the impact due to any disruption.

#### 8.1.4.4. Workspace unavailability

Exclusively dedicated work facilities provide backup office space for mission-critical functions requiring onsite presence if an office location becomes unavailable. These backup facilities are fully equipped and networked with the distributed data centres and always operational. Also, business transfer plans between Clearstream's different operations locations and remote working can be used to mitigate workspace unavailability.

#### 8.1.4.5. Staff unavailability

Business continuity solutions also cover the significant unavailability of staff, e.g., during a pandemic-related incident or terrorist attacks. Solutions are designed to ensure that the minimum staff and skills required are available outside the impacted location. Staff dispersal and business transfer plans between Clearstream's different operations locations are in place so that, if one of these locations is impacted, mission-critical activities can be continued by staff in other locations. Measures are defined to mitigate the availability risks during a widescale pandemic, either with a regional or cross regional impact. Focus is on ensuring the well-being of staff e.g., by rotational working or remote working, thus ensuring staff availability. Measures are adaptable to also adhere to any recommendations or directives issued by local authorities.

#### 8.1.4.6. Supplier unavailability

Clearstream ensures the continuous provision of critical supplier services by several means, such as regular due diligence reviews of suppliers' BCM arrangements, provision of services by alternative suppliers where possible, and service level agreements describing minimum service levels and contingency procedures.

#### 8.1.4.7. Incident and crisis management process

Clearstream has implemented a Group-wide incident and crisis management process that, in a structured and effective manner, facilitates a coordinated response and rapid reaction to an incident or crisis. The process aims to minimise business and market impact, enabling a swift recovery and return to regular business activity.

Incident managers have been appointed in the respective business areas as single points of contact in case of incidents and crises to ensure the appropriate response mechanisms are in place to ensure an escalation up to the Executive Board and the notification of customers and other relevant external parties.

#### 8.1.4.8. "Real-life" simulation testing

Clearstream adopts a comprehensive and ambitious business-continuity testing approach that simulates scenarios as close as possible to real-life situations whilst reducing associated risks and avoiding customer impacts. BCM plans are tested regularly, at least annually and mostly unannounced.

BCM test results are validated against the following objectives:

- Functional effectiveness: validating all technical functionalities.
- Execution ability: staff must be familiar with and knowledgeable in the execution of BCM procedures.
- Recovery time: the functions in the scope of the business continuity plans must be operational within the defined recovery time objective.

Test results are reported to the Executive Board. Customers are regularly invited to participate in Clearstream's BCM tests to provide them with the direct assurance of Clearstream's BCM preparedness.

### 8.1.5. Insurance

Insurance is an additional tool used by Clearstream to mitigate the impact of operational risk by transferring risks above a certain threshold to third parties through a comprehensive insurance program. To achieve the optimum risk/benefit versus premium ratio, insurance policies are negotiated either through insurance brokers or directly with highly rated insurers to purchase tailor-made policies reflecting the specificities of CBL's business.

### 8.1.6. Monitoring & Reporting

The reporting approach laid out in 4.11 Risk monitoring and reporting also applies to the management of operational risk. Operational risk is monitored in the context of the Internal Capital Adequacy Assessment (ICAAP) of Clearstream, which is defined centrally and calculated on a regular basis. For detailed information on ICAAP please refer to 4.12 ICAAP information.

# 9. Credit Risk

## 9.1. Concise credit risk statement

As an O-SII, Clearstream has a dedicated focus on maintaining strong internal risk controls, limits, processes, and having a framework that encompasses a safe and stable financial institution. One example of this is through setting credit limits, which are mainly granted for the purpose of facilitating the settlement of securities transactions (€164.581 billion at the end of 2021 granted from CBL). Credit risk mainly arises from intraday credit, as well as from custody, securities financing, treasury operations, and settlement over the Bridge with Euroclear for CBL.

Sources of credit risk are assessed after considering all business segments, products, and services. The Bank's list of sources of credit risk is updated annually (should changes occur) as part of our policies and risk inventory. These sources of credit risk include:

- Credit risk from settlement activities (including income events), i.e., when CBL grants intraday credit (cash loans) to its participants, mainly to facilitate settlement activities, but also for cash withdrawals (i.e., the credit risk relating to income events, FX trades, corporate actions requiring payment of exercise fees).
- Credit risk from its securities financing business: In the securities financing business, the ASL program provides opportunities for borrowers to avoid settlement failures, and for lenders to earn additional income from their portfolios. Regarding ASL, the Bank is exposed to credit risk as it acts as a guarantor. Moreover, credit risk may arise from the ASLplus and ASL principal programs, where the Bank acts as a principal.
- Credit risk from treasury activities, including repos, reverse repos, FX trades, interest rate and currency swaps, and unsecured placements. This credit risk arises in case the counterparty defaults prior to the performance of the respective obligation.
    - Additionally, from a treasury investment perspective, issuer risk may arise from a credit event affecting an issuer of securities and resulting in either the deterioration of the market value of the securities or in the issuer's inability to pay amounts due
- Credit risk from Bridge activities, in case of a default of Euroclear Bank before having paid for securities already delivered by Clearstream.

In addition, Clearstream may grant credit limits that are used to facilitate the settlement of securities transactions and support the securities financing business. Credit is granted exclusively on a collateralised basis where prudent haircuts are applied to the pertinent collateral, apart from certain unsecured settlement limits granted to sovereign and supranational institutions based on the strong credit quality of these counterparts where zero risk weight is applied in line with Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 (CRR), Regulation (EU) No 876/2019 (CRR 2), and with specific approval by the Executive Board. Furthermore, credit limits are set for the placement of funds with counterparties; credit processing is arranged in guidelines and work instructions.

Continuing in the scope of credit limits, these are set in accordance with the customer's financial standing, as indicated by factors such as the customer's credit rating and net worth taking into account the level of activity in the customer's accounts and level of collateralisation. The evaluation of counterparties and the credit risk classification takes place within the "credit assessment," which is performed by the Bank's credit division. A quarterly internal rating benchmarking exercise with regard to external sources is performed, and internal ratings are adjusted when deemed necessary. The collateral recoverability is part of the tests performed by the Credit Default Management Team.

From a governance point of view, the Executive Board determines the governing principles within Clearstream's Credit Strategy. This includes overall credit granting criteria, and ensuring that the Bank's credit activities executed within the framework are articulated within the Credit Strategy. The credit risk management function of Clearstream provides independent monitoring on all credit risk-related activities. It is also 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 Clearstream.

The credit risk management function is responsible for ensuring credit exposures remain within levels consistent with prudential standards and therefore within predefined limits. It ensures that exceptions to the Credit Policy, procedures, and limits are reported on a timely basis to the Executive Board, and other relevant functions. All members of the Executive Board are ultimately responsible for the risk strategy, which reflects the Bank's risk appetite in defining the maximum loss the Executive Board is willing to assume in one year, the risk tolerance, and desired performance levels.

Furthermore, risk management is a fundamental component of Clearstream's management and control framework. Overall effective and efficient risk management is vital to protect Clearstream's interests and simultaneously enabling it to achieve its corporate goals. Clearstream has established a Group-wide risk management system comprising roles, processes, and responsibilities applicable to all employees and organisational units of Clearstream. This ensures that emerging risks are identified and managed as early as possible.

Clearstream's risk strategy is based upon the business strategy and regulates the extent of risks taken throughout the various business activities of Clearstream. Clearstream ensures this by determining conditions for risk management, risk control, and risk limitation. Thus, Clearstream gives considerable attention to its risk mitigation process, and ensures that appropriate measures are taken to avoid, reduce, and transfer risk or, alternatively, to intentionally accept it. This means that timely and adequate control of risk must be ensured, and information required for controlling risk is assessed using structured and consistent methods and processes. The results are collated and incorporated into a reporting system enabling measurement and control of risks. Consequently, risk reporting is based on reliable information and carried out on a regular basis and ad hoc, if necessary.

According to Art. 178 CRR, a debtor is in default when either or both of the following conditions apply:

- The institution has material reason to consider that the obligor is unlikely to pay its (credit) obligations in full, without recourse by the institution to actions such as realising collateral (if held).
- The obligor is past due more than 90 successive calendar days on any material part of its overall credit obligation to the institution.

Clearstream's internal definition of "impairment" according to the International Financial Reporting Standards (IFRS) is compliant with the definition of "default" outlined in Art. 178 of CRR.

## 9.2. Credit Risk Overview

Clearstream credit risk is in accordance with Art. 435(1), 442 and 453 CRR 2, the following paragraph will provide required information on credit risk and credit risk mitigation as laid down in section 4.8 – Credit risk and general information on CRM in the EBA Guidelines on disclosure requirements under Part Eight of Regulation (EU) No. 575/2013 and (EU) No. 876/2019.

Also, the CSD-Regulation Commission Delegated Regulation (EU) 2017/390 [CSDR Level II], for the purposes of the Art. 18(1), provides that a CSD-banking service provider shall design and implement policies and procedures that comply with the following requirements:

- Measure intraday and overnight credit risk;
- Monitor intraday and overnight credit risk;
- Manage intraday and overnight credit risk; and,
- Publicly disclose its credit risks.

For the purposes of the above last point (h) of Art. 18(1), Art. 28 states that the CSD-banking service provider shall publicly disclose annually a comprehensive qualitative statement that specifies how credit risks, including intraday credit risks are measured, monitored, and managed.

### 9.2.1. Measurement, Monitoring, Management of Intraday and Overnight Credit Exposures

Given the nature of Clearstream's business and core role through clearing and settling securities in addition to custody, credit risk is present in CBL in following business lines: custody (mainly related to asset servicing activities), settlement, securities financing, treasury operations, and from settlement over the Bridge with Euroclear for CBL. To respond to these identified sources of credit risks including intraday credit risk, CBL has put in place adequate controls and an operational framework to manage its activities under the Regulation (EU) No 909/2014. The latter requires CBL to measure, monitor, and manage on an ongoing basis its intraday and overnight credit exposure for each banking-type ancillary service provided.

In conformity with Articles 19 to 23 and Article 27 and 28 of CSDR Level 2, CBL identifies and measures intraday credit risk exposures by way of operational and analytical tools that identify and measure intraday credit exposures on an ongoing basis. Accordingly, CBL meets the requirements of the measurement referred to in EBA RTS Article 19, as the reports generated in relation to this article are established either on an ad-hoc, daily, or monthly basis, as described below.

- Measurement of intraday and overnight Credit Exposures: to identify and measure intraday credit risk exposure, CBL, through analytical tools as the Credit Exposure Monitoring Tool (CEMT). These tools enable the measurement and monitoring of credit exposures and credit limits at (i) account level, (ii) institution level, and (iii) Principal Holding level. More specifically, the identification and measurement of intraday credit risk is calculated at least daily for the metrics depending on external data availability and on ongoing basis. The CEMT relies on the latest intraday capture of the data from several source systems (credit, collateral, settlement, treasury, income, etc.) enriching its data set for an in-depth analysis and monitoring.
- Monitoring and Management of intraday and overnight Credit Exposures: the monitoring activity is performed through a set of daily reports and processes. These are used to monitor and report intraday and overnight credit exposures against limits and collateral. Through the combination of, among others, predefined credit limits, the monitoring of the creditworthiness of the individual participants, the collateral classification and valuation, early-warning signals, as well as the intraday and overnight credit exposure monitoring and reporting, CBL has appropriate risk-management tools in place to manage and control the identified credit risks.

## 9.3. Governance

Clearstream's general risk management structure, organisation, and process, as well as its risk strategy, are specified in chapter 4. Risk management overview. The present status and the business direction for credit risk are stated in a credit risk strategy. The Executive Board periodically examines and adjusts the credit risk strategy as necessary.

The credit risk strategy is set in accordance with the Risk Management Policy and reported annually to the Supervisory Board. The credit risk strategy represents the framework and defines, the principles, credit risk appetite, the credit authorities, collateral eligibility, the basic counterparty quality, as well as the fundamental country and currency risk categories. The credit risk strategy is translated into a limit system, which is also monitored regularly and ad hoc.

Please see the Concise Risk Statement above for additional information.

The credit risk management section manages country risk by setting limits for each country based on the country's internal credit rating. Currency limits are established for non-major currencies to cover currency exposure. Any exception to the Credit Risk Policy must be approved by the Executive Board. All credit risk exposures are regularly reviewed and monitored. As well, Clearstream conducts special reviews when information indicating an adverse change in the risk assessment of the exposure or collateral is received from external and internal sources.

The exposure limit, mentioned above, is set to ensure that Clearstream does not take on a very large exposure, resulting in excessive risk, by attributing it on too few participants or counterparties. Luxembourg banking regulations also impose risk concentration limits that must be respected for each applicable exposure. The exposures after credit risk mitigation techniques, that is collateral, to an individual customer or group of connected customers above 25% of own funds, are reported as a breach under the Large Exposures regulation.

Credit risk control is performed by the credit risk management section, and is an independent function, while working across the organisation to ensure stable credit risk management. The credit risk management section is responsible for issuing a monthly credit report to the Executive Board and Group Risk Monitoring, as well as for credit exposure reporting to Group Risk Monitoring, which forms the basis of the credit VaR calculations.

### 9.3.1. Use of Standardised Approach

Prior to August 2020, for the exposure class pertaining to central governments and central banks, Clearstream used the credit assessments by the OECD[3]. In addition, Clearstream also nominated the external credit assessment institution (ECAI) Standard & Poor's for the same exposure class, because OECD stopped assessing so-called "high-income countries" in 2013. In August 2020 external credit assessment institutions Fitch and Moody's were added as nominated ECAIs and Luxembourg supervisor was notified accordingly. For the "regional governments or local authorities" and "public sector entities" and "institutions" (credit institutions, investment firms and other dedicated financial counterparties) exposure classes, the dedicated risk weight is derived from that of the respective country of domicile.

The exposures of Clearstream are mainly to the exposure classes of institutions (47%), corporates (27%), and central governments or central banks (14%); the remainder are shown below with the accompanying risk weight. The current exposures to central governments and central banks are mainly risk-weighted at 0%. Exposures to institutions generally have a short original maturity of less than or equal to three months; therefore, under Art. 120 paragraph 2 CRR the risk weight is 20%. The risk weighting for multilateral development banks is in most cases 0%. Covered bonds obtain a risk weighting based on the risk weightings assigned to senior unsecured claims on the credit institution that issues the covered bond. All other exposures in the different exposure classes mostly achieve the prescribed risk weighting of an unrated position ("unrated" implies that no credit rating by an eligible ECAI exists or no ECAI has been nominated for that purpose). Clearstream complies with the risk weighting as defined in Section 2, Chapter 2 of Part 3, Title II CRR. The table below shows the applied risk weights for each exposure class:

| Exposure classes | Risk weight | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | 0% | 20% | 50% | 100% | 150% | 250% | |
| | a | e | g | j | k | l | p |
| Central governments or central banks | 7,411,558 | 2,246 | 455 | 738 | - | - | **7,414,998** |
| Regional government or local authorities | 180,421 | 3 | - | - | - | - | **180,423** |
| Public sector entities | 753,137 | - | - | - | - | - | **753,137** |
| Multilateral development banks | 449,408 | 22 | - | - | - | - | **449,430** |
| International organisations | 133,749 | - | - | - | - | - | **133,749** |
| Institutions | - | 29,716,510 | 57,124 | - | - | - | **29,773,634** |
| Corporates | - | - | - | 17,047,727 | 284 | - | **17,048,011** |
| Retail exposures | - | - | - | - | - | - | **-** |
| Exposures secured by mortgages on immovable property | - | - | - | - | - | - | **-** |
| Exposures in default | - | - | - | - | 4,987 | - | **4,987** |
| Exposures associated with particularly high risk | - | - | - | - | - | - | **-** |
| Covered bonds | - | - | - | - | - | - | **-** |
| Exposures to institutions and corporates with a short-term credit assessment | - | - | - | - | - | - | **-** |
| Units or shares in collective investment undertakings | - | - | - | - | - | - | **-** |
| Equity exposures | - | - | - | 10,288 | - | 27,410 | **37,697** |
| Other items | 2 | - | - | 22,108 | - | - | **22,110** |
| TOTAL | **8,928,276** | **29,718,781** | **57,579** | **17,080,861** | **5,271** | **27,410** | **55,818,178** |

*Table 16: Standardised approach with risk weights*

[3] Country risk classification: http://www.oecd.org/tad/xcred/crc.htm.

### 9.3.2. Credit risk exposure distribution

#### 9.3.2.1. Value adjustments and provisions

Clearstream assesses at each balance sheet date, whether there is objective evidence that a financial asset or group of financial assets is impaired, where appropriately applying the expected loss model as introduced by IFRS 9 Financial Instruments.

Clearstream does not have material amounts of value adjustments and provisions for credit risk exposures at present, mainly because of its business model, which is focused on short-term lending activities to enable efficient and secure settlement processes, and the possibility to directly collect trade receivables within two (2) days.

#### 9.3.2.2. Past due items and default or non-performing exposures

According to the definitions stated below, Clearstream had no material past due items or defaulted exposures on its books on the reporting date or during the year under review.

#### 9.3.2.3. Definition of past due

The CRR classifies an exposure as "past due" if a counterparty has failed to make a payment when contractually due, when the debtor has exceeded an external limit communicated to it, as well as when the debtor has utilised credit without prior consent.

#### 9.3.2.4. Definition of default or non-performing

According to Art. 178 CRR, a debtor is in default when either or both of the following conditions apply:

- The institution has material reason to consider that the obligor is unlikely to pay its (credit) obligations in full, without recourse by the institution to actions such as realising collateral (if held).
- The obligor is past due more than 90 successive calendar days on any material part of its overall credit obligation to the institution.

Clearstream's internal definition of "impairment" according to the International Financial Reporting Standards (IFRS) is compliant with the definition of "default" outlined in Art. 178 CRR.

Related to our definition of default or non-performing exposures, credit risk mainly arises in the short term and with credit institutions or governmental counterparties. Treasury counterparties, as well as CCBs for the operational network, are selected based on a high degree of creditworthiness and operational reliability. Due to the short-term nature of the business performed by Clearstream, strict internal guidelines and close monitoring of business, there have been no material credit losses at Clearstream since 1970.

### 9.3.2.5. Distribution of credit risk exposures

In the following, the distribution of the credit risk exposures is broken down by exposure classes (Art. 442 (c) CRR 2), geographical area (Art. 442 (d) CRR 2), industry (Art. 442 (e) CRR 2), and residual maturity (Art. 442 (f) CRR 2).

Building on the performing and non-performing exposures, on 31 December 2021, the allocation per exposure class is shown in the table below. Most of the exposures held by Clearstream are with central governments and institutions, which account for more than 93% of exposures. Compared with the year-end amount, the table also shows the average exposure during the year under review.

Clearstream has most of its cash balances held at central banks, where most of the exposures are deemed to be in good standing, as shown by the performing nature. Of the non-performing exposures, €1.4 million is driven by credit institutions, however, they have not moved beyond their current stage in non-performance. The first table shows the defaulted exposures next to the ones not defaulted per exposure class.

| (in 000s of €) | Gross carrying amount/nominal amount | | | | | | Accumulated impairment, accumulated negative changes in fair value due to credit risk and provisions | | | | | | Accumulated partial write-off | Collateral and financial guarantees received | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Performing exposures | | | Non-performing exposures | | | Performing exposures – accumulated impairment and provisions | | | Non-performing exposures – accumulated impairment, accumulated negative changes in fair value due to credit risk and provisions | | | | On performing exposures | On non-performing exposures |
| | | Of which stage 1 | Of which stage 2 | | Of which stage 2 | Of which stage 3 | | Of which stage 1 | Of which stage 2 | | Of which stage 2 | Of which stage 3 | | | |
| Cash balances at central banks and other demand deposits | 8,187,151 | 8,187,150 | - | - | - | - | - | - | - | - | - | - | | - | - |
| Loans and advances | 4,647,973 | 4,647,973 | - | 1,391 | - | - | (1) | (1) | - | (662) | - | - | | 4,257,248 | - |
| *Central banks* | 5,915 | 5,915 | - | - | - | - | - | - | - | - | - | - | | - | - |
| *General governments* | 3,223 | 3,223 | - | - | - | - | - | - | - | - | - | - | | - | - |
| *Credit institutions* | 3,864,308 | 3,864,308 | - | 842 | - | - | (0) | (0) | - | (231) | - | - | | 3,785,281 | - |
| *Other financial corporations* | 761,768 | 761,768 | - | 342 | - | - | (0) | (0) | - | (274) | - | - | | 471,967 | - |
| *Non-financial corporations* | 12,759 | 12,759 | - | 207 | - | - | (0) | (0) | - | (156) | - | - | | - | - |
| *Of which SMEs* | - | - | - | - | - | - | - | - | - | - | - | - | | - | - |
| *Households* | - | - | - | - | - | - | - | - | - | - | - | - | | - | - |
| Debt securities | 1,516,006 | 1,516,006 | - | - | - | - | (237) | (237) | - | - | - | - | | - | - |
| *Central banks* | - | - | - | - | - | - | - | - | - | - | - | - | | - | - |
| *General governments* | 623,768 | 623,768 | - | - | - | - | (237) | (237) | - | - | - | - | | - | - |
| *Credit institutions* | 892,238 | 892,238 | - | - | - | - | - | - | - | - | - | - | | - | - |
| *Other financial corporations* | - | - | - | - | - | - | - | - | - | - | - | - | | - | - |
| *Non-financial corporations* | - | - | - | - | - | - | - | - | - | - | - | - | | - | - |
| Off-balance-sheet exposures | *886,325* | *886,325* | - | - | - | - | - | - | - | - | - | - | | - | - |
| *Central banks* | | | | | | | | | | | | | | | |
| *General governments* | | | | | | | | | | | | | | | |
| *Credit institutions* | | | | | | | | | | | | | | | |
| *Other financial corporations* | | | | | | | | | | | | | | | |
| *Non-financial corporations* | | | | | | | | | | | | | | | |
| *Households* | | | | | | | | | | | | | | | |
| *Total* | *15,237,455* | *15,237,454* | - | *1,391* | - | - | *(239)* | *(239)* | - | *(662)* | - | - | - | *4,257,248* | - |

*Table 17: Performing and non-performing exposures, and related provisions*

As shown below, CBL holds most of its exposures with central and regional governments, central banks, PSEs, MDBs and institutions. No retail or SME exposure was held during the year under review. In accordance with IFRS 9, CBL recognised exposures in default.

| | Net exposure value | | | | | |
|---|---|---|---|---|---|---|
| (in 000s of €) | On demand | <= 1 year | > 1 year <= 5 years | > 5 years | No stated maturity | Total |
| Loans and advances | 212,327 | 4,436,374 | - | - | - | 4,648,701 |
| Debt securities | | 394,254 | 1,091,039 | 30,475 | - | 1,515,769 |
| *Total* | **212,327** | **4,830,627** | **1,091,039** | **30,475** | **-** | **6,164,469** |

*Table 18: Maturity of exposures*

The following table provides information about the changes in the stock of non-performing and impaired loans.

| (in 000s of €) | Gross carrying amount |
|---|---|
| **Initial stock of non-performing loans and advances** | 2,985 |
| Inflows to non-performing portfolios | 747 |
| Outflows from non-performing portfolios | (2,341) |
| Outflows due to write-offs | (2,341) |
| Outflow due to other situations | - |
| **Final stock of non-performing loans and advances** | 1,391 |

*Table 19: Changes in the stock of non-performing loans & advances*

Although Clearstream deals primarily with institutions, central banks, or central governments, we also have corporate counterparties, also mentioned in 8.3.1. Use of Standardised Approach. The next table shows the split of the defaulted and non-defaulted exposure per economic sector of the counterparty. On 31 December 2021, our non-performing exposures were €207,000, and mostly consisted of information and communication counterparties. The vast majority of the carrying amount are performing nearly €13 million.

| | a | b | c | d | e | f |
|---|---|---|---|---|---|---|
| | Gross carrying amount | | | | Accumulated impairment | Accumulated negative changes in fair value due to credit risk on non-performing exposures |
| | | Of which non-performing | | Of which loans and advances subject to impairment | | |
| (in 000s of €) | | | Of which defaulted | | | |
| Agriculture, forestry and fishing | - | - | - | - | - | - |
| Mining and quarrying | 0 | - | - | 0 | - | - |
| Manufacturing | 12 | - | - | 12 | - | - |
| Electricity, gas, steam and air conditioning supply | 6 | - | - | 6 | - | - |
| Water supply | - | - | - | - | - | - |
| Construction | - | - | - | - | - | - |
| Wholesale and retail trade | 69 | - | - | 69 | - | - |
| Transport and storage | 20 | - | - | 20 | - | - |
| Accommodation and food service activities | 10 | - | - | 10 | - | - |
| Information and communication | 11,271 | 95 | - | 11,271 | (79) | - |
| Financial and insurance actvities | 1,241 | - | - | 1,241 | - | - |
| Real estate activities | - | - | - | - | - | - |
| Professional, scientific and technical activities | 203 | 30 | - | 203 | (7) | - |
| Administrative and support service activities | 57 | 16 | - | 57 | (12) | - |
| Public administration and defense, compulsory social security | - | - | - | - | - | - |
| Education | 7 | - | - | 7 | - | - |
| Human health services and social work activities | - | - | - | - | - | - |
| Arts, entertainment and recreation | 1 | - | - | 1 | - | - |
| Other services | 69 | 66 | - | 69 | (59) | - |
| *Total* | *12,967* | *207* | - | *12,967* | *(157)* | - |

*Table 20: Credit quality of loans and advances to non-financial corporations, by industry*

Similar to above, the breakdown of exposure in default and non-performing exposures, according to country are included in the Appendix B, quality of non-performing exposures by geography.

The majority of the Bank's performing, and non-performing exposures are driven by credit institutions and other financial corporations. The following table shows the Bank's performing and non-performing exposures on 31 December 2021:

| | Gross carrying amount/nominal amount | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Performing exposures | | | Non-performing exposures | | | | | | | | |
| (in 000s of €) | | Not past due or past due ≤ 30 days | Past due > 30 days ≤ 90 days | | Unlikely to pay that are not past due or are past due ≤ 90 days | Past due > 90 days ≤ 180 days | Past due > 180 days ≤ 1 year | Past due > 1 year ≤ 2 years | Past due > 2 years ≤ 5 years | Past due > 5 years ≤ 7 years | Past due > 7 years | Of which defaulted |
| Cash balances at central banks and other demand deposits | 8,187,151 | 8,187,151 | - | - | - | - | - | - | - | - | - | - |
| Loans and advances | 4,647,973 | 4,647,782 | 192 | 1,391 | - | 177 | 492 | 233 | 336 | 93 | 60 | - |
| *Central banks* | 5,915 | 5,915 | - | - | - | - | - | - | - | - | - | - |
| *General governments* | 3,223 | 3,223 | - | - | - | - | - | - | - | - | - | - |
| *Credit institutions* | 3,864,308 | 3,864,208 | 100 | 842 | - | 152 | 461 | 158 | 53 | 17 | 1 | - |
| *Other financial corporations* | 761,768 | 761,732 | 36 | 342 | - | 10 | 12 | 71 | 236 | 13 | 0 | - |
| *Non-financial corporations* | 12,759 | 12,704 | 56 | 207 | - | 15 | 19 | 4 | 47 | 63 | 59 | - |
| *Of which SMEs* | - | - | - | - | - | - | - | - | - | - | - | - |
| *Households* | - | - | - | - | - | - | - | - | - | - | - | - |
| Debt securities | 1,516,006 | 1,516,006 | - | - | - | - | - | - | - | - | - | - |
| *Central banks* | - | - | - | - | - | - | - | - | - | - | - | - |
| *General governments* | 623,768 | 623,768 | - | - | - | - | - | - | - | - | - | - |
| *Credit institutions* | 892,238 | 892,238 | - | - | - | - | - | - | - | - | - | - |
| *Other financial corporations* | - | - | - | - | - | - | - | - | - | - | - | - |
| *Non-financial corporations* | - | - | - | - | - | - | - | - | - | - | - | - |
| Off-balance-sheet exposures | 886,325 | | | | | | | | | | | - |
| *Central banks* | | | | | | | | | | | | |
| *General governments* | | | | | | | | | | | | |
| *Credit institutions* | | | | | | | | | | | | |
| *Other financial corporations* | | | | | | | | | | | | |
| *Non-financial corporations* | | | | | | | | | | | | |
| *Households* | | | | | | | | | | | | |
| ***Total*** | *15,237,455* | *14,350,938* | *192* | *1,391* | *-* | *177* | *492* | *233* | *336* | *93* | *60* | - |

*Table 21: Credit quality of performing and non-performing exposures by past due days*

### 9.3.3. Stress Testing

As part of a robust risk management framework, Clearstream performs stress tests on our credit risk function. The term "stress test" comprises the entirety of qualitative and quantitative analysis methods of rare but plausible events. There are two stress tests performed for credit risk:

- The "Default of the Largest Counterparty Group Stress Test," where the default of the counterparty Group with the largest unsecured exposure is simulated monthly, after utilisation of all respective collateral and after taking the recovery rate into account.
- The "Economic Deterioration Stress Test," where the impact on Clearstream of a deterioration of the economic environment is simulated monthly. To capture the worsening of the economy, certain credit risk model parameters are adjusted compared to the standard VaR simulation

The results of the "Default of the Largest Counterparty Group Stress Test" and the "Economic Deterioration Stress Test" are compared to limits, which are defined as a fraction of the available Risk-Bearing Capacity. The stress test results are reported to the Executive Board every quarter and semi-annually to the Supervisory Board.

In addition to the stress tests defined above, a "Reverse Credit Stress Test" is also performed, which aims to identify the number of unsecured credit lines that exceed the available risk-bearing capacity.

In 2021, the stress tests did not reveal any risks endangering the going concern of Clearstream's business.

### 9.3.4. Mitigation

Disclosure requirements concerning credit risk mitigation are laid down in Section C EBA Guidelines on disclosure requirements under Part Eight of Regulation (EU) No. 575/2013, and 876/2019 in conjunction with Art. 453 CRR and CRR 2.

The credit risk mitigation technique used by Clearstream Banking S.A. for solvency purposes is collateralisation. For Clearstream, only net positions are relevant.

The portfolio companies of Deutsche Börse Group are highly integrated and perform a variety of services for each other. Therefore, respective fees are invoiced, resulting in payables and receivables. To optimise cash flows and reduce payment efforts in situations with material cash flows in both directions, positions are held in current accounts based on netting agreements. Debits and credits are netted immediately, and net positions are settled once a month.

Accounts with customers or CCBs are generally maintained on a current account basis. Therefore, all movements in these accounts and currencies are immediately netted to single account balances.

For credit purposes, except as otherwise agreed between the client and Clearstream, all client accounts with Clearstream, in whatever currency they are denominated, are deemed to form elements of a single, indivisible current account, and Clearstream may at any time set off, in whole or in part, credit and debit balances standing to any accounts held by the customer with Clearstream.  Despite these netting options, no netting takes place for regulatory and risk management purposes. For credit purposes, cash credit positions from these arrangements are taken as cash collateral. For solvency purposes, this collateral is not considered.

In the following table, all unsecured carrying amounts on 31 December 2021 were made up of other term loans, trade receivables, and overnight balances (on demand [call] and short noticed [current account]).

| | Unsecured carrying amount | Secured carrying amount | | | |
|---|---|---|---|---|---|
| | | | Of which secured by collateral | Of which secured by financial guarantees | |
| | | | | | Of which secured by credit derivatives |
| (in 000s of €) | a | b | c | d | e |
| Loans and advances | 379,260 | 4,269,441 | 4,269,441 | - | 0 |
| Debt securities | 1,515,769 | | - | - | |
| Total | 1,895,028 | 4,269,441 | 4,269,441 | - | 0 |
| *Of which non-performing exposures* | 729 | - | - | - | 0 |
| *Of which defaulted* | - | - | | | |

*Table 22: Credit risk mitigation techniques*

### 9.3.4.1. Collateral

The purpose of the settlement credit limit is to facilitate the settlement of securities transactions against payment. Two types of settlement credit limit are currently available, the Technical Overdraft Facility (TOF) and the Unconfirmed Funds Facility (UCF). Under the Credit Terms and Conditions and the General Terms and Conditions, Clearstream Banking S.A. has a pledge on all customer assets held in the customer account(s) defined as pledge account(s) to secure customer obligations to CBL for the services rendered by CBL to this customer. These contracts are complemented by netting provisions permitting the offset of credit and debit balances standing to customer accounts.

Collateral eligibility is defined and approved by the Credit section within the boundaries of the Credit Policy as approved by the Executive Board. Eligibility and haircut are dependent on the security's credit, market, liquidity, and legal risks.

Eligible collateral in the form of securities are subject to a margin deduction from their market value; haircuts range from 2% to 100% depending on the issue type, credit quality, security's market and liquidity risks. The following instruments are eligible as collateral to support cash financing facilities:

- Fixed income securities with a minimum S&P, Fitch or Moody's rating of BBB-/Baa3, issued by sovereigns and central banks, local and regional governments, government agencies and supranational institutions, corporate and credit institutions;
- European covered bonds; and,
- Select equities included in STOXX Europe 50 and STOXX North America 50 indices.

In general, all securities not classified as eligible are ineligible as collateral, including the following:

- Investment funds;
- Warrants;
- Structured securities, for example, CDO, CLO, CLN, MBS;
- Own paper; and
- Subordinated securities.

Collateral haircuts are automatically recalculated daily; the collateral policy is reviewed at least once a year.  Customer collateral positions are evaluated daily, based on prices received from various reliable securities data vendors. The system automatically blocks any transaction on a given account whose settlement requires more than the available collateral.

In the application of Art. 453(f) and (g), information on exposure value covered by financial collateral, other collateral, guarantees, and credit derivatives is to be understood as information on outstanding secured exposures and the secured amount within those exposures. Please find the required information in the two tables here below:

As explained above, for loans provided to customers, exposures are secured by pledges on clients' accounts and all assets are held with Clearstream Banking S.A., and not via guarantees or credit derivatives. The debt instruments are of high quality, issued by central and regional governments, PSE, MDBs or large credit institutions. In the table below, the majority of the off-balance sheet guarantees and commitments are secured by eligible financial collateral.

Credit limit concentration threshold relating to country group, customer internal ratings and collateral as well as currency concentration limits are established and reported to the CBL Executive Board on a monthly basis.

The following table shows the respective total credit risk exposure for on-balance, and off-balance sheet amounts in the standardised approach, before and after applying credit risk mitigation techniques and CCF, as well as the RWA applied for each relevant exposure class:

| Exposure classes | Exposures before CCF and before CRM | | Exposures post CCF and post CRM | | RWAs and RWAs density | |
|---|---|---|---|---|---|---|
| | On-balance-sheet exposures | Off-balance-sheet exposures | On-balance-sheet exposures | Off-balance-sheet amount | RWAs | RWAs density (%) |
| Central governments or central banks | 7,414,998 | - | 7,414,998 | - | 1,415 | 0.02% |
| Regional government or local authorities | 180,423 | - | 180,423 | - | 1 | 0.00% |
| Public sector entities | 753,137 | - | 753,137 | - | - | 0.00% |
| Multilateral development banks | 449,430 | - | 449,430 | - | 4 | 0.00% |
| International organizations | 133,749 | - | 133,749 | - | - | 0.00% |
| Institutions | 4,204,115 | 25,569,519 | 905,018 | 452,272 | 288,595 | 21.26% |
| Corporates | 1,246,566 | 15,801,446 | 379,774 | 188,044 | 567,960 | 100.03% |
| Retail | - | - | - | - | - | 0.00% |
| Secured by mortgages on immovable property | - | - | - | - | - | 0.00% |
| Exposures in default | 4,987 | - | 4,987 | - | 7,481 | 150.00% |
| Exposures associated with particularly high risk | - | - | - | - | - | 0.00% |
| Covered bonds | - | - | - | - | - | 0.00% |
| Institutions and corporates with a short-term credit assessment | - | - | - | - | - | 0.00% |
| Collective investment undertakings | - | - | - | - | - | 0.00% |
| Equity | 37,697 | - | 37,697 | - | 78,812 | 209.07% |
| Other items | 22,110 | - | 22,110 | - | 22,108 | 99.99% |
| TOTAL | 14,447,213 | 41,370,965 | 10,281,324 | 640,316 | 966,376 | 8.85% |

*Table 23: Credit risk exposures, standardised approach, pre- and post-collateral*

Reverse repurchase agreements and ASLplus loans are classified as Securities Financing Transactions (SFTs) and therefore, they are not reported as on-balance or off-balance transactions. However, for the purpose of the above table, reverse repurchase agreements are integrated in on-balance sheet exposures, while ASLplus are part of off-balance exposures.

### 9.3.5. Repurchase Agreements

Clearstream Banking S.A. bases a significant part of the Group's liquidity on reverse repo agreements with a maximum maturity of one year, but usually with maturities of three months or less. Repo transactions must be governed by a Global Master Repurchase Agreement (GMRA) and are only concluded with banking counterparties fulfilling minimum rating criteria.

Repo transactions are settled via Clearstream's settlement system, or the Euroclear system via the "Bridge," or the domestic settlement systems of Clearstream's depositories. All settlement systems used are proven for that type of transaction.

Securities taken as collateral in repo-style transactions must fulfil specific requirements:

- Only the most liquid, least volatile and daily priced debt instruments with a defined credit rating (minimum long-term credit rating of Moody's [Aa3] or Standard & Poor's [AA-] or Fitch [AA-]); in the absence of a rating for the issue, the issuer rating (lowest available is relevant) are eligible as collateral for repo transactions;
- Issuers are limited to sovereigns, local governments, government agencies explicitly guaranteed by national governments, supranational banks, and all issuers with an explicit sovereign or local government guaranty;
- Items not acceptable as collateral include ABS, MBS (RMBS and CMBS) and other forms of non-standard collateral (such as CDOs, derivative bonds, credit-linked bonds, callable bonds, perpetual bonds, warrants);
- All collateral must have an active market and must be liquid;
- Subordinated securities are not eligible;
- Transactions in which the securities given as collateral are issued by either the counterparty ("own assets") or an affiliate of the counterparty are not allowed. For this reason, specific wrong way risk is not a factor for Clearstream; and,
- The maximum remaining life to maturity of the accepted securities is ten (10) years.

Cross-currency collateralisation is generally possible. It was not used for bilateral transactions but in the context of tri-party repos. Bilateral transactions must be "plain vanilla" on a single fixed-income security. In tri-party transactions (including Eurex Repo GC Pooling transactions), multiple fixed-income securities may be taken as collateral. Structured transactions are not allowed.

Haircuts on the securities are applied within tri-party repo transactions (including Eurex Repo GC Pooling transactions). All collateral is valued daily. To secure the cash lent through reverse repurchase agreements, CBL agrees on margin calls with the repo counterparty daily to keep cash and collateral in balance.

For solvency purposes, according to Art. 227 CRR 2, the application of zero volatility adjustments is possible in most cases. Where the conditions of the regulation stated above are not fulfilled, supervisory haircuts as laid down in Art. 224 CRR 2 apply. In cases of FX mismatch, further cross-currency haircuts are to be applied.

### 9.3.6. ASL

ASL (Automated Securities Lending) is a lending program that allows customers who are short of securities due to settlement failure to borrow securities from other Clearstream customers (lenders).

CBL acts as:

- Lending agent, offering:
  - Automatic detection of loan requirements to cover a failed trade;
  - Automatic identification of loan supply from ASL lenders;
  - Anonymous transfer of securities to the ASL borrower (the undisclosed relationship between lender and borrower); and,
  - Administration of the loan.
- Collateral agent, monitoring the quality and sufficiency of collateral regarding:
  - Eligibility;
  - Collateral value;
  - Concentration limits;
  - Fluctuations in the market values of positions pledged as collateral (mark-to-market of the loan and the collateral);
  - Securities prices, reviewed several times a day depending on the closing time of the market; and,
  - Automatic collateral substitution.
- Guarantor for the collateralised loans:
  - Underwriting the risk involved if the borrower defaults on its obligations;
  - Managing collateral securities pledged by the borrower to CBL; and,
  - Assigning loan limits to borrowers to avoid any new loan opening if the limit is reached.

In the ASL program, each loan position is guaranteed by CBL. The guarantee is backed by securities pledged by the borrower, as follows:

- Collateral securities are pledged by the borrower to CBL under a first-ranking pledge under Luxembourg law. Collateral quality and sufficiency are monitored by CBL daily; and,
- A second-ranking pledge on collateral in favour of the lender – in the unlikely event of a simultaneous default by CBL and the borrower, the right to the collateral passes to the lender.

The coverage value of the guarantee related to an ASL loan is equal to the market value of the securities plus an additional margin. Standard margins, varying from 0% to 15%, are applied depending on the securities lent.

The collateral eligibility criteria of the ASL program are the same as those for Clearstream's settlement engine. Collateral eligibility is defined and approved by the Credit section. Eligibility and haircut are dependent on the credit, market, liquidity, and legal risks of the security.

Eligible securities are subject to a margin deduction from their market value; haircuts range from 2% to 100% depending on the issue type, credit quality, security's market, and liquidity risks. Securities issued by or correlated to the customer are not eligible as collateral. Collateral haircuts are automatically recalculated daily; collateral policy is reviewed at least once a year.

Customers' collateral positions are evaluated daily, based on prices received from various data vendors. The system automatically blocks any transaction on a given account whose settlement requires more than the available collateral.

### 9.3.7. ASLplus

The ASLplus program is a securities lending program that enables customers to enhance the revenues that can be realised as a lender by offering access to the wholesale trading market. Clearstream Banking S.A. acts as a principal to the lenders in ASLplus and lends on securities to market participants through various counterparties.

The Credit section defines collateralised securities borrowing limits for each borrower and credit limits are agreed based on standard framework agreements between CBL and each borrower. Generally, apart from limited exceptions, only securities rated A+[4] and above are eligible for collateral with haircuts ranging from 2% to 15% depending on the issuer type. Furthermore, both the exposure and the collateral are subject to daily valuation and re-margining; the exposure and the collateral may be denominated in a different currency.

Mortgage-backed and other structured securities are not eligible as collateral.

To mitigate cross-currency risk in ASLplus, additional coverage is requested where there is a currency mismatch between a customer's loan and collateral portfolios. The add-on haircut ranges from 0.8% (if the currency mismatch represents more than 20% of the exposure amount) to 3.2% (if it exceeds 80%) for more than three business days.

The additional haircut requirement may be increased to the following levels if the foreign exchange mismatch amount exceeds the indicated thresholds:

- 3% for FX mismatch amount between EUR 2 billion and EUR 2.75 billion;
- 4% for FX mismatch amount between EUR 2.75 billion and EUR 3.5 billion;
- 6% for FX mismatch amount above EUR 3.5 billion.

4 Securities rated below A+ are accepted with restrictive concentration limits for certain collateral schedules.

Collateral for ASLplus business is delivered in a collateral pool serving several loans. Out of the pool, collateral with a value of at least the requested collateral value based on internal credit rules is blocked for the total of the associated loans. No allocation on a loan-by-loan basis is done for credit purposes.

As for the collateralised placing, a zero weighting as per the application of Art. 227 CRR is generally possible. As the lending business covers a broader range of securities that do not fulfil the criteria laid down in Art. 227 CRR, and the collateral given by the ultimate lender only partially fulfils these criteria, only a portion is zero weighted. For the remainder, the supervisory haircuts are applied. Since there is a notable portion of cross-currency collateralisation, additional FX haircuts are applied.

### 9.3.8. Counterparty Credit Risk

As per Art. 439, 444 and 452 CRR 2, banks are required to disclose the counterparty credit risk regarding instruments referred to in Part Three, Title II, Chapter 6 CRR 2.

The credit risk strategy is set in accordance with the Risk Management Policy and reported annually to the supervisory board. The credit risk strategy represents the framework and defines, amongst other things, the principles, credit risk appetite, the credit authorities, collateral eligibility, the basic counterparty quality, as well as the fundamental country and currency risk categories.

Credit limits are set in accordance with the customer's financial standing, as indicated by factors such as the customer's credit rating and net worth taking into account the level of activity in the customer's accounts and level of collateralisation.

The evaluation of counterparties and the credit risk classification takes place within the "credit assessment," which is performed by the Credit section. A quarterly internal rating benchmarking exercise with regards to external sources is performed, and internal ratings are adjusted when deemed necessary.

Collateral recoverability is also part of the tests performed by the Credit Default Management Team.

The credit risk strategy is set in accordance with the Risk Management Policy and reported annually to the supervisory board. The credit risk strategy represents the framework and defines, amongst other things, the principles, credit risk appetite, the credit authorities, collateral eligibility, the basic counterparty quality, as well as the fundamental country and currency risk categories.

As previously mentioned, the general risk management structure, organisation, and process, and the risk strategy are described in 4. Risk management overview. As with credit risk, business directives for counterparty credit risk are stated in the credit risk strategy, which is set in accordance with the Risk Management Policy and reported annually to the supervisory board. The credit risk strategy sets the operating limits for counterparty credit exposure, which are regularly monitored as per the Credit Policy. Moreover, the Credit Policy defines the risk controlling (incl. wrong-way risk) and risk mitigation techniques.

Prior to August 2020, for the exposure class pertaining to central governments and central banks, Clearstream used the credit assessments by the OECD. In addition, Clearstream also nominated the external credit assessment institution (ECAI) Standard & Poor's for the same exposure class, because OECD stopped assessing so-called "high-income countries" in 2013. In August 2020 external credit assessment institutions Fitch and Moody's were added as nominated ECAIs and Luxembourg supervisor was notified accordingly.

For the "regional governments or local authorities" and "public sector entities" and "institutions" (credit institutions, investment firms and other dedicated financial counterparties) exposure classes, the dedicated risk weight is derived from that of the respective country of domicile. The risk weighting for multilateral development banks is in most cases 0%.

Covered bonds obtain a risk weighting based on the risk weightings assigned to senior unsecured claims on the credit institution that issues them. All other exposures in the different exposure classes mostly achieve the prescribed risk weighting of an unrated position; unrated implies that no credit rating by an eligible ECAI exists or no ECAI has been nominated for that purpose. Clearstream complies with the risk weighting as defined in Section 2, Chapter 2 of Part 3, Title II CRR 2.

#### 9.3.8.1. Governance

In Clearstream Banking S.A., exposure to CCR arises from both over-the-counter (OTC) and centrally cleared derivatives.

As previously mentioned, the general risk management structure, organisation and process, and the risk strategy are described in 4. Risk management overview. As with credit risk, business directives for counterparty credit risk are stated in the credit risk strategy, which is set in accordance with the Risk Management Policy and reported annually to the supervisory board. The credit risk strategy sets the operating limits for counterparty credit exposure, which are regularly monitored as per the Credit Policy. Moreover, the Credit Policy defines the risk controlling (incl. wrong-way risk) and risk mitigation techniques.

Clearstream Banking S.A. is not generally involved in the derivatives business. CBL has modest derivatives positions to hedge interest rate or foreign exchange risk. There were limited positions in place at the end of 2021.

### 9.3.8.2. Measurement and Mitigation

Following points 114, 115, 116 and 117 of the guidelines on disclosure requirements, institutions are supposed to disclose information regarding the methods used to measure the exposure value of instruments subject to capital requirements for CCR and a comprehensive picture of the institution's exposure to CCPs.

The following table discloses a comprehensive view of the methods used to calculate CCR regulatory requirements and the main parameters used within each method.

| | Replacement cost (RC) | Potential future exposure (PFE) | EEPE | Alpha used for computing regulatory exposure value | Exposure value pre-CRM | Exposure value post-CRM | Exposure value | RWEA |
|---|---|---|---|---|---|---|---|---|
| EU - Original Exposure Method (for derivatives) | 88,943 | 140,257 | | 1.4 | 320,880 | 320,880 | 320,880 | 127,608 |
| EU - Simplified SA-CCR (for derivatives) | - | - | | 1.4 | - | - | - | - |
| SA-CCR (for derivatives) | - | - | | 1.4 | - | - | - | - |
| Financial collateral comprehensive method (for SFTs) | | | | | 45,159,771 | 390,273 | 390,273 | 196,439 |
| Total | | | | | 45,480,650 | 711,153 | 711,153 | 324,047 |

*Table 24: Analysis of CCR exposure, by approach*

The next table provides a summary of the CVA regulatory calculations.

| (in 000s of €) | Exposure value | RWEA |
|---|---|---|
| Total transactions subject to the Advanced method | - | - |
| (i) VaR component (including the 3× multiplier) | | - |
| (ii) stressed VaR component (including the 3× multiplier) | | - |
| Transactions subject to the Standardized method | 320,880 | 53,436 |
| Transactions subject to the Alternative approach (Based on the Original Exposure Method) | - | - |
| **Total transactions subject to own funds requirements for CVA risk** | **320,880** | **53,436** |

*Table 25: Transactions subject to own funds requirements for CVA risk*

As per point 117 of the EBA Guidelines on the disclosure requirements for this report, the following table discloses a breakdown of CCR exposures by exposure class and by risk weight (riskiness attributed):

| Exposure class (in 000s of €) | Risk weight | | | |
|---|---|---|---|---|
| | e | f | i | l |
| | 20% | 50% | 100% | Total exposure value |
| Central governments or central banks | - | - | - | - |
| Regional government or local authorities | - | - | - | - |
| Public sector entities | - | - | - | - |
| Multilateral development banks | - | - | - | - |
| International organizations | - | - | - | - |
| Institutions | 41,177 | 28,562 | - | 69,739 |
| Corporates | - | - | 57,869 | 57,869 |
| Retail | - | - | - | - |
| Institutions and corporates with a short-term credit assessment | - | - | - | - |
| Other items | - | - | - | - |
| **Total exposure value** | **41,177** | **28,562** | **57,869** | **127,608** |

*Table 26: Standardised approach, CCR exposures by regulatory exposure class and risk weights*

On 31 December 2021, CBL did not hold any exposure to central counterparties. Hence, the table as per Part Three, Title II, Chapter 6, Section 9 CRR 2 is not disclosed.

In addition to the overall information on counterparty credit risk, Art. 439 CRR 2 also requires disclosure of risk mitigation concerning CCR as laid out in points 120 and 121 of EBA Guidelines on disclosure requirements under Part Eight of Regulation (EU) No. 575/2013.

At Clearstream, derivative instruments are only used to a small extent, primarily for hedging purposes. Such instruments can only be used in established and regularly tested operational procedures. Hedging documentation is maintained to IAS 39 standards. The dealings with interest rate or foreign exchange risks (measurement, assignment of internal capital and limits, etc.) are described in detail in 11. Market risk.

In cases where a certain level of foreign exchange exposure, and therefore risk, is exceeded, the risk of each currency exposure should be hedged. For Clearstream, the level of materiality is expressed as 10% of consolidated EBITDA of the budget year to be hedged for each currency exposure. For the protection of Clearstream's budgeted interest income, the Treasury section may hedge the budgeted interest income for up to 50% of the customer credit balances for the upcoming budget period(s) through approved hedging instruments. Foreign exchange outright contracts hedging the foreign exchange risk are settled via Continuous Linked Settlement (CLS)[5] to minimise settlement risk and executed with counterparties only where a Credit Support Annex (CSA) is signed to mitigate credit risk resulting from market movements.

5 CLS (Continuous Linked Settlement): CLS is a global multi-currency settlement system that aims to eliminate foreign exchange (FX) settlement risk due to time-zone differences by settling both legs of an FX transaction simultaneously (payment vs. payment).

The original exposure method under Art. 275 CRR 2 is used by Clearstream to calculate the exposure value for OTC derivative instruments and long settlement transactions. The original exposure thus obtained is the exposure value.

FX swaps are considered as a funding or an investment vehicle for currencies where no or limited deposit market exists (overnight swaps) or for the conversion of USD liquidity (overnight and/or term FX swaps) into EUR used to purchase/repo against highly liquid paper delivered to BCL serving as a liquidity buffer.

On 31 December 2021, Clearstream Banking S.A. did not hold any credit derivatives on its books. Hence, the report does not include a table containing information in conjunction with Art. 439 (g) and (h) CRR 2 concerning credit derivatives.

### 9.3.9. Monitoring and Reporting

The credit risk team reports new credit lines and changes of credit lines – both increases as well as reductions – changes of the internal rating for customers, and credit exposures to Group Risk Monitoring. Besides that, limit breaches – if any – are reported to the Executive Board and Group Risk Monitoring.

The reporting approach described under 4.11 Risk monitoring and reporting also applies to the management of credit risk. On this basis, Group Risk Monitoring assesses the credit risk and reports VaR results as well as risk issues to the Executive Board. Besides the assessment of the VaR, Group Risk Monitoring also measures credit risk concentration and performs stress test calculations on credit risk (see 9.3.3 Stress testing).

# 10. Liquidity Risk

## 10.1. Liquidity Risk Overview

Clearstream's liquidity risk appetite represents the level of liquidity risk that Clearstream accepts in order to pursue its business objectives and in meeting its regulatory obligations. The risk acceptance criteria are translated into a limit system, and liquidity stress test scenarios are defined.

Regarding the limit systems and in addition to regulatory ratios, Clearstream has defined prudent internal limits to ensure conservative assumptions about a changing liquidity situation. These limits prohibit the creation of mismatch positions if there is a sudden or temporary decrease of available cash until this is permitted again by the liquidity risk exposure. Liquid assets should amount to at least a minimum percentage (depending on the currency or group of currencies) of the last 30-day average net customer cash balances.

Treasury Middle Office is responsible for issuing daily and monthly reports to CBL Executive Management and Clearstream Risk Management. Treasury Middle Office monitors daily limit observances and routinely reports breaches to CBL Executive Management and Clearstream Risk Management.

Liquidity stress tests are performed by Risk Management, analyzing whether enough sources are available to cover needs in stressed market conditions within a certain time frame. The design of a stress test scenario is such that the assumptions are extreme, but plausible. The stress tests are calculated and reported monthly to the Asset and Liabilities Committee (ALCO). Treasury Front Office will evaluate and adjust the adequacy of its liquidity providers per the results and analysis of the stress tests.

Following CSSF Circular 09/403, Clearstream has formulated its Clearstream Banking Treasury Liquidity Management Policy, approved by the Executive Boards of Clearstream Banking S.A. and Clearstream Banking AG. The liquidity parameters stated in the liquidity policy are reviewed quarterly by Treasury Middle Office.

This policy contains specific requirements to implement a liquidity risk strategy that includes contingency planning, governance, and the definition of senior management responsibilities. Required changes are proposed via the ALCO to CBL Executive Management within the annual update for approval.

Day-to-day implementation of the liquidity management strategy is the responsibility of the Head of Treasury Front Office, reporting the Key Performance Indicators (KPIs) to the member of the CBL Executive Board responsible for Treasury.

Clearstream Risk Management oversees the liquidity risk exposure from the second line of defence perspective validating the assessment, monitoring, and reporting activities.  CBL's ALCO monitors and oversees those activities and makes recommendations to the Executive Board.

## 10.2. Measurement

For CBL the target for liquidity management is the ability to:

- Manage CBL's varying cash position because of customer and own activity with the aim of having sufficient liquidity available in all currencies for a timely provision of domestic and cross-border settlement and payment services as they fall due, including liquidity management of cross-currency exposure where relevant;
- Keep intraday cash balances with nostro banks within the boundaries set by the liquidity risk tolerance and established concentration limits; and,
- Have in place measures to deal with unexpected disruptions to its cash flows.

This is ensured by a permanent measurement, monitoring, and control of the intraday expected and actual cash flows.

## 10.3. Intraday Liquidity Measurement, Monitoring and Management

This chapter is added to meet the regulatory requirement stated in the Commission Delegated Regulation (EU) 2017/390 (DR 2017/390) Article 40 on public disclosure of a comprehensive qualitative statement that specifies how liquidity risks, including intraday liquidity risks are measured, monitored, and managed and is also used as a summary for the Pillar III liquidity risk chapter.

CBL's liquidity management objective is its ability to:

- Manage varying cash positions as a result of customer and own activity with the aim to have sufficient liquidity available in all currencies for a timely provision of domestic and cross-border settlement and payment services as they fall due, including liquidity management of cross-currency exposures where relevant.
- Keep intraday cash balances with cash correspondent banks (CCBs) and depositories within the boundaries in line with its liquidity risk tolerance and established concentration limits.
- Have in place measures to deal with unexpected disruptions to its cash flows by measuring, monitoring, and managing intraday actual and expected flows.

CBL's liquidity requirements are mainly intraday and overnight. CBL is required to mitigate the liquidity risks from the CSDR provision of banking-type ancillary services with qualifying liquid resources (QLR) in each relevant currency. The minimum amount of CBL'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.

To address the CSDR related liquidity risk requirements, CBL has at its disposal the following QLRs as specified in Article 34 DR 2017/390:

- Own cash (uninvested CBL's own funds) deposited at the Central Bank of Luxembourg in a dedicated account separated from CBL's participant cash;
- Committed lines of credit or similar arrangements;
- Own assets funded with CBL's own funds; and,
- Appropriated participant collateral in case of default.

All sources of liquidity risk are considered for the measurement, monitoring and management of CBL liquidity (including intraday) which includes its relations to the entities and linked financial market infrastructures or other entities that may pose liquidity risk to its intraday liquidity flows, i.e., Treasury counterparties, cash correspondent banks (CCBs), depositories, etc. CBL's liquidity management policy states the roles and responsibilities when facing a crisis event where day-to-day liquidity generation measures would not be sufficient to cover a liquidity shortage in one or several currencies. The liquidity issue would be escalated to CBL's Executive Board which can decide in view of the liquidity crisis event to activate exceptional liquidity generation measures listed in CBL's liquidity management policy.

CBL has intraday control procedures in place defining intraday liquidity management processes, timelines, thresholds for escalation to Management and crisis management system alerting the appropriate level of management depending on the seriousness of liquidity incidents.

For managing its ability to provide sufficient liquidity to honor its liquidity management objectives, CBL have put ex-ante measures in place to control the required level of liquidity. A verification that all obligations have been met is done ex post.

### 10.3.1. Measurement

In measuring liquidity risk, CBL has put in place effective operational and analytical tools to measure and compare on an ongoing basis its liquid resources to its liquidity needs (intraday, overnight and multiday period). These tools allow CBL to monitor and managed its intraday, overnight and multiday period liquidity risks. These tools allow the measurement on an ongoing basis of the liquidity metrics required by DR 2017/390 Article 30(1) such as CBL's available qualifying and non-qualifying liquid resources and some additional useful metrics used to calculate the appropriate value of intraday funding required. A prudent value of the liquid assets is assessed by considering their quality, concentration, immediate availability and market conditions. Intraday qualifying liquid resources are valued and calibrated under stress market conditions including all stress scenarios referred to in DR 2017/390 Article 36(7).

### 10.3.2. Monitoring

These effective operational and analytical tools allow CBL to monitor on a near to real-time basis its intraday liquidity positions against its expected activities and available resources based on balances and remaining intraday liquidity capacity. They also allow the monitoring of its intraday and overnight liquidity exposures on an ongoing basis against the maximum intraday liquidity exposure that has been historically recorded.

### 10.3.3. Management

For each currency for which CBL acts as settlement agent, CBL estimates the intraday liquidity inflows and outflows for all the banking-type ancillary services provided, anticipates the timing of these flows and, forecasts the intraday liquidity needs that may arise at different periods during the day.

CBL has arranged to acquire sufficient intraday funding to meet its intraday objectives, to manage the timing of its liquidity outflows and to deal with unexpected disruptions of its intraday liquidity flows.

In parallel, CBL assesses a prudent value of its liquid assets deemed sufficient for its intraday exposure by monitoring their quality, concentration, availability and by valuing its qualifying resources under stressed market conditions. CBL has in place appropriate governance on the placement of its liquid assets. These are maintained in separate accounts under the direct management of the liquidity management function and may only be used as source of contingent funds during stress periods.

For the risk of unexpected disruptions to its intraday liquidity flows, CBL runs daily extreme but plausible scenarios prescribed under CSDR (but not limited to) to identify and manage the risks to which it would be exposed following the default of at least two participants to which it has the largest liquidity exposure.

In practice, to monitor its actual cash balances held with its CCBs, depositories and central bank account, CBL captures intraday credit and debit advices received from its agents, intermediaries and central bank, and compiles intraday on a near to real-time basis the current actual available cash balances in its intraday Liquidity management tool.

CBL also uses this tool to match 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. This operational and analytical intraday liquidity management tool allows on an ongoing basis liquidity monitoring at CBL's CCBs, depositories and central bank. The tool produces management reports that support the intraday liquidity management process and issues intraday alerts in case intraday thresholds are breached.

## 10.4. Hedging Policies

As defined in the Clearstream Banking Treasury Liquidity Management Policy, to ensure that Clearstream has its liquidity risk (including intraday) under control, Treasury permanently measures and monitors the intraday expected and actual cash flows mainly stemming from cash and securities settlement activities for each currency and agent.

To ensure that there is sufficient liquidity (including intraday) to honour its liquidity management objective, Clearstream has ex ante liquidity risk mitigating measures in place. Ex post, Clearstream verifies that all obligations have been met and all buffer and ratio requirements comply as described in the policies.

Liquidity management guidelines are defined in the Clearstream Banking Liquidity Management Policy. The objective of liquidity management is to ensure the ability to respond to daily changing customer net long/short cash balances. Customers maintain cash balances with Clearstream and draw on intraday credit facilities (i-TOFs) because of their securities settlement activities. To meet its objective, Clearstream Banking S.A. maintains several liquidity sources. In compliance with CSDR, CBL has set up qualifying liquid resources (QLR). It ensures that the minimum amount of available QLR is at any time at least 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.

Further, CBL has defined liquidity buffers in EUR, USD, and GBP currencies. The estimated size of the minimum required liquidity buffers in EUR, USD, and GBP currencies is determined by the stress test results. The EUR liquidity buffer is the sum of cash held at the central bank, cash held with creditworthy financial institutions, and unencumbered assets/collateral readily available and convertible into cash. The USD and GBP liquidity buffers are composed of cash held with creditworthy financial institutions and unencumbered assets/collateral readily available and convertible into cash.

Minimum required liquidity buffers, and additionally target buffers, have been determined. Target buffers indicate the EUR equivalent liquidity amount which should constantly be available in each of the relevant currencies.

To complement the permanent liquidity buffers, Clearstream has – amongst others – the following arrangements and measures in place to mitigate liquidity risks:

- A network of cash correspondent banks and depositories to support the funding requirements for CBL's settlement operations in more than 40 currencies via uncommitted, unsecured overdraft lines;
- A broad range of money market counterparties for both secured and unsecured funding;
- A variety of committed liquidity facilities (can be drawn in multiple currencies intraday);
- Multi-currency revolving credit facility (including a swing line for intraday credit drawing right);
- A multi-currency Euro Commercial paper program (can be drawn in EUR, USD and GBP);
- By pledging eligible securities with their respective central banks, CBL and CBF are granted credit lines and can participate in the regular tender operations conducted by the

- BCL and Bundesbank, respectively, and in the ECB's marginal lending facility in a contingency scenario;
- Procedures of prioritisation of payment obligations;
- Intraday procedures and tools to anticipate and forecast potential intraday liquidity shortfalls; and,
- Escalation and contingency funding procedures.

### 10.4.1. Contingency Funding

Additional liquidity generation capabilities are available to face a contingency situation. These additional contingency funding capabilities and actions are listed below.  Contingency liquidity generation capabilities are as follows:

- EUR 750 million revolving credit facility (including a EUR 400 million intraday swing line);
- Sale of customer collateral (in the event of a customer's default);
- Liquidation/buy-in of securities for Clearstream Treasury repo transactions;
- Sale and repo out of proprietary fixed coupon and/or FRN portfolio
- Committed FX Swap facilities (coverage in multiple currencies)
- Marginal Lending Facility (EUR only); and,
- Intra-Group funding.

Other actions related to contingency funding include:

- Cancellation of customer UCF/TOF lines;
- Flagging income and redemption proceeds "Upon Receipt of Funds" (URF);
- Timed payments/prioritised payments.

Clearstream Risk Management is responsible for the timely reporting of liquidity stress test results to the CRO of Clearstream, Head of Treasury, Head of Group Credit, and the respective boards and committees based on the outcome. If any breaches occur, Treasury, Credit, Product, Risk, and the responsible Risk Committee evaluate the result of the liquidity stress tests and agree on subsequent mitigating actions, including adjustments to the liquidity framework and updates of the contingency liquidity funding plan if needed.

## 10.5. Stress Testing

A variety of stress tests is used as the main control tool for liquidity risk. A liquidity stress test is performed by identifying the liquidity needs in case of a certain event and analyzing whether enough liquidity sources are available to cover those needs within a certain time frame. The design of a stress test scenario is such that the assumptions are extreme, but plausible. The stress tests are calculated and reported regularly by Risk Management. Where the liquidity stress tests result in breaches, Clearstream Risk Management (CRM) will report to CBL's Risk Committee and the Executive Board of Clearstream Banking S.A. Jointly with CRM, Treasury will review and adjust its contingency plan, and/or funding plan, and inform the Executive Board of CBL. CRM and Treasury will evaluate and adjust the adequacy of its liquidity risk management framework and liquidity providers per the results and analysis of the stress tests.

## 10.6. Management Approval of Liquidity Risk

Following CSSF Circular 09/403, Clearstream has formulated its Clearstream Banking Treasury Liquidity Management Policy, reviewed by the ALCO, and approved by the Executive Boards of Clearstream Banking S.A. and Clearstream Banking AG. The liquidity parameters stated in the liquidity policy are reviewed every quarter.

This policy contains specific requirements to implement a liquidity risk strategy that includes contingency planning, governance, and the definition of senior management responsibilities. Required changes are proposed to CBL Executive Management within the annual update for approval.

### 10.6.1. Concise Liquidity Risk Statement

To complement the regulatory ratios, the Treasury Policy has defined the following two internal liquidity ratios.

- Internal liquidity ratio I: $\frac{liquid\ assets}{net\ customer\ cash}$
- Internal liquidity ratio II: $\frac{liquidity\ sources}{customer\ credit\ usage}$

The objective of the internal liquidity ratio II is to ensure that liquidity sources provide sufficient liquidity to cover peak customer end-of-day overdraft balances observed over the preceding two years. The ratio is calculated monthly.

### 10.6.2. Funding Source Concentration

To ensure that the overall risk exposure related to treasury investment activity remains within acceptable concentration limits, Group Credit as per the Credit Policy allocates credit limits for all approved investments for each counterparty and at the corresponding counterparty Group level.

Also, to avoid excessive intraday cash concentration on its cash correspondent network intraday, overnight cash concentration limits are set and constantly monitored. Intraday overstepping of cash concentration limits results in alerts to Treasury, which is responsible for day-to-day liquidity management, and requires immediate action to reduce the current cash concentration. Treasury ensures diversification of liquidity sources by arranging multiple types of committed funding arrangements and ensuring a minimum number of liquidity providers for each main currency. Treasury Middle Office controls the concentration of liquidity providers via daily reporting and reports breaches to the CBL Executive Board.

### 10.6.3. Liquidity Buffer

Further, CBL has defined liquidity buffers in EUR, USD, and GBP currencies. The estimated size of the minimum required liquidity buffers in EUR, USD and GBP currencies is determined by the stress test results. The EUR liquidity buffer is the sum of cash held at the central bank, cash held with creditworthy financial institutions, and unencumbered assets/collateral readily available and convertible into cash. The USD and GBP liquidity buffers are composed of cash held with creditworthy financial institutions and unencumbered assets/collateral readily available and convertible into cash.

Minimum required liquidity buffers, and additionally target buffers, have been determined. Target buffers indicate the EUR equivalent liquidity amount which should constantly be available in each of the relevant currencies.

During 2021, the liquidity buffer was comfortably above the limits and targets as set in the Clearstream Banking Treasury Liquidity Management Policy.

| Currency | Actual buffer (in EUR '000,000) | Minimum required liquidity buffer (in EUR '000,000) | Target liquidity buffer (in EUR '000,000) | Liquidity recovery option indicator (amber) | Liquidity recovery option indicator (red) |
|---|---|---|---|---|---|
| EUR | 7,832 | 1,700 | 4,000 | 4,000 | 1,700 |
| USD | 2,448 | 1,000 | 1,900 | 1,900 | 1,000 |
| GBP | 359 | 150 | 250 | 250 | 150 |

*Table 27: Clearstream Banking Treasury Liquidity buffer*

## 10.7. Governance

Liquidity risk management is incorporated into Clearstream's governance set-up. Treasury Front Office performs the day-to-day liquidity risk management for Clearstream Banking S.A. (CBL). Clearstream Risk Management and Treasury Middle Office are regularly reporting on the liquidity risk of Clearstream and the results of stress tests.

Clearstream Risk Management oversees the liquidity risk exposure from the second-line of defence perspective validating the assessment, monitoring, and reporting activities. CBL's ALCO monitors and oversees those activities and makes recommendations to the Executive Board.

Clearstream's liquidity risk appetite represents the level of liquidity risk that Clearstream accepts in order to pursue its business objectives and in meeting its regulatory obligations. The risk acceptance criteria are translated into a limit system, and liquidity stress test scenarios are defined in accordance with the risk appetite.

Regarding the limit systems and in addition to regulatory ratios, Clearstream has defined prudent internal liquidity limits to ensure conservative assumptions about a changing liquidity situation. These limits prohibit the creation of mismatch positions if there is a sudden or temporary decrease of available cash until this is permitted again by the liquidity risk exposure. Liquid assets should amount to at least a minimum percentage (depending on the currency or group of currencies) of the last 30-day average net customer cash balances.

Treasury Middle Office is responsible for issuing daily and monthly reports to the CBL Executive Management and Clearstream Risk Management. Treasury Middle Office monitors daily limit observances and routinely reports breaches to the CBL Executive Management and Clearstream Risk Management.

Liquidity stress tests are performed by Risk Management, analyzing whether enough sources are available to cover needs in stressed market conditions within a certain time frame.  The design of a stress test scenario is such that the assumptions are extreme, but plausible.  The stress tests are calculated and reporting monthly to the ALCO.  Treasury Front Office will evaluate and adjust the adequacy of its liquidity providers per the results and analysis of the stress tests.

Following CSSF Circular 09/403, Clearstream has formulated its Clearstream Banking Treasury Liquidity Management Policy, approved by the CBL Executive Board. The liquidity parameters stated in the liquidity policy are reviewed every quarter.

This policy contains specific requirements to implement a liquidity risk strategy that includes contingency planning, governance, and the definition of senior management responsibilities. Required changes are proposed to the CBL Executive Management within the annual update for approval.

## 10.8. Strategy

For Clearstream, the target for liquidity management is the ability to respond to daily, including intraday, changing customer net long/short cash balances. Customers maintain cash balances with Clearstream and draw on credit facilities because of their securities settlement activities.

The investment strategy is driven by the cash amounts customers leave in their settlement accounts with Clearstream Banking S.A. To limit liquidity risk that may arise from investments, strict mismatch limits are established. Consequently, Treasury Front Office must invest funds with the objectives:

i. To have sufficient liquid resources such as highly liquid collateral or investments readily available and convertible into cash to sustain liquidity risks under a wide range of potential stress scenarios including intraday; and
ii. To have a maximum of liquidity available within one business day including intraday via overnight secured/unsecured placements and overnight foreign exchange swaps with creditworthy financial institutions, mostly executed after the customer deadline towards the respective currency.

Due to the very short-term nature (mainly intraday) of Clearstream obligations arising from its core settlement activities, there is no need for long term funding. Clearstream liquidity requirements are intraday and overnight. However, to maintain a sufficient market presence for potential contingency situations, Clearstream has a multi-currency EUR 1 bn Euro Commercial Paper (ECP) program in place under which it permanently issues, mostly in USD and EUR currencies.

Treasury Front Office manages liquidity including intraday per entity, per currency and per cash correspondent bank or depository acting as cash agent with the aid of its intraday liquidity management tool (ILM). ILM is capable to monitor actual cash flows as reported online by its cash correspondent banks / agents, using standard SWIFT reporting capabilities, as well as expected forthcoming cash flows from its customers, corporate actions or other activities such as payment flows. A real-time online overview of such flows combined with an automated alerting system ensures that Treasury Front Office can detect intraday unsecured exposure to its cash correspondent banks / agents in excess of predetermined intraday concentration limits as well as intraday overdraft positions and take mitigating actions in due time. These measures aim to protect against liquidity risk which may arise from the temporary failure of a cash correspondent bank / agent or underlying participant. The online overview of flows allows to identify potential liquidity issues and escalate immediately if necessary.

In line with CSDR CBL has set up qualifying liquid resources (QLR) that allow to address liquidity stress. CBL's minimum available QLR 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.

Mismatch limits are allocated to acquire highly liquid securities (collateral via reverse repo trades or assets via direct investments) which can be utilised for liquidity generation in the repo market or via ECB standing facilities in EUR currency and to ensure a permanent liquidity buffer readily available and convertible into cash.

### 10.8.1. Liquidity Management Objectives

For Clearstream, the target for liquidity management is the ability to:

- Manage CBL's varying cash position because of customer and own activity with the aim of having sufficient liquidity available in all currencies for a timely provision of domestic and cross-border settlement and payment services as they fall due, including liquidity management of cross-currency exposure where relevant;
- Keep intraday cash balances with nostro banks within the boundaries set by the liquidity risk tolerance and established concentration limits; and
- Have in place measures to deal with unexpected disruptions to its cash flows.

This is ensured by a permanent measurement, monitoring and control of the expected and actual cash flows.

#### 10.8.1.1. Meet payment obligations

Customers maintain cash balances with CBL and may additionally draw on credit facilities (unconfirmed funds facility (UCF) and intraday technical overdraft facilities (i-TOFs)) as a result of their securities settlement activities. For EUR, USD, GBP, AUD and JPY, Treasury analyses the historical net customer cash balance development to determine the minimum balance that is available for investments with a tenor exceeding overnight (Treasury mismatch limits). Customer requests to pay out customer long balances and payments related to trades initiated by Treasury are addressed in the established liquidity stress scenarios.

### 10.8.2. Measurement

To ensure that Clearstream has its liquidity risk (including intraday) under control, Treasury permanently measures and monitors the expected and actual cash flows mainly stemming from cash and securities settlement activities for each currency and agent.

To ensure that there is sufficient liquidity (including intraday) to honour its liquidity management objectives, Clearstream has ex ante liquidity risk mitigating measures[6] in place. Ex post, Clearstream verifies that all obligations have been met and all buffer and ratio requirements comply as described in the policies.

Clearstream also performs daily and monthly liquidity stress tests, which are explained in detail in 10.5. Stress tests.

## 10.9. Regulatory liquidity ratio

For Clearstream Banking S.A., regulatory ratios have been defined by national law. Reporting duties are monthly. The minimum ratio for CBL is 100%.

CBL needs to hold a liquidity buffer of high-quality liquid assets (HQLA) to cover the net cash outflows in stressed conditions over thirty days. The HQLA at CBL consist of cash held with central banks, own securities and securities received in reverse repo transactions. For the last three months of 2021, CBL had an average LCR of 120%.  See below for unweighted average value and weighted average value.

6 Among others, qualifying liquid resources in compliance with CSDR, permanent liquidity buffers, overdraft facilities with Clearstream's cash correspondent banks, prioritisation of payment obligations, committed facilities, ECP program, intraday procedures to anticipate potential intraday liquidity shortfalls, etc.

| (in 000s of €) | Total unweighted value (average) | | | | Total weighted value (average) | | | |
|---|---|---|---|---|---|---|---|---|
| Quarter ending on | 31-Dec-21 | 30-Sep-21 | 30-Jun-21 | 31-Mar-21 | T | 30-Sep-21 | 30-Jun-21 | 31-Mar-21 |
| Number of data points used in the calculation of averages | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| HIGH-QUALITY LIQUID ASSETS | | | | | | | | |
| Total high-quality liquid assets (HQLA) | | | | | 15,235,190 | 13,838,003 | 14,502,665 | 13,900,645 |
| CASH - OUTFLOWS | | | | | | | | |
| Retail deposits and deposits from small business customers, of which: | - | - | - | - | - | - | - | - |
| *Stable deposits* | - | - | - | - | - | - | - | - |
| *Less stable deposits* | - | - | - | - | - | - | - | - |
| Unsecured wholesale funding | 14,561,106 | 13,204,663 | 14,676,530 | 16,098,009 | 13,825,884 | 12,414,585 | 13,859,340 | 15,163,759 |
| *Operational deposits (all counterparties) and deposits in networks of cooperative banks* | - | - | - | - | - | - | - | - |
| *Non-operational deposits (all counterparties)* | 14,345,832 | 13,162,995 | 14,539,765 | 16,023,540 | 13,610,609 | 12,372,917 | 13,722,575 | 15,089,291 |
| *Unsecured debt* | 215,275 | 41,668 | 136,765 | 74,469 | 215,275 | 41,668 | 136,765 | 74,469 |
| *Secured wholesale funding* | | | | | 8,049 | 383 | 1,275 | 788 |
| Additional requirements | 110,760 | 110,609 | 110,537 | 150,212 | 110,760 | 110,609 | 110,537 | 137,852 |
| *Outflows related to derivative exposures and other collateral requirements* | 110,760 | 110,609 | 110,537 | 136,479 | 110,760 | 110,609 | 110,537 | 136,479 |
| *Outflows related to loss of funding on debt products* | - | - | - | - | - | - | - | - |
| *Credit and liquidity facilities* | - | - | - | 13,733 | - | - | - | 1,373 |
| Other contractual funding obligations | 99,494 | 98,278 | 104,511 | 117,781 | 85,589 | 70,172 | 72,592 | 71,342 |
| Other contingent funding obligations | 1,238,709 | 877,061 | 1,229,946 | 1,099,971 | - | - | - | - |
| TOTAL CASH OUTFLOWS | | | | | 14,030,281 | 12,595,748 | 14,043,744 | 15,373,741 |
| CASH - INFLOWS | | | | | | | | |
| Secured lending (e.g. reverse repos) | 45,470,664 | 48,719,499 | 52,526,764 | 50,242,377 | 68,633 | 21,177 | 23,561 | 57,514 |
| Inflows from fully performing exposures | 1,188,625 | 1,274,380 | 1,619,723 | 3,826,882 | 1,184,826 | 1,265,453 | 1,607,292 | 3,817,782 |
| Other cash inflows | 243,581 | 132,508 | 250,410 | 167,052 | 98,198 | 51,892 | 75,537 | 52,440 |
| (Difference between total weighted inflows and total | | | | | - | - | - | - |
| (Excess inflows from a related specialised credit institution) | | | | | - | - | - | - |
| TOTAL CASH INFLOWS | 46,902,869 | 50,126,387 | 54,396,897 | 54,236,311 | 1,351,657 | 1,338,521 | 1,706,389 | 3,927,736 |
| *Fully exempt inflows* | - | - | - | - | - | - | - | - |
| *Inflows subject to 90% cap* | - | - | - | - | - | - | - | - |
| *Inflows subject to 75% cap* | 6,704,597 | 6,484,172 | 7,637,339 | 9,477,272 | 1,351,657 | 1,338,521 | 1,706,389 | 3,927,736 |
| TOTAL ADJUSTED VALUE | | | | | | | | |
| LIQUIDITY BUFFER | | | | | 15,235,190 | 13,838,003 | 14,502,665 | 13,900,645 |
| TOTAL NET CASH OUTFLOWS | | | | | 12,678,624 | 11,257,227 | 12,337,354 | 11,446,005 |
| LIQUIDITY COVERAGE RATIO | | | | | 120% | 123% | 118% | 121% |

*Table 28: Liquidity Coverage Ratio*

To compliment the regulatory ratios, the Treasury Policy has defined the following two internal liquidity ratios.

### 10.9.1. Internal liquidity ratio I (liquid assets/net customer cash)

The objective of the internal liquidity ratio I limit is to ensure a more dynamic adaptation to a changing liquidity situation. These limits prevent the new creation of mismatch positions by traders in cases of a sudden/temporary decrease of net customer cash balances until this is permitted again by the liquidity risk exposure.

The basis for the calculation of the liquid assets and net customer cash is the treasury operating system, in which all treasury transactions are recorded. Liquidity is calculated for EUR, USD, GBP, AUD and JPY and combined EUR and USD.

The ratio is monitored daily by the Treasury Middle Office, an independent unit, and reported monthly to CBL Executive Management, Risk Management, and the Head of Treasury. The ratio is the responsibility of the Head of Treasury, who acts as the secondary controlling body. One breach of the liquidity ratio occurred in 2021.

On 31 December 2021, the internal liquidity ratio I was as follows:

| Currencies | Ratio | Limits |
|---|---|---|
| EUR+USD | 118% | >50% |
| EUR | 175% | >50% |
| USD | 67% | >60% |
| GBP | 97% | >90% |
| AUD | 109% | >90% |
| JPY | 96% | >90% |

*Table 29: Internal liquidity ratio I*

### 10.9.2. Internal liquidity ratio II (liquidity sources/customer credit usage)

The objective of the internal liquidity ratio II is to ensure that liquidity sources provide sufficient liquidity to cover peak customer end-of-day overdraft balances observed over the preceding two years. The ratio is calculated monthly.

During 2021, all ratios and limits were in line with the limits set in the Clearstream Banking Treasury Liquidity Management Policy. The internal ratio II on 31 December 2021 was reported as follows:

| Currencies | Ratio | Limits |
|---|---|---|
| EUR+USD | 430% | >200% |
| EUR | 397% | >100% |
| USD | 559% | >100% |

*Table 30: Internal liquidity ratio II*

## 10.10. Mitigation

Liquidity management objectives are defined in the Clearstream Liquidity Management Policy. The objective of liquidity management is to ensure the ability to respond to daily changing customer net long/short cash balances. Customers maintain cash balances with CBL and may additionally draw on credit facilities (unconfirmed funds facility (UCF) and intraday technical overdraft facilities (i-TOFs)) as a result of their securities settlement activities.

To meet its objectives, CBL maintains several liquidity sources. In compliance with CSDR, CBL has set up qualifying liquid resources. It ensures that the minimum amount of available QLR is at any time at least 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.

Further, the Bank has defined liquidity buffers in EUR, USD, and GBP currencies. The estimated size of the minimum required liquidity buffers in EUR, USD, and GBP currencies is determined by the stress test results. The EUR liquidity buffer is the sum of cash held at the central bank, cash held with creditworthy financial institutions, and unencumbered assets/collateral readily available and convertible into cash. The USD and GBP liquidity buffers are composed of cash held with creditworthy financial institutions and unencumbered assets/collateral readily available and convertible into cash.

Minimum required liquidity buffers, and additionally target buffers, have been determined. Target buffers indicate the EUR equivalent liquidity amount which should constantly be available in EUR, USD, and GBP currencies.

To complement the permanent liquidity buffers, Clearstream has – amongst others – the following arrangements and measures in place to mitigate liquidity risks:

- A network of cash correspondent banks and depositories to support the funding requirements for CBL's settlement operations in more than 40 currencies via uncommitted, unsecured overdraft lines;
- A broad range of money market counterparties for both secured and unsecured funding;
- A variety of committed liquidity facilities (can be drawn intraday in multiple currencies);
- Multi-currency revolving credit facility (including a swing line for intraday credit drawing right);
- A multi-currency Euro Commercial paper program;
- By pledging eligible securities with the central bank (BCL - Banque Central du Luxembourg), CBL is granted credit lines and can participate in the regular tender operations conducted by the BCL and in the ECB's marginal lending facility in a contingency scenario;
- Procedures of prioritisation of payment obligations;
- Intraday procedures and tools to anticipate and forecast potential intraday liquidity shortfalls; and,
- Escalation and contingency funding procedures.

To ensure that the overall risk exposure related to treasury investment activity remains within acceptable concentration limits, Group Credit as per the Credit Policy allocates credit limits for all approved investments for each counterparty and at the corresponding counterparty Group level.

Furthermore, to avoid excessive intraday cash concentration on its cash correspondent network, intraday and overnight cash concentration limits are set and constantly monitored. Intraday overstepping of cash concentration limits results in intraday alerts to Treasury, which is responsible for day-to-day liquidity management, and requires immediate action to reduce the current cash concentration.

Treasury ensures diversification of liquidity sources by arranging multiple types of intraday committed funding arrangements and ensuring a minimum number of liquidity providers for each relevant currency. Treasury Middle Office controls the concentration of liquidity providers via daily reporting and reports breaches to the CBL Executive Board.

### 10.10.1. Stress Testing

Clearstream uses scenario analysis as part of its regular stress testing as per CSSF Circular 09/403, which requires that institutions conduct liquidity stress tests that enable them to assess the potential impact of extreme but plausible stress scenarios on their liquidity positions and their current contemplated risk mitigation.

Clearstream Risk Management handles the liquidity stress test process. The stress test framework includes clearly defined objectives, well-designed scenarios tailored to Clearstream's liquidity risk strategy, well-documented assumptions, informative management reports, ongoing and effective reviews of the stress testing process, and recommended actions based on stress test results. The general scope of these tests is to determine whether Clearstream has sufficient liquidity to meet various types of future liquidity demands under stressful conditions.

#### 10.10.1.1. Pre-CSDR authorisation

Until CBL received its license for providing banking-type ancillary services under the Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories and amending Directives 98/26/EC and 2014/65/EU and Regulation (EU) No 236/2012 (hereafter: "CSDR"), Clearstream Risk Management performed two daily liquidity stress tests, three quarterly classical liquidity stress tests and three quarterly reverse stress tests considering idiosyncratic, market disruption and combined scenarios.

#### 10.10.1.2. Scenarios for the overnight liquidity

Clearstream has defined three classical scenarios to stress liquidity risk quarterly:

##### 10.10.1.2.1. Scenario 1 – base scenario/quarterly

The base scenario considers the lowest net cash balances by currency in the most recent five-year time horizon.

##### 10.10.1.2.2. Scenario 1 result:

In this scenario, based on the lowest net cash balances in the past five years, Clearstream can manage expected outflows in cash balances for all currencies.

##### 10.10.1.2.3. Scenario 2 – market disruption scenario/quarterly

The market disruption scenario considers a disruption in the macroeconomic environment. The assumption is that customer cash balances would drop by 10% (from their lowest historical five-year level), money market funding lines would decline by 50%, and overdraft lines at CCBs/depositories by 20%.

##### 10.10.1.2.4. Scenario 2 result:

Despite the reduced availability of funding sources, Clearstream can fund short positions in most currencies. Remaining short balances can be covered through FX swaps.

##### 10.10.1.2.5. Scenario 3 – market disruptions and idiosyncratic scenario/quarterly

The market disruption/idiosyncratic scenario considers a disruption in the macroeconomic environment and a downgrade of Clearstream's credit rating. The assumption is that customer cash balances would drop by 30% (from their lowest historical five-year level), money market funding lines would no longer be accessible, and overdraft lines at CCBs/depositories would decline by 60%.

##### 10.10.1.2.6. Scenario 3 result:

In this scenario, USD currency short balances can be covered through uncommitted CCBs/depositories overdraft lines. The excess funding capacity can be used to cover short balances in other currencies through FX swaps. Exceptional overnight credit usage could also be restricted to be in line with available liquidity and CCBs/depositories overdraft lines since credit facilities in Clearstream are allocated on an unconditionally revocable basis and primarily for intraday usage in support of customer settlement activities.

##### 10.10.1.2.7. Scenario 4 – cover 2

The cover 2 scenario simulates the default of the two customers with the largest intraday liquidity exposure, including their parent enterprises and subsidiaries, as well as a market disruption and a downgrade of CBL's external credit rating.

##### 10.10.1.2.8. Scenario 4 result:

In this scenario, the results show that Clearstream could generate sufficient liquidity. In most cases, Clearstream had a liquidity surplus or could generate sufficient liquidity using FX swaps.

#### 10.10.1.2.9. Scenario 5 – cover 1 + CSD-banking service provider

The cover 1 + CSD-banking service provider scenario simulates the default of the customer with the largest intraday liquidity exposure including its parent enterprises and subsidiaries, the default of a major service provider of Clearstream, a market disruption and a downgrade of CBL's external rating.

#### 10.10.1.2.10. Scenario 5 results:

In this scenario, test results show that Clearstream could generate sufficient liquidity. In most cases, Clearstream had a liquidity surplus or could generate sufficient liquidity using FX swaps.

Upon receipt of its license for providing banking-type ancillary services under the CSDR, Scenario 4 and Scenario 5 have been decommissioned and replaced with a tailored CBL CSDR LST model.

### 10.10.1.3. Post-CSDR authori*s*ation

CBL implemented a new Liquidity Stress Testing (LST) framework which was designed to comply with the CSDR. The regulations ensure that systemically important securities infrastructures are subject to common EU rules. It has mandated the EBA to develop regulatory technical standards (RTS), which the Commission adopted as "Commission Delegated Regulation (EU) 2017/390" that specifies the details of the frameworks and tools for monitoring, measuring and management, reporting and public disclosure of the liquidity risks, including those that occur intraday. The key requirements on liquidity stress testing are described in Articles 35 (5), 36 (6) and 36 (7) of Commission Delegated Regulation (EU) 2017/390.

The new forward-looking CBL CSDR LST model considers all entities and products that may pose a material liquidity risk to CBL and is calculated on combined and relevant currency level, where the liquidity exposures are tested against CBL's qualifying liquid resources (QLR).

The CSDR-compliant LST model is composed of ten LST scenarios. Eight scenarios are calculated on a daily basis, and two scenarios are calculated on a monthly basis.

The LST scenarios were designed using different combinations of the requirements described in Article 35 (5), 36 (6) and 36 (7) Commission Delegated Regulation (EU) 2017/390. They comprise amongst others the default of the two customers with the largest intraday liquidity exposures and the default of an important service provider.

The liquidity risk appetite of CBL is focused on the liquidity gap. It is defined as the relevant key risk indicator, which is used to monitor the viability of the Bank'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.

In the large majority of calculated LST scenarios, Clearstream had sufficient qualifying liquid resources to cover the identified liquidity need. Any potential liquidity gaps have been appropriately assessed and all necessary actions have been taken by Clearstream to prevent reoccurrence. As of 31 December 2021, all risk mitigating measures have been fully implemented.

### 10.10.2. Medium-Term Liquidity Sources

Despite the very short-term nature of Clearstream's liquidity risk because of its core settlement activities, situations might arise where funding requirements exceed the usual maximum of 48 hours.

The following instruments are available for funding:

- EUR 1 billion multi-currency Euro Commercial Paper Program;
- BCL tender participation in EUR and USD;
- Repurchase agreements and committed repo funding lines (can be drawn in multiple currencies);
- Foreign exchange swaps and committed foreign exchange swap facilities (can be drawn in multiple currencies);
- Revolving credit facility (can be drawn in EUR, USD and GBP).

### 10.10.3. Permanent Liquidity Sources

Permanently available liquidity consists of CBL's own funds and the stable part of net customer cash in EUR and USD currencies based on historical data, as follows:

- Based on historical data over the most recent two-year horizon (with a 99% confidence level), the permanently available liquidity must be sufficient to cover all term investments (fixed and variable coupon bonds, CBL reversed repos and structured products) in EUR and USD.
- Based on historical data over the most recent five-year horizon (with a 99% confidence level), the permanently available liquidity must be sufficient to cover all long-term investments.

At year-end 2021, the own funds amounted to €1.212 billion.

Figures for the stable part of the net customer cash in EUR and USD currency, based on historical data, were as follows:

- Based on historical data over the most recent two-year horizon (with a 99% confidence level), the stable part of the net customer cash (EUR and USD combined) amounted to the EUR equivalent of 11.902 billion.
- Based on historical data over the most recent five-year horizon (with a 99% confidence level), the stable part of the net customer cash (EUR and USD combined) amounted to the EUR equivalent of 12.303 billion. Together with own funds, the sum of permanently available liquidity is the EUR equivalent of 15.205 billion, which is sufficient to cover the size of long-term investments, which is the EUR equivalent of 1.565 billion. The sum of permanently available liquidity is sufficient to cover the size of all term investments, which is the EUR equivalent of 2.345 billion.

### 10.10.4. Contingency Funding

Additional liquidity generation capabilities are available to face a contingency situation. These additional contingency funding capabilities and actions are listed below.

- Contingency liquidity generation capabilities:
  - EUR 750 million revolving credit facility (including a EUR 400 million intraday swing line);
  - Sale of customer collateral (in the event of a customer's default);
  - Liquidation/buy-in of securities for Clearstream Treasury repo transactions;
  - Sale and repo out of proprietary fixed coupon and/or FRN portfolio
  - Committed FX Swap facilities (coverage in multiple currencies)
  - Marginal Lending Facility (EUR only)
  - Intra-Group funding;
- Other actions:
  - Cancellation of customer UCF/TOF lines;
  - Flagging income and redemption proceeds "Upon Receipt of Funds" (URF);
  - Timed payments/prioritised payments.

Clearstream Risk Management is responsible for the timely reporting of liquidity stress tests results to CRO of Clearstream, Head of Treasury, Head of Group Credit, and the respective boards and committees based on the outcome. If any breaches occur, Treasury, Credit, Product, Risk and the responsible Risk Committee evaluate the result of the liquidity stress tests and agree on subsequent mitigating actions, including adjustments to the liquidity framework and updates of the contingency liquidity funding plan if needed.

## 10.11. Monitoring and Reporting

CBL's liquidity risk exposure and breaches of limits are controlled and reported daily by Treasury Middle Office. Treasury Middle Office reports any limit excesses occurring within Treasury activity to CBL Executive Management.

The reporting approach laid out in 4.11. Risk monitoring and reporting also applies to the management of Liquidity risk. Furthermore, the Internal Liquidity Adequacy Assessment of Clearstream is defined centrally and produced on an annual basis. The executive management is ultimately responsible for the Risk Strategy of Clearstream and the internal liquidity adequacy statement. Clearstream Risk Management prepares, updates, and reviews the ILAAP report, presents it to the relevant Executive Boards for approval and provides the report to the regulatory authorities. The ILAAP report is subject to a 4-eyes principle. The checks are performed using the EBA Reader's Manual. The input to the report is prepared and collected by Clearstream Risk Management team members including other relevant parties. The final report is reviewed by the Chief Risk Officer of CH and the Head of Risk Management of CBL.

The process includes the first and second line of defence. The ILAAP Report is also reviewed by CBL Compliance in line with CSSF requirements. The CBL Chief Compliance Officer issues recommendations after having reviewed the report which will be discussed with CRM during a meeting and incorporated into the report. Internal Audit, as the third line of defence, reviews the ILAAP regularly.

The executive management is ultimately responsible for the ILAAP with a focus on:

- Ultimate responsibility for the liquidity adequacy statement as well as for the review and approval of the ILAAP
- Review and approval of internal risk management documentation
- Approval of the overall risk strategy and risk appetite
- Approval of the risk quantification methodologies, including high-level risk measurement assumptions, parameters, data, and systems used
- Approval of the risk identification process as well as the internal risk inventory and taxonomy
- Approval of the stress testing framework
- Ongoing review and approval of the monthly liquidity risk related reporting
- Approval of the Liquidity Risk Management Framework
- Approval of the liquidity strategy and capital planning
- Overseeing the integration of internal capital and liquidity framework (ICAAP and ILAAP) into the company

The components are supported by objectives, assumptions, and methodologies, and are captured by clear, concise, and consistent documentation approved by the Executive Management. Altogether, the complete risk profile of CBL has been considered to determine the required liquidity. As a result, CBL's liquidity reserves are adequate to cover all identified risks.

# 11. Market Risk

## 11.1. Market Risk Governance

As per the Investment Policy, Clearstream is not involved in proprietary trading activities and does not maintain a trading book. Market risks arise as currency risk in net positions in foreign currencies. It also arises as an interest-rate risk in the banking book, particularly from money market activities (mostly secured) and investments in securities as part of investment or short-term portfolios that are purchased with the intention to "buy and hold."

Clearstream's general structure, organisation and process of risk management and its risk strategy are described in the section 4. Risk management overview.

The Investment Policy sets the framework for hedging future currency risk and interest income. It includes the approved hedging instruments and the delegation of power for hedging interest income and foreign exchange risk. Any individual currency exposure exceeding the level of materiality has to be hedged.

The risk strategy is translated into a limit system, which is monitored regularly. The Investment Policy defines limits, and responsibilities.

## 11.2. General Measurement

Besides the overall risk appetite calculated via VaR, interest rate risk is calculated on all positions under Treasury management, applying a predefined parallel shift on the yield curve. Interest rate risk on all positions under Treasury management is computed daily by applying a 1% parallel shift for the money market portfolio and a 2% parallel shift for the investment portfolio to the respective yield curve and assessing the effect on the net present value (NPV) of this portfolio.

In cases where Clearstream's budgeted interest income should be hedged, the effectiveness of potential hedges is measured, and the credit rating of the trade counterparties is regularly controlled.

Foreign exchange risk is controlled using a limit system. Since Clearstream has payables and receivables in foreign currencies, only the net exposure is relevant for the exposure calculation. In cases where a certain level of foreign exchange exposure is exceeded in a currency, the risk of this currency exposure should be hedged. For Clearstream, the level of materiality is expressed as 10% of the budget year's consolidated EBITDA to be hedged for each currency exposure. The effectiveness of potential foreign exchange risk hedges is measured, and the credit rating of the trade counterparties is regularly controlled.

Since Clearstream Banking S.A. calculates its market risk exposure for regulatory purposes according to the standardised approach, it is required to disclose its capital requirements according to point 127 of the EBA Guidelines in conjunction with Art. 445 CRR. However, as previously mentioned, CBL does not maintain a trading book. Hence, CBL's only risk exposure – which is addressed in this chapter – is the foreign exchange risk in the banking book. Also, the FX risk net exposure subject to capital charge does not exceed the threshold of 2% of own funds as per Art. 351 CRR. Thus, the required table would only be filled with zeros and would not provide any additional value to the reader. Hence CBL decided not to disclose it. Instead, CBL provides information on the open currency position as per Art. 351 and 352 CRR in the following table:

| | ALL POSITIONS | | NET POSITIONS | | Positions subject to capital charge | | |
|---|---|---|---|---|---|---|---|
| | LONG | SHORT | LONG | SHORT | LONG | SHORT | MATCHED |
| Reporting currency and currencies closely correlated | 8,756,800 | 7,271,569 | 1,485,308 | 76 | - | - | - |
| All other currencies (including CIUs) | 9,227,898 | 9,214,681 | 21,474 | 8,257 | 21,474 | - | - |
| Gold | - | - | - | - | - | - | - |

## 11.3. Market Risk Mitigation

Market price risk can arise in connection with cash investments or borrowing because of fluctuations in interest rates, foreign exchange rates and other prices, as well as through corporate transactions. In the year under review, the expected foreign exchange exposure resulting from CBL's budgeted USD-based net interest income (NII) was hedged against a change in foreign exchange rate.

If a foreign exchange hedge is undertaken, testing of the effectiveness of hedging transactions is performed regularly in compliance with IFRS 9.

## 11.4. Monitoring & Reporting

Treasury Middle Office performs market risk control. Treasury Middle Office is responsible for monitoring compliance with limits and issues monthly reports to the relevant executive management and Group Risk Monitoring. Treasury Middle Office monitors exposures against limits daily and immediately reports excesses to executive management, Group Risk Monitoring and Treasury. This function is independent of the Treasury Front Office, which manages liquidity and executes transactions (liquidity management function).

## 11.5. Foreign Exchange Risk

Clearstream Banking S.A. transacts settlement and custody services business in more than 40 different currencies.
Customers maintain cash and securities accounts with CBL in those currencies in which they transact their business. Amounts in currency transmitted to CBL by customers are registered in the respective customers' account(s) in that currency. The same is true for any withdrawal of funds by customers (for example, for settlement purposes or custody payments).

Debits and credits of all customers in the same currency are held by CBL at its cash correspondent banks (CCBs). Clearstream Banking AG's net customer positions are centrally reflected in CBL's overall position. Treasury analyses balances for each currency as a basis for placings. Where there is a requirement to fund net currency credit facilities, such takings are always made in the relevant currency. Therefore, concerning multi-currency settlement, CBL bears no material currency risk.

A limited amount of local currency is held at CBL representative offices in each location to cover expenses. Also, interest earned on currency placings above interest payable to customers on currency balances will cause small (generally long) currency positions.
Additionally, Clearstream provides foreign exchange services to its customers. To remain within the approved limits set in the Clearstream Banking Treasury Investment Policy, foreign exchange risk resulting from the execution of customer foreign exchange requests is covered daily in the foreign exchange market.

### 11.5.1. Foreign exchange risk measurement

Foreign exchange currency positions stemming from corporate activities and customer foreign exchange transactions are covered via spot foreign exchange transactions. The Clearstream Banking Treasury Investment Policy defines the maximum open foreign exchange position allowed for all currencies. A report showing the foreign exchange positions in all currencies is produced daily. The Treasury Middle Office unit (hierarchically independent from Treasury) controls the foreign exchange positions against the limit on a daily basis, and reports any overstepping of the limit to the executive board. No overstepping was reported in 2021.

Forward foreign exchange transactions may be undertaken in anticipation of expected future exposures in foreign currencies to hedge the expected foreign exchange exposure resulting from CBL's budgeted USD based net interest income (NII). No hedge performed in 2021.

### 11.5.2. Interest Rate Risk in the Banking Book

Clearstream Banking S.A.'s cash is placed and refinanced primarily through overnight secured reverse repos and placings with Banque Centrale du Luxembourg in EUR currency and overnight foreign exchange swaps. In addition, CBL primarily purchases highly liquid and low-risk-weighted investments for capital ratio purposes. The investment portfolio of CBL aims at providing core capital investment. Consequently, these portfolios are constructed to contain both market and credit risks and consist mainly of zero-risk-weighted debt securities.

Derivative instruments are not offered to customers. The use of derivative instruments is restricted to:

- Forward foreign exchange contracts that hedge or eliminate structural foreign exchange exposures.
- FX swap contracts to avoid large unsecured exposures with commercial banks and/or to convert available funds in one currency into another currency where funds are required to support the securities settlement efficiency.

Clearstream monitors currency and interest rate exposures daily using reporting generated by the general ledger accounting system and its customer cash ledgers or the treasury ledger.

Clearstream's assets and liabilities are managed to contain interest rate risk (IRR) within limits established by the Clearstream Banking Treasury Investment Policy. Liabilities usually determine the structure of its assets. The close matching of investments and customer deposits ensures that Clearstream can control its IRR.

The Clearstream Banking Treasury Investment Policy defines the maturity mismatch limits, the IRR sensitivity limits, and the maximum tenor for each currency or group of currencies. Limits are based on the IRR and the concepts of duration and gap. Duration means the remaining maturity of every deal on the asset and liability side. Gap means the IRR on the asset side minus the IRR on the liability side. The IRR is calculated daily based on the net present value (NPV) of a 1% interest rate change for trades/instruments with a remaining life to maturity of less than one year and otherwise a 2% interest rate change.

| | 31 December 2021 (€' 000) | | | | 31 December 2020 (€' 000) | | | |
|---|---|---|---|---|---|---|---|---|
| | Mismatch/Portfolio | | Interest Rate Risk (IRR) | | Mismatch/Portfolio | | Interest Rate Risk (IRR) | |
| | Exposure | Limit | Exposure | Limit | Exposure | Limit | Exposure | Limit |
| CBL Investment portfolio (Fixed and FRN) | 1,487,016 | 2,500,000 | 67,456 | 72,000 | 1,139,487 | 2,500,000 | 42,117 | 72,000 |
| CBL MM portfolio | 344,861 | 5,800,000 | 560 | 18,000 | 1,546,585 | 5,800,000 | 13,982 | 18,000 |

Based on CSSF requirements[7], Clearstream also calculates the IRRBB as a percentage of own funds. The IRR is measured as a 2% parallel shift of the yield curve. The non-trading book includes the investment portfolio and related fair value hedges, cash flow hedges and the short-term portfolio.

[7] http://www.cssf.lu/en/supervision/banks/regulation/circulars/info/article/1719/

| *Interest Rate Risk - Banking Book (IRRBB) as per circular CSSF 16/642 as of* | *31 Dec 2021* | | |
|---|---|---|---|
| | Currency | Scenario result | Scenario as percentage of own funds |
| Base EVE (in EUR equivalent) | EUR | 1,029,820,179 | - |
| (a) Standard shock: +200bps shift up | EUR | -64,245,873 | -5.29% |
| (b) Standard shock: -200bps shift down | EUR | 28,151,492 | 2.32% |
| (c) Scenario 1: Parallel shift up | EUR | -64,602,998 | -5.32% |
| (d) Scenario 2: Parallel shift down | EUR | 28,151,492 | 2.32% |
| (e) Scenario 3: Steepened curve | EUR | 6,450,603 | 0.53% |
| (f) Scenario 4: Flattened curve | EUR | -26,000,733 | -2.14% |
| (g) Scenario 5: Short rate up | EUR | -47,731,129 | -3.93% |
| (h) Scenario 6: Short rate down | EUR | 20,852,772 | 1.72% |
| Eligible own funds<br>(source: Regulatory Reporting - December 2021) | EUR | 1,214,206,197 | |
| (a) IRRBB standard shock (+200bps) as percentage of own funds | | -5.29% | |
| (b) IRRBB standard shock (-200bps) as percentage of own funds | | 2.32% | |
| Early warning trigger | | -15% | |
| Threshold set by CSSF | | -20% | |

| Weighted Average Maturity in days | |
|---|---|
| Assets | 87 |
| Liabilities | 31 |

*Table 31: IRRBB*

# 12. Remuneration

## 12.1. Remuneration Overview

The Remuneration Policy ("Policy") is a central element for the implementation of the remuneration systems within the organisation. It is composed, in particular, according to Regulation (EU) No. 2019/876 ("CRR 2"), Directive (EU) 2019/878 ("CRD V"), the EBA Guidelines 2015/22 on sound remuneration policies[8], Law of 5 April 1993 on the financial section (as amended) ("Luxembourg Law"), and related CSSF circulars. The Policy is regularly reviewed to ensure compliance with the latest regulations; the last review took place in 2021.

As the CRR disclosure requirements are fulfilled in the Remuneration Policy and annual Group Remuneration Report, this report only provides a summary of the key points and features of the Policy. For more detailed information, interested persons can refer to the Clearstream Remuneration Policy[9] or the Clearstream Group Remuneration Report[10].

## 12.2. Governance

The Remuneration Committee is set up by the Supervisory Board and responsible for advising the Supervisory Board on the remuneration policy. The following are members of the Remuneration Committee of Clearstream Banking S.A., Luxembourg:

| | |
|---|---|
| Chairman | Stephan Leithner |
| Vice-Chairman | Gregor Pottmeyer |
| Member | Wolfgang Gaertner |

Tasks and responsibilities:

- Supervises the reasonableness of the remuneration system of executive management members. In particular, it supervises the appropriateness of the compensation of the Head of the risk function and of the compliance function as well as employees having a substantial influence on the overall risk profile of the institution. It also supports the Supervisory Board in monitoring the reasonableness of the remuneration system of employees as well as the institution. At the same time, it assesses the impacts of the remuneration system on the risk, capital, and liquidity management.
- Supports the Supervisory Board in overseeing the internal control system and all other relevant areas in the structuring of the remuneration system.

[8] The revised Guidelines EBA/GL/2021/04 apply from 31 December 2021.
[9] https://www.clearstream.com/resource/blob/2815360/90b7aa51fc6261d9aef0b85a5f245584/clearstream-group-remuneration-policy-2021-ci-cbl-cs-data.pdf
[10] https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/remuneration-information

Further details regarding the CBL Remuneration Committee, in particular its composition and tasks/responsibilities, are stipulated in the Clearstream Banking S.A. Supervisory Board Internal Rules & Regulations.

In 2021 the regulatory compliant remuneration system in place was further developed under provision of legal advice from Gleiss Lutz. The consultancy has been commissioned by Deutsche Börse AG Group HR.

The Executive Board of Clearstream Holding AG as a superordinate company according to the German Banking Act (KWG) is responsible for the implementation of a Clearstream Group-wide policy. The Clearstream Group remuneration system including remuneration schemes and the respective Terms & Conditions of instruments, which apply to the respective categories of staff, is implemented according to a cascading process from Clearstream Holding AG at Group level down to entity level of inter alia Clearstream Banking S.A., especially taking into account the regulatory requirements of Luxembourg.

The Clearstream Group Remuneration Policy for Clearstream International S.A., Clearstream Banking S.A. and Clearstream Services S.A. (including their subsidiaries, branches and representative offices based in Luxembourg) provides the applicable framework for the design and implementation of the Remuneration systems for all employees of the Company.

The contents are the same across the Clearstream Group for all Companies unless there are relevant differences in the business model, the risk profiles or local requirements that justify a difference in individual case.

Clearstream Banking S.A. shall conduct an annual risk analysis to identify categories of staff whose professional activities have a material impact on the institution's risk profile ("Risk Takers") and to whom specific requirements apply according to the respective regulatory specifications, unless exemptions apply.

An employee is deemed to be identified as Risk Taker especially if one of the qualitative and appropriate quantitative criteria on the identification of Risk Takers set out in Regulation (EU) 2021/923 is met. In this respect and amongst others, the following categories of staff are identified as Risk Takers:

- All members of the Executive Board or Supervisory Board,
- Members of the senior management,
- Employees responsible and accountable to the management body for control activities of the independent risk management function, compliance function or internal audit function,
- Employees heading or having managerial responsibility and whose professional activities are deemed to have a material impact on risk profile of a material business unit,

- Employees heading a (control) function responsible for legal affairs, finance including taxation, budgeting and accounting procedures, human resources, remuneration policy, information technology (which is considered as a technology function), information security, the management of outsourcing arrangements, the prevention of money laundering and terrorist financing or economic analysis
- Employees identified pursuant to quantitative criteria, e.g. employees whose total Remuneration exceed criterions set out by regulation and whose professional activities are deemed to have a material impact on the institution's risk profile.

Within Clearstream Banking S.A., the Supervisory Board decides on the remuneration system for the members of the Executive Board. The Executive Board decides on the remuneration system of all employee groups except for members of the Supervisory Board and members of the Executive Board.

The remuneration system has been elaborated in cooperation with the relevant Clearstream Group's control units (i.e., Risk Management, Compliance, Internal Audit, Human Resources and the Group Compensation Officer, in the following "Compensation Officer" and Deputy Group Compensation Officer, in the following "Deputy Compensation Officer"), taking into account Luxembourg specificities.

Within the Group, the competent functions of the consolidating institution and subsidiaries, including CBL, are supposed to interact and exchange information as appropriate.

In case individual performance is determined, this shall be based on the achievement of a mix of quantitative/financial and qualitative/non-financial agreed targets, which shall be challenging and ambitious. Targets shall be consistent with the business and risk strategies, corporate values, risk appetite, long-term interests, as well as the cost of capital and the liquidity of the Group/Company.

The full amount of variable remuneration is subject to an ex-ante risk adjustment in case of negative performance contributions, breach of duty and unconscionable conduct; it can be reduced to zero before the bonus award is made. The reduction shall not be compensated by positive performance contributions.

The performance of members of the Executive Board, Risk Takers and other employees is measured annually and documented and tracked in the respective appraisal systems. The performance assessment is executed by the respective line manager or, for members of the Executive Board, by the Supervisory Board.

The individual performance measurement is ensured through the respective appraisal systems.

The Policy is regularly reviewed to ensure compliance with the latest regulations; the last review took place in 2021 and reflects the revised requirements on the Risk Analysis.

The individual targets for Risk Takers in control units shall be independent from the performance of the business area they monitor and should not compromise their independence or create conflicts of interest in their advisory role.

To ensure that the remuneration parameters of Risk Takers in control units and the business units they control are not predominantly synchronised, targets only include the Group target achievement of Deutsche Börse Group as well as individual targets. The overall target achievement is measured by Group target achievement of Deutsche Börse Group and by the individual targets, which are equally weighted.

Specifically, for Risk Takers in control units primarily control targets shall be set.

Guaranteed variable remuneration is exceptional and is only allowed in connection with the hiring of new staff, is limited to a maximum period of one year and subject to appropriate equity and liquid resources as well as sufficient capital in order to ensure the Company's Risk-Bearing Capacity

In general, severance payments are variable remuneration. Payments in connection with premature termination shall take due account of the performance over time and shall not reward falling short of performance expectations or misconduct following art. 38-6(h) Luxembourg Law.

The variable remuneration must not limit the Group's or CBL's ability to sustainably maintain or recover an appropriate capital base. If the Group's or CBL's ability to sustainably maintain or recover an appropriate suitable capital base is limited, no variable remuneration is to be granted. The total amount of the variable remuneration shall be determined in a formal, transparent, and comprehensible process. Representatives of the relevant control units (for the determination of the bonus pool, performance criteria and remuneration awards) shall be involved within their scope of duties.

The Total Amount of variable remuneration is determined by summing up the actual individual variable remuneration that shall be awarded to all employees of the Company whereas such summed up amount is subject to the examination of side conditions, e.g., on performance criteria derived from the Company's business and risk strategy in order to promote long-term sustainable success of the Company and to adequately reflect costs of capital and liquidity as well as risks incurred.

For the determination of the variable remuneration the target achievement on Company measurement level and the target achievement of the individual targets are multiplied with a risk adjustment factor. The risk adjustment factor is in general a combination based on the ratio of Value at Risk ("VaR") relative to the Available Risk Bearing Capacity ("ARBC") and the liquidity risk consideration reflecting the limits according to the respective risk strategy. In line with the Company's risk strategy, the VaR incorporates applicable risk types such as operational, financial, and business risk as well as liquidity risk. The limit utilisation of each risk type (operational, financial, business and liquidity risk) is measured on a monthly basis, and evaluated using a traffic light system in accordance with the limits defined in the risk strategy. In the situation of a yellow or red traffic light, an assessment of the escalation process and mitigating measures (e.g., capital allocation) is conducted to derive a potential reduction factor.

There shall be an appropriate ratio between the fixed and the variable remuneration. The variable remuneration may amount up to a maximum of 100% of the fixed remuneration. In case national regulatory requirements allow the shareholders, owners or members of the institution to approve a ratio of 1:2 between the Fixed and Variable Remuneration components, the Variable Remuneration may amount up to a maximum of 200% of the Fixed Remuneration

## 12.3. Performance link with remuneration levels

The total amount of the variable remuneration is based on a combination of the assessment of the performance of the overall result of the Group as well as individual targets including the area of responsibility. Details are stipulated in the respective remuneration scheme and the documentation of the determination of the total amount of variable remuneration.

The variable remuneration shall consider the overall performance of the Clearstream Group and, respectively, the institution, the performance of the areas of responsibility and individual performance contributions, with each measurement level generally equally weighted. The allocation of the variable remuneration components within the Company shall also consider all types of current and future risks. When assessing individual performance, financial and non-financial criteria are considered. Further, the assessment of the performance is set in a multi-year framework. The criteria for determining the variable remuneration shall be consistent with the objective of long-term sustainable performance. Details are stipulated in the remuneration scheme.

If the deferral rule applies, at least 50% of the deferred and non-deferred parts of the variable remuneration shall be linked to the Group's long-term performance. For this purpose, the corresponding parts of the variable remuneration shall be granted in the form of Deutsche Börse AG share-based remuneration (instruments). Exemption limits in accordance with regulatory requirements of the Company and the Group may apply.

If the deferral rule applies, a substantial portion – at least 50% – of any variable remuneration shall be in shares or equivalent share-linked instruments. Instruments shall be applied to both the deferred and non-deferred (upfront) portion of variable remuneration.

Guidelines for variable remuneration shall take due account of possible mismatches of performance and risk periods. Payments of variable remuneration shall be deferred as appropriate. Variable remuneration is not guaranteed, i.e., all variable remuneration is based on a performance measurement and can be zero.

The pay-out schedules shall be sensitive to the time horizon of risks. In case variable remuneration is paid, due account shall be taken of possible mismatches of performance and risk periods, and it shall be ensured that payments are deferred as appropriate. If the deferral rule applies, at least 40% or respectively, 60% (depending on the category of Risk Taker or in case of a variable remuneration of a high amount) of the variable remuneration component shall be deferred over a period that is no less than four to five years. Remuneration payable shall vest no faster than on a pro rata basis.

Further, a substantial portion – at least 50% – of any variable remuneration shall be in shares or equivalent share-linked instruments. Instruments shall be applied to both the deferred and non-deferred (upfront) portion of variable remuneration.

Before vesting, there is only an entitlement to an accurate determination of the respective part of the variable remuneration. Details, in particular the pay-out schedule, are stipulated in the remuneration scheme and the terms and conditions of instruments, in each case as applicable from time to time. Exemption limits in line with regulatory requirements of the Company and the Group may apply. As there could be cases where the activity of one staff member, given the individual's job function or individual risk assessment, may have a higher material impact on the institution's risk profile, even though the remuneration is not material, the exemption limit shall not be applied automatically and generally.

This neutralisation on the level of the individual relates to the pay-out of parts of variable remuneration in instruments, the deferral of parts of the variable remuneration and the ex-post incorporation of risk (malus and clawback); it also takes into consideration the individual's job function.

The sustainability of the performance contributions of each Risk Taker, his/her area of responsibility as well as the overall performance of the Company will be considered. Moreover, the financial situation of the Company, in particular significant changes in the capital base, decreases in the financial capacity and the risk-bearing capacity will be taken into account (back-testing).

In the case of a negative back-test, malus can apply to all elements: the cash portion as well as share-based portions of deferred remuneration, in case of evidence of misbehavior or serious error (e.g., breach of code of conduct and other internal rules, especially concerning risks), negative performance contributions, significant failure of risk management respectively significant changes in the capital base, or significant downturn in the financial performance. In case of the circumstances described above have occurred to a significant degree, a reduction or forfeiture of portions of the deferred variable remuneration including the share-based instruments applies.

The regulations on adjustment of variable remuneration are complemented through the implementation of repayment obligations for Risk Takers in accordance with regulatory requirements (so-called "Clawback"). In case of a significant involvement in or the responsibility for a behaviour which led to a significant loss for the Company or to a major regulatory sanction, or a severe breach of relevant external or internal regulations concerning standards of suitability and conduct has been carried out, the respective Risk Taker is obliged to repay any variable remuneration already paid out respectively any claim to payment of variable remuneration shall lapse.

In addition to the share-based components already mentioned for identified Risk Takers, there are no shareholding requirements.

For more detailed information we refer to the additional Clearstream Group Remuneration Report mentioned above, which will be published on the Clearstream website.

# 13. Environmental, Social, and Governance (ESG)

## 13.1. ESG Overview

With ESG taking on a stronger importance in financial markets, the Bank is pleased to include an excerpt of ESG from the Deutsche Börse Group (hereinafter, "DBG," the/our "Group") level. CH is directly and fully owned by Deutsche Börse AG, the ultimate parent company. We would like to thank our colleagues at DBG for their kind contribution to Clearstream Banking S.A.'s Pillar III report in 2022 (based on 2021 results). We have formatted it to be in the Clearstream format (except for pictures), however, for DBG format, please see the Annual Report. The Bank is intending to provide a summary of a Clearstream-specific ESG disclosure during the publication of our semi-annual disclosures, which will occur in mid-September 2022.

As part of Clearstream's Global Securities Financing product offerings, more information can be found under Sustainable Finance. In addition, the Bank's Investment Fund Services (IFS) division also highlights its contribution to safe, robust, and highly automated post-trading infrastructure services, which can be found IFS Sustainable Finance.

## 13.2. ESG: Commitment and opportunity for Deutsche Börse

Sustainability is more than an obligation for our own business model: it also represents an important guiding principle for shaping capital markets. In this sense, we view sustainability from two perspectives: establishing sustainability as a priority for our internal processes, and, as a provider of market infrastructure, offering our customers solutions that enable them to make their own businesses more sustainable. This duality is expressed in our sustainability strategy, which we updated in 2021 following a wide-ranging stakeholder survey. Our sustainability strategy reflects the topic of sustainability both in our Group strategy and across our business areas. It can be summarised in four ambitions:

1. **Leading by example.** By integrating four ESG targets – employee satisfaction, ESG net revenue[11], carbon neutrality and ESG ratings – into our Executive Board remuneration, we assume our corporate responsibility in a holistic way. Our integrated report as well as the fact that our report is almost[12] completely audited with reasonable assurance underlines our ambition to lead by example.
2. **Increasing transparency.** Our exchanges and reporting standards (Prime Standard and guidelines) create market clarity and provide orientation for private and institutional investors. For further information, please see the chapter "Transparent markets" in the Annual Report.
3. **Provide solutions.** With our products we enable our customers in the financial and real economy to carry out their green transformation economically and efficiently. We earned around seven per cent of our net revenue with ESG products in 2021.[1] For further information see chapter "Definition of our ESG net revenue" in the Annual Report.

[11] ESG net revenue according to the internal definition of Deutsche Börse Group – see "Definition of our ESG net revenue".
[12] Only exception are the $CO_2$-figures. These are unaudited.

4. **Measure impact.** We systematically review all our sustainability activities for effectiveness. To underline their importance for the Group as a whole, sustainability indicators became part of our steering parameters with effect from financial year 2021. In the following chapter "How we add value," we elaborate our value creation process.

As of 2021, our Executive Board is informed frequently of relevant market and sales performance with regards to ESG and determines the strategic course from this perspective. It is mainly monitored and managed by the Group CEO and CFO, as well as via the segments. As part of the CEO division the Group ESG Strategy team is responsible for the ESG activities within the Group and the reporting. It executes our climate strategy, conducts market trend analysis, and works closely with the entities in DBG in implementing their product strategies. The Group Sustainability Board oversees the implementation of our ESG strategy. The Board convenes four times a year and in 2021 its members comprised one representative from each of the Executive Board divisions, plus the Head of Group ESG Strategy and one Executive Board member (2021: CFO). The individual entities and business areas are responsible for the concrete implementation of the ESG business strategy. In addition to the individual product areas, our risk management function is also involved with ESG matters.

At the Supervisory Board level for DBG, the newly formed Strategy and Sustainability Committee deals with ESG, by advising the Executive Board on matters of strategic importance. These include sustainable corporate governance and our ESG business activities.

## 13.3. How we add value

At DBG, our purpose is "We at Deutsche Börse create trust in the markets of today and tomorrow." Trust is essential for functioning markets and sustainable economies. We provide fair and transparent, reliable, and stable infrastructures that ensure safe and efficient markets around the globe. By providing market infrastructure, we foster growth and thus contribute to the prosperity of future generations. This takes place using a combination of several input factors of our value creation, which we describe below using the IIRC framework.

Our value creation process

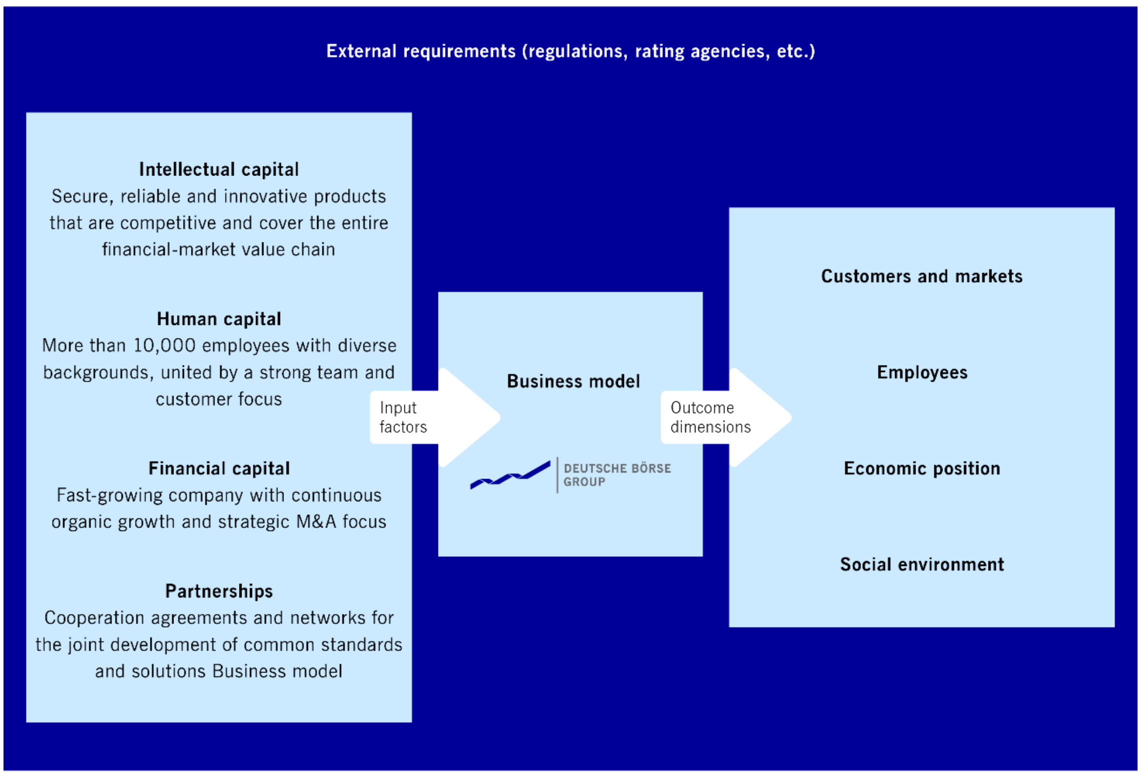


*Figure 5: DBG value creation*

To implement our business model, and following the IIRC terminology, DBG implements the following four capitals (input factors) model that we deploy within a binding regulatory framework: intellectual capital, human capital, financial capital, and partnerships. They enable us to create short, medium, and long-term value with our business model. Our result can be allocated to the following four outcome-dimensions:

**Customers and markets:** Our products and services contribute to increased transparency for market participants, and to enable them to price in and integrate market developments, changes, and transformations. By doing so, we enable better-informed decisions for our clients.

**Employees:** As an employer, we take wide-ranging measures to use the full potential of our human capital. Furthermore, we take a strong focus to strengthen our employee satisfaction and loyalty. All this helps to build an employer brand that illustrates what makes us unique and why jobseekers should decide to work with us.

**Economic situation:** As a fast-growing company, we create financial value, substance, and returns for our investors, employees, customers, and society, for which to build on.

**Social environment:** Our value creation reaches far beyond what impacts us directly as a company. A few examples include our own carbon emissions, human rights issues in the supply chain or our involvement in financial market initiatives.

This stylised value creation process forms the basis for the other chapters in this combined management report and for our management and steering parameters using various KPI, which we describe in the next chapter.

## 13.4. Our strategy and steering parameters

We secure our superior market position and continued viability by means of our medium-term growth strategy Compass 2023, which defines the strategic direction and targets for the years ahead. Among the most important secular growth drivers are the trends from over-the-counter (OTC) to on-exchange trading, the higher demand for ESG services, the increasing importance of the buy-side, passive investments and the digitisation of the financial sector. Inorganic growth will also play an important role. We are aiming for overall growth in net revenue of 10 per cent p.a. on average until 2023. Secular initiatives and M&A are each intended to contribute growth of around 5 per cent. Furthermore, earnings before interest, tax, depreciation, and amortisation (EBITDA) as well as the earnings per share before purchase price allocations (Cash EPS) are planned to grow by around 10% per annum, on average.

We have made significant progress with the implementation of this strategy in the course of last year. Significant milestones and further information can be found on the DBG homepage.

Moreover, we continuously review our organic growth initiatives, which we particular rely on for expansion in secular growth markets and asset classes. Regarding external growth opportunities, the focus is on strengthening existing high-growth areas, and exploring new asset classes and services. Key initiatives and growth drivers are described in Chapter 12 "Report on opportunities" of the Annual Report.  Additionally, the remuneration system for the Executive

Board and executive staff has created a number of incentives for growth in the individual business divisions. The Remuneration report of DBG (page 277 of the Annual Report) provides a detailed description of all targets. In 2021, we also integrated ESG targets into the remuneration system for the Executive Board for the first time. These targets include climate neutrality of Deutsche Börse Group, good ESG ratings, employee satisfaction, and growth in net revenue from ESG products.

We have translated our targets into key performance indicators (KPI), which we assign to our four value creation categories:

Overview of chapters and KPI

| Chapter of integrated report | Page | KPI | Target | 2021 |
|---|---|---|---|---|
| Our customers and markets | 14 | | | |
| | | System availability (customer facing IT)* | >99.5% | |
| Our employees | 20 | | | |
| | | Employee satisfaction* | >71.5% | |
| | | Women in leadership positions[1,*] | >20% | |
| Economic situation | 27 | | | |
| | | Net revenue* | 10% CAGR 2019-23 | |
| | | | 3.5 €bn in 2021 | |
| | | EBITDA* | 10% CAGR 2019-23 | |
| | | | 2.0 €bn in 2021 | |
| | | Cash EPS | 10% CAGR 2019-2023 | |
| | | ESG net revenue[2,*] | >10% | |
| Our social environment | 52 | | | |
| | | $CO_2$ emissions per workspace[3] | Net zero by 2025 (−100% vs. 2019) | |

1) Group-wide target in senior management.
2) ESG net revenue according to the internal definition of Deutsche Börse Group – see "Definition of our ESG net revenue".
3) Unaudited figure.
* Our most significant financial and non-financial key performance indicators.

## 13.4.1. Steering parameters for our customers and markets

As a provider of market infrastructure, we maintain impartial, transparent, and secure marketplaces. In this context, we use our systems availability as a key performance indicator. A value of more than 99.5% is the target for our systems availability customer facing IT.

### 13.4.2. Steering parameters for our employees

We use two key performance indicators for measuring employee-related factors: The first indicator is used to measure employee satisfaction on an annual basis and to take action based on the results. The second indicator is used to calculate the percentage of women in leadership positions on an annual basis. In terms of employee satisfaction, we have defined a result of more than 71.5 per cent approval in the annual employee survey as the target. For the proportion of women in leadership positions the goal was set to reach over 20 per cent in senior management (the first three management levels below the Executive Board). On 31 December 2021, the proportion of women in senior management was 21%. For 2022, we have made a voluntary commitment that exceeds the requirements of section 76 (4) AktG. We want to have a percentage of women in leadership positions of 22% in senior management and of 30% in lower management.

### 13.4.3. Steering parameters for our economic situation

The most important KPIs for the management of our economic situation are net revenue and EBITDA, as these are vital for the successful execution of our growth strategy and set incentives for profitable growth. The basis is net revenue in the consolidated financial statements. This consists of sales revenue plus the treasury result from banking and similar business as well as other operating income, less volume-related costs. The strategic focus on growth means that net revenue is very important for our Group. One of the most important pillars of the corporate strategy, in addition to absolute growth, is the profitability of this growth. To indicate this strategic relevance, EBITDA is one of the core metrics for controlling our Group, and implementing the corporate strategy. EBITDA stands for earnings before interest, tax, depreciation, and amortisation and as such reflects our profitability. It is a common indicator for measuring profitability. Another key financial control criterion is earnings per share before purchase price allocations (Cash EPS), since all profit and loss effects are reflected in this indicator, and it can therefore be used to measure the successful implementation of the growth strategy.

ESG net revenue[13] is the indicator for the ESG business in the context of our growth strategy. The aim is to keep expanding the ESG business and continue our growth in this area. Therefore, we are aiming for annual growth of 10 per cent in our net revenue from ESG products.

### 13.4.4. Steering parameters for our social environment

Our objective is to become climate-neutral on a net basis by 2025. All our efforts will be reviewed by the Science Based Target initiative (SBTi) by the end of 2023. We ensure the climate-neutrality of our Group by avoiding at least 70 per cent of our $CO_2$ emissions per workspace by 2022 and compensate for the remaining emissions by means of emissions reduction projects.

[13] ESG net revenue according to the internal definition of Deutsche Börse Group – see "Definition of our ESG net revenue."

### 13.4.5. Outside-in steering parameters: Ratings

We also include the results of our credit and ESG rating agencies as additional steering parameters. This outside-in view serves as an external evaluation of our actions as well as our results and plans. Therefore, thus outside-in view is an important steering function for us.

In terms of credit ratings at the Group level, we aim for a net debt/EBITDA ratio not exceeding 1.75 and free funds from operations (FFO) relative to net debt greater than or equal to 50%, in order to achieve the "minimum financial risk profile" consistent with the current AA rating in accordance with S&P Global Ratings methodology. In addition, an interest coverage ratio of at least 14 is targeted for DBG using this methodology.

In terms of ESG ratings, our aim is to achieve a place in the 90th percentile in three leading independent ESG ratings (S&P, Sustainalytics, MSCI). In addition to the actual ESG rating, we monitor the development of our ESG ratings very closely, to systematically identify and realise potential for improvements over the years.

### 13.4.6. Definition of our ESG net revenue

The EU Taxonomy does not apply directly to our business model and therefore, is not suitable as a reference framework for classifying our products and services in terms of sustainability. As a result, we devised our own definition of ESG net revenue in the course of a strategic dialogue. Since the beginning of the year, we have been explicitly measuring our ESG net revenue according to this definition, which we describe in more detail below.

The products and services of our respective segments generate economic value in different areas of the financial sector and the real economy and are often not comparable. From a Group perspective, this requires a wide-ranging definition of ESG net revenue, which then has to be broken down into more detail at the segment level. From the Group perspective, net revenue is deemed to be ESG net revenue if the products concerned are related to the transformation of the real and/or financial economy in terms of environmental, social, and governance aspects.

This relationship exists if our products can increase the general transparency of information in terms of the three ESG dimensions – not only for investors, founders, asset managers and market participants, but also for external observers:

- Environmental: This particularly comprises compliance with climate targets, regulatory requirements, and environmental standards and/or credible commitments.
- Social: This particularly includes compliance with labour law in all regions and operations, equal opportunities for all employees and minimum standards for suppliers.
- Corporate governance: This particularly includes minimum standards for the transparency of internal processes and control mechanisms.

Each operating segment in Deutsche Börse Group can increase its information transparency in these three dimensions by including ESG aspects in its product portfolio – be it by integrating ESG ratings, data and/or analysis, or by reporting data on trading volumes for securities, derivatives, renewable energies and/or commodities. Our product portfolio can increase information transparency specifically by providing generally accepted indicators as market signals.

# 14. Appendix A

| (in 000s of €) | General credit exposures | | Relevant credit exposures – Market risk | | Securitization exposures | Total exposure value | Own fund requirements | | | | Risk-weighted exposure amounts | Own fund requirements weights (%) | Countercyclical buffer rate (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Exposure value under the standardized approach | Exposure value under the IRB approach | Sum of long and short positions of trading book exposures for SA | Value of trading book exposures for internal models | Exposure value for non-trading book | | Relevant credit risk exposures - Credit risk | Relevant credit exposures – Market risk | Relevant credit exposures – Securitization positions in the non-trading book | Total | | | |
| **Breakdown by country:** | | | | | | | | | | | | | |
| Andorra | 4,933 | | | | | 4,933 | 395 | | | 395 | 4,933 | 0.00 | - |
| United Arab Emirates | 1,982,849 | 0 | 0 | 0 | 0 | 1,982,849 | 155,976 | 0 | 0 | 155,976 | 1,949,705 | 0.29 | - |
| Armenia | 10,514 | | | | | 10,514 | 841 | | | 841 | 10,514 | 0.00 | - |
| Argentina | 17,961 | 0 | 0 | 0 | 0 | 17,961 | 2,155 | 0 | 0 | 2,155 | 26,942 | 0.00 | - |
| Austria | 432,007 | 0 | 0 | 0 | 0 | 432,007 | 3,284 | 0 | 0 | 3,284 | 41,052 | 0.01 | - |
| Australia | 36,794,671 | 0 | 0 | 0 | 0 | 36,794,671 | 6,232,750 | 0 | 0 | 6,232,750 | 77,909,375 | 11.57 | - |
| Bosnia and Herzegovina | 2,079 | 0 | 0 | 0 | 0 | 2,079 | 166 | 0 | 0 | 166 | 2,079 | 0.00 | - |
| Belgium | 6,049,012 | 0 | 0 | 0 | 0 | 6,049,012 | 483,921 | 0 | 0 | 483,921 | 6,049,012 | 0.90 | - |
| Bahrain | 572,147 | 0 | 0 | 0 | 0 | 572,147 | 45,772 | 0 | 0 | 45,772 | 572,148 | 0.08 | - |
| Bermuda | 144,401 | 0 | 0 | 0 | 0 | 144,401 | 11,552 | 0 | 0 | 11,552 | 144,401 | 0.02 | - |
| Brunei | 2,370 | 0 | 0 | 0 | 0 | 2,370 | 190 | 0 | 0 | 190 | 2,370 | 0.00 | - |
| Brazil | 5,793 | 0 | 0 | 0 | 0 | 5,793 | 463 | 0 | 0 | 463 | 5,793 | 0.00 | - |
| Bahamas | 1,212 | 0 | 0 | 0 | 0 | 1,212 | 97 | 0 | 0 | 97 | 1,212 | 0.00 | - |
| Canada | 901,285 | 0 | 0 | 0 | 0 | 901,285 | 77,107 | 0 | 0 | 77,107 | 963,835 | 0.14 | - |
| Switzerland | 56,629,822 | 0 | 0 | 0 | 0 | 56,629,822 | 4,530,386 | 0 | 0 | 4,530,386 | 56,629,822 | 8.41 | - |
| Chile | 43,364 | 0 | 0 | 0 | 0 | 43,364 | 3,469 | 0 | 0 | 3,469 | 43,364 | 0.01 | - |
| China | 644 | 0 | 0 | 0 | 0 | 644 | 52 | 0 | 0 | 52 | 644 | 0.00 | - |
| Colombia | 43,347 | 0 | 0 | 0 | 0 | 43,347 | 3,468 | 0 | 0 | 3,468 | 43,348 | 0.01 | - |
| Costa Rica | 68,716 | 0 | 0 | 0 | 0 | 68,716 | 5,497 | 0 | 0 | 5,497 | 68,716 | 0.01 | - |
| Curaçao | 29,382 | 0 | 0 | 0 | 0 | 29,382 | 2,351 | 0 | 0 | 2,351 | 29,382 | 0.00 | - |
| Cyprus | 196,535 | 0 | 0 | 0 | 0 | 196,535 | 15,723 | 0 | 0 | 15,723 | 196,535 | 0.03 | - |
| Czech Republic | 1,407,914 | 0 | 0 | 0 | 0 | 1,407,914 | 112,633 | 0 | 0 | 112,633 | 1,407,914 | 0.21 | 0.50 |
| Germany | 45,590,658 | 0 | 0 | 0 | 0 | 45,590,658 | 3,351,209 | 0 | 0 | 3,351,209 | 41,890,108 | 6.22 | - |
| Denmark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - |
| Dominican Republic | 33,683 | 0 | 0 | 0 | 0 | 33,683 | 2,695 | 0 | 0 | 2,695 | 33,683 | 0.01 | - |
| Ecuador | 16,515 | 0 | 0 | 0 | 0 | 16,515 | 1,321 | 0 | 0 | 1,321 | 16,515 | 0.00 | - |
| Egypt | 68,162 | 0 | 0 | 0 | 0 | 68,162 | 5,453 | 0 | 0 | 5,453 | 68,162 | 0.01 | - |
| Spain | 63,978 | 0 | 0 | 0 | 0 | 63,978 | 5,118 | 0 | 0 | 5,118 | 63,978 | 0.01 | - |
| Finland | 965 | 0 | 0 | 0 | 0 | 965 | 77 | 0 | 0 | 77 | 965 | 0.00 | - |
| France | 3,255,233 | 0 | 0 | 0 | 0 | 3,255,233 | 337,251 | 0 | 0 | 337,251 | 4,215,641 | 0.63 | - |
| United Kingdom | 320,444,221 | 0 | 0 | 0 | 0 | 320,444,221 | 26,005,733 | 0 | 0 | 26,005,733 | 325,071,661 | 48.26 | - |
| Georgia | 236,661 | 0 | 0 | 0 | 0 | 236,661 | 18,933 | 0 | 0 | 18,933 | 236,661 | 0.04 | - |
| Guernsey | 22,560 | 0 | 0 | 0 | 0 | 22,560 | 1,843 | 0 | 0 | 1,843 | 23,039 | 0.00 | - |
| Gibraltar | 2,515 | 0 | 0 | 0 | 0 | 2,515 | 201 | 0 | 0 | 201 | 2,515 | 0.00 | - |
| Greece | 13,974 | 0 | 0 | 0 | 0 | 13,974 | 1,118 | 0 | 0 | 1,118 | 13,974 | 0.00 | - |
| Guatemala | 20,282 | 0 | 0 | 0 | 0 | 20,282 | 1,623 | 0 | 0 | 1,623 | 20,282 | 0.00 | - |
| Hong Kong | 489,498 | 0 | 0 | 0 | 0 | 489,498 | 39,169 | 0 | 0 | 39,169 | 489,610 | 0.07 | 1.00 |
| Indonesia | 1,557,208 | 0 | 0 | 0 | 0 | 1,557,208 | 124,577 | 0 | 0 | 124,577 | 1,557,208 | 0.23 | - |
| Ireland | 1,764,465 | 0 | 0 | 0 | 0 | 1,764,465 | 152,680 | 0 | 0 | 152,680 | 1,908,501 | 0.28 | - |
| Israel | 50 | 0 | 0 | 0 | 0 | 50 | 4 | 0 | 0 | 4 | 50 | 0.00 | - |
| Isle of Man | 61,874 | 0 | 0 | 0 | 0 | 61,874 | 4,950 | 0 | 0 | 4,950 | 61,874 | 0.01 | - |
| India | 4,929 | 0 | 0 | 0 | 0 | 4,929 | 394 | 0 | 0 | 394 | 4,929 | 0.00 | - |
| Italy | 3,315,110 | 0 | 0 | 0 | 0 | 3,315,110 | 265,992 | 0 | 0 | 265,992 | 3,324,903 | 0.49 | - |
| Jersey | 114,190 | 0 | 0 | 0 | 0 | 114,190 | 9,707 | 0 | 0 | 9,707 | 121,340 | 0.02 | - |
| Japan | 5,410,693 | 0 | 0 | 0 | 0 | 5,410,693 | 432,855 | 0 | 0 | 432,855 | 5,410,693 | 0.80 | - |
| Kenia | 5,191 | 0 | 0 | 0 | 0 | 5,191 | 415 | 0 | 0 | 415 | 5,191 | 0.00 | - |
| Korea, Republic of | 2,128,969 | 0 | 0 | 0 | 0 | 2,128,969 | 172,622 | 0 | 0 | 172,622 | 2,157,770 | 0.32 | - |
| Kuwait | 37,118 | 0 | 0 | 0 | 0 | 37,118 | 2,969 | 0 | 0 | 2,969 | 37,118 | 0.01 | - |
| Cayman Islands | 1,051,458 | 0 | 0 | 0 | 0 | 1,051,458 | 84,117 | 0 | 0 | 84,117 | 1,051,458 | 0.16 | - |
| Kazakhstan | 1,146,971 | 0 | 0 | 0 | 0 | 1,146,971 | 91,758 | 0 | 0 | 91,758 | 1,146,971 | 0.17 | - |
| Lebanon | 78,155 | 0 | 0 | 0 | 0 | 78,155 | 9,379 | 0 | 0 | 9,379 | 117,232 | 0.02 | - |
| Sri Lanka | 3,678 | 0 | 0 | 0 | 0 | 3,678 | 441 | 0 | 0 | 441 | 5,517 | 0.00 | - |
| Luxembourg | 64,924,518 | 0 | 0 | 0 | 0 | 64,924,518 | 5,257,862 | 0 | 0 | 5,257,862 | 65,723,277 | 9.76 | 0.50 |
| Latvia | 48,049 | 0 | 0 | 0 | 0 | 48,049 | 3,844 | 0 | 0 | 3,844 | 48,049 | 0.01 | - |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Libya | 13,702 | 0 | 0 | 0 | 0 | 13,702 | 1,096 | 0 | 0 | 1,096 | 13,702 | 0.00 | - |
| Morocco | 4,031 | 0 | 0 | 0 | 0 | 4,031 | 322 | 0 | 0 | 322 | 4,031 | 0.00 | - |
| Monaco | 24,412 | 0 | 0 | 0 | 0 | 24,412 | 1,953 | 0 | 0 | 1,953 | 24,413 | 0.00 | - |
| North Macedonia | 7,108 | 0 | 0 | 0 | 0 | 7,108 | 569 | 0 | 0 | 569 | 7,108 | 0.00 | - |
| Macau | 65,194 | 0 | 0 | 0 | 0 | 65,194 | 5,216 | 0 | 0 | 5,216 | 65,194 | 0.01 | - |
| Malta | 7,614 | 0 | 0 | 0 | 0 | 7,614 | 609 | 0 | 0 | 609 | 7,614 | 0.00 | - |
| Mauritius | 115 | 0 | 0 | 0 | 0 | 115 | 9 | 0 | 0 | 9 | 115 | 0.00 | - |
| Mexico | 6,113 | 0 | 0 | 0 | 0 | 6,113 | 489 | 0 | 0 | 489 | 6,113 | 0.00 | - |
| Malaysia | 3,536,410 | 0 | 0 | 0 | 0 | 3,536,410 | 282,913 | 0 | 0 | 282,913 | 3,536,410 | 0.53 | - |
| Netherlands | 1,657,531 | 0 | 0 | 0 | 0 | 1,657,531 | 132,755 | 0 | 0 | 132,755 | 1,659,437 | 0.25 | - |
| Norway | 2,340,865 | 0 | 0 | 0 | 0 | 2,340,865 | 187,269 | 0 | 0 | 187,269 | 2,340,865 | 0.35 | 1.00 |
| Oman | 41,021 | 0 | 0 | 0 | 0 | 41,021 | 3,282 | 0 | 0 | 3,282 | 41,021 | 0.01 | - |
| Panama | 39,662 | 0 | 0 | 0 | 0 | 39,662 | 3,173 | 0 | 0 | 3,173 | 39,662 | 0.00 | - |
| Peru | 22,999 | 0 | 0 | 0 | 0 | 22,999 | 1,840 | 0 | 0 | 1,840 | 22,999 | 0.00 | - |
| Philippines | 539,155 | 0 | 0 | 0 | 0 | 539,155 | 43,132 | 0 | 0 | 43,132 | 539,155 | - | - |
| Poland | 37,274 | 0 | 0 | 0 | 0 | 37,274 | 2,982 | 0 | 0 | 2,982 | 37,274 | 0.00 | - |
| Portugal | 2,166,098 | 0 | 0 | 0 | 0 | 2,166,098 | 173,288 | 0 | 0 | 173,288 | 2,166,098 | 0.32 | - |
| Puerto Rico | 3,908 | 0 | 0 | 0 | 0 | 3,908 | 313 | 0 | 0 | 313 | 3,908 | 0.32 | - |
| Qatar | 95,758 | 0 | 0 | 0 | 0 | 95,758 | 7,661 | 0 | 0 | 7,661 | 95,758 | - | - |
| Romania | 5,390 | 0 | 0 | 0 | 0 | 5,390 | 431 | 0 | 0 | 431 | 5,390 | 0.00 | - |
| Russian Federation | 2,564,308 | 0 | 0 | 0 | 0 | 2,564,308 | 205,145 | 0 | 0 | 205,145 | 2,564,308 | - | - |
| Saudi Arabia | 1,172 | 0 | 0 | 0 | 0 | 1,172 | 94 | 0 | 0 | 94 | 1,172 | - | - |
| Sweden | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - |
| Singapore | 842,340 | 0 | 0 | 0 | 0 | 842,340 | 67,387 | 0 | 0 | 67,387 | 842,340 | - | - |
| Slovakia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 1.00 |
| San Marino | 24,949 | 0 | 0 | 0 | 0 | 24,949 | 1,996 | 0 | 0 | 1,996 | 24,949 | - | - |
| El Salvador | 558,416 | 0 | 0 | 0 | 0 | 558,416 | 44,673 | 0 | 0 | 44,673 | 558,416 | - | - |
| Thailand | 2,118,138 | 0 | 0 | 0 | 0 | 2,118,138 | 169,451 | 0 | 0 | 169,451 | 2,118,138 | - | - |
| Turkey | 252,459 | 0 | 0 | 0 | 0 | 252,459 | 20,197 | 0 | 0 | 20,197 | 252,459 | 0.20 | - |
| Trinidad and Tobago | 32,643 | 0 | 0 | 0 | 0 | 32,643 | 2,611 | 0 | 0 | 2,611 | 32,643 | 0.00 | - |
| Taiwan, Province of China | 1,284,974 | 0 | 0 | 0 | 0 | 1,284,974 | 102,798 | 0 | 0 | 102,798 | 1,284,974 | 0.00 | - |
| Ukraine | 2,187 | 0 | 0 | 0 | 0 | 2,187 | 175 | 0 | 0 | 175 | 2,187 | 0.00 | - |
| United States | 8,966,622 | 0 | 0 | 0 | 0 | 8,966,622 | 698,708 | 0 | 0 | 698,708 | 8,733,853 | 1.30 | - |
| Uruguay | 157,790 | 0 | 0 | 0 | 0 | 157,790 | 12,623 | 0 | 0 | 12,623 | 157,790 | 0.00 | - |
| Venezuela | 596,493 | 0 | 0 | 0 | 0 | 596,493 | 71,579 | 0 | 0 | 71,579 | 894,739 | 0.11 | - |
| Virgin Islands, British | 453,928 | 0 | 0 | 0 | 0 | 453,928 | 36,391 | 0 | 0 | 36,391 | 454,886 | 0.00 | - |
| Viet Nam | 2,741 | 0 | 0 | 0 | 0 | 2,741 | 258 | 0 | 0 | 258 | 3,220 | 0.00 | - |
| South Africa | 2,742,600 | 0 | 0 | 0 | 0 | 2,742,600 | 219,408 | 0 | 0 | 219,408 | 2,742,600 | 0.25 | - |
| OtherCountries | 41,335,464 | 0 | 0 | 0 | 0 | 41,335,464 | 3,306,837 | 0 | 0 | 3,306,837 | 41,335,464 | 3.34 | - |
| **Total** | **629,804,075** | **0** | **0** | **0** | **0** | **629,804,075** | **53,884,190** | **0** | **0** | **53,884,190** | **673,552,373** | | |

| (in 000s of €) | a |
|---|---|
| Total risk exposure amount | 4,037,268 |
| Institution specific countercyclical capital buffer rate | 0.05% |
| Institution specific countercyclical capital buffer requirement | 2,182 |

# 15. Appendix B

| (in 000s of €) | Gross carrying/nominal amount | | | | Accumulated impairment | Provisions on off-balance-sheet commitments and financial guarantees given | Accumulated negative changes in fair value due to credit risk on non-performing exposures |
|---|---|---|---|---|---|---|---|
| | | Of which non-performing | | Of which subject to impairment | | | |
| | | | Of which defaulted | | | | |
| *On-balance-sheet exposures* | | | | | | | |
| *Andorra* | *5* | - | - | | - | | - |
| *United Arab Emirates* | *2,152* | - | - | | *(0)* | | - |
| *Armenia* | *23* | - | - | | - | | - |
| *Argentina* | *4,703* | - | - | | - | | - |
| *Austria* | *1,381* | *0* | - | | *(0)* | | - |
| *Australia* | *607,423* | - | - | | *(0)* | | - |
| *Bosnia and Herzegovina* | *2* | - | - | | - | | - |
| *Bangladesh* | *56* | - | - | | - | | - |
| *Belgium* | *385,416* | *0* | - | | *(0)* | | - |
| *Bulgaria* | *423* | - | - | | *(0)* | | - |
| *Bahrain* | *132* | - | - | | - | | - |
| *Bermuda* | *144* | - | - | | - | | - |
| *Brunei Darussalam* | *2* | - | - | | - | | - |
| *Brazil* | *120* | - | - | | *(0)* | | - |
| *Bahamas* | *2* | - | - | | - | | - |
| *Canada* | *180,703* | *9* | - | | *(5)* | | - |
| *Switzerland* | *143,604* | *1* | - | | *(1)* | | - |
| *Chile* | *43* | - | - | | - | | - |
| *Cameroon* | *0* | - | - | | - | | - |
| *China* | *3,680* | - | - | | - | | - |
| *Colombia* | *43* | - | - | | - | | - |
| *Costa Rica* | *69* | - | - | | *(0)* | | - |
| *Cape Verde* | *1* | - | - | | - | | - |
| *Curaçao* | *29* | - | - | | - | | - |
| *Cyprus* | *204* | - | - | | *(0)* | | - |
| *Czech Republic* | *5,372* | - | - | | *(0)* | | - |
| *Germany* | *817,731* | *21* | - | | *(2)* | | - |
| *Denmark* | *11,037* | - | - | | - | | - |
| *Dominican Republic* | *34* | - | - | | - | | - |
| *Algeria* | *50* | - | - | | - | | - |
| *Ecuador* | *17* | - | - | | - | | - |
| *Estonia* | *45* | - | - | | - | | - |
| *Egypt* | *68* | - | - | | - | | - |
| *Spain* | *2,425* | - | - | | *(0)* | | - |
| *Finland* | *127* | - | - | | - | | - |
| *Fiji* | *2* | - | - | | - | | - |
| *France* | *949,960* | *34* | - | | *(210)* | | - |
| *United Kingdom* | *2,100,404* | *357* | - | | *(296)* | | - |
| *Georgia* | *244* | - | - | | - | | - |
| *Guernsey* | *111* | *9* | - | | *(8)* | | - |
| *Gibraltar* | *3* | - | - | | - | | - |
| *Greece* | *1,377* | *0* | - | | *(0)* | | - |
| *Guatemala* | *20* | - | - | | - | | - |
| *Hong Kong* | *7,061* | *9* | - | | *(8)* | | - |
| *Croatia* | *2,978* | - | - | | - | | - |
| *Hungary* | *237* | - | - | | *(0)* | | - |
| *Indonesia* | *8,889* | - | - | | - | | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Ireland* | *23,408* | *317* | - | | *(32)* | | - |
| *Israel* | *1,490* | - | - | | - | | - |
| *Isle of Man* | *63* | - | - | | *(0)* | | - |
| *India* | *111* | - | - | | - | | - |
| *Iran, Islamic Republic of* | *35* | - | - | | - | | - |
| *Iceland* | *33,017* | - | - | | *(0)* | | - |
| *Italy* | *2,989* | *52* | - | | *(45)* | | - |
| *Jersey* | *200* | *18* | - | | *(15)* | | - |
| *Jordan* | *21* | - | - | | - | | - |
| *Japan* | *19,399* | - | - | | - | | - |
| *Kenya* | *5* | - | - | | - | | - |
| *Korea, Republic of* | *369* | *1* | - | | *(0)* | | - |
| *Kuwait* | *39* | - | - | | - | | - |
| *Cayman Islands* | *91* | - | - | | - | | - |
| *Kazakhstan* | *1,154* | - | - | | *(0)* | | - |
| *Lao People's Democratic Republic* | *1* | - | - | | - | | - |
| *Lebanon* | *78* | *0* | - | | *(0)* | | - |
| *Liechtenstein* | *174* | - | - | | - | | - |
| *Sri Lanka* | *4* | - | - | | - | | - |
| *Lithuania* | *1* | - | - | | - | | - |
| *Luxembourg* | *7,710,649* | *359* | - | | *(98)* | | - |
| *Latvia* | *188* | - | - | | - | | - |
| *Libya* | *168* | - | - | | - | | - |
| *Morocco* | *111* | - | - | | - | | - |
| *Monaco* | *72* | - | - | | - | | - |
| *Montenegro* | *1* | - | - | | - | | - |
| *Macedonia, the Former Yugoslav Republic of* | *7* | - | - | | - | | - |
| *Mongolia* | *1* | - | - | | - | | - |
| *Macao* | *232* | - | - | | - | | - |
| *Mauritania* | *1* | - | - | | - | | - |
| *Malta* | *153* | - | - | | - | | - |
| *Mauritius* | *0* | - | - | | - | | - |
| *Maldives* | *4* | - | - | | - | | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Mexico* | *87* | - | - | | - | | - |
| *Malaysia* | *3,571* | - | - | | *(0)* | | - |
| *Netherlands* | *824* | *13* | - | | *(10)* | | - |
| *Norway* | *484,310* | *0* | - | | *(0)* | | - |
| *New Zealand* | *1,042* | - | - | | - | | - |
| *Oman* | *42* | - | - | | *(0)* | | - |
| *Panama* | *43* | - | - | | - | | - |
| *Peru* | *23* | - | - | | - | | - |
| *Philippines* | *616* | - | - | | - | | - |
| *Poland* | *758* | - | - | | *(0)* | | - |
| *Puerto Rico* | *4* | - | - | | - | | - |
| *Portugal* | *292* | - | - | | - | | - |
| *Qatar* | *163* | *0* | - | | *(0)* | | - |
| *Romania* | *953* | - | - | | - | | - |
| *Serbia* | *27* | - | - | | - | | |
| *Russia* | *2,567* | - | - | | *(0)* | | |
| *Saudi Arabia* | *321* | - | - | | *(0)* | | - |
| *Sweden* | *908* | - | - | | *(0)* | | - |
| *Singapore* | *49,145* | *0* | - | | *(0)* | | - |
| *Slovenia* | *67* | - | - | | *(0)* | | - |
| *Slovakia* | *168* | - | - | | *(0)* | | - |
| *San Marino* | *32* | - | - | | *(0)* | | - |
| *Senegal* | *1* | - | - | | - | | - |
| *El Salvador* | *4* | - | - | | - | | - |
| *Thailand* | *2,119* | *0* | - | | *(0)* | | - |
| *Tunisia* | *18* | - | - | | - | | - |
| *Turkey* | *9,085* | - | - | | *(0)* | | - |
| *Trinidad and Tobago* | *33* | - | - | | - | | - |
| *Taiwan, Province of China* | *1,387* | - | - | | *(0)* | | - |
| *Ukraine* | *282* | - | - | | - | | - |
| *United States* | *269,966* | *21* | - | | *(15)* | | - |
| *Uruguay* | *241* | - | - | | *(0)* | | - |
| *Holy See (Vatican City State)* | *78* | - | - | | - | | - |
| *Venezuela, Bolivarian Republic of* | *673* | *140* | - | | *(77)* | | - |
| *Virgin Islands, British* | *18* | *18* | - | | *(16)* | | - |
| *Viet Nam* | *19* | *9* | - | | *(8)* | | - |
| *Vanuatu* | *3* | - | - | | - | | - |
| *South Africa* | *2,480* | - | - | | - | | - |
| *Argentina* | - | - | - | | | - | |
| *Cyprus* | - | - | - | | | - | |
| *Estonia* | - | - | - | | | - | |
| *Finland* | - | - | - | | | - | |
| *Fiji* | - | - | - | | | - | |
| *Iran, Islamic Republic of* | - | - | - | | | - | |
| *South Africa* | - | - | - | | | - | |
| *Other Countries* | - | - | - | | | - | |
| *Total* | *15,334,729* | *1,391* | - | - | *(900)* | - | - |

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Clearstream Holding AG.
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July 2022

Document number: 6475