Pillar 3 Disclosure Report of Eurex Clearing AG

Disclosures as of 31 December 2021

Pillar 3 Disclosure Report of Eurex Clearing AG 2021
According to Part 8 of Regulation (EU) No. 876/2019 (Capital Requirements Regulation, CRRII) and No. 575/2013 (Capital Requirements Regulation CRR) in conjunction with § 26a German Banking Act (Kreditwesengesetz, KWG).

June 2022

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Eurex Clearing AG June 2022

EUREX

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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 1 concerns the minimum quantitative (capital) requirements related to credit, operational and market risks. In addition, when the Basel III framework was translated into European law, requirements to calculate a Leverage Ratio as well as Liquidity Coverage Ratio and Net Stable Funding Ratio came into force
- Pillar 2 requires banks to integrate the risks of Pillar 1 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 3 promotes market discipline through disclosure and thereby transparency to the public

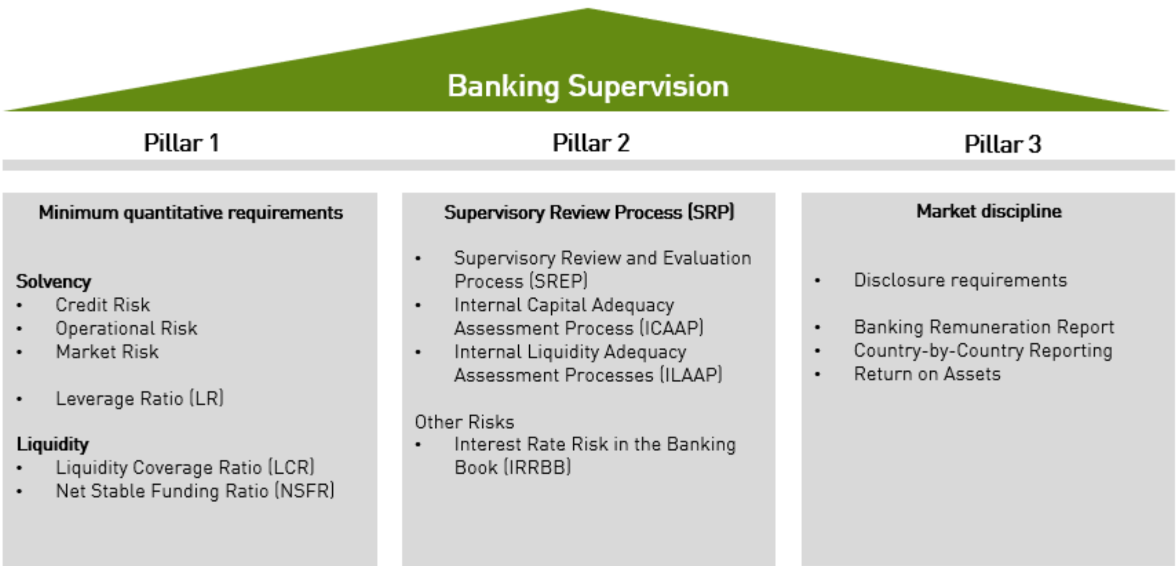

Figure 1. Overview regulatory framework

In December 2010, the Basel Committee on Banking supervision published the global regulatory framework on capital and liquidity, 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 “Basel III: Finalising post-crisis reforms” in December 2017.
The first elements of the Basel III standards were introduced in European law by the Capital Requirements Regulation (EU) No 575/2013 (CRR) and the Capital Requirements Directive 2013/36/EU (CRD). In May 2019, a revised prudential regulation package was introduced, further transposing the Basel III standards into European law through amended versions of the CRR (through Regulation (EU) 2019/876 – CRR 2) and the CRD (through Directive (EU) 2019/878 – CRD 5). In addition, the EU banking package also contained a revised Banking Recovery and Resolution Directive (BRRD, amended as per Directive (EU) 2019/879 – BRRD 2), 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.

The EU rules deviate in some aspects from the Basel III standards to take into account some European specificities. One key change 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 but are nevertheless required to maintain a banking license. As such, CRR 2 contains important requirements from a Eurex Clearing AG perspective.

According to point (a) of Article 6 (4) (a) CRR, institutions authorized as CCPs according to Article 14 Regulation (EU) No 648/2012 (EMIR) are exempted from the Net Stable Funding Ratio (NSFR) on an individual basis. Similarly, due to their distinct business model, CCPs have been exempted from the leverage ratio requirement according to Article 6 (5) CRR.

In January 2021 Regulation (EU) 2021/23 on a framework for the recovery and resolution of central counterparties was published which will exclude CCPs authorised under EMIR from requirements under the BRRD, including MREL.

With these exemptions, the impact of the new regulatory requirements on Eurex Clearing AG was significantly reduced. 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 amending CRR, CRD as well as BRRD in October 2021, the EU initiated the finalisation 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 Eurex Clearing AG, 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.

Expect for dedicated exemptions, CRR 2 applies since 28 June 2021, whereas CRD 5 was transposed in German law through the so-called Risk Reduction Act (Risikoreduzierungsgesetz), which entered into force in December 2020.

This report provides the Pillar 3 disclosures of Eurex Clearing AG as set out in Part Eight of the CRR 2 as applicable as of 31 December 2021.

In addition to the previously mentioned regulation and directives, this report considers the following regulatory publications specifying applicable disclosure requirements:

- 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.

In the following, we refer to the respective laws in place as of 31 December 2021 if not stated otherwise.

1.1.1. Objective of the report

The objective of this Disclosure Report is to fulfil the disclosure requirements detailed in Part 8 CRR and Section 26a KWG, at the legal entity level of Eurex Clearing AG ("Eurex Clearing", "ECAG"). More specifically, the report intends to provide a detailed overview on Eurex Clearing AG's:

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

To ensure adequate fulfilment 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 ECAG is ultimately responsible for the *Disclosure Policy* and must approve any material changes to the policy. The policy defines disclosure content, allocates responsibilities and defines disclosure processes and timelines.

1.1.2. Scope of application (Article 436 CRR 2)

Eurex Clearing AG has no subsidiary that requires consolidated supervision based on Article 18 CRR 2 or Section 10a KWG. In addition, ECAG is not included in a group of undertakings that is subject to supervision on a consolidated level. As such, this Disclosure Report only covers ECAG on a stand-alone basis. All disclosed information is reported in ECAG's accounting and reporting currency, Euro, if not otherwise specified.

1.1.3. Frequency and means of Disclosure (Article 433 & 434 CRR 2)

In accordance with Article 434 CRR 2, ECAG publishes its Disclosure Report on its website: https://www.eurexclearing.com/clearing-en/about-us/regulatory-standards/pillar-iii-disclosure-report/Pillar-III-Disclosure-Report-31368

The report is updated once a year. In addition to the Pillar 3 report, the following documents are also made available:

- A remuneration report that fulfils the requirements according to Article 450 CRR 2. The report is disclosed on an annual basis on the website of ECAG https://www.eurex.com/ec-en/find/about-us/remuneration
- The Country-by-Country reporting to fulfil the requirements according to Section 26a (1) sentence 2 KWG (implementation of Article 89 CRD IV into German law) is included as an annex to the financial statements of ECAG that is published on the website of the German Federal Gazette (www.bundesanzeiger.de) and that can also be found on the website of ECAG: https://www.eurex.com/ec-en/find/corporate-overview/annual-reports

Information about the Return on Assets (“RoA”) according to Section 26a (1) sentence 4 KWG (implementation of Article 90 CRD IV into German law) is disclosed in the management report of the financial statement of ECAG that is published on the website of the German Federal Gazette (www.bundesanzeiger.de) and that can also be found on the website of ECAG: https://www.eurex.com/ec-en/find/corporate-overview/annual-reports.

1.2. Eurex Clearing AG

Eurex Clearing AG was founded on 9 March 1998 in Germany and has its registered office at Mergenthalerallee 61, 65760 Eschborn, Germany. Eurex Clearing AG is a stock corporation (Aktiengesellschaft). It is governed by its Articles of Incorporation and German company law.

1.2.1. Corporate structure

Eurex Clearing AG is a wholly owned subsidiary of Eurex Frankfurt AG that in turn is wholly owned by Deutsche Börse AG (“DBAG”). A control and profit transfer agreement dated 18 November 1998 is in place between Eurex Frankfurt AG and Eurex Clearing AG. Eurex Clearing AG does not have any branches.

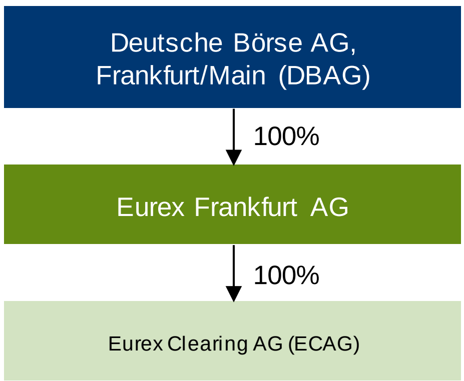

Figure 2. Overview corporate structure

1.2.2. Business operations

As one of the leading central counterparties globally, Eurex Clearing builds trusted relationships with and amongst market participants, paving their way for efficient risk management via unique clearing models.
By doing so, Eurex Clearing assures the safety and integrity of markets while setting standards in risk management. By clearing the broadest scope of products under a single framework in Europe — both listed products and OTC across derivatives and securities finance – and accepting the world’s widest spectrum of eligible collateral, Eurex Clearing delivers efficiencies to our clients.
The main business objectives are:

- Providing clearing services (clearing business) for derivatives, equities, bonds and secured funding, and the securities financing market;
- Being a CCP that is legally interposed between buyer and seller of the transactions;
- Mitigating counterparty risk and maximising the clients’ operational efficiency;
- Continuously extending the scope and range of cleared products;
- Extending the services to new markets.

ECAG acts as a CCP for transactions concluded on Eurex Deutschland ("Eurex") and for transactions involving domestic and foreign securities traded on Frankfurter Wertpapierbörse and for transactions processed on the trading platform of Eurex Repo GmbH. Additionally, ECAG is also providing CCP services for OTC transactions involving interest rate, inflation, and currency products.

1.2.3. Licencing and regulatory supervision

Eurex Clearing AG is a company incorporated in Germany and licensed as a credit institution under supervision of the German Financial Supervisory Authority ("Bundesanstalt für Finanzdienstleistungs-aufsicht", "BaFin").

ECAG is licensed to perform proprietary trading in its own name and for its own account according to Section 32 (1a) KWG. On 1 August 2013, ECAG was further licensed by the German Federal Financial Supervisory Authority to perform deposit taking business and lending business according to Section 1 (1) sent. 2 no. 1 and no. 2 KWG and is therefore also classified as CRR credit institution.

On 10 April 2014, ECAG has been granted authorisation as a Central Counterparty under the European Market Infrastructure Regulation ("EMIR"). The authorisation as a CCP also determines Eurex Clearing as a qualifying CCP ("QCCP") under CRR.

As of 1 February 2016, Eurex Clearing is also a derivative clearing organisation ("DCO") registered with the U.S. Commodity Futures Trading Commission ("CFTC").

ECAG is furthermore recognised:

- As foreign central counterparty by the Swiss Financial Market Supervisory Authority ("FINMA") as from 29 March 2018;
- As a Recognised Clearing House by the Monetary Authority of Singapore as from 14 September 2018;
- As a Financial Instrument Clearing Organization by the Japanese Financial Services Agency; and,
- And has a permanent exemption to offer clearing services in Ontario, Canada.

Further details on the licensing and supervision can be looked up on ECAG's website[2].

[2] https://www.eurex.com/ec-en/find/about-us/licensing-supervision

2. Key Metrics

(in 000s of €)	2021	2020	2019	2018
Available own funds (amounts)				
Common Equity Tier 1 (CET1) capital	749,813	749,813	614,813	514,813
Tier 1 capital	749,813	749,813	614,813	514,813
Total capital	749,813	749,813	614,813	514,813
Risk-weighted exposure amounts				
Total risk exposure amount	1,567,711	1,303,000	1,210,237	1,266,679
Capital ratios (as a percentage of risk-weighted exposure amount)				
Common Equity Tier 1 ratio (%)	47.83%	57.55%	50.80%	40.64%
Tier 1 ratio (%)	47.83%	57.55%	50.80%	40.64%
Total capital ratio (%)	47.83%	57.55%	50.80%	40.64%
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 excessive leverage (%)	7.00%	7.00%	7.00%	1.75%
of which: to be made up of CET1 capital (percentage points)	3.94%	3.94%	3.94%	3.94%
of which: to be made up of Tier 1 capital (percentage points)	5.25%	5.25%	5.25%	5.25%
Total SREP own funds requirements (%)	15.00%	15.00%	15.00%	15.00%
Combined buffer and overall capital requirement (as a percentage of risk-weighted exposure amount)				
Capital conservation buffer (%)	2.50%	2.50%	2.50%	1.88%
Conservation buffer due to macro-prudential or systemic risk identified at the level of a Member State (%)	0.00%	0.00%	0.00%	0.00%
Institution specific countercyclical capital buffer (%)	0.00%	0.25%	0.03%	0.09%
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 (%)	0.00%	0.00%	0.00%	0.00%
Combined buffer requirement (%)	2.50%	2.75%	2.53%	1.97%
Overall capital requirements (%)	17.50%	17.75%	17.53%	16.97%
CET1 available after meeting the total SREP own funds requirements (%)	32.83%	n/a	n/a	n/a
Leverage ratio				
Total exposure measure	n/a	33,258,513	27,078,346	n/a
Leverage ratio (%)	n/a	2.25%	2.27%	n/a
Liquidity Coverage Ratio				
Total high-quality liquid assets (HQLA) (Weighted value -average)	34,215,527	32,120,083	26,021,212	24,191,804
Cash outflows - Total weighted value	27,362,472	23,548,367	17,633,970	25,281,547
Cash inflows - Total weighted value	1,648,300	893,157	928,870	1,497,354
Total net cash outflows (adjusted value)	25,714,173	22,655,210	16,705,100	23,784,194
Liquidity coverage ratio (%)	133.06%	141.78%	155.77%	101.71%

Table 1: Key Metrics

3. Funds and Capital

3.1. Composition of Capital

The following subsections disclose the information as required by Article 437 paragraph 1 CRR 2 and details set out in Commission Implementing Regulation (EU) No 1423/2013.

The following Table 2 summarises ECAG'S total amount of regulatory capital. Tier 1 capital represents the eligible own funds of ECAG and consists solely of subscribed capital and reserves.

	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	25,000	26 (1), 27, 28, 29, EBA Art. 26 (3)
Retained earnings	9,501	26 (f) (c)
Accumulated other comprehensive income (and other reserves)	715,313	26 (1)
Common Equity Tier 1 (CET1) capital before regulatory adjustments	**749,813**	**Sum of lines1 tto 5a**
Common Equity Tier 1 (CET1) capital: regulatory adjustments		
Total regulatory adjustments to Common Equity Tier 1 (CET1)	**0**	34, 105
Common Equity Tier 1 (CET1) capital	**749,813**	36 (f) (j)
Additional Tier 1 (AT1) capital: instruments		
Additional Tier 1 (AT1) capital before regulatory adjustments	**-**	
Additional Tier 1 (AT1) capital: regulatory adjustments		
Total regulatory adjustments to Additional Tier 1 (AT1) capital	**0**	
Additional Tier 1 (AT1) capital	**0**	
Tier 1 capital (T1 = CET1 + AT1)	**749,813**	Sum of lines 29 and 44
Tier 2 (T2) capital: instruments		
Tier 2 (T2) capital: regulatory adjustments		
Tier 2 (T2) capital	**0**	
Total capital (TC = T1 + T2)	**749,813**	
Total Risk exposure amount	**1,567,711**	**Sum of lines 45 and 58**
Capital ratios and requirements including buffers		
Common Equity Tier 1 capital	47.83%	92 (2) (a)
Tier 1 capital	47.83%	92 (2) (b)
Total capital	47.83%	92 (2) (c)
Institution CET1 overall capital requirements	10.94%	
of which: capital conservation buffer requirement	2.50%	
of which: countercyclical capital buffer requirement	0.00%	
of which: systemic risk buffer requirement	0.00%	
of which: Global Systemically Important Institution (G-SII) or Other Systemically Important Institution (O-SII) buffer requirement	0.00%	
of which: additional own funds requirements to address the risks other than the risk of excessive leverage	8.40%	
Common Equity Tier 1 capital (as a percentage of risk exposure amount) available after meeting the minimum capital requirements	**32.83%**	
Amounts below the thresholds for deduction (before risk weighting)		
Applicable caps on the inclusion of provisions in Tier 2		
Cap on inclusion of credit risk adjustments in T2 under standardised approach	3,921,808	

Table 2. Composition of regulatory capital

3.1.1. Description of the main features of capital instruments

Disclosures under point (b) of Article 437 CRR 2 are shown in the below Table 3 in line with the disclosure templates set out in the Implementing Regulation (EU) No 1423/2013.

Features		Instrument
1	Issuer	Eurex Clearing AG
2	Unique identifier (e.g. ISIN, etc.)	N/A
2a	Public or private placement	
3	Governing law(s) of the instrument	German Stock Corporation Act (AktG)
3a	Contractual recognition of write down and conversion powers of resolution authorities	
Regulatory treatment		
4	Transitional CRR rules	Common Equity Tier 1
5	Post-transitional CRR rules	Common Equity Tier 1
6	Eligible at solo/ (sub-)consolidated/ solo & (sub-)consolidated	Solo
7	Instrument type (types to be specified by each jurisdiction)	Ordinary Shares
8	Amount recognised in regulatory capital (currency in million, as of most recent reporting date)	€ 25
9	Nominal amount of instrument (in million, in currency of issuance)	€ 25
9a	Issue price	€ 25
9b	Redemption price	N/A
10	Accounting classification	Shareholders' equity
11	Original date of issuance	3/9/1998
12	Perpetual or dated	perpetual
13	Original maturity date	N/A
14	Issuer call subject to prior supervisory approval	No
15	Optional call date, contingent call dates and redemption amount	N/A
16	Subsequent call dates, if applicable	N/A
Coupons/dividends		
17	Fixed or floating dividend/coupon	N/A
18	Coupon rate and any related index	N/A
19	Existence of a dividend stopper	N/A
20a	Fully discretionary, partially discretionary or mandatory (in terms of timing)	N/A
20b	Fully discretionary, partially discretionary or mandatory (in terms of amount)	N/A
21	Existence of step up or other incentive to redeem	No
22	Noncumulative or cumulative	Noncumulative
23	Convertible or non-convertible	Nonconvertible
24	If convertible, conversion trigger(s)	N/A
25	If convertible, fully or partially	N/A
26	If convertible, conversion rate	N/A
27	If convertible, mandatory or optional conversion	N/A
28	If convertible, specify instrument type convertible into	N/A
29	If convertible, specify issuer of instrument it converts into	N/A
30	Write-down features	No
31	If write-down, write-down trigger(s)	N/A
32	If write-down, full or partial	N/A
33	If write-down, permanent or temporary	N/A
34	If temporary write-down, description of write-up mechanism	N/A
34a	Type of subordination (only for eligible liabilities)	
34b	Ranking of the instrument in normal insolvency proceedings	
35	Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument)	N/A
36	Non-compliant transitioned features	No
37	If yes, specify non-compliant features	N/A
37a	Link to the full term and conditions of the instrument (signposting)	

(1) 'N/A' inserted if the question is not applicable

Table 3: Capital Instruments

3.2. Reconciliation of own funds items to audited financial statements

A full reconciliation of own funds to the audited financial statements pursuant to point (a) of Article 437 paragraph 1 CRR 2 must be disclosed by institutions as laid out in the Implementing Regulation (EU) No 1423/2013. The balance sheet reconciliation for ECAG is shown in the below.

	Balance sheet as in published financial statements	Under regulatory scope of consolidation
(in 000s of €)	**As at period end**	**As at period end**
Assets - *Breakdown by asset clases according to the balance sheet in the published financial statements*		
Liquid funds	31,479,009	33,710,612
Receivables from credit insitutions	4,429,178	1,514,395
Payable on demand	*3,443,142*	*1,514,395*
Other receviables	*986,036*	*0*
Receivables from customers	139,446	825,915
Bonds and other fixed-interest securities	12,012	12,012
Bonds and debt instruments of public-sector issuers	*12,012*	*12,012*
Assets held in trust	93,617	0
Property, plant and equipment	4	4
Other assets	22,895	111,560
Deferred expenses	178	0
Total assets	**36,176,338**	**36,174,498**
Liabilities - *Breakdown by liability clases according to the balance sheet in the published financial statements*		
Liabilities to credit institutions	27,431,062	-
Payable on demand	*26,792,996*	-
Other payables	*638,067*	-
Liabilities to customers	7,816,668	-
Other payables	*22,092*	-
Payables on demand	*7,794,576*	-
Liabilities held in trust	93,617	-
Other liabilities	29,585	35,363,775
Provisions	55,593	50,125
Provisions for pensions and similar obligations	*2,696*	*2,628*
Provisions for tax	*6,445*	*761*
Other provisions	*46,453*	*46,736*
Total liabilities	**35,426,525**	**35,413,900**
Shareholders' Equity		
Subscribed capital	25,000	25,000
Capital reserves	715,313	715,313
Retained earnings	9,501	9,501
Legal reserves	*2,500*	-
Other retained earnings	*7,001*	-
Unappropriated surplus	-	-
Total shareholders' equity	**749,813**	**749,813**

Table 4: Balance Sheet Reconciliation

Based on the profit transfer agreement with Eurex Frankfurt, the profit for the fiscal year 2021 of an amount of €10.784 million (2020: €12.041 million) was transferred.

3.3. Other Regulatory capital levels

Risk weighted assets and capital requirements for credit risk positions

The table below shows risk weighted assets and capital requirements for credit risk exposures. ECAG uses the Standardized Approach to calculate its capital requirements for credit risk.

(in 000s of €)	31 December 2021	
Exposure class	**Risk weighted assets**	**Capital requirements**
Institutions	304,936	24,395
Corporates	8,322	666
Other (including equity holding)	487	39
Total	**313,745**	**25,100**

Table 5: Capital requirements for credit risk

The total capital requirements, risk weighted assets and risk indicators related to credit, market and operational risk are summarised below.

	Total risk exposure amounts (TREA)		Total own funds requirements
	a	b	c
(in 000s of €)	31.12.2021	31.12.2020	31.12.2021
Credit risk (excluding CCR)	311,888	202,497	24,951
Of which the standardised approach	311,888	202,497	24,951
Counterparty credit risk - CCR	1,857	695	149
Of which other CCR	1,857	695	149
Settlement risk	-	-	-
Securitisation exposures in the non-trading book (after the cap)	-	-	-
Position, foreign exchange and commodities risks (Market risk)	-	-	-
Large exposures	-	-	-
Operational risk	1,253,967	1,099,808	100,317
Of which basic indicator approach	1,253,967	1,099,808	100,317
Total	**1,567,711**	**1,303,000**	**125,417**

Table 6: Overview of total risk exposure amounts

3.4. Countercyclical capital buffer

The countercyclical capital buffer aims to ensure that banking sector capital requirements reflect the macro-financial environment in which banks operate. According to Commission Delegated Regulation (EU) 2015/1555 on the disclosure of information in relation to the compliance of institutions with the requirement for a countercyclical buffer, institutions need to disclose the following two tables.

(in 000s of €)	General credit exposures		Relevant credit exposures – Market risk		Securitisation exposures Exposure value for non-trading book	Total exposure value	Own fund requirements				Risk-weighted exposure amounts	Own fund requirements weights (%)	Countercyclical buffer rate (%)
	Exposure value under the standardised 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			Relevant credit risk exposures - Credit risk	Relevant credit exposures – Market risk	Relevant credit exposures – Securitisation positions in the non-trading book	Total			
Breakdown by country:													
BE	31	0	0	0	0	31	2	0	0	2	31	0.34%	0.00%
CH	98	0	0	0	0	98	8	0	0	8	98	1.09%	0.00%
DE	8,209	0	0	0	0	8,209	657	0	0	657	8,209	91.72%	0.00%
GB	569	0	0	0	0	569	46	0	0	46	569	6.36%	0.00%
HK	7	0	0	0	0	7	1	0	0	1	7	0.07%	1.00%
LU	0	0	0	0	0	0	0	0	0	0	0	0.00%	0.50%
US	37	0	0	0	0	37	3	0	0	3	37	0.41%	0.00%
Other countries	0	0	0	0	0	0	0	0	0	0	0	0.00%	0.00%
Total	**8,950**	**0**	**0**	**0**	**0**	**8,950**	**716**	**0**	**0**	**716**	**8,950**	**100%**	

Table 7: Geographical distribution of credit exposures relevant for the calculation of the countercyclical capital buffer

(in 000s of €)	a
Total risk exposure amount	1,567,711
Institution specific countercyclical capital buffer rate	0.00%
Institution specific countercyclical capital buffer requirement	12

Table 8: Amount of institution-specific countercyclical capital buffer

3.5. Leverage Ratio

Due to an exemption from reporting the leverage ratio as of the reference date 2021, it is not disclosed. For 2019 and 2020, please see they Key Metrics table.

4. Governance and organizational framework

4.1. Governance arrangements

4.1.1. General arrangements (Article 435 (2) CRR)

Eurex Clearing AG is incorporated in Germany in the form of a stock corporation (Aktiengesellschaft). The German Stock Corporation Act (Aktiengesetz – "AktG") requires such a company to set up an Executive Board (Subsection 76 et seq. AktG) and a Supervisory Board (Subsection 95-116 AktG).

ECAG maintains a comprehensive *Policy for the assessment of the suitability of members of the Governing Bodies and Key Function Holders* (in the following referred to as *Suitability Assessment Policy*) and a corresponding side-letter defining specific job descriptions of Executive Board and Supervisory Board members. The objective of this policy is to ensure that members of the Executive Board, the members of the Supervisory Board and key function holders of ECAG 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/2021/06/ESMA35-36-2319) and BaFin guidance notes regarding the members of the Executive Board and the Supervisory Board in accordance with the German Banking Act as amended.

In the *Suitability Assessment Policy*, ECAG 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.

- Eurex Clearing aims to achieve a balanced representation of women and men.
- The age structure of the Boards should be of an appropriately broad range.
- An appropriately broad range of educational and professional backgrounds should be present in the Boards.
- The composition of the Boards should reflect Eurex Clearing AG'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 worktime, 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.

The rules of the limitation of mandates in accordance with Section 25c (2) KWG and Section 25d (3) KWG must be complied with. Under this definition, and in consideration of the legal permissibility of the aggregation of mandates, on 31 December 2021 all members of the Executive Board and Supervisory Board of ECAG 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.

4.1.2. Executive Board

According to ECAG’s Articles of Incorporation, the Executive Board shall be composed of at least two members who are appointed by the Supervisory Board of ECAG. The Executive Board is chaired by the CEO.
The recruitment process of members of the Executive Board starts with the Nomination Committee to prepare and the Supervisory Board to resolve on a job description and candidate profile for a specific position. The Nomination Committee identifies and recommends suitable members for the approval of the Supervisory Board. The appointment of new members of the Executive Board of ECAG requires to retrieve a statement of non-objection by the BaFin.
According to ECAG’s Articles of Incorporation, the Executive Board shall be composed of at least two members who are appointed by the Supervisory Board of ECAG. The Executive Board is chaired by the CEO.

The recruitment process of members of the Executive Board starts with the Nomination Committee to prepare and the Supervisory Board to resolve on a job description and candidate profile for a specific position. The Nomination Committee identifies and recommends suitable members for the approval of the Supervisory Board. The appointment of new members of the Executive Board of ECAG requires to retrieve a statement of non-objection by the BaFin.

Significant business principles as well as risk management standards are defined by the ECAG Executive Board in the form of business and risk strategies. Furthermore, the ECAG Executive Board bears the overall responsibility for the formation and effectiveness of the Internal Control System.

The members of the Executive Board must be professionally suitable and reliable for the management of ECAG and must be able to devote sufficient time to fulfil their tasks. Further, sufficient theoretical and practical knowledge of the business of a CCP/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;
- 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).

The ECAG Executive Board, in general, holds meetings every second week, whereby, according to the Rules of Procedure for the Executive Board, every ECAG Executive Board member can request the convention of a meeting, at any time.

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

Name / Position	Number of directorships
Erik Tim Müller - Chief Executive Officer	3 (thereof 2 within Deutsche Börse Group)
Matthias Graulich	2 (thereof 2 within Deutsche Börse Group)
Jens Janka	1
Manfred Matusza	1
Dmitrij Senko	3 (thereof 1 within Deutsche Börse Group)

Table 9: Number of directorships held per Executive Board Member

4.1.3. Supervisory Board

The ECAG Supervisory Board is the central control and supervisory body. Its key tasks consist of overseeing the work of the ECAG Executive Board, appointing its members and approving important corporate decisions and corporate planning. Moreover, the Supervisory Board monitors the effectiveness of risk management systems and evaluates the risk strategy. The members of the ECAG Supervisory Board are elected for a term not exceeding five years.

ECAG's Supervisory Board is composed according to the following criteria:

- Twelve members in total;
- At least one member with specific knowledge and expertise in the area of accounting and one further member in auditing;
- At least one member (i.e. one member of the compensation review committee) with sufficient knowledge and professional expertise in the area of risk management and risk controlling. In particular, the member should have knowledge of designing remuneration schemes coherent with a given risk appetite, risk strategy and capital situation
- In each of the following areas, at least two members of the Supervisory Board should have sound knowledge:
  - Accounting, finance, and audit
  - Risk management and compliance
  - Information technology and security
  - Clearing business
  - Regulatory requirements
- At least one third, but no less than two, of the members must be independent in the meaning of Article 2 paragraph 28 EMIR.

On 31 December 2021, the Supervisory Board consisted of the persons displayed in Table 10, which also discloses the number of directorships held by each member as required by Article 435 (2) (a) CRR.

Name - Position	Number of directorships
Jeffrey Tessler – Chairperson	3 (thereof 2 within Deutsche Börse Group)
Gregor Pottmeyer – Vice-Chairperson	6 (thereof 5 within Deutsche Börse Group)
Peter Barrowcliff (until 23.06.2021)	2
Charles Bristow	1
Tammo Diemer	3
David Feldmann	1
Nikolaus Giesbert	2
Wim den Hartog	2
Tong Lee	1
Karin Labitzke (since 23.09.2021)	3 (thereof 3 within Deutsche Börse Group)
Clifford Lewis	1
Roselyne Renel	2
Thilo Roßberg	1

Table 10: Number of directorships held per Supervisory Board Member

The ECAG Supervisory Board meets at least four times a year. In these meetings, it is informed about normal business activities as well as all substantial business events. In case of extraordinary incidents, the ECAG Supervisory Board is informed immediately.

4.1.4. Committees

In 2021, the ECAG Supervisory Board Committees comprised the Audit & Risk Committee, the Compensation Review Committee and the Nomination Committee that are each composed of at least three members. In addition, the EMIR Risk Committee was established pursuant to Art. 28 Regulation (EU) 648/2012 (EMIR) and Chapter I Part 1 Number 1.5 of the clearing conditions of Eurex Clearing AG (the “Clearing Conditions”). The EMIR Risk Committee is chaired by an independent member of the ECAG Supervisory Board and reports to the ECAG Supervisory Board.

Audit & Risk Committee

Members	Tasks and responsibilities
▪ Tammo Diemer (Chairperson) ▪ Wim den Hartog ▪ Jeffrey Tessler	▪ Deals with audit matters particularly related to the preparation of annual budget, accounting processes, internal and external audits, compliance, and control systems. ▪ Discusses and examines the annual financial statements and the auditor’s report on the annual financial statements in detail, reports the results to the Supervisory Board and recommends e.g., that the Supervisory Board approves the annual financial statements. ▪ Addresses risk matters, inter alia advises the Supervisory Board on the institution’s current and future risk appetite

Members	Tasks and responsibilities
	and risk strategy, and examines whether the incentives provided by the remuneration system take into account the risk, capital and liquidity structure of Eurex Clearing.

In 2021, the Audit & Risk Committee met 4 times (information disclosed as required by Article 435 (2) (d) CRR 2).

Compensation Review Committee

Members	Tasks and responsibilities
▪ Jeffrey Tessler (Chairperson) ▪ Clifford Lewis ▪ Gregor Pottmeyer	▪ Supervises the reasonableness of the remuneration system of the Executive Board including the design and further development of the Remuneration Policy. ▪ Oversees the compensation for selected senior control functions and risk takers as well as the determination of the aggregate remuneration of the members of the Executive Board. ▪ Supports the Supervisory Board in the monitoring of the reasonableness of the remuneration system regarding employees below the Executive Board.

Nomination Committee

Members	Tasks and responsibilities
▪ Jeffrey Tessler (Chairperson) ▪ Roselyn Renel ▪ Gregor Pottmeyer	▪ Identifies candidates to fill vacancies in the Executive Board. ▪ Prepares the proposals for the election of members of the Supervisory Board. ▪ Assesses the composition and performance of the Executive Board and the Supervisory Board in their entirety. ▪ Assesses the knowledge, skills and experience of individual members of the Executive Board and the Supervisory Board periodically, at least annually.

EMIR Risk Committee

Members	Tasks and responsibilities
▪ Roselyne Renel (Chairwoman) ▪ Wim den Hartog (Vice Chairman) ▪ ABN Amro Group NV Willem-Jan Aalbers ▪ APG Asset Management Jan-Mark van Mill	▪ Advises the Supervisory Board and the Executive Board on any EMIR and other relevant matters, i.e. arrangements that may impact the risk management of the CCP, such as a significant change in its risk model, the default procedures, the criteria for accepting clearing members, the clearing of new classes of instruments or the outsourcing of functions.

Members	Tasks and responsibilities
▪ Bank of America Michael Spokoyny ▪ Barclays Bank Plc Luca Nicastro ▪ BlackRock Vicky Hsu ▪ BNP Paribas Cecule Barthelemy ▪ Brevan Howard Investment Products Ltd Alexandre Assouline ▪ DRW Mark Wendland ▪ Goldman Sachs International Matteo Farina ▪ J.P. Morgan Securities Plc Rogier van Kempen ▪ Morgan Stanley Sebastien Renard ▪ Optiver V.O.F. Robert van Gulik ▪ Societe Generale Newedge UK Ltd. Nicolas Meyer ▪ Susquehanna International Group Michael Phelan ▪ Swiss Life Matthias Vögeli ▪ Union Investment Christoph Hock	

4.2. Risk management overview

4.2.1. Risk management framework

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

4.2.2. Risk strategy

ECAG has developed two risk strategy statements, which are linked to the defined strategic objectives.

1. Risk limitation – protecting and ensuring continuity of operations
2. Supporting growth in the various business divisions

ECAG's risk strategy is based upon its business strategy and regulates the extent of risks taken through its various business activities.
All members of the Executive Board of ECAG are ultimately responsible for the risk strategy, which reflects ECAG'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 ECAG'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 all business activities and that adequate measures are in place to implement the strategies, policies, and procedures.

4.2.3. Risk appetite

The risk strategy includes statements concerning risk appetite and sets limits. The following concepts are calculated:

- Required Economic Capital – Economic perspective:
  The Required Economic Capital is the economic perspective (former Liquidation principle) according to the ICAAP. It is defined as the Value at Risk (VaR) based on 99.990% percent confidence level. A correlation of 1 is used between different risk types, as this is the most conservative approach.
    - Required Economic Capital is compared with the Available Risk-Bearing Capacity ("ARBC"), which is defined as regulatory own funds (eligible regulatory capital).
    - Available Risk-Bearing Capacity is updated according to the respective regulatory reporting frequency. Due to reporting deadline discrepancy between risk reporting and regulatory reporting, regular risk reports usually use ARBC based on the regulatory own funds from the previous regulatory reporting period.

- Normative perspective and other regulatory capital requirements:
    - Eurex Clearing AG must also calculate their capital requirements for various risk types in line with the Pillar I requirements of Basel III. In addition, ECAG must fulfil EMIR capital requirements. Eurex Clearing AG uses the standard approach for analysing and evaluating credit and market risk and employs for operational risk the basic indicator approach in order to calculate regulatory capital requirements.

The RBC for individual risk types is defined as a fraction of the overall Risk-Bearing Capacity. When allocating the respective Risk-Bearing capacity to a risk type, the respective risk profile for ECAG is taken into account.

4.2.4. Risk profile

Eurex Clearing distinguishes between financial and operational risks. Financial risks are divided into credit, market, and liquidity risks. Operational, credit and liquidity risks are classified as material risks.

The risk profile did not change significantly in financial year 2021. As of 31 December 2021, the REC of Eurex Clearing AG amounted to €393 million, with the REC composition for the individual risk types as follows: For operational and financial risk the REC was €185 million and €208 million. Financial risk was made up of credit risk with REC of €202 million and market risk with REC of €6 million.

The overall risk profile as defined, adopted and approved via the risk strategy links to the business strategy as outlined above.

The risk strategy was approved by the Executive Board of ECAG in August 2021.

4.2.5. Risk culture

Risk awareness and a corresponding risk-conscious culture are encouraged, amongst other things, through appropriate organisational structures and responsibilities, adequate processes, and the knowledge of employees. The appropriateness of the risk management and controlling systems is to be checked continuously. ECAG aims to meet the four indicators of sound risk culture developed by 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.

4.3. Risk management process

ECAG's risk management process is based on the three lines of defence model, see Figure 3. Furthermore, the process aims at ensuring that all threats, causes of loss and potential disruptions are:

- Properly identified as soon as possible (identification);
- Centrally recorded (notification);
- Assessed (that is, quantified in financial terms to the largest possible extent);
- Controlled (mitigation & control); and,
- Reported in a timely manner and consistently, together with suitable recommendations to the Executive Board (monitoring & reporting).

These five key processes as well as adequate quality standards are defined in the Group Risk Management Policy and are reviewed on an ongoing basis by an independent audit function.

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

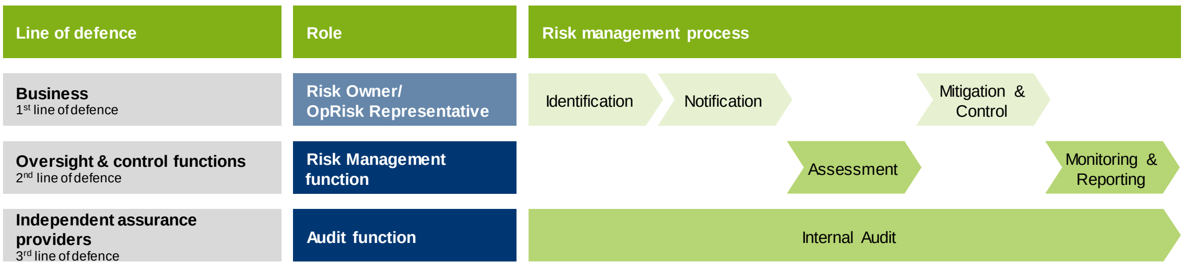

Figure 3. Five-level risk management system with central and decentralised responsibilities

4.3.1. Risk identification

Risk identification includes the identification of all threats, causes of loss and potential disruptions with regards to existing or new processes as well as internal activities or external factors.

More specifically, the risk identification process is on one hand proactive, based on regular reviews of processes in order to identify weak areas and points of failure (e.g., manual processes, processes without double keying or four-eyes controls in place, specific procedures subject to high volumes or tight deadlines) or based on scenarios of disruption or failure taking into consideration all sources of issues (e.g., unavailability of systems, human error). For the purpose of properly investigating potential risks for Eurex Clearing a risk inventory process has been established. The inventory process is carried out at least once a year by ERM. On the other hand, the risk identification process is also reactive as a consequence of an incident.

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 available statistics are insufficient.

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

4.3.2. Risk notification

The process step of risk notification ensures that risks are centrally recorded. To do so, all organisational units and individual employees must notify ERM in a timely manner of the risks that they have identified and quantified.

4.3.3. Risk assessment

Eurex Clearing assesses material risks on an ongoing basis applying both concepts (a) economic perspective (using REC) and (b) for additional information purposes Earnings at Risk to aggregate risks at company level. The main instrument that ECAG uses for the purpose of quantification is the Value at Risk ("VaR") concept. The VaR quantifies the risks to which a company is exposed and indicates the maximum cumulative loss ECAG could face if certain independent loss events materialise over a specific time horizon for a given probability.

Eurex Clearing also considers extreme scenarios and factors these into its risk management. Such extreme scenarios include both stress tests across all risk types and stress tests for specific material risk types.

4.3.4. Risk mitigation and control

Risk mitigation and control involves the determination and implementation of the most appropriate reaction to the identified risk. It encompasses risk avoidance, risk reduction, risk transfer and intentional risk acceptance.

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

4.3.5. Risk monitoring and reporting

Enterprise Risk Management is the independent risk controlling function of Eurex Clearing, responsible for monitoring and reporting risks.

A detailed risk report is submitted to the Executive Board of Eurex Clearing at least once a quarter. The Supervisory Board, the EMIR Risk Committee and the Audit & Risk Committee also receive quarterly risk reports.

Limit breaches are explained in detail and reported to the Executive Board before the 10th business day following the end of the respective quarter of the year or ad-hoc in case the regular monitoring process identifies a limit breach. The regular risk reports contain risk quantification results in comparison with the limits, risk related qualitative information, information about stress tests and capital adequacy information.

In addition to the above-mentioned risk monitoring and reporting functions, Internal Audit serves as the 3rd line of defence and provides further assurance of the risk management process by conducting independent audits.

In the Executive Board meeting on 06 October 2021 the Executive Board concluded that the Risk Management System is effective.

5. Management of credit risk

ECAG defines credit risk as the risk of a counterpart not being able to fulfil a contractual obligation causing a financial loss to ECAG.

For the purpose of its own credit risk management, ECAG divides credit risk, based on relationship that the counterparty has with ECAG, into:

- Credit risk related to core CCP business;
- Credit risk arising from cash investments.

5.1. Credit risk related to core CCP business

Within the core CCP business, ECAG acts as a principal from a legal perspective. However, ECAG is not economically involved in the transactions and their related risks. As such, the positions are not recognised in the balance sheet and thus do not fall under the Pillar 1 risk positions. Associate collateral, in the form of securities, is also not considered for Pillar 1 purposes.

The credit risk stemming from the core CCP business is dealt with under Pillar 2 and complies with EMIR requirements.

The framework to manage all credit risks, which are related to the core CCP business, is laid out in the *CCP Credit Risk Management Policy* and will not be detailed further in the Pillar 3 report since it is not considered for Pillar 1 purposes. Further information can be found on the following internet site: https://www.eurex.com/ec-en/services/risk-management/default-waterfall

5.2. Credit risk related to cash investments

Credit risk can also arise from cash investments. The cash balances which are invested by the CCP mainly consist of Eurex Clearing's own funds and Member Cash Deposits. The framework to manage credit risk, which is related to cash investments, is laid out in the ECAG Treasury Policy and the ECAG Credit Policy for Treasury Activities.

5.3. Strategy and process

Credit risk is classified as a material risk in ECAG's risk strategy and as of 31 December 2021 the share of credit risk in the REC of ECAG was 51%.

The risk management process for credit risk follows the overall risk management process as presented in 4.3. Risk management process.

5.4. Structure and organisation

Within ECAG, the credit risk management function is performed by dedicated organizational units and governing bodies. In particular, the following tasks are performed, and responsibilities are assigned:

- The creditworthiness of potential new counterparties and the creditworthiness of issuers of collateral accepted by ECAG is assessed by credit specialists.
- The creditworthiness of existing counterparts is regularly reviewed and continuously monitored. The monitoring is accompanied by maintaining a credit watch list for counterparts whose credit worthiness is in doubt.
- Treasury counterpart credit limits are approved by an internal Credit Committee comprised out of two Executive Board members and senior risk personnel.
- Comprehensive and timely credit reports are compiled regularly and provided to internal (e.g., Executive Board and Enterprise Risk Management) and to external (e.g., regulators) stakeholders by dedicated middle office functions.

5.5. Assessment

5.5.1. Limits

For the credit risk arising from cash investments, ECAG defines limits per counterparty and depending on the exposure type, secured exposure and unsecured exposure, on the basis of at least annual credit checks and using ad hoc analyses, as necessary.

5.5.2. Stress testing

ECAG performs stress tests and reverse stress test to ensure the adequacy of its financial resources. The term "stress test" comprises the entirety of qualitative and quantitative analysis methods of rare but plausible events. The following stress tests are performed for credit risk:

- The "Default of the Largest Counterparty Group Stress Test", where the default of the counterparty group towards which ECAG has the largest credit risk exposure is simulated after utilisation of all respective collateral and after taking the recovery rate into account;
- The "Economic Deterioration Stress Test", where the impact of a deterioration of the economic environment on ECAG is simulated. To capture the worsening of the economy, certain credit risk model parameters are stressed 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 that are defined as a fraction of the available Risk Bearing Capacity.

If the tests show a potential consumption of the default fund that is greater than a predefined threshold, ECAG’s Executive Board is informed and decides on risk mitigating actions. Risk mitigating actions include member-specific actions, e.g., extra margin requirements, or member-wide actions, e.g., an increase of the size of the default fund by increasing the default fund contribution by all.

In addition to the stress tests defined above, a “Reverse Credit Stress Test” is also performed aiming at analysing how many clearing members could default before ECAG becomes insolvent.

In the year under review, the stress tests did not reveal any risks that endanger the going concern of ECAG‘s business.

5.6. Mitigation and control

5.6.1. For cash investments

ECAG follows a restrictive investment policy in order to safeguard the clearing house and its participants.

As a principle, clearing members’ cash collateral and the CCPs own funds are placed with counterparties of adequate creditworthiness, preferably on a secured basis, or through direct investments in debt instruments, such as Floating Rate Notes and Fixed Coupon Bonds. Uninvested cash is deposited with the central bank of issue, if access has been granted. Furthermore, investments are distributed across multiple counterparties, each provided with a predefined limit.

Repo transactions are governed by a framework agreement (Global Master Repurchase Agreement or “Deutscher Rahmenvertrag für Finanzgeschäfte”) and are, in accordance with EMIR, settled via operators of a securities settlement system that ensures full protection of those instruments.

Securities accepted as collateral need to fulfil all of the strict conditions of highly liquid financial instruments as required by EMIR. In particular, securities accepted as collateral need to be:

– Debt instruments issued or guaranteed by high quality obligors (mainly 0% risk-weight);
– Issued or guaranteed by governments, central banks, multilateral development banks, the European Financial Stability Facility (EFSF) or the European Stability Mechanism (ESM);
– Freely transferable and without any regulatory constraint or third-party claims that impair liquidation; in addition, subordinated securities are not eligible; and,
– Have an active outright sale or repurchase agreement market and reliable price data on these instruments must be published on a regular basis.

Furthermore, ECAG applies haircuts on the securities accepted as collateral. According to the underlying repurchase agreement, ECAG may also issue a margin call that requires the counterparty to post additional collateral in case the market value of the collateral initially provided decreases to predefined levels. Cross currency collateralisation is, in principle, possible but would require additional haircuts.

5.7. Monitoring and reporting

Credit risk information is integrated into the regular overall risk management reporting.

New credit lines on treasury counterparties and changes of existing credit lines (increases as well as reductions), changes of the internal rating for counterparties and credit exposures are reported to the internal "Credit Committee". Besides that, limit breaches, if any, are reported to the Executive Management and to Enterprise Risk Management.

5.8. Disclosure on credit risk exposures

As described in the introduction above, the credit risk disclosed in the below tables does not include the core CCP business of ECAG.

ECAG uses the standardised approach according to Article 111 et seq. CRR to determine the own funds requirement for credit risk under Pillar 1.

For the central governments and central banks' exposure class, ECAG uses the credit assessments by OECD1. In addition, ECAG nominated the External Credit Assessment Institution (ECAI) Standard & Poor's for the same exposure class as OECD ceased to assess so-called "high income countries" in 2013. For regional governments or local authorities, 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 residence. The German supervisors have been notified of the use of credit assessments by OECD and Standard & Poor's.

The risk weights of the remaining exposure classes are mainly derived from unrated positions meaning that no ECAI has been nominated.

ECAG complies with the risk weighting as defined in Section 2 of Chapter 2 of Part Three, Title II of the CRR 2. ECAG applies credit risk mitigation ("CRM") techniques.

[1] Country Risk Classification: http://www.oecd.org/tad/xcred/crc.htm

ECAG uses the comprehensive method for financial collateral according to Article 223 CRR for the purposes of credit risk mitigation.

For capital requirements purposes, according to Article 227 CRR the application of zero volatility adjustments is possible. Where the conditions of the regulation stated above are not met, supervisory haircuts according to Article 224 CRR apply. In cases of FX mismatch, further cross-currency haircuts are applied.

Most of ECAG's exposures are towards central governments and central banks as well as institutions. As per year end 2020 (and year-end 2019) all exposures to central governments and central banks are risk-weighted with 0%. The exposures to institutions have only a short maturity of less than or equal to three months, thus, pursuant to Article 120 paragraph 2 CRR a risk weight of 20% is applied.

Exposure classes (in 000s of €)	**Risk weight**			**Total**
	0%	**20%**	**100%**	
	a	e	j	p
Central governments or central banks	33,710,612	-	-	33,710,612
Regional government or local authorities	6,963	-	-	6,963
Public sector entities	5,069	-	-	5,069
Multilateral development banks	-	-	-	-
International organisations	-	-	-	-
Institutions	-	1,515,395	-	1,515,395
Corporates	-	-	8,322	8,322
Retail exposures	-	-	-	-
Exposures secured by mortgages on	-	-	-	-
Exposures in default	-	-	-	-
Exposures associated with particularly high	-	-	-	-
Covered bonds	-	-	-	-
Exposures to institutions and corporates with	-	-	-	-
Units or shares in collective investment	-	-	-	-
Equity exposures	-	-	-	-
Other items	-	-	487	487
TOTAL	**33,722,645**	**1,515,395**	**8,809**	**35,246,849**

Table 11: Standardised approach

The following table shows the total credit risk exposure values per exposure class and risk weight before and after applying credit risk mitigation techniques (CRM) and credit conversion factor (CCF).

Exposure classes (in 000s of €)	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 exposures	RWAs	RWAs density (%)
	a	b	c	d	e	f
Central governments or central banks	33,710,612	-	33,710,612	-	-	0%
Regional government or local authorities	6,963	-	6,963	-	-	0%
Public sector entities	5,069	-	5,069	-	-	0%
Institutions	1,514,395	2,000	1,514,395	1,000	303,079	20%
Corporates	8,322	-	8,322	-	8,322	100%
Other items	487	-	487	-	487	100%
TOTAL	**35,245,849**	**2,000**	**35,245,849**	**1,000**	**311,888**	**0.88%**

Table 12: Standardised approach, credit risk exposure and CRM effects

5.8.1. Detailed information and distribution of credit risk exposures

5.8.1.1. Distribution of credit risk exposures

The following tables illustrate the distribution of the credit risk exposures, broken down by exposure classes, geographical areas, and residual maturity according to Article 442 CRR 2.

On 31 December 2021, the geographical distribution of credit risk exposures is as shown below.

(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							
AT	-	-	-	-	-		-
AU	-	-	-	-	-		-
BE	-	-	-	-	-		-
CA	167,756	-	-	167,756	-		-
CH	94	-	-	94	-		-
DE	12,050	-	-	12,050	-		-
ES	-	-	-	-	-		-
FR	3	-	-	3	-		-
GB	297,413	-	-	297,413	-		-
IE	-	-	-	-	-		-
KR	522	-	-	522	-		-
LU	0	-	-	0	-		-
NO	481,817	-	-	481,817	-		-
NZ	-	-	-	-	-		-
US	170,669	-	-	170,669	-		-
Off-balance-sheet exposures							
DE	2,000	-	-			-	
Total	***1,132,324***	**-**	**-**	***1,130,324***	**-**	**-**	**-**

Table 13: Geographical breakdown of exposures

Table 14 below provides information about the residual contract maturity, broken down by exposure classes. Most exposures are short-term with a significant part being overnight exposures.

Exposure class (in 000s of €)	No more than three months	Up to one year	Over one year	Total
Central governments and central banks	33,710,612	0	0	33,710,612
Regional governments, local authorities and other public bodies	0	1,961	5,002	6,963
Public sector entities	0	0	5,069	5,069
Institutions	2,334,637	0	2,000	2,336,637
Corporates	8,322	0	0	8,322
Other (including equity holding)	487	0	0	487
Total 2021	**36,054,058**	**1,961**	**12,072**	**36,068,091**

Table 14: Maturity of exposures

5.8.1.2. Value adjustments and provisions

In accordance with German GAAP, ECAG assesses, at each balance sheet date, whether there is objective evidence that a financial asset is impaired. Only indications of impairment incurred at the balance sheet date resulting from past events and current economic conditions can be considered. Losses expected as a result of future events, independent of the probability of occurrence, are not recognised. According to the policies of ECAG and in line with sound banking practices and regulations, ECAG makes value adjustments and provisions, when necessary and due to individual decisions.

ECAG does not have any value adjustments and provisions for credit risk exposures at present, because it does not have any impaired assets.

5.8.1.3. Past due items and default or non-performing exposures

Pursuant to the below stated definitions, ECAG had no past due items or defaults or non-performing exposures in its books at the reporting date or during the year under review.

5.8.1.4. Definition of past due

An exposure is classified as “past due” in case a counterparty has failed to make a payment when contractually due, when the debtor has exceeded an external limit communicated to him as well as when the debtor has utilised credit without prior consent. This definition is used likewise for regulatory and accounting purposes.

5.8.1.5. Definition of default or non-performing

According to Article 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.

The definition of "impairment" used for accounting purposes is compliant with the definition of "default" outlined in Article 178 CRR.

5.9. Disclosure of exposures to counterparty credit risk (CCR)

On 31 December 2021, the following table is the CCR exposures by approach.

	Alpha used for computing regulatory exposure value	Exposure value pre-CRM	Exposure value post-CRM	Exposure value	RWEA
EU - Original Exposure Method (for derivatives)	1.4				
EU - Simplified SA-CCR (for derivatives)	1.4				
SA-CCR (for derivatives)	1.4				
IMM (for derivatives and SFTs)	1.4				
Financial collateral comprehensive method (for SFTs)		820,242	9,284	9,284	1,857
VaR for SFTs					
Total		**820,242**	**9,284**	**9,284**	**1,857**

Table 15: Analysis of CCR exposure by approach

5.10. Disclosure of exposures in equities not included in the trading book

In general Equities held in the non-trading book concern strategic participations in companies with business related to the business of Eurex Clearing. Due to the strategic alignment, no participation is held in order to make short-term profits (no trading intent).

Unlike to prior year, there were no shares in affiliated companies as at the reporting date. The prior year 100% participation in Eurex Clearing Security Trustee GmbH was merged into Eurex Clearing AG in the 2020 financial year.

In general, equity participations are disclosed under investment in subsidiaries and valued considering the provisions of the Handelsgesetzbuch (HGB, German Commercial Code). According to § 340e HGB in connection with §§ 252 and 253 HGB, such assets may not be recognised at an amount higher than their purchase price, reduced by depreciation, amortisation, and write-downs in accordance with particular requirements for fixed assets. Items of fixed assets may be written down in order to carry them at the lower of cost or market value at the balance-sheet date. Impairment losses shall be recognised if impairment is expected to be permanent.

5.11. Asset encumbrance

The disclosure of information on asset encumbrance pursuant to Article 443 CRR and further detailed in the Commission Delegated Regulation (EU) 2021/637 of supplementing Regulation (EU) No 575/2013 and Regulation (EU) No 876/2019 of the European Parliament and of the Council with regard to regulatory technical standards for disclosure of encumbered and unencumbered assets.

The disclosed figures are median values based on the reported quarter-end figures as required.

As shown in the table below Table 16, the overall level of encumbrance is low while the encumbered assets relates to assets held in trust.

	Carrying amount of encumbered		Fair value of encumbered assets		Carrying amount of unencumbered		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 disclosing institution	**98,657**	**-**			**28,908,116**	**26,492,971**		
Equity instruments	-	-	-	-	-	-	-	-
Debt securities	-	-	-	-	11,111	11,111	11,116	11,116
of which: covered bonds	-	-	-	-	-	-	-	-
of which: securitisations	-	-	-	-	-	-	-	-
of which: issued by general governments	-	-	-	-	9,038	9,038	9,045	9,045
of which: issued by financial corporations	-	-	-	-	-	-	-	-
of which: issued by non financial corporations	-	-	-	-	-	-	-	-
Other assets	98,657	-			15,510	-		

Table 16: Encumbered and unencumbered assets

The fair-value of non-encumbered collaterals from collateralised placings is shown below:

(in 000s of €)	Fair value of encumbered collateral received or own debt securities issued	of which notionally eligible EHQLA and HQLA	Unencumbered Fair value of collateral received or own	of which EHQLA and HQLA
	010	030	040	060
Collateral received by the disclosing institution	-	-	758,539	681,935
Loans on demand	-	-	-	-
Equity instruments	-	-	-	-
Debt securities	-	-	758,539	681,935
of which: covered bonds	-	-	-	-
of which: securitisations	-	-	-	-
of which: issued by general governments	-	-	604,050	604,050
of which: issued by financial corporations	-	-	33,643	139,190
of which: issued by non-financial corporations	-	-	-	-
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	**98,657**	**-**		

Table 17: Collateral received

As there were no matching liabilities to the only source of encumbrance, however, for consistency, other sources of encumbrance are disclosed below.

(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	**0**	**0**
Other sources of encumbrance	**98,657**	**98,657**

Table 18: Encumbered assets/collateral received and associated liabilities

6. Management of operational risk

Operational risk is defined as the risk of loss resulting from inadequate or defective systems and internal processes, human or technical failure, from inadequate or defective external processes, from damage to physical assets and from legal risks that could arise from non- or inappropriate compliance with new or existing laws and regulations and all contractual commitments. Based on this definition, ECAG distinguishes between the following operational risk classes:

- Availability (technical infrastructure, facilities, staff);
- Service deficiency (errors & omissions, supplier deficiencies, product flaws);
- Damage to physical assets (accidents, natural hazards, terrorism, sabotage);
- Legal offences & business (non-respect of laws & legal practice, contract, corporate governance)

6.1. Strategy and process

Operational risk is classified as a material risk in ECAG's risk strategy and as of 31 December 2021 the share of operational risk in the REC of ECAG was 47%.

The risk management process for operational risk follows the overall risk management process as presented in 4.3. Risk management process. The operational risk scenarios are specified internally and the required economic capital for operational risks is calculated based on a Value-at-Risk approach.

6.2. Structure and organisation

Operational risk management is performed by ERM. Operational risk representatives and owners play a crucial role in identifying, assessing, and monitoring operational risks.

6.3. Assessment

Operational risks are estimated and quantified using a Value-at-Risk concept. A key component of ECAG's operational risk assessment is its internally developed operational risk model. The operational risk model combines a frequency distribution, that models the likelihood of the occurrence of loss events, with a severity distribution, that describes the size of operational losses, yielding in a loss distribution. The loss distribution allows ECAG to estimate potential operational risks at different confidence levels. The input data for the model are internal and external loss data and the results of a structured scenario analysis.

The operational risk model serves the purpose to determine the required economic capital for operational risk based on a 99.9% confidence level for a one-year holding period. The required economic capital is compared with the available risk bearing capacity for operational risk that in turn is specified in ECAG's risk strategy.

The loss-, frequency-, severity distributions, the input data for the model as well as the stress tests performed are described in the following sections.

6.3.1. The loss distribution

The aggregated loss distribution models the complete spectrum of operational risks that ECAG faces in terms of frequency and severity. Applying an actuarial technique by modelling the likelihood of the occurrence of an event (i.e. the frequency) independently from the impact of such an event (i.e. the severity) and then combining these two distributions by Monte Carlo simulations gives the required aggregated loss distribution. From the aggregated loss distribution, the required risk figures are derived:

- Expected loss: The expected loss as the actual statistical mean of the aggregated loss distribution.
- Value-at-Risk: The amount that is not exceeded in q% cases of all years.

6.3.2. The frequency distribution

Due to the discrete nature of the occurrence of loss events, the frequency is modelled using a discrete probability distribution. ECAG uses a Poisson distribution for the purpose of modelling the frequency of loss events. Two criteria that must be fulfilled in order to use the Poisson distribution to model the frequency of loss events are that the loss events arising from operational risks are 1) rare and 2) independent. As it is deemed reasonable to assume both criteria are fulfilled it is also deemed reasonable to model the frequency of loss events with the Poisson distribution. Furthermore, the Poisson distribution has the characteristic that is additive thus allowing to easily aggregate several events to one cumulated event. For events that are expected to happen no more than once over a 12-month horizon, a Bernoulli distribution may be used.

6.3.3. The severity distribution

The severity distributions describe the size of the losses. The severity is modelled by the uniform distribution with two parameters: minimum and maximum loss. The parameters are estimated by experts in a structured way supported by statistical analysis and additional information to the extent it is possible.

6.3.4. The input data

The input data consists of internal and external loss data and the outcome of a structured scenario analysis.

The structured scenario analysis is the result of annual workshops between ERM and operational risk representatives. A key outcome of the workshops is estimates regarding the probability and the degree of financial loss arising from operational risks. The assessment incorporates various types of information such as the number of claims for damages asserted by customers against Eurex Clearing, the share of transactions processed fully automatically (straight-through processing), faults and interruptions in the system infrastructure as well as audit results from Internal Audit. As such, the workshops serve as a key process for identifying and assessing operational risks.

6.3.5. Stress Testing

In order to achieve a better understanding of the largest risks, help gauge the potential vulnerability to exceptional but plausible events and assess the impact on the capital, ERM runs stress tests. The stress tests focus on plausible events considering the respective frequency of occurrence per risk scenario.

6.4. Mitigation and control

ECAG gives considerable attention to its operational risk mitigation process with the aim to reduce the frequency and severity of potential operational risk events. ECAG's operational risk mitigation process has two cornerstones that are described in turn in the following sections:

- Business continuity planning
- An insurance programme

ECAG's operational risk mitigation process comprises several quality and control initiatives that aims at ensuring that ECAG's operations have sufficient controls to prevent any fraud or operational service deficiency. If an event of this kind nonetheless occurs a thorough analysis is performed in order to be able to define measures that will reduce the probability of recurrence.

6.4.1. Business continuity management

The unavailability of core processes and resources represents a substantial operational risk for ECAG a comprehensive Business Continuity Management ("BCM") approach has been implemented to act as a key mitigating factor for availability risk. The BCM organisation and key operational risks addressed by BCM processes are described in the following paragraphs.

6.4.1.1. BCM organisation at Eurex Clearing

The business continuity function is responsible for the overall monitoring of ECAG's readiness to deal with incidents, emergencies, and crises. Organisational roles, responsibilities and guiding principles are all documented in a formal *Business*

Continuity Management Policy. Business continuity plans are developed by the individual organisational units as each unit is responsible for its continuity and operational resilience.

6.4.1.2. BCM arrangements

The implemented BCM arrangements aim to minimise the impact of the unavailability of key resources, addressing not only the unavailability of systems, workspace, and suppliers, but also the loss of significant numbers of staff in order to ensure the continuity of the most critical operations.

6.4.1.3. Systems unavailability

Data centres in the main operating locations are 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 at the time of a disruption.

6.4.1.4. Workspace unavailability

Dedicated backup facilities provide office space for mission critical staff in the event that an office location becomes unavailable. These backup facilities are always fully equipped and connected to the distributed data centres and operational. In addition, business transfer plans between ECAG's different operations locations can be used to mitigate workspace unavailability.

6.4.1.5. Staff unavailability

Business continuity measures address the loss of significant numbers of staff, covering emergency scenarios and potential pandemics. 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 ECAG's different operations locations are employed such that, if one of these locations is impacted, mission critical activities can be continued by staff in other locations.

6.4.1.6. Supplier unavailability

ECAG assures itself of the continuous provision of critical supplier services by a number of means, such as regular due diligence review of suppliers' BCM arrangements, provision of services by alternative suppliers if possible and service level agreements, describing the minimum service levels expected from suppliers, and contingency procedure requirements.

6.4.1.7. Incident and crisis management process

ECAG has implemented an incident and crisis management process that can facilitate a coordinated response and rapid reaction to an incident or crisis in a controlled and effective manner. The process aims to minimise business and market impact, as well as enable the speedy return to regular business activity. Incident Managers have been appointed in their respective business areas in case of incidents, emergencies, and crises. They will also ensure the appropriate escalation to the Executive Management and notification to customers.

6.4.1.8. “Real-life” simulation testing

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

6.4.2. The insurance programme

The second cornerstone of ECAG operational risk mitigation process is the transfer of risks above a certain threshold to third parties through a comprehensive insurance programme.

In order to achieve the optimum risk/benefit versus premium ratio, insurance policies are negotiated either through insurance brokers or directly with the insurers to purchase tailor-made policies reflecting the specificities of our business.

Each major insurance cover is reviewed annually taking into consideration the evolution of ECAG’s risk profile.

6.5. Monitoring and reporting

Operational risk information is integrated into the regular overall risk management reporting.

In addition, the results of the annual operational risk review are presented to the Executive Board. The report includes summary statistics and trend analyses of operational risk events and a summary of major changes to the operational risk model, concept, methodology and general quality improvements of operational risk management processes.

Thresholds are defined for key risk indicators (“KRI”) and risk indicators (“RI”). If the observed value exceeds the threshold, an escalation process is initiated, i.e., an analysis/investigation is carried out by the operational risk representative or the risk owner.

6.6. Disclosure on operational risk

To determine the own funds requirement for operational risk under Pillar 1, ECAG uses the Basic Indicator Approach as defined in Art. 315 CRR.

Banking activities (in 000s of €)		Relevant indicator Year-3	Year-2	Last year	Own funds requirement	Total operational risk-weighted exposure
1	Banking activities subject to basic indicator approach (BIA)	588,631	657,821	759,895	100,317	1,253,967

Table 19: Operational risk own funds requirements and risk-weighted exposure amounts

7. Management of market risk including interest rate risk of exposures on positions not included in the trading book

Market risk may result from currency, interest rate or other market price fluctuations (e.g., equity price).

7.1. Strategy and process

With regard to market risk, risk control measures are applied to protect the clearing house from financial risks. The risk strategy is translated into a limit system, which is monitored on a regular basis.

Eurex Clearing AG's Treasury activities are governed by the *ECAG Treasury Policy* which outlines the investment guidelines, specifies the risk and risk limits, and summarises the roles and responsibilities in line with segregation of duties.

In accordance to applicable regulations, Eurex Clearing assigns the highest priority to the principles of capital preservation (i.e. minimising credit and market risk), and liquidity maximisation to ensure the CCP's ability to satisfy its payment obligations at all times.

Eurex Clearing does not conduct proprietary trading activities. Eurex Clearing's investment activities are related to the placement of clearing members' cash collateral and the investment of Eurex Clearing's own liquidity. In addition, investments are made in bonds, futures and equities in the context of the Contractual Trust Agreement (CTA) to meet the pension fund obligations. Thus, all investments are allocated to the non-trading book in accordance with the CRR.

7.2. Structure and organisation

Eurex Clearing follows a restrictive investment policy in order to safeguard the clearing house and its participants. As a principle, clearing members' cash collateral is placed with counterparties of adequate creditworthiness, preferably on a secured basis via reverse repo, or through direct investments in debt instruments. Uninvested cash is deposited with the central bank of issue, if access has been granted.

Placements may only be executed with approved counterparties and within approved counterparty limits. In secured transactions and in direct investments eligible securities must meet very high eligibility criteria. Only highly liquid financial instruments bearing minimal market and credit risk are eligible. Investments are subject to a strict limit system, including e.g., mismatch limits restricting term transformation for secured investments.

7.3. Assessment

7.3.1. Interest Rate Risk

Eurex Clearing only engages in limited term transformation, assets and liabilities mainly have matching terms. Changes in interest rates may impact ECAG's P&L. Hence, the interest rate risk (IRR) between interest-earning assets and interest-bearing liabilities shall be limited. Interest rate sensitive assets include ECAG's money market and investment portfolios, while interest rate sensitive liabilities mainly consist of customer assets in form of cash collateral, for which ECAG grants its clearing members interest. Related, we describe the interest rate risk in the banking book (IRRBB) in subsequent chapters.

Such interest rates are in principle calculated based on a pre-defined benchmark rate per currency, complemented by a cash handling fee, while ECAG obtains the realised interest rate from the investment of the cash collateral.

For risk management purposes, the interest rate risk in the banking book (IRRBB) is defined as the risk arising from interest rate changes which have an adverse impact on the Group's economic value and earnings. The risk is measured and monitored on a regular basis using a 99.9%-VaR Monte-Carlo simulation, ad-hoc shifts to the relevant curve as well as the EBA shock scenarios.

7.3.1.1. Interest rate risk limits

Strict IRR limits are established constraining the maximum market risk from potential adverse changes in market interest rates. IRR is calculated based on the net present value (NPV) of a predefined yield change calculated for the remaining days to maturity or coupon reset.

When calculating IRR, Eurex Clearing applies a parallel shift of the yield curve of minimum 1% (or higher depending on remaining days to maturity) and assesses the resulting effect on the NPV of the portfolio on a daily basis. An IRR limit defines the maximum acceptable loss which can be caused by an adverse shift in the yield curve.

7.3.1.2. Stop-Loss Limits

To identify unfavourable changes in market conditions a Stop-Loss limit has been established. The Stop-Loss limit defines the amount up to which the fair value of a portfolio can decline upon which a prompt review of the portfolio shall be conducted, and actions shall be implemented to reduce the interest rate risk sensitive position to cut further losses. The unrealised loss is calculated daily based on the yield difference between position yield and market yield over the remaining life to maturity.

7.3.2. Measurement

IRRBB calculation is performed on a quarterly basis for the purpose of regulatory reporting. However, the interest-rate risk assessment is performed monthly for internal purposes using a 99.9%-VaR Monte-Carlo Simulation simulating the change in relevant interest curves.

From the regulatory perspective, Eurex Clearing AG follows the shock scenarios prescribed in the EBA guidelines. For internal purposes, a Monte-Carlo Simulation is performed. Hence, no specific shock is used in the base case. For stress case assessment, we use a flat 220 basis points shock.

Due to the plain vanilla structure of the items on our books, we do not overlay behavioural assumptions over the contractual features of the products. The EBA guidelines shock scenarios are used for reporting purposes.

7.3.3. Foreign exchange risk

Eurex Clearing places cash, in general, in the same currency in which clearing members cash contributions are denominated. Hence, FX risks are mainly restricted to the net interest earned and fees collected in foreign currencies. Such exposures are monitored and managed by Treasury.

Due to the limited amounts, no active foreign exchange management is conducted. A monthly reporting on market risks, which include risks arising from FX, is established. Besides this, Eurex Clearing may enter into FX transactions to hedge or close out open positions stemming from its CCP business, to reduce FX exposure or to cover liquidity needs in particular currencies.

7.3.4. Other Market Risks

In addition to interest rate and currency risk, other market risks arise also from investments in bonds, investments in funds, futures within the framework of a contractual trust arrangement (CTA) to meet pension fund obligations. For the CTA, the investment is protected by a pre-defined floor, which reduces the risk of extreme losses.

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7.4. Mitigation and control

IRR is being monitored and controlled by a set of limits and triggers. In case of interest rate risk limit or trigger being exceeded, a prompt review of the portfolio shall be conducted, and potential actions shall be decided.

In order to limit essential IRR arising from the benchmark related compensation system, in exceptional cases such as, but not limited to, market disruptions, Eurex Clearing reserves the right to calculate customer interest rates on the basis of interest earned through the placement of funds instead of predefined benchmark rates if necessary.

7.5. Monitoring and reporting

Treasury Middle Office monitors compliance with all limits stipulated in the ECAG Treasury Policy on a regular basis, and issues regular reports to the ECAG Executive Board and to Enterprise Risk Management. Identified limit excesses are reported immediately to Senior Management incl. ECAG Executive Board Members responsible for Treasury and Risk.

7.6. Disclosure exposures for market risk

In order to determine the own funds requirement for market risk under Pillar 1, ECAG uses the Standard Approach as defined in Article 325 et seq. CRR 2. ECAG does not maintain a trading book. Accordingly, the transactions of ECAG are exclusively subject to the own funds requirements for the foreign currency risk of the banking book (see Table 21). ECAG is neither subject to settlement risk nor commodities risk as defined in the CRR. Since the reporting date 31 December 2020, ECAG has applied the de minimis threshold according to Article 351 CRR, and continues to be applied through 31 December 2021.

(in 000s of €)	RWEAs
Outright products	
Foreign exchange risk	1,713,781
Options	
Total	**1,713,781**

Table 20: Capital requirements for market risk

7.7. Disclosure exposures on interest rate risk on positions in the banking book (IRRBB)

Eurex Clearing identifies and measures interest rate risk on a regular basis. Information on interest rate risks in the investment book must be disclosed in accordance with Article 448 CRR 2.

Quarterly, in accordance with the BaFin circular 06/2019 (BA)[3], Eurex Clearing computes and reports to BaFin the level of interest rate risk in its banking book (IRRBB) and demonstrates that its regulatory capital is sufficient to withstand an unexpected parallel shift in the interest rate yield curve of ± 200 basis points (supervisory standard test). Additionally, ECAG reports to BaFin six early warning indicators in accordance with the BaFin circular 06/2019.

In the event a standard shock scenario materialised, that is, the 20% threshold of regulatory capital is exceeded, procedures and actions necessary to mitigate the decline in the net present value of the interest rate sensitive positions would take place, and standard regulatory protocols would be followed. Nonetheless, Eurex Clearing AG remained well below the threshold due to a strong risk management framework and fiduciary responsibility to maintain financial market stability as a CCP.

The following table shows the change in net present value of its interest rate sensitive positions in the event of shifts in the rate structure curves within the supervisory standard test (± 200 basis points), as well as within the six further interest rate scenarios (early warning indicators) specified in accordance with the BaFin circular 06/2019.

[3] BaFin Circular (BA) -Interest rate risk in the Banking book:

https://www.bafin.de/SharedDocs/Veroeffentlichungen/DE/Rundschreiben/2019/rs_06-2019_ZAER.html

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Interest Rate Risk - Banking Book (IRRBB) as per BaFin Rundschreiben 09/2018 (BA) as of		***31 Dec 2021***	
	Currency	Scenario result	Scenario as percentage of own funds
Base EVE (in EUR equivalent)	EUR	831,417,436	-
(a) Standard shock: +200bps shift up	EUR	4,473,242	0.60%
(b) Standard shock: -200bps shift down	EUR	-3,215,608	-0.43%
(c) Scenario 1: Parallel shift up	EUR	4,473,260	0.60%
(d) Scenario 2: Parallel shift down	EUR	-3,215,608	-0.43%
(e) Scenario 3: Steepened curve	EUR	2,443,159	0.33%
(f) Scenario 4: Flattened curve	EUR	-3,830,575	-0.51%
(g) Scenario 5: Short rate up	EUR	-501,591	-0.07%
(h) Scenario 6: Short rate down	EUR	53,160	0.01%
Eligible own funds (source: Regulatory Reporting - December 2021)	EUR	749,813,424	
(a) IRRBB standard shock (+200bps) as percentage of own funds		0.60%	
(b) IRRBB standard shock (-200bps) as percentage of own funds		-0.43%	
Early warning trigger		-15%	
Threshold set by Bafin and Deutsche Bundesbank		-20%	
Weighted Average Maturity in days			
Assets		1	
Liabilities		7	

Table 21: Interest rate risk on positions in the banking book

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8. Management of liquidity risk

Liquidity risk is the risk arising from the inability to meet payment obligations in case of mismatches between liquidity needs and liquidity sources. Multiple measures are in place to detect potential liquidity risk exposures and to ensure the availability of sufficient financial resources in the daily business as well as in a stress event.

8.1. Strategy and processes

Eurex Clearing pursues the following objectives in its liquidity risk management:

- Fulfilment of all demands for repayment of Member Cash Deposits ("MCDs");
- Fulfilment of all settlement obligations, while ensuring settlement efficiency, by pre-financing purchases and late payments of customers resulting from CCP transactions; and,
- Coverage of financing needs in case of one or multiple clearing members ("CMs") defaulting.

Eurex Clearing's Liquidity Risk Management Framework is designed to optimise the management of available financial resources while reducing liquidity risk to the greatest possible extent.

Eurex Clearing measures, monitors and manages liquidity risk in accordance and compliance with Articles 43 (Other financial resources) and 44 (Liquidity risk controls) Regulation (EU) No 648/2012 (EMIR) and Articles 32 to 34 (Liquidity risk controls) of Delegated Regulation (EU) No 153/2013 as well as Article 411 and subsequent of Regulation (EU) No 575/2013 (CRR 2) and Commission Delegated Regulation (EU) 2018/1620. Eurex Clearing has implemented aforementioned regulatory standards in its Liquidity Risk Management Framework.

The framework is documented in Eurex Clearing's *Liquidity Risk Management Policy*. The *Liquidity Risk Management Policy* is revised on a regular basis, at least annually, and has been approved by the Executive Board and the Supervisory Board, after consultation with the EMIR Risk Committee.

8.2. Structure and organisation

To maintain appropriate oversight and control over ECAG's liquidity risk management, ECAG established a comprehensive organizational structure to manage and oversee its day-to-day activities and to ensure compliance with the corresponding policies and regulatory requirements.

Liquidity Indicators are a fundamental component of ECAG's Liquidity Risk Management Framework to inform of the potential for, or an actual deterioration of the capacity of ECAG to meet its current and foreseen liquidity and funding needs. Liquidity indicators outlined in further chapters are monitored and reported on a daily basis.

8.3. Assessment

8.3.1. Key Liquidity Indicators

In line with regulatory standards, Eurex Clearing has established a comprehensive set of liquidity indicators and triggers to detect negative developments early and to initiate mitigating measures to restore liquidity in time. In the following chapters, the Key Liquidity Indicators are outlined.

8.3.1.1. Excess Clearing Liquidity

In compliance with Article 44 of Regulation (EU) 648/2012, Eurex Clearing needs to maintain sufficient financial resources taking into account the liquidity risk generated by the default of the two CMs (including all affiliates) to which it has the largest exposures ("Cover-2"). The "Excess Clearing Liquidity" is defined as a liquidity indicator to measure all available liquidity exceeding the 'Cover-2' requirements.

8.3.1.2. Liquidity Coverage Ratio (LCR)

The LCR focuses on the short-term resilience of the liquidity risk profile and requires Eurex Clearing to hold an adequate stock of unencumbered high quality liquid assets (liquidity buffer) that can be converted into cash easily and immediately in private markets to meet its liquidity needs (net liquidity outflows) for a 30-calendar day liquidity stress scenario. Regulation (EU) No 575/2013 (CRR) and No 876/2019 (CRR 2) supplemented by Commission Delegated Regulation (EU) 2018/1620 with regards to liquidity coverage requirements for credit institutions set out the detailed rules for the calculation of the LCR. More detailed information regarding the LCR is disclosed in 8.6. Disclosure on Liquidity Coverage Ratio.

8.3.1.3. Liquidity buffer

The indicator "Liquidity Buffer" is based on Eurex Clearing's daily pre-financing activities in all relevant currencies in order to preserve sufficient liquidity for the management of settlement processes at all times.

8.3.1.4. Own Liquidity

Own Liquidity is defined as Eurex Clearing’s own funds plus intra-group funding. This indicator shall ensure that sufficient own liquidity is available to cover Eurex Clearing´s own operational risks and ensure the ability to maintain the operational functionality of Eurex Clearing´s corporate business.

8.3.2. Stress Testing

In order to assess the liquidity situation for Eurex Clearing and to ensure sufficient liquid resources at all times, Eurex Clearing runs a comprehensive stress testing program of its liquid financial resources in order to identify and mitigate potential liquidity shortfalls at an early stage.
Eurex Clearing’s financial resources need to be tested over a range of market scenarios applying different stress levels. Both stresses to the exposure as well as the liquidity sources shall be considered.

In line with the so-called ‘Cover-2’ requirement in Article 44 of Regulation (EU) 648/2012 (EMIR) and Article 32 of Regulation (EU) 153/2013, Eurex Clearing needs to maintain sufficient financial resources to cover the liquidity risk generated by the default of the two CMs (including all affiliates) to which it has the largest exposures. Additional to the regulatory requirements, Eurex Clearing has implemented various scenarios including market disruption as well as idiosyncratic components to ensure it maintains sufficient liquidity at all times to meet the calculated requirements of the different scenarios.

8.4. Mitigation and control

Eurex Clearing has a wide range of measures which may be initiated in case of a deterioration in the CCP’s liquidity profile.

Section 25a KWG in combination with Chapter BTR 3 ‘Liquidity Risk’ of MaRisk requires institutions to develop effective contingency plans taking into account the outcome of alternative scenarios. Treasury shall be responsible for designing and monitoring of funding plans. For this purpose, ECAG Funding Plan and Contingency Funding Plan has been established and shall be initiated in case of a Key Liquidity Indicator breach. In addition, the Recovery Plan utilizes specific measures defined in the Funding Plan to strengthen the liquidity position in case of a breach of an early warning or recovery indicator.

8.5. Monitoring and reporting

Treasury monitors and manages Eurex Clearing's liquidity needs and sources on a daily basis, minimising the risk of potential liquidity shortfalls. All currencies, accounts and settlement locations the CCP is active in are considered.

Additionally, liquidity stress test results and the development of the liquidity indicators are monitored and reported on a daily basis. The Executive Board is informed on a monthly basis about liquidity indicators as defined in the Recovery Plan, and on a quarterly basis, the Executive Board receives a comprehensive liquidity risk reporting.

In the year under review, Eurex Clearing had held sufficient liquidity at all times to keep the liquidity indicators above the early warning limits.

8.6. Disclosure on Liquidity Coverage Ratio (LCR)

Institutions need to hold a liquidity buffer of high-quality liquid assets ("HQLA") to cover their net cash outflows in stressed conditions over a thirty-day period. The Liquidity Coverage Ratio is set at a minimum ratio of 100%.

The following table details the composition and level of the LCR as of 31 December 2021:

	Scope of consolidation: Solo								
		a	b	c	d	e	f	g	h
	(in 000s €)	Total unweighted value (average)				Total weighted value (average)			
EU 1a	Quarter ending on (DD Month YYY)	31.12.2021	30.09.2021	30.06.2021	31.03.2021	31.12.2021	30.09.2021	30.06.2021	31.03.2021
EU 1b	Number of data points used in the calculation of averages	3	3	3	3	3	3	3	3
HIGH-QUALITY LIQUID ASSETS									
1	Total high-quality liquid assets (HQLA)					34,215,527	27,234,905	27,084,745	27,263,164
CASH - OUTFLOWS									
2	Retail deposits and deposits from small business customers, of which:	-	-	-	-	-	-	-	-
3	*Stable deposits*	-	-	-	-	-	-	-	-
4	*Less stable deposits*	-	-	-	-	-	-	-	-
5	Unsecured wholesale funding	34,554,559	27,006,020	27,781,356	26,237,489	27,361,672	19,926,942	20,894,517	18,597,754
6	*Operational deposits (all counterparties) and deposits in networks of cooperative banks*	9,589,320	9,436,751	9,179,815	10,185,305	2,397,330	2,359,188	2,294,954	2,546,326
7	*Non-operational deposits (all counterparties)*	24,965,238	17,569,268	18,601,541	16,052,184	24,964,342	17,567,754	18,599,563	16,051,427
8	*Unsecured debt*	-	-	-	-	-	-	-	-
9	*Secured wholesale funding*					-	-	-	-
10	Additional requirements	2,000	2,000	2,000	2,000	800	800	800	800
11	*Outflows related to derivative exposures and other collateral requirements*	-	-	-	-	-	-	-	-
12	*Outflows related to loss of funding on debt products*	-	-	-	-	-	-	-	-
13	*Credit and liquidity facilities*	2,000	2,000	2,000	2,000	800	800	800	800
14	Other contractual funding obligations	-	-	-	-	-	-	-	-
15	Other contingent funding obligations	-	-	-	-	-	-	-	-
16	TOTAL CASH OUTFLOWS					27,362,472	19,927,742	20,895,317	18,598,554
CASH - INFLOWS									
17	Secured lending (e.g. reverse repos)	820,242	707,893	1,000,763	680,000	151,763	128,850	145,679	-
18	Inflows from fully performing exposures	1,496,537	971,854	1,841,826	579,457	1,496,537	971,685	1,837,593	576,470
19	Other cash inflows	-	-	-	-	-	-	-	-
EU-19a	(Difference between total weighted inflows and total weighted outflows arising from transactions					-	-	-	-
EU-19b	(Excess inflows from a related specialised credit institution)					-	-	-	-
20	TOTAL CASH INFLOWS	2,316,779	1,679,747	2,842,589	1,259,457	1,648,300	1,100,535	1,983,273	576,470
EU-20a	*Fully exempt inflows*	-	-	-	-	-	-	-	-
EU-20b	*Inflows subject to 90% cap*	-	-	-	-	-	-	-	-
EU-20c	*Inflows subject to 75% cap*	2,316,779	1,679,747	1,679,747	1,259,457	1,648,300	1,100,535	1,983,273	576,470
TOTAL ADJUSTED VALUE									
EU-21	LIQUIDITY BUFFER					34,215,527	27,234,905	27,084,745	27,263,164
22	TOTAL NET CASH OUTFLOWS					25,714,173	18,827,206	18,912,045	18,022,083
23	LIQUIDITY COVERAGE RATIO					133.06%	144.66%	143.21%	151.28%

Table 22: Level and components of the Liquidity Coverage Ratio

The HQLA at Eurex Clearing mainly consists of deposits held with central banks, securities received in reverse repo transactions and the investment portfolio. As of 31 December 2021, the LCR of Eurex Clearing AG amounted to 133.06% (2020: 144.06%).

Appendix A. Abbreviations used in this document

AktG	Aktiengesetz
BaFin	Bundesanstalt für Finanzdienstleistungsaufsicht (Federal Financial Supervisory Authority)
BCBS	Basel Committee on Banking SupervisionCC
BCM	Business Continuity Management
CCP	Central Counterparty
CM	Clearing Members
CRD	Capital Requirements Directive
CRD IV	Capital Requirements Directive IV
CRM	Credit Risk Mitigation
CRR	Capital Requirements Regulation
CFTC	Commodity Futures Trading Commission
DCO	Derivative Clearing Organisation
EaR	Earnings at Risk
EBA	European Banking Authority
ECAI	External Credit Assessment Institution
ECAG	Eurex Clearing AG
EFSF	European Financial Stability Facility
EMIR	European Market Infrastructure Regulation
ERM	Enterprise Risk Management
ESM	European Stability Mechanism
EU	European Union
FINMA	Financial Market Supervisory Authority
FX	Foreign Exchange
HGB	Handelsgesetzbuch (German Commercial Code)
HQLA	High Quality Liquid Assets
ICM	Individual Clearing Model
IRR	Interest Rate Risk
KRI	Key Risk Indicators
KWG	Gesetz über das Kreditwesen (German Banking Act)
LCR	Liquidity Coverage Ratio
LR	Leverage Ratio
MCD	Member Cash Deposits
NPV	Net Present Value
OECD	Organisation for Economic Cooperation and Development
PD	Probability of Default
QCCP	Qualifying Central Counterparty
RBC	Risk Bearing Capacity
RI	Risk Indicators
RoA	Return on Assets
RWA	Risk-weighted Asset
SA	Standardised Approach (in connection with operational risk)
SI	Significant Institution
SSM	Single Supervisory Mechanism
STA	Standardised approach (in connection with credit risk)
VaR	Value-at-Risk

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