Pillar 3 disclosure 2017

Euroclear • July 2018

Foreword from Lieve Mostrey

Group Chief Executive Officer, Euroclear SA/NV

Euroclear is one of the world's leading financial market infrastructure groups with closely guarded reputation for safety, security and resilience. Our clients and the wider market have high expectations of us, and we work hard to ensure that we meet those expectations, which includes maintaining an overall low risk profile. I am therefore pleased to present Euroclear's Pillar 3 Disclosure Report 2017 which explains and confirms our safe, resilient and low risk approach to running our business.

In the course of 2017, significant enhancements were made to the quality and robustness of Euroclear's risk arrangements. This was driven largely by changes brought about by CSD Regulation and our desire to reflect recent evolutions in market practices. These developments will continue throughout 2018 and will further reinforce our resilience and refine our risk management approach across the Euroclear group, thereby helping ensure we maintain our low risk profile.

Euroclear's Pillar 3 Disclosure Report 2017 has been prepared in accordance with relevant Euroclear governance review processes and in accordance with Regulation (EU) No. 575/2013 (CRR) and associated European Banking Authority guidelines on CRR disclosure requirements.

Lieve Mostrey

Group Chief Executive Officer
Euroclear SA/NV

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Euroclear's Pillar 3 Disclosure 2017 provides the market and our key stakeholders with further insight on the group's key risks [1], and how they are managed. Specific improvements in this year's Disclosure include:

- an enhanced Operational Risk section
- presentational improvements to tables & templates in line with new **EBA (European Banking Authority)** guidance

A number of key developments in the year (outlined below) have contributed to an overall reduction in the group's risk profile.

Central Securities Depositories Regulation (CSDR)

Euroclear CSDs have undertaken significant efforts in the course of 2017 to meet the requirements of CSDR, and CSD licences are expected to be granted over the course of 2018/19. Additionally, **Euroclear Bank SA/NV (EB)** will also apply for a CSDR banking services licence.

CSDR introduces specific rules on credit risk management, collateralisation and management of intraday liquidity risk on top of Basel III requirements. The result is a significant reduction in the risks associated with provision of EB banking services.

Risk transformation programme

In conjunction with the CSDR implementation programme, Euroclear is also pursuing a group-wide Risk Transformation Programme across the three lines of defence. The Risk Transformation Programme aims to further mature the group's risk management arrangements in line with Board, market and regulatory expectations. Risk Transformation Programme topics include risk governance, risk appetite framework and risk culture amongst others.

In addition to reinforcing Euroclear's robust risk management framework, the programme further clarifies the risk management related roles and responsibilities of the Board and its Committees, Senior Management, Line Management and the Control Functions.

The Risk Transformation Programme provides the means by which the group's CSDR risk related requirements will be delivered and embedded. The Risk Transformation Programme is delivering good results and is expected to run until end 2019.

Liquidity risk management

Euroclear Bank performed an **ILAAP (Internal Liquidity Adequacy Assessment Process)** assessment for the first time in 2017. It aimed to assess the adequacy of EB's systems and expertise in managing its liquidity risks. The ILAAP is consistent with the Board's understanding of the Bank's liquidity position as well as its main drivers and vulnerabilities and was approved by the Board in December 2017.

Euroclear Bank also increased the frequency of its liquidity back-testing from quarterly to daily to enable the Bank to identify and react much more swiftly to any new structural issues. Results of the back-tests demonstrate that Euroclear Bank has enough quality liquid resources to withstand a simultaneous default of two major participants. Additionally, Euroclear Bank has increased its committed liquidity facilities with a number of respected liquidity providers. Limits per currency have also been implemented at participant level to better control potential liquidity exposure resulting from default.

[1] The Disclosure is provided at the consolidated level on the basis that this captures all relevant key risks. Euroclear Bank SA/NV is considered a significant subsidiary for the purpose of Pillar 3 disclosure, therefore additional information, mainly on capital structure and adequacy, is incorporated in the report.

Euroclear Bank has also extended use of appropriation of pledged collateral agreements to all participants to generate liquidity rapidly following the default of clients. These agreements allow Euroclear Bank to appropriate the client pledged collateral (immediate transfer of ownership). Appropriated collateral can then be re-used with liquidity providers or pledged with the National Bank of Belgium pending full liquidation.

Intraday credit

Euroclear Bank is continuously looking at initiatives to reduce the intraday credit provided to its participants.

Recovery, Restructuring & Orderly Wind-down

Euroclear Bank continues to evolve and mature its Recovery, Restructuring and Orderly Wind-down plan:

(i) enhance the practical implementation of the plan by developing a decision-making playbook to support recovery handling, and documenting the practical steps that would need to be taken to execute the options and strategies identified in the plan;

(ii) better integrate the plan with the broader risk framework, by applying a common view of risk and of the events that could threaten financial viability; and

(iii) evaluate the adequacy and comprehensiveness of the options set available to Euroclear Bank to deal with relevant extreme stress scenarios.

Cyber Resilience Programme

In line with many other organisations, Euroclear has established a Cyber Resilience Programme in addition to actions for meeting the requirements of CPMI IOSCO’s 2016 cyber resilience guidance and the SWIFT Customer Security Program. The Cyber Resilience Programme will support Euroclear’s cyber strategy and will further increase the group’s cyber risk capabilities commensurate with the evolving global threat environment.

Implementation of the Basel Framework at Euroclear

The Basel III accords require banks to disclose a complete risk report to the market -at least once a year. This Disclosures report contains all the information that is relevant for assessing Euroclear's risk profile and capital adequacy.

Euroclear SA/NV is the parent company of Euroclear Bank and the **Central Securities Depositories (CSDs)** of the Euroclear group. Euroclear Bank is the only CSD in the Euroclear group that is also a credit institution.

Euroclear Bank and all consolidated levels above, as well as Euroclear SA/NV (stand-alone), have to comply with the requirements formulated in the transposition of the Basel Accord into European regulation (hereafter: '**Basel Framework**').

As Financial Market Infrastructures, Euroclear Bank and the Euroclear CSDs are also subject to the **CPMI-IOSCO Principles for Financial Market Infrastructures** issued in April 2012.

Euroclear group CSD entities (including Euroclear Bank) are undertaking all necessary actions to comply with the EU Regulation on improving securities settlement in the European Union and on central securities depositories ('**CSDR**' – EU 909/2014).

In addition, Euroclear SA/NV and Euroclear Bank are subject to the **Bank Recovery** and **Resolution directive**. Recovery, Restructuring and Orderly Wind-down plans have been developed in accordance with requirements under this directive, as well as related requirements in the CSD Regulation, associated regulatory technical standards and guidelines issued by the National Bank of Belgium.

What is the Basel III Framework?

Basel III is a reform package for the existing Basel II framework, an internationally agreed set of measures developed by the Basel Committee on Banking Supervision (BCBS) setting global minimum standards for the amount of capital that banks must hold to cover the risks they are exposed to. Basel III was published in response to the financial crisis of 2007-09 and its measures aim to strengthen the regulation, supervision and risk management of banks.

The Basel III requirements are translated into European law through the Capital Requirements Directive (CRD IV) and Regulation (EU) No. 575/2013 on prudential requirements for credit institutions and investment firms (CRR). The new regulation gradually entered into force starting on 1 January 2014.

In December 2017, the BCBS reached an agreement towards the finalisation of Basel III.

Overall, the agreed reforms:
- improve the standardised approaches, to make them more robust and risk sensitive
- constrain the use of the internal models
- improve the operational risk framework
- introduce a leverage ratio buffer for global systemically important banks (G-SIBs)
- and introduce a different output floor

This marks a critical milestone in the finalisation of the post-crisis regulatory framework. Now Basel's members will need to transpose Basel III into national/EU law.

The Basel Framework differentiates between three so-called pillars, which are expected to be mutually reinforcing. Pillar 1 is centered on the capital requirements related to the credit, market and operational risks that banks run. Under Pillar 2, banks are expected to produce their own assessment of capital and liquidity adequacy, based on the risks that they face in their activities, including additional risk types such as market risk in the banking book. Pillar 2 also lays out the interaction between the banks' own assessments and the banking supervisors' response. Pillar 3 aims to promote market discipline through the disclosure of institutional information.

Pillar 3 requirements concern the regular disclosure of information of interest to the market.

Part of the Pillar 3 disclosure concerns risk management methods and practices, and the organisation of the risk management function. Another part is focused on, among other things, the actual data relating to exposures and associated capital requirements.

Under the Basel framework, the Pillar 3 requirements are included in the European Capital Requirements Regulation ('CRR').

This publication contains Euroclear's Pillar 3 disclosure for 2017.

Pillar 1 at Euroclear

Euroclear has obtained approval to apply the **Foundation Internal Ratings-Based Approach (FIRBA)** for credit risk under Pillar 1 as from Q1 2007.

The FIRBA is applied at the level of Euroclear Bank and at all consolidated levels above.

Furthermore, Euroclear Bank determines the ratings of counterparties and clients, and assigns its own probabilities of default. As Euroclear Bank does not have any history of credit losses, it chose not to apply an **Advanced Internal Ratings-Based Approach (AIRBA)**. More information on Euroclear Bank's use of the FIRBA can be found in the chapter on credit risk management.

With respect to operational risk, Euroclear has approval to use the **Advanced Measurement Approach (AMA)** for the calculation of Pillar 1 capital requirements since Q1 2008.

The Standardised Approach (TSA) and the **Basic Indicator Approach (BIA)** are used respectively for the CSDs and the other group entities. More information on operational risk management can be found in the relevant chapter.

Euroclear uses a hybrid approach at all consolidated levels by combining the AMA for Euroclear Bank with a Standardised or Basic Indicator Approach for the other group entities.

Pillar 2 at Euroclear

The scope of Pillar 2 is broader than the one of Pillar 1. The Supervisory Review Process (SRP) aims at ensuring that institutions adequately understand and manage their risks through dialogue with their supervisors. Under the **Internal Capital Adequacy Assessment Process (ICAAP)**, institutions are expected to identify and quantify the residual risks they face, and also to relate these to the level of good quality capital needed to implement their corporate goals. At the same time, the **Supervisory Review and Evaluation Process (SREP)** is to ensure that institutions have adequate arrangements, strategies, processes and mechanisms as well as capital and liquidity to ensure sound management and coverage of their risks, including those revealed by stress testing and risks institutions may pose to the financial system. Euroclear maintains an active dialogue with its regulators on these aspects.

In addition, Euroclear delivers on a regular basis to regulators standardised reports on risks not covered under Pillar 1 (interest rate risk in the banking book, liquidity risk and concentration risk on specific sectors or geographic areas). Information on these risks is also included in the Pillar 3 disclosure.

Pillar 3 at Euroclear

Scope of application

Complete Pillar 3 information is disclosed at the highest consolidated level considering it captures all key risks Euroclear faces.

In addition, specific information, mainly on capital structure and adequacy, is published for Euroclear Bank, which is considered as a significant subsidiary for the purpose of this disclosure.

Euroclear Bank is the only credit institution with a banking license in the group and, as such, is by far the largest contributor to the credit, liquidity and market risks faced by the group. Information on these risks therefore mainly affect Euroclear Bank. Specific figures for Euroclear Bank are very close to the figures included in this publication, which apply to the group as a whole.

Basis of consolidation

There are no differences in the basis of consolidation for accounting and prudential purposes at Euroclear.

Subsidiaries are entities for which the group has the power to govern the financial and operating model generally accompanying a shareholding greater than half of the voting rights. Subsidiaries are fully consolidated from the date that control is transferred to the group. They are de-consolidated from the date that control ceases.

All subsidiaries are fully consolidated, with the exception of Euroclear's nominee companies. The list of subsidiaries and nominee companies can be found in the Euroclear plc consolidated financial statements and Parent company financial statements at 31 December 2017.

Frequency and method

Qualitative and quantitative year end Pillar 3 information is disclosed annually shortly after the publication of the Annual Report based on the situation at the end of the previous year. The frequency of this disclosure may change in the future to respond to market information needs or where Euroclear's risk profile or appetite changes materially.

ERM framework effectiveness

The Board has concluded that Euroclear's ERM framework and associated risk management systems are adequate with regard to the group's risk profile and strategy.

Pillar 3 Disclosure governance process

The information provided in this report has been through a robust internal governance process involving review and approval by the Euroclear Group Risk Committee, Euroclear Bank Management Committee, Board Risk Committee and Board, and the Euroclear SA/NV Management Committee, Board Risk Committee and Board.

Decisions on whether to withhold certain information on materiality, confidentiality or for proprietary reasons were taken by the Euroclear SA/NV and Euroclear Bank Boards on advice of their respective Board Risk Committees.

This Pillar 3 Disclosure Report has been prepared at the Euroclear plc consolidation level and in accordance with relevant Euroclear governance review processes and Regulation (EU) No. 575/2013 (CRR) and associated European Banking Authority guidelines and published on www.euroclear.com.

Overview of risk management and capital requirements

As a leading financial market infrastructure, Euroclear plays a central role in supporting the functioning and development of efficient, sound and stable capital markets by providing resilient, reliable and secure post-trade services. To ensure the organisation's risk arrangements continue to meet Board, market and regulatory expectations (e.g. CSDR), Euroclear has initiated a group-wide risk transformation programme in early 2017 across the three lines of defence. This programme is delivering good results and is expected to run until end 2019. The programme aims to reinforce Euroclear's robust risk management framework in line with the increasing regulatory requirements including further clarification of the roles and responsibilities of the Board and its Committees, Senior Management, Line Management and the Control Functions. The programme's main focus in 2017/18 is to ensure compliance with the CSD Regulation.

Enterprise Risk Management framework

The **Enterprise Risk Management (ERM)** framework defines the overall approach to how risk is managed at Euroclear. The framework structures the way Euroclear manages its risks, within the Board's risk appetite, whilst pursuing its strategy and corporate objectives. It also details the roles and responsibilities of the three lines of defence. The framework is supported by a number of board-approved policies, management handbooks, processes, procedures, and internal control systems, all of which are regularly reviewed and updated to maintain their relevance.

Euroclear's ERM framework is structured around a number of core components covering:

- Business strategy, objectives and risk appetite
- Risk governance
- Risk policies & guidelines
- Risks in execution
  (covering risk identification & assessment; risk analysis & prioritisation; risk response & control; and risk monitoring & reporting)
- Data & technology
- Risk culture

Governance

The *Euroclear SA/NV* Board of Directors is the ultimate decision-making body for the group. Its overarching responsibility is to define and oversee the implementation of the group's strategy and objectives, as well as its risk policies (including risk appetite), and to supervise the Euroclear SA/NV management. The Board of Directors has established a number of committees, including Risk, Audit, Remuneration and Nomination & Governance committees, to advise them on risk related topics.

The Euroclear SA/NV Board has also established a Management Committee with decision- making authority and entrusted it with the general management of the Company with the exception of setting the strategy, risk appetite, general policy and other powers reserved to the Board or the shareholders by law or by the Articles of Association.

The Euroclear SA/NV Management Committee is advised on risk-related matters by:

- the Group Executive Committee. It is an advisory committee to the Euroclear SA/NV Management Committee. Its main role is to bring together the members of the Management Committee of Euroclear SA/NV as well as senior executives in key functions from across the Euroclear group. Its principal role is to ensure that material and relevant issues impacting the group are known and discussed at the most senior executive level in an effective and timely way.
  The existence and operation of the Group Executive Committee does not detract from the responsibility of each legal entity in the Euroclear group for the management of its own affairs in line with the sound governance arrangements in place in that entity.

- the Group Risk Committee. Its main role being to maintain a holistic and structured view of the main risks of the group and to ensure that these are actively managed. The Group Risk Committee monitors the evolution of Euroclear's risk profile and control environment, reviews and approves risk and compliance related assessments and frameworks. It advises and/or escalates to the Management Committee, if needed. It also reviews and advises on policy handbooks and board policies, and provides recommendations for approval of these documents to the Management Committees or Executive Committees of the Euroclear's CSDs and of Euroclear SA/NV.

- the Euroclear SA/NV Credit and Assets and Liabilities Committee. Its main role is to advise on dividend proposals, capital planning and restructuring, funding, investment policy, hedging, financial policy and stress testing for Euroclear SA/NV, the group and the CSDs regarding the financial plan, capital, liquidity and cash requirements and liability.

Euroclear's CSDs

Each Euroclear CSD has a Board of Directors as their ultimate decision-making body. Their overarching responsibilities are to define and oversee the implementation of the CSD's strategy and objectives, as well as its risk policies (including risk appetite), and to supervise the CSD's management. These Boards of Directors have established committees advising them on risk related topics (along the lines of those established by Euroclear SA/NV).

The Board of Directors of each of the CSDs have also established a Management Committee or Executive Committee [1] with decision-making authority and entrusted it with the general management of the entity within the strategy, risk appetite and general policy decided by the Board, and to implement such strategy and general policy.

The composition and terms of reference of the Board and Board Committees as well as information on Board selection criteria and gender diversity, have been posted on **www.euroclear.com**.

(1) Naming, structure and objectives of committees may differ by entity, to adapt to local needs.

The CSD Management Committees or Executive Committees have set up several internal committees providing advice on risk-related matters:

- the **Risk, (Local Security) & Operating Committee**, which reviews the risks introduced by new services or products and monitors the evolution of the risk profile and control environment. This includes the risk review of operational issues, financial exposures, reputation, business continuity matters, local security, compliance and issues arising during the implementation phase of new projects as well as the impact of such issues on the economic capital and proposes risk mitigation actions. It also monitors the service level management of outsourced services.

- the **Group Admission Committee** (for Euroclear Bank and the ESES CSDs) [1] puts forward a recommendation to Senior Management on both new admission requests (i.e. whether the candidates for admission comply with the entity's relevant admission criteria) as well as on any client no longer fulfilling the admission criteria.

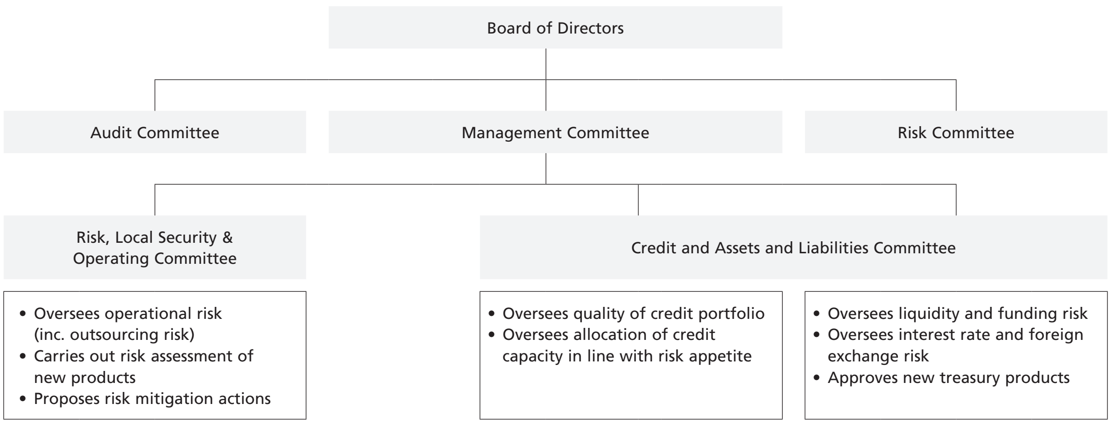
- Euroclear Bank's **Credit and Assets and Liabilities Committee (CALCO)**, evaluates the short and long-term impact of strategic matters of credit and treasury on the Bank's reputation, financial performance and shareholder's equity. The CALCO also advises on policy matters, key assumptions and parameters used in the credit risk and asset and liability of Euroclear Bank.

These committees also propose relevant policy changes.

[1] The decision to admit or refuse an application is taken by the Senior Management (Euroclear Bank & ESES: Management Committee; Euroclear Finland: Chief Executive Officer; Euroclear Sweden: Commercial together with Local Heads of Legal, Risk and Operations). For Euroclear UK & Ireland there is an automatic admission if criteria are fulfilled.

Example: Euroclear Bank Committee Structure

(Committees related to risk management only)



Risk culture

Risk culture forms an integral part of the corporate culture that the Board and Senior Management seek to promote and embed in Euroclear. Our risk culture enables all individuals at Euroclear to make sound and informed decisions that take due account of the risks we face.

The key elements of the Board's desired risk culture are:

- always acting ethically and with integrity,
- demonstrating courage through speaking up where necessary;
- sharing responsibility for maintaining our culture of risk awareness; understanding both the good (upside risk) and the harm (downside risk) that can arise from the decisions we take;
- taking ownership, making timely decisions and openly reporting the risks we take;
- an environment of open communication and effective challenge in which decision- making processes encourage taking a broad range of views and promote engagement; and
- recruiting and retaining the right people, and maintaining reward and remuneration policies consistent with our desired risk culture.

Euroclear communicates and embeds its risk culture principles through a combination of senior management 'tone at the top', its Code of Conduct, the ERM framework and various training and education programmes on behaviour and ethics. These elements are underpinned by Euroclear's 'Speak up' whistle-blowing policy and supporting arrangements.

Euroclear monitors and enforces its desired risk culture through a combination of formal and informal means such as:

- Compliance & Ethics, Risk Management and Internal Audit observations and recommendations
- Reports of inappropriate risk behaviours and incidents
- Management, Board and regulatory perceptions

Diversity

Ensuring a well-trained, diverse mix of people of all ages, nationalities, gender and backgrounds with a wide range of skills is key to delivering our business strategy in an increasingly complex environment.

Euroclear aims to create a workplace where diversity and equality are key strengths in helping us achieve our business goals.

Therefore, Euroclear has implemented a Diversity & Inclusion strategy and action plan across the Group, which seeks to promote equality of opportunity for all our people, regardless of gender, ethnicity, sexual orientation, religion or disability.

Currently, three of Euroclear's five CSD Chief Executive Officers are female, as well as having a female Group CEO. Despite this, Euroclear recognises the need to make further progress in achieving gender balance at senior levels.

Consequently, the Euroclear CSDs have each set themselves a three year goal of achieving one third female board membership by the end of 2019. A similar three year target was recently agreed by the Board of Euroclear SA/NV.

Further information on our diversity objectives and our wider Corporate & Social Responsibility aims and ambitions is provided in the Euroclear SA/NV Annual Report 2017.

Three lines of defence

In line with best market practice, Euroclear has adopted a three lines of defence model.

- **1st line of defence – Line Management**:

  Line management ensures that the right risk culture is embedded in the different business units. It owns the risks linked to the activities it undertakes to reach its business objectives. It must identify, measure, control and manage these risks, and define and operate a control system to ensure Euroclear reaches its business objectives within its risk appetite. Line management is the primary source of (non-independent) assurance on the adequacy and effectiveness of the control environment to Senior Management and the Board. In addition, line management owns the business continuity and recovery plans.

- **2nd line of defence – Risk Management and Compliance & Ethics**:

  Risk Management

  The Board oversees that well-resourced, effective and independent control functions are in place. In particular, the Board ensures that the Risk Management function provides robust, independent oversight of 1st line's risk-taking activities. Euroclear achieves its goals and delivers its strategy within the Board's risk appetite. The Risk Management function aims to deliver and maintain an effective ERM framework; provides the Board and Senior Management with high quality, independent advice and guidance; and helps foster a healthy risk culture throughout the organisation.

  Compliance & Ethics

  Compliance & Ethics monitors, tests and reports to management on controls relating to laws and regulations falling within its remit and advises on remedial actions. Compliance & Ethics also provides regular trainings across the organisation to increase awareness of compliance risks and ethical issues.

  The group-wide ethical and compliance risk management framework allows Euroclear to adequately identify, monitor and manage the full spectrum of legal and compliance risks (including conduct risk). These include, amongst others, fraud, market abuse and money laundering. In addition, a specific focus is devoted to assess our controls linked to economic sanctions taken by authorities. This framework is supported by a major communication effort that helps maintain a high level of staff awareness.

  Moreover, the Finance division has established a permanent control framework to provide assurance on the effectiveness of the internal control environment around the financial statements.

- **3rd line of defence – Internal Audit**: Internal Audit provides comprehensive assurance based on the highest level of independence and objectivity within the organisation, in order to support the Board and Senior Management in reaching their objectives. Internal Audit's scope is unrestricted, and provides assurance on the adequacy and effectiveness of Euroclear's governance, risk management and internal controls.

Euroclear's risk capacity, appetite and control environment

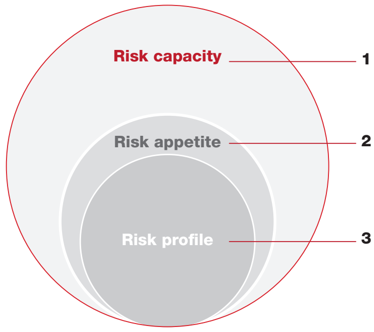
Euroclear defines its risk capacity as:

- the total loss that Euroclear can bear, given our capital base and liquidity requirements without entering a recovery situation; and
- measured with reference to the maturity of our risk management and control capabilities, as well as regulatory constraints.

Euroclear's risk capacity can also be considered on a qualitative basis. Events that would lead us to reconsider our risk capacity include a significant credit agency downgrade, a material regulatory incident or a qualified audit opinion from our external auditor.

Euroclear's risk appetite is set by the Board and, represents the maximum amount of risk the Board is willing to accept to achieve its objectives, including preservation of the long-term strength of the company and of the trust of all key stakeholders. Euroclear articulates and monitors its risk appetite by way of metrics associated with each of Euroclear's primary risk categories, thereby providing senior management and the Board with an indication of risk profile versus appetite.

As risk appetite is inherently dynamic, it is reviewed and adjusted on an ongoing basis. Our approach is highlighted in the following diagram.



1. The large difference between risk appetite and capacity reflects Euroclear's desire to maintain a low overall residual risk profile.
2. In normal circumstances our risk profile remains within risk appetite. However, it is possible that on rare occasions our risk profile exceeds our appetite which should trigger Board review.
3. Risk limits are set to trigger management responses before risk appetite is exceeded.

Risk appetite statement

Euroclear's mission, and what our clients, the capital markets and other relevant stakeholders expect from us, is to:

- develop and maintain efficient post-trade services which are resilient, reliable and secure;
- support the development of sound and stable capital markets, locally and globally; and
- serve the public good by supporting the efficiency of markets and actively enabling the reduction of systemic risk wherever possible.

Euroclear's strategy is chosen to help achieve these aspirations. It is reinforced by the regulatory framework in which Euroclear operates, which aims to minimise the risks associated with providing financial market infrastructure services. Therefore, Euroclear operates with an overall low residual risk appetite.

For information on the nature, extent, purpose and economic substance of material transactions within the group, affiliates and related parties, please see Euroclear SA/NV Annual Report 2017 financial statement note XXVI Transactions with other companies in the Euroclear group.

Internal control systems

To ensure risk taking is appropriate and remains within Euroclear's appetite, Euroclear has defined a system of internal controls, limits and processes. Controls are established by business management and are aligned to the mission of each business unit. Controls are designed in line with the risks they aim to mitigate. The cascade of controls is the foundation of Euroclear's Internal Control System (ICS).

The Risk Management division provides the framework to support the controls frameworks. Line Management maintains the controls and performs monitoring activity, aimed at building a sound and complete control environment. Line management highlights missing or ineffective controls through a self-disclosure framework and ensures the completeness of action plans necessary to close control gaps.

Recovery, Restructuring & Orderly Wind-down

Building from the wider risk and controls framework, Euroclear has developed a Recovery, Restructuring and Orderly Wind-down plan for Euroclear SA/NV, Euroclear Bank and for each CSD in the group. Each plan sets out alternative response strategies to address potential threats to financial viability. The plans are integrated with established processes for risk identification, assessment and analysis, and leverage existing governance and crisis management frameworks.

Euroclear risk categories

The following table provides the list and definition of the key risk categories that Euroclear faces.

To manage these risks, the Board and Management have defined a series of risk appetite statements and set limits on the amount of risk that Euroclear entities are prepared to accept.

Conduct & culture	Risks arising from our corporate and risk culture, governance arrangements, conduct and dealings with stakeholders and shareholders, and our corporate responsibility as an international financial organisation. Stakeholders might include clients, participant, suppliers, regulators, competitors and other financial market infrastructures.
Operational	The risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. This definition excludes legal and compliance risk.
Legal & Compliance	Risks arising from: • applicable laws, regulations, market rules, prescribed practices and our own internal policies in all relevant jurisdictions • upcoming laws and changing regulatory environment • the negotiation of rules, procedures and contracts in all relevant jurisdictions • conflicts of laws between jurisdictions
Credit	The risk to Euroclear's earnings or capital arising from Euroclear's obligor's failure to perform due to inability or unwillingness on its financial obligations to Euroclear on time and in full. In the scope of its activities Euroclear's obligors are defined as borrowing participants, cash correspondents and settlement banks , treasury counterparts and issuers of securities in the investment and treasury securities portfolio.
Liquidity	Risks arising from being unable to settle a cash or securities obligation when due resulting from inappropriate and/or insufficient liquidity sources.
Market	Market risk is the uncertainty on the value of assets and liabilities (on- or off-balance sheet) and on the future earnings (linked to foreign exchange or interest rate movements).
Strategic & Business	**Business Risk** – Short term risks to our financial results and solvency arising from, for instance: • business decisions • product and client portfolios • human capital and other resources • underfunded defined benefit pension obligations **Strategic Risk** – Medium to long term risks to our existence and our ability to deliver our strategy, arising from, for instance: • our strategy & business model • strategic decisions • implementation of strategy • technology, IT infrastructure and software
Change & project	Change Risk is the Risk of failure with respect to the change management process including the tools and techniques to manage the people side of change to achieve the required business outcome. Project Risk is defined as an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives.

Systemic and Reputational Risks are transversal risks of the above ones.

Systemic
Risk of disruption to financial services organisations that has the potential to have serious consequences for the financial system and/or the real economy. Systemic risk events can originate in, propagate through, or remain outside of Euroclear.

Reputational
The risk to Euroclear's status as a trusted FMI with a closely guarded reputation for transparency, stability, safety and resilience, potentially resulting in increasingly intrusive regulatory supervision, reduced earnings, increased operating, capital or regulatory costs, or destruction of shareholder value.

Risks in execution – the four stages of the ERM cycle

Identify and assess

Risk identification is one of the most critical steps of any risk management process. Failure to identify risks is likely to undermine the effectiveness of management´s decision- making and may result in failure to achieve business objectives.

To ensure our risks are well identified and assessed, Euroclear encourages an environment which proactively identifies and manages risks and control weaknesses, as opposed to the reactive logging of risks.

Risks can be assessed on a qualitative or quantitative basis (or both), using two key parameters: risk likelihood (or probability) and risk impact (or severity). The product of these two parameters results in a risk rating.

Additionally, Euroclear uses stress testing to provide an additional, specialist approach to assessing and understanding the risks we face. It is used to help us understand our risk profile, our resilience to internal and external shocks and, consequently, the viability of our business model.

Amongst others, the use of stress testing, the monitoring of key risk and key performance indicators (KRIs and KPIs), the risk assessments performed by the business, including for new (or material changes to existing) products and services, and the annual self-assessment exercises contribute to this proactive identification and logging of risks and control weaknesses.

In addition, in its role of independent challenger, the Risk Management division performs risk assessments on selected topics and reports the outcome to Senior Management and the Board.

Analyse and prioritise

Once identified, assessed and logged, each risk should be analysed and prioritised, to ensure that the initial assessment is correct and that the following dimensions are well understood:

- how does the risk manifests itself
- whether it is a potentially systemic risk
- what drives the risk
- whether the risk is linked to any other risk
- what controls are in place
- what KRIs are in place
- what is the target residual risk
- does the risk need to be modelled or analysed through a scenario

Once those questions are considered answered, line management can prioritise the mitigating actions for the identified risk. It is a pragmatic judgement call that takes into account all the other risks that require mitigating actions from line management at a point in time.

Respond and control

Dependent upon the significance of an identified risk and Euroclear's risk appetite, business owners may choose to adopt one of Euroclear's four main risk response strategies:

- **Mitigate** – mitigating risks entails reducing the likelihood that they materialise or reducing their potential impact or both. For example, in the case of credit risk, by making use of collateral. When risks are identified, mitigating action plans and their target dates are all logged. The business owners are responsible for developing solutions to mitigate risks effectively, with the Risk Management division providing advice and monitoring the successful implementation of these mitigating actions through the regular review of outstanding critical and high risk issues.

- **Accept** – risks can be accepted when for instance the costs required to mitigate the risk outweigh the benefits. The decision to accept a risk is proposed by the business owner to the appropriate governance body for review and approval. The governance body constructively challenges the business owner's risk analysis and rationale for risk acceptance. All accepted risks must be recertified by management at least annually, taking into account the impact accepted risks may have on other identified risks. Recertified accepted risks are periodically reviewed and challenged by the relevant governance body.

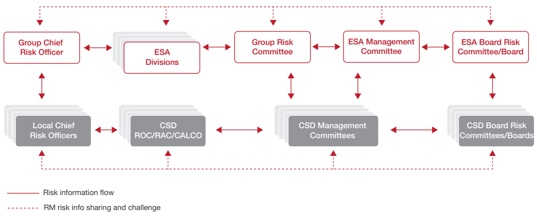
- **Transfer / Insure / Hedge** – business owners can transfer a risk to a third party, typically through insurance. Euroclear has a group insurance programme that covers most insurable risks. Situations are tracked where risk exposures can be transferred to a third party via insurance or a hedge at corporate level, e.g. hedges to cover interest rate or foreign exchange risks. In cases where such a transfer is not possible, other business resilience measures are considered.

- **Avoid** – risks are avoided if Euroclear opts not to engage in certain activities (e.g. particular transactions, credit provision, and the launch of a new product or service) or to change its business model, because the risk of having large losses exceeds the risk appetite for any relevant risk type.

Specific information on the risk management of credit, market, liquidity and operational risks is provided separately in this report.

Monitor & Report

As outlined in the illustration below, the 1st line of defence reports the results of its identified risks, risk assessments, main findings and proposed actions to its local **Risk & Operating Committee ('ROC') / Credit and Assets Liabilities Committee ('CALCO')** [(1)]. It also shares the results with the Risk Management division, which challenges the conclusions and action plans when necessary.



Every division maintains a **Positive Assurance Report ('PAR')**, which is a management tool allowing it to demonstrate the adequacy and effectiveness of its controls, as well as to identify weaknesses within the controls system it is accountable for. As part of the Risk Transformation Programme, Euroclear is in the process of integrating explicit key risk dimensions into the PAR.

Twice a year, the 1st line uses the conclusions from the PAR as its input for the group **Assurance Map ('AM')**, to report to the senior management and boards of Euroclear on the adequacy and effectiveness of its control environment.

The Risk Management and Internal Audit divisions add their own independent assessment of the 1st line's control environment, which allows them to confirm, nuance or reject the 1st line's assessment, thus giving Senior Management and the Boards a consolidated and comprehensive overview of the control environment. This gives Senior Management the tools necessary to take informed decisions with respect to the control environment and recommend or request remedial actions where needed.

(1) CALCO only relates to Euroclear SA/NV and Euroclear Bank.

This process is complemented on a yearly basis by a 'self-assessment exercise', made of two distinct processes: the **Risk & Control Self- Assessment ('RCSA')** and the **Horizontal Self-Assessment ('HSA')**.

The output of that exercise is reflected in the **Assurance Map** and serves to produce Euroclear's yearly **Internal Controls Systems ('ICS')** Report where the high impact control weaknesses are identified and reported along with remedial actions, for the Boards' review and the regulators' reference.

The self-assessment exercise is conducted through workshops, facilitated by the Risk Management division. The process and its output are however owned by the business. The aim of these workshops are to:

- build an accurate and consistent assessment of Euroclear's Internal Control Systems;
- increase risk awareness and promote an ongoing assessment of risks and controls by the business;
- identify new risks and control weaknesses, both at the divisional level (through the RCSA) and transversal ones (through the HSA); and
- help management make well-founded statements on the effectiveness of Euroclear's Internal Control Systems.

A quarterly CRO report is submitted to Euroclear SA/NV Board and to the Boards of Euroclear CSDs outlining the group and entities' key risks and their current risk profiles respectively.

In addition, the Risk Management division periodically monitors ICS issues and the overall effectiveness of the ERM framework.

Finally, as the third line of defence, the Internal Audit division regularly conducts assessments of the ERM framework, or parts thereof, to report to the board of directors on the adequacy and effectiveness of the framework and of the ICS. These reports are shared with Senior Management and the Boards (as appropriate) to help them, and the Risk Management division, improve the control framework.

The Control Functions

Risk Management

Risk Management function organisation and responsibilities

As part of the group-wide Risk Transformation Programme, the Risk Management function's mission has been revised as 'providing robust, independent oversight of risk-taking activities across the Euroclear group to help it achieve its goals and deliver its strategy'. In addition, the Risk Management function has adopted a matrix operating model which enables the CSD CROs to draw on Risk Management division subject matter expertise and resources as needed.

In aiming to meet its mission, the Risk Management function strives to:

- deliver and maintain an effective ERM framework
- help foster a healthy risk culture throughout the Euroclear organisation
- provide the Board and Senior Management with high quality, independent risk advice and guidance

Euroclear's ERM framework supports management in the systematic and disciplined identification, evaluation and management of risk across all aspects of the Euroclear business.

The group **Chief Risk Officer (CRO)**, as head of the Risk Management division, has the overall responsibility for ensuring there is a robust independent oversight of risk-taking activities across the Euroclear group. CROs of the different Euroclear entities ('CSD CROs') have the same responsibility at the level of their entity.

The group CRO has a direct reporting line to the Chairman of the Euroclear SA/NV (ESA) Board Risk Committee in addition to his normal (i.e. day-to-day) reporting line to the ESA **Chief Executive Officer (CEO)**.

Where required, the group CRO has unmediated access to the ESA Chairman, Board and Board Risk Committee.

Decisions on appointment and removal of the Group CRO are made by the Board on the recommendation of the Board Risk Committee.

The performance and remuneration of the group CRO is reviewed by the ESA Board Risk Committee with input from the CEO and Remuneration Committee, and a recommendation is made to the ESA Board. The independence of the group CRO is reinforced through his direct access to the Chairman and the members of the ESA Board Risk Committee.

CSD CROs follow the same arrangements at the local level. In addition, they report functionally to the Euroclear group CRO to enable the group to meet its regulatory consolidated risk oversight obligations.

Reporting

At least quarterly, each CSD CRO formally reports to Senior Management and their respective Board Risk Committee, detailing Euroclear's current risk profile, emerging risks and commenting on the key risks.

With the same frequency, the group CRO produces a CRO report summarising the key risks at group level to the Euroclear SA/NV Management Committee and to the ESA Board Risk Committee.

In addition, the Risk Management division will escalate immediately to the appropriate level material risk issues when, in its opinion, either a significant new risk emerges or mitigating actions for an existing risk are considered insufficient.

Compliance and Ethics

Compliance an Ethics function organisation and responsibilities

The Compliance and Ethics function is responsible for supporting the business in identifying, assessing, monitoring and managing compliance and ethics risks across the Group. It seeks to achieve this through a number of means including:

- Delivering, maintaining and overseeing the effective operation of a sustainable and consistently applied compliance and ethics framework aligned with Euroclear's enterprise risk management framework
- Reinforcing first line accountability for compliance risk management through providing independent advice and robust challenge and helping foster an appropriate compliance and ethics culture
- Providing the Board and senior management with a high quality, independent view of Euroclear's compliance and ethics risks, including emerging risks

Compliance and Ethics division has a Board-approved Charter that sets out its independence, scope, role and responsibilities.

The group **Chief Compliance Officer (CCO)**, as head of the Compliance and Ethics division, has the overall responsibility for ensuring there is a robust independent oversight of compliance and ethics risks across the Euroclear group. CCOs of the different Euroclear entities ('CSD CCOs') have the same responsibility at the level of their entity.

The group CCO has a direct reporting line to the Chairman of the ESA Audit Committee in addition to his normal (i.e. day-to-day) reporting line to the ESA CEO. Where required, the group CCO has unmediated access to the ESA Chairman, Board and Audit Committee.

Decisions on appointment and removal of the Group CCO are made by the ESA Board on the recommendation of the ESA Audit Committee.

The performance and remuneration of the group CCO is reviewed by the ESA Audit Committee with input from the group CEO and Remuneration Committee, and a recommendation is made to the ESA Board. The independence of the group CCO is reinforced through his direct access to the Chairman and the members of the ESA Audit Committee.

CSD CCOs follow the same arrangements at the local level. In addition, they report functionally to the Euroclear group CCO to enable the group to meet its regulatory consolidated compliance risk oversight obligations.

The division uses a service line model based on two units:

i) CSD Chief Compliance Officers with responsibility for overseeing the effectiveness of compliance arrangements within each CSD
ii) A Centre of Excellence comprising of Risk Advisory, Assurance, Financial Crime and other Services delivery teams (incl. Awareness, policies, etc.) providing CSDs with resources and expertise under the terms of a formal shared services agreement

Reporting

Compliance and Ethics function reporting to the Management Committee and Board (including committees) includes, amongst others:

- A risk-based annual compliance plan detailing planned compliance reviews and resourcing
- Results of Compliance and Ethics monitoring and compliance reviews, including key findings and recommendations, analysis of significant incidents and breaches
- Any material risk of legal, administrative or regulatory sanction

In addition, Compliance and Ethics reports to and is in regular contact with the NBB and the FSMA.

Internal Audit

Internal Audit function organisation and responsibilities

Internal Audit's (IA) mission is to provide reasonable assurance, in an independent and objective way, on the adequacy and effectiveness of the governance, risk management and internal controls to support the Board and senior management in reaching their objectives.

IA's Board approved Charter:

- describes IA's mission, purpose, authority and responsibility;
- stipulates that CSD Heads of Internal Audit have the necessary stature in the organisation with proper independence in determining the Audit Universe, Audit Plan and scope of audit reviews, performing work (through an unlimited access right to all records and data of the company), and communicating results.

The group **Chief Auditor (CA)**, as head of the Internal Audit division, has the overall responsibility for ensuring there are robust internal audit arrangements in place across the Euroclear group. Head of Internal Audit of the different Euroclear entities ('HIA') have the same responsibility at the level of their entity.

The CA has a direct reporting line to the Chairman of the ESA Audit Committee in addition to an administrative reporting line to the ESA CEO. Where required, the CA has unmediated access to the ESA Chairman, Board and Audit Committee.

Decisions on appointment and removal of the CA are made by the ESA Board on the recommendation of the ESA Audit Committee.

The performance and remuneration of the CA is reviewed by the ESA Audit Committee with input from the Remuneration Committee. The Group CEO may be consulted as part of this process. A recommendation is made to the ESA Board.

The independence of the CA is reinforced through his direct access to the Chairman and the members of the ESA Audit Committee.

Heads of Internal Audit follow the same arrangements at the local level. In addition, they report functionally to the Euroclear group CA to enable the group to meet its regulatory consolidated internal audit oversight obligations.

Internal Audit is structured around three main roles:
i) CSD Heads of Audit
ii) Audit domains
iii) Support

In order to carry out its mission, IA has set up a comprehensive universe including all processes carried out by the Group. The Audit Plan covers the full universe and is the result of:

- a risk and control based approach: each line of the universe is assessed quarterly via audit scans to assess the need for a risk-based audit;
- a cyclical approach: if no internal or external audit (only quarterly audit scans) has been carried out for 2 years, then a rotational audit will be performed using the most appropriate approach and a report or memo issued; and
- mandatory audits deriving from regulatory obligations (e.g. Mifid, remuneration policy, etc.) or contractual obligations.

This approach ensures that the Audit Plan remains commensurate to the risk profile and focuses on the areas presenting the highest risks or being heavily control dependent.

IA has designed its audit methodology to comply with the Institute of Internal Auditors' International Professional Practices Framework (IPPF).

IA's on-going Quality Assurance and Improvement Programme (QAIP) ensures continued compliance to the IPPF. This programme includes internal assessments (such as self-assessments, peer reviews, Stakeholder Satisfaction Questionnaire) and periodic external assessments by a qualified, independent reviewer.

The results of the QAIP are reported yearly to the Management Committee and Audit Committee. As part of a three year external assessment cycle, the 2015 External Quality Assessment performed by Ernst Young confirmed IA's compliance with Institut of Internal Auditors Standards.

Reporting

IA reporting to the MC and Board level includes the following:

- Audit Plan: this report provides explanations on the drivers supporting the plan and gives an overview of the audit planning envisaged over a 3-year horizon. It is reviewed by the MC and the AC and recommended by the AC to the Board for approval;
- IA activity report: this report covers the progress on the internal audit plan, the results of audit work (including concerns regarding the effectiveness or timeliness of Management's actions to address audit issues), and resourcing. In addition to this, IA sends any communication, audit memos and reports it deems necessary, directly to MC members; and
- the Control Matters for AC Attention: this report highlights matters related to the internal control environment that Internal Audit considers to be of high risk to the organisation, either now or in the near future, and that should be a priority for management to have strong and close oversight over. The report also provides an update of the main control issues raised by Internal Audit.

IA also has regular meetings with regulators and external auditors. Audit reports are communicated to these stakeholders upon request.

Capital requirements

In addition to the capital requirements imposed by local company laws, some Euroclear companies are also subject to regulatory capital requirements. Euroclear SA/NV, Euroclear Belgium, Euroclear Bank standalone and above-consolidated levels, are subject to capital requirements under the Basel Framework. The CSDs, as settlement institutions, are subject to specific local regulatory requirements and will be subject as of 2018 to the capital requirements stipulated under CSDR.

The other entities of the Euroclear group are not subject to regulatory requirements.
At all times, Euroclear ensures that each entity maintains sufficient capital to:

- comply with its legal and local regulatory requirements; and
- allow it to continue to operate properly.

There are no other material impediments to the transfer of own funds between a CSD and Euroclear SA/NV.

Risk-weighted Assets (RWA)

Euroclear Bank, as a credit institution, is required to calculate its risk-weighted assets in accordance with the European **Capital Requirements Regulation (CRR)**. Furthermore, Euroclear SA/NV and Euroclear plc as holding companies of a credit institution, are also subject to the same requirements.

Risk-weighted assets are calculated to cover credit, operational and market risks.

Credit Risk

The risk-weighted assets for credit risk take into consideration balance-sheet assets and off-balance-sheet exposures that may give rise to credit risk. Where applicable collateral and other eligible guarantees are taken into account.

Euroclear Bank stand-alone and consolidated and all consolidated levels above, use the Foundation Internal Ratings-Based Approach (FIRBA). Hence for these entities own estimations based on the probabilities of default associated with internal ratings are used (Internal Ratings Based Approach). More information on this can be found in the Credit Risk Management section.

For Euroclear SA/NV stand-alone, and at the level of Euroclear Belgium and all entities, the standardised approach is used. As these entities bear minimal credit risk, there is no intention to evolve towards an Internal Ratings-Based (IRB) approach in the short term. Under the Standardised approach, Euroclear makes use of external ratings from the three major rating agencies (Moody's, Standard & Poor's and Fitch) for the limited credit exposure these entities incur and maps these ratings to the credit quality steps using the standard conversion rules published by EBA.

Operational Risk

For operational risk, Euroclear Bank is permitted by the NBB to use the **Advanced Measurement Approach (AMA)** for the calculation of Pillar 1 capital requirements. At all consolidated levels above Euroclear Bank, a hybrid approach is used by combining the AMA for Euroclear Bank with a Standardised Approach for the group's other entities.

Market Risk

As Euroclear Bank is a limited purpose bank and does not have a trading book, the market risk that Euroclear Bank incurs is very limited. For market risk, Euroclear uses the Standardised Approach to cover the Foreign Exchange risk.

The next table following sets out the group's Tier 1 and total capital, which both comfortably meet regulatory requirements.

It gives details of the risk- weighted assets and regulatory capital requirements of both Euroclear plc and Euroclear Bank as at 31 December 2017.

Risk-weighted assets and regulatory capital

Overview of Risk Weighted Assets [1] *Euroclear consolidated (€'000)*	Risk-weighted assets [2]		Minimum capital requirement
	December 2017	December 2016	December 2017
Credit risk (excluding CCR)	2,218,063	2,135,688	177,445
of which the foundation IRB (FIRB) approach	2,218,063	2,135,688	177,445
Counterparty Credit Risk	11,410	15,724	913
of which original exposure	3,755	5,959	300
of which Credit Valuation Adjustment	7,655	9,766	612
Settlement risk	–	–	–
Securitisation exposures in the banking book	–	–	–
Market risk	352,470	350,340	28,198
of which the standardised approach	352,470	350,340	28,198
Large exposures	–	–	–
Operational risk	4,210,683	4,157,035	336,855
of which basic indicator approach	1,818	35,272	145
of which standardised approach	858,865	834,263	68,709
of which advanced measurement approach	3,350,000	3,287,500	268,000
Amounts below the thresholds for deduction (subject to 250% risk weight)	–	–	–
Floor adjustment	–	–	–
Total	**6,792,627**	**6,658,788**	**543,410**

(1) Template EU OV1 – EU MR1-B

(2) Risk- weighted as represent the total capital requirement multiplied by a factor of 12.5. This means that the risk-weighted assets do not only relate to credit and market risk, but also comprise the gross-up of the capital requirements related to operational risks. For Euroclear, the latter are the main source.

The CRR requires the bank to maintain at all times:

- a ratio of total capital to risk-weighted assets that cannot fall under a threshold of 8%;
- a ratio of Tier 1 capital to risk-weighted assets that must exceed a threshold of 6%;
- a ratio of common equity Tier1 capital exceeding 4.5%; and
- a capital conservation buffer of 2.5% in common equity as of 2016 and phased in over 4 years between 2016 and 2019.

Euroclear Bank and Euroclear SA/NV have, together with seven other banks or banking groups in Belgium, been identified in 2015 by the NBB as domestically systemically important institutions (D-SII) under Belgian Banking law and CRD IV.

Euroclear SA/NV consolidated maintains as well an internal view on the amount of capital that it needs to have in order to protect itself from unexpected losses. These losses are resulting from the risks it faces in its various activities under Pillar 2 of the Basel Framework.

The internal view on Euroclear Bank's capital needs is based on economic capital models, which estimate the amount of capital that Euroclear needs to have in order to protect itself from unexpected losses resulting from the risks it faces in its various activities. This view is complemented by what-if loss scenarios as part of an annual stress testing programme. Euroclear Bank is therefore confident that the resulting capital requirements are adequate to support the risks that it faces.

In addition, the NBB started in 2016 to apply a common equity Tier 1 capital ratio surcharge of 0.75% to Euroclear Bank standalone, Euroclear Bank and Euroclear SA/NV consolidated. The 0.75% is applied in three tranches of 0.25% to each of these entities.

	Euroclear Bank (€'000)
Pillar 1 capital requirements	334,000
Pillar 2 capital requirements	1,054,000

Composition of Capital

Euroclear's total capital is only made up of Tier 1 capital. Tier 1 is essentially made up of shareholders' capital, share premium, consolidated reserves and retained earnings. Goodwill and intangible fixed assets are deducted in full from Tier 1 capital. This section can be read in conjunction with the Financial Statements of Euroclear.

The table below reconciles the composition of regulatory capital as at 31 December 2017 to the audited financial statements in accordance with Article 2 in Commission implementing regulation (EU) No 1423/2013.

As at 31 December 2017, the regulatory consolidation scope is identical to the statutory consolidation scope.

Regulatory capital composition

31 December 2017 (€'000)	Euroclear consolidated	Euroclear Bank	Reference to balance sheet
Called up share capital and share premium	**146,370**	**843,505**	a
- Share capital	3,147	285,497	
- Share premium	143,223	558,008	
Capital redemption reserve	**684**	–	b
Other reserves	**1,079,646**	**94,048**	b
- of which cash flow hedge	38	-	c
Retained earnings [1]	2,443,969	**668,535**	
- PY retained earning	2,262,893	594,741	d
- CY retained earnings	235,989	73,794	d
- Defined benefit plan	(60,382)	–	b
- Non-taxable reserve	5,469	–	b
Shareholder's equity as per financial statements	**3,670,669**	**1,606,088**	
Proposed dividend [1]	**(122,751)**	–	d
Regulatory adjustments			
- Goodwill and other intangible assets	(1,012,067)	(44)	e
- Cash flow hedge	(38)	–	c
- Negative amounts resulting from the calculation of expected loss amounts	(4,912)	(4,542)	
- CET1 instruments of financial sector entities where the institution does not have a significant investment	(50,964)	–	
Common Equity Tier 1 capital	**2,479,937**	**1,601,502**	
Qualifying Tier 1 instruments	–	–	
Qualifying Tier 2 instruments	–	–	
Total capital base	**2,479,937**	**1,601,502**	

[1] Retained earnings after appropriation and transfer for Euroclear Bank, proposed dividend already deducted in shareholder's equity as per Financial Statement

Transitional own funds

Common equity Tier 1 capital: instruments and reserves of Euroclear Bank stand-alone

	31 December 2017 (€'000)	Amount at disclosure date	Reference to balance sheet
1	Capital instruments and the related share premium accounts	843,505	a
	- of which: Ordinary shares and related share premium	843,505	
2	Retained earnings	668,535	d
3	Accumulated other comprehensive income (and other reserves, to include unrealised gains and losses under the applicable accounting standards)	94,048	b
6	Common Equity Tier 1 (CET1) capital before regulatory adjustments	1,606,088	
Common Equity			
8	Intangible assets (net of related tax liability) (negative amount)	-44	e
12	Negative amounts resulting from the calculation of expected loss amounts	-4,542	
28	Total regulatory adjustments to Common equity Tier 1 (CET1)	-4,586	
29	Common equity Tier 1 (CET1)	1,601,502	
45	Tier 1 capital (T1 = CET1 + AT1)	1,601,502	
58	Tier 2 (T2) capital	–	
59	Total capital (TC = T1 + T2)	1,601,502	
60	Total risk weighted assets	4,177,022	
Capital ratios and buffers			
61	Common Equity Tier 1 (as a percentage of risk exposure amount)	38.34%	
62	Tier 1 (as a percentage of risk exposure amount)	38.34%	
63	Total capital (as a percentage of risk exposure amount)	38.34%	
64	Institution specific buffer requirement (CET1 requirement in accordance with article 92(1)(a) plus capital conservation and countercyclical buffer requirements, plus systemic risk buffer, plus the systemically important institution buffer (G-SII or O-SII buffer), expressed as a percentage of risk exposure amount) (2)	1.75%	
65	- of which: capital conservation buffer requirement	1.25%	
68	Common equity Tier 1 available to meet buffers (as a percentage of risk exposure amount)	30.34%	
72	Direct and indirect holdings of the capital of financial sector entities where the institution does not have a significant investment in those entities (amount below 10% threshold and net of eligible short position)	2,593	

(1) Amounts subject to pre-regulation(eu) N° 575/2013 treatment or prescribed residual amount of regulation (eu) N° 575/2013.

(2) Capital conservation buffer of 0.625% (2.5% phased in over four years between 2016 and 2019) and O- SII buffer of 0.50% (as per NBB November 10, 2015 regulation identifying Euroclear Bank as Other Systemically Important Institution imposing to hold an additional 0.75% buffer of CET1 (phased in over three years between 2016 and 2018).

Common equity Tier 1 capital: instruments and reserves of Euroclear

	31 December 2017 (€'000)	Amount at disclosure date	Amount [1]	Reference to balance sheet
1	Capital instruments and the related share premium accounts	146,370		a
	- of which: Ordinary shares and related share premium	146,370		
2	Retained earnings	2,376,131		d
3	Accumulated other comprehensive income (and other reserves, to include unrealised gains and losses under the applicable accounting standards)	1,025,417		b
6	Common Equity Tier 1 (CET1) capital before regulatory adjustments	3,547,918		
Common Equity				
8	Intangible assets (net of related tax liability) (negative amount)	-1,012,067		e
11	Fair value reserves related to gains or losses on cash flow hedges	-38		c
12	Negative amounts resulting from the calculation of expected loss amounts	-4,912		
18	Direct and indirect holdings by the institution of the CET1 instruments of financial sector entities where the institution does not have a significant investment in those entities (amount above the 10% threshold and net of eligible short positions) (negative amount)	-50,964		
28	Total regulatory adjustments to Common equity Tier 1 (CET1)	-1,067,981		
29	Common equity Tier 1 (CET1)	2,479,937		
45	Tier 1 capital (T1 = CET1 + AT1)	2,479,937		
58	Tier 2 (T2) capital	0		
59	Total capital (TC = T1 + T2)	2,479,937		
60	Total risk weighted assets	6,792,627		
Capital ratios and buffers				
61	Common Equity Tier 1 (as a percentage of risk exposure amount)	36.51%		
62	Tier 1 (as a percentage of risk exposure amount)	36.51%		
63	Total capital (as a percentage of risk exposure amount)	36.51%		
68	Common equity Tier 1 available to meet buffers (as a percentage of risk exposure amount)	28.51%		
72	Direct and indirect holdings of the capital of financial sector entities where the institution does not have a significant investment in those entitites (amount below 10% threshold and net of eligible short position)	241,766		
75	Deferred tax assets arising from temporary differences (amount below 10% threshold, net of related tax liability where the conditions in Article 38(3) are met)	79,431		

[1] Amounts subject to pre-regulation(eu) N° 575/2013 treatment or prescribed residual amount of regulation (eu) N° 575/2013.

Leverage Ratio

The Basel III leverage ratio framework follows the same scope of regulatory consolidation as the Basel risk based capital framework. It is a supplemental non-risk-based 'back-stop.' It is defined as the capital measure (the numerator) divided by the exposure measure (the denominator). The capital measure is made up of Basel III Tier 1 capital. The non-binding minimum leverage ratio is currently set at 3%.

The tables below show the components of the leverage ratio for Euroclear group as at 31 December 2017.

CRR Leverage Ratio Disclosure

Table LRSum: Summary reconciliation of accounting assets and leverage ratio exposures

31 December 2017 (€'000)		**Euroclear consolidated**
1	Total assets as per published financial statements	22,008,266
2	Adjustment for entities which are consolidated for accounting purposes but are outside the scope of regulatory consolidation	–
3	(Adjustment for fiduciary assets recognised on the balance sheet pursuant to the applicable accounting framework but excluded from the leverage ratio exposure measure in accordance with Article 429(13) of Regulation (EU) No 575/2013 'CRR')	–
4	Adjustments for derivative financial instruments	63,822
5	Adjustments for securities financing transactions 'SFTs'	170,980
6	Adjustment for off-balance sheet items (ie conversion to credit equivalent amounts of off-balance sheet exposures)	824,908
EU-6a	(Adjustment for intragroup exposures excluded from the leverage ratio exposure measure in accordance with Article 429 (7) of Regulation (EU) No 575/2013)	–
EU-6b	(Adjustment for exposures excluded from the leverage ratio exposure measure in accordance with Article 429 (14) of Regulation (EU) No 575/2013)	–
7	Other adjustments	-1,063,069
8	**Total leverage ratio exposure**	**22,004,908**

Table LRCom: Leverage ratio common disclosure

31 December 2017 (€'000)		Euroclear consolidated
On-balance sheet exposures (excluding derivatives and SFTs)		
1	On-balance sheet items (excluding derivatives, SFTs and fiduciary assets, but including collateral)	13,975,507
2	(Asset amounts deducted in determining Tier 1 capital)	-1,063,069
3	**Total on-balance sheet exposures (excluding derivatives, SFTs and fiduciary assets) (sum of lines 1 and 2)**	**12,912,438**
4	Replacement cost associated with all derivatives transactions (ie net of eligible cash variation margin)	–
5	Add-on amounts for PFE associated with all derivatives transactions (mark-to-market method)	–
EU-5a	Exposure determined under Original Exposure Method	63,822
6	Gross-up for derivatives collateral provided where deducted from the balance sheet assets pursuant to the applicable accounting framework	–
7	(Deductions of receivables assets for cash variation margin provided in derivatives transactions)	–
8	(Exempted CCP leg of client-cleared trade exposures)	–
9	Adjusted effective notional amount of written credit derivatives	–
10	(Adjusted effective notional offsets and add-on deductions for written credit derivatives)	–
11	**Total derivative exposures (sum of lines 4 to 10)**	**63,822**
Securities financing transaction exposures		
12	Gross SFT assets (with no recognition of netting), after adjusting for sales accounting transactions	8,032,760
13	(Netted amounts of cash payables and cash receivables of gross SFT assets)	–
14	Counterparty credit risk exposure for SFT assets	38,434
EU-14a	Derogation for SFTs: Counterparty credit risk exposure in accordance with Article 429b (4) and 222 of Regulation (EU) No 575/2013	–
15	Agent transaction exposures	132,546
EU-15a	(Exempted CCP leg of client-cleared SFT exposure)	–
16	**Total securities financing transaction exposures (sum of lines 12 to 15a)**	**8,203,740**
Other off-balance sheet exposures		–
17	Off-balance sheet exposures at gross notional amount	8,249,079
18	(Adjustments for conversion to credit equivalent amounts)	-7,424,171
19	**Other off-balance sheet exposures (sum of lines 17 to 18)**	**824,908**
Exempted exposures in accordance with CRR Article 429 (7) and (14) (on and off balance sheet)		
EU-19a	(Exemption of intragroup exposures (solo basis) in accordance with Article 429(7) of Regulation (EU) No 575/2013 (on and off balance sheet))	–
EU-19b	(Exposures exempted in accordance with Article 429 (14) of Regulation (EU) No 575/2013 (on and off balance sheet))	–
Capital and total exposures		
20	**Tier 1 capital** (1)	**2,366,699**
21	**Total leverage ratio exposures (sum of lines 3, 11, 16, 19, EU-19a and EU-19b)**	**22,004,908**
Leverage ratio		
22	**Leverage ratio**	**10.76%**
Choice on transitional arrangements and amount of derecognised fiduciary items		
EU-23	Choice on transitional arrangements for the definition of the capital measure	–
EU-24	Amount of derecognised fiduciary items in accordance with Article 429(11) of Regulation (EU) NO 575/2013	–

(1) Difference with Tier 1 capital disclosed in own fund template is due to CY retained earnings after deduction of proposed dividends.

CRR leverage ratio exposures

31 December 2017 (€'000)		**Euroclear consolidated**
EU-1	Total on-balance sheet exposures (excluding derivatives, SFTs, and exempted exposures), of which:	13,976,030
EU-2	- Trading book exposures	–
EU-3	Banking book exposures, of which:	13,976,030
EU-4	- Covered bonds	–
EU-5	- Exposures treated as sovereigns	7,961,704
EU-6	- Exposures to regional governments, MDB, international organisations and PSE NOT treated as sovereigns	–
EU-7	- Institutions	4,116,152
EU-8	- Secured by mortgages of immovable properties	–
EU-9	- Retail exposures	–
EU-10	- Corporate	68,179
EU-11	- Exposures in default	–
EU-12	- Other exposures (eg equity, securitisations, and other non-credit obligation assets)	1,829,994

Asset encumbrance

In accordance with Article 443 of Regulation (EU) 575/2013 (the Capital Requirements Regulation – CRR), the below information on asset encumbrance is disclosed for Euroclear consolidated.

The amounts in the three below tables are the median of the end-of-period values for each of the four quarters of the year (as per the EBA Regulatory Technical Standards published).

Asset encumbrance [(1)]

31 December 2017 (€'000)	Encumbered assets		Unencumbered assets	
	Carrying amount	Fair value	Carrying amount	Fair value
	010	040	060	090
010 – Assets of the reporting institution	35,386	–	24,314,440	–
030 – Equity instruments	–	–	307,081	307,081
040 – Debt instruments	35,386	35,386	5,101,576	5.101.576
120 – Other assets	–	–	19,021,038	–

The broad categories of asset type (column 060) are:

- Debt instruments (5,1Bn or 21% of total assets): Euroclear capital and part of client end-of-day cash positions are invested in prime European Sovereign debt or International organisations; and
- Other assets 19 Bn or 78% of total assets):
  - Client end-of-day balances are invested with high quality market counterparts, preferably by using reverse repurchase agreements (72%).
  - the tangible and intangible assets 7%.

Collateral received [(2)]

31 December 2017 (€'000)	Fair value of encumbered collateral received or own debt securities issued	Fair value of collateral received or own debt securities issued available for encumbrance
	010	040
130 – Collateral received by the reporting institution	469,605	8,121,432
150 – Equity instruments	–	–
160 – Debt instruments	469,605	8,121,432
230 – Other collateral received	–	–
240 – Own debt securities issued other than own covered bonds or ABS	–	–

The entire collateral received results from the secured financing transactions concluded by the Euroclear Bank Treasury department. High credit and liquidity collateral criteria are required.

(1) Template A – Assets
Template B – Collateral

Sources of encumbrance [1]

31 December 2017 (€'000)	Matching liabilities contingent liabilities or securities lent 010	Assets, collateral received and own debt securities issued other than covered bonds and ABSs encumbered 030
010 – Carrying amount of selected financial liabilities	450,057	470,113

Activities do not lead to asset encumbrance as Euroclear consolidated is not involved in derivatives transactions. The encumbrance is fully concentrated on Euroclear Bank SA and results from repo deals. The purpose of these repo deals is to maintain an active relationship with cash givers in case of contingency situations.

(1) Template C – Sources of encumbrance

Credit risk management

Credit risk is the risk to Euroclear's earnings or capital arising from Euroclear's obligor's [1] failure to perform due to inability or unwillingness on its financial obligations to Euroclear on time and in full. The degree of credit risk depends on the credit standing of the obligor and on the duration, amount and nature of the exposure that Euroclear has with that participant or other counterpart. As of the implementation of the CSDR, Euroclear Bank is subject to limitations on the banking services it provides as well as specific rules on credit risk management and collateralization over and above the Basel III requirements.

Euroclear Bank

Credit risk is mainly taken on borrowing participants and on other counterparts when performing the day-to-day balance sheet management.

All credit granted to borrowing participants is uncommitted and must be secured by proprietary collateral, for which strict collateralisation rules apply. As of 2018, unsecured exposure on borrowing participants will only be permitted when allowed under CSDR (i.e. exempted entities).

Euroclear Bank has also treasury exposures resulting from participants' end-of-day cash positions. These balances are usually re-deposited in the market with high quality counterparties for a short duration, preferably by using reverse repurchase agreements (reverse repos) or invested in very high quality securities with relatively short-term maturities. Unsecured treasury credit exposure is allowed but kept limited.

The Euroclear CSDs

The CSDs have no direct cash relationship with their clients as their transactions settle in central bank money. Consequently, they cannot extend loans or credit facilities to their customers. The Euroclear CSDs are exposed to credit risk related to the reinvestment of their cash surplus with their bank counterparties. Credit risk is however mitigated through a strict investment policy limiting among others the allowed counterparties (rating minimum in the 'A' range), type of instruments, currencies and maturity (maximum three years).

Unless stated otherwise, the scope of the credit risk disclosure is on Euroclear Bank as this is the only credit institution of the group and the main entity within the Euroclear group facing credit risk.

(1) In the scope of its activities Euroclear's obligors are defined as borrowing participants, cash correspondents and settlement banks, treasury counterparts and issuers of securities in the investment and treasury securities portfolio.

Strategies and processes

Credit Risk Framework

Euroclear Bank's credit risk framework is based on Euroclear Bank's credit risk appetite, which is limited by:

- the available capital allocated annually for credit risk by the Euroclear Bank Board;
- regulatory limits - caps - including risk concentration limits and capital adequacy ratios; and
- internal limits, for example, credit, country or treasury limits.

The credit risk framework addresses among others the size and condition of credit facilities for borrowing participants and market facilities to support treasury activity, concentrations and collateral quality. Its main principles can be summarised as follows:

- The granting of a credit or market facility is a discretionary decision based on an appropriate assessment of the creditworthiness and risk profile of respectively the borrowing participant or other counterpart;
- The size and conditions of the facility reflect the financial soundness of the borrowing participant or other counterpart, must be in line with its Euroclear Bank activity, and internal and regulatory limits;
- Credit facilities are intraday, uncommitted (aiming at settlement efficiency) and may be multi-currency. The active monitoring of currency fluctuations may however require an adjustment to the size of the credit facilities from time to time. No credit is granted for currencies in which Euroclear Bank has no liquidity capacity;
- Credit facilities are fully collateralised with collateral for which strict collateralisation rules apply. Furthermore, collateral is held and pledged in Euroclear Bank and a collateral agreement must be in place to allow liquidation of the collateral in the event of a borrowing participant default.

Board policies and handbooks are approved by the Euroclear Bank Board or Management Committee and are renewed at least annually or in case of material changes. Additionally operational processes are designed and reassessed on a regular basis to actively monitor and minimize credit risks.

The risk of a credit loss for Euroclear Bank is deemed very low and to date Euroclear Bank has not experienced any credit losses, not even during the period of market turmoil. This is largely due to the very short duration (mostly intra-day) and predominantly secured nature of its credit exposures.

Credit Exposures

Credit facilities vis-à-vis Participants

Euroclear Bank provides uncommitted multi-currency and multi-purpose credit facilities to its participants to support their activity in the Euroclear System, mainly on an intra-day basis. Credit officers within the Credit department determine whether or not credit facilities can be offered to a given participant, and the size of such facilities. The size of the credit facilities is based on risk appetite and the desired risk profile in accordance with the risk management framework and is reviewed when required or at least annually. Facilities can be reduced or withdrawn at any time, without notice.

Credit facilities are primarily used for the following purposes:

- **Settlement activities**: Euroclear Bank may extend credit to participants to facilitate (local market) settlements on **Delivery-Versus-Payment (DVP)** basis, as from when it sends instructions (to the local market) for either matching or settlement purposes. Settlement credit exposure (due to primary and secondary market activity) occurs when Euroclear Bank debits a participants' cash account to execute a transaction for an amount above the cash available in that currency, provided that such participant has been granted a credit line and has sufficient collateral or when there are structural time lags in the flow of funds as a result of time-zone and operating hours differences of the various intermediaries involved in the payments.
- **Securities lending and borrowing**: Participants must have credit arrangements in place with Euroclear Bank as a prerequisite to borrow securities through the Euroclear Securities Lending and Borrowing Programme. In order to support settlement activity, the Securities Lending and Borrowing program automatically generates a securities borrowing for the account of the participants who adhered to the program, provided that sufficient securities are available in the lending pool (i.e. securities held by lenders that are available for lending on an automatic basis) and that the applicable risk management measures are met on the securities borrower side (respect of the credit limit and full collateralisation of the position).
- **General Collateral Access (GCA)**: Participants must have credit arrangements in place with Euroclear Bank as a prerequisite to borrow securities through the GCA Programme. GCA is a service allowing participants to borrow high-quality sovereign and supranational securities on demand (primarily for collateral management purposes). All GCA loans are fully collateralised and borrowers have a dedicated credit limit for this activity within their global credit limit.
- **Cash services**: Euroclear Bank provides cash services to its participants allowing them to transfer funds in/out. Euroclear Bank also allows participants to use their credit line to wire out expected proceeds linked to Euroclear Bank services (due to different time zones and currency deadlines).

Euroclear Bank limits the aggregate operating exposure at individual and family level. The **Global Family Limit (GFL)** puts a cap on the maximum credit (absolute limit) provided to any single family. Additionally, credit limits per currency for participants have been setup in line with Euroclear Bank's ability to generate liquidity in the respective currencies.

Participants may receive temporary credit in excess of their credit facilities, upon appropriate collaterisation and approvals. The objective of the temporary credit is to unblock transactions that would otherwise prevent the settlement of a chain of transactions, which could result in liquidity risks for Euroclear participants.

Participants that benefit from credit facilities are required to execute special credit documentation with Euroclear Bank.

Unsecured credit facilities are only provided when allowed under CSDR i.e. to exempt entities in accordance with Article 23(2) of Regulation (EU) 390/2017, and central banks, multilateral development banks and international organisations (other than exempt entities) of which the exposures are covered by Euroclear Bank's eligible capital after deduction of the regulatory CSDR capital requirement.

Credit exposures vis-à-vis other counterparties

In addition to the operating exposure on participants, Euroclear Bank is exposed to financial institutions as a result of regular treasury operations, including:

- **Cash placements**: Euroclear Bank has treasury exposures resulting from participant's end-of-day cash positions. These long cash positions are placed in the market with high quality counterparties for a short duration, preferably by using reverse repo transactions. Additionally it is the role of Treasury to manage cash flows such that the end of day positions at cash correspondents are flat. However, credit exposure can arise from any long cash positions that Euroclear Bank has throughout the day (intraday credit risk) and on any residual long cash position left overnight. Cash correspondents are appointed after going through a rigorous selection process aiming at ensuring the risk they pose to Euroclear Bank and its participants are acceptable.
- **The Investment and Treasury Book**: Euroclear Bank purchases securities for its investment and treasury books, but the Treasury can only invest in highly rated and liquid securities. Furthermore to preserve Euroclear Bank's capital, Euroclear Bank's investment book can only be invested according to the concentration limits defined.

Credit exposures to other counterparties are limited by specific facilities for market transactions ("market facilities"). Credit officers within the Credit department determine whether or not market facilities can be offered to a given counterparty and the size of such facilities.

Unsecured credit exposure on counterparties that are not borrowing participants such as treasury counterparts is allowed but kept limited (e.g. voluntary unsecured exposure on non-investment grade counterparties is not allowed).

The credit exposure of the interoperable link (i.e. the Bridge) with **Clearstream Banking Luxembourg (CBL)** is secured by means of a letter of credit issued by a consortium of creditworthy financial institutions in Euroclear Bank's favour. In accordance with Article 16(k) of Regulation (EU) 390/2017, no credit institution has committed to a share of the total outstanding letter of credit above 10%. In the event of a CBL default Euroclear Bank is however also exposed to the syndicate of banks that have issued the letter of credit. By end 2018, the credit risk management principles governing the bridge activity will be re-enforced to meet CSD-R requirements.

Total and average net amount of exposures under the FIRBA

Euroclear Bank has been authorised by the NBB to use a maturity-adjustment factor in its FIRBA model, to account for the very short durations of its exposures. At 14 days, this maturity adjustment factor has been chosen very conservatively to reflect the delays that Euroclear would face when trying to realise the collateral of a defaulting participant or other counterpart. The maturity adjustment factor is not used for exposures with a clearly defined or longer maturity (e.g. investments held in the investment book).

Credit exposure includes exposure from participants and other counterparties but excludes the exposure from short/medium term derivative transactions which are captured as counterparty credit exposure.

	Euroclear consolidated [1] [2]				
31 December 2017 (€'000)	**Total net exposures**	**Central governments and central banks**	**Institutions**	**Corporates**	**Equities**
Net exposures at the end of the period	55,102,325	7,961,704	46,591,031	279,444	270,145
Average gross credit exposures Euroclear SA/NV [3]	56,932,314	7,587,969	48,667,254	390,130	286,962

(1) Any difference between total amounts and the sum of components are due to rounding.

(2) Template EU CRB-B data

(3) Average gross exposure is based on four data points taken at the end of each quarter. There are some important fluctuations in the data.

Residual maturity breakdown of credit exposures

Generally credit exposure is less than 24 hours (i.e. intraday). The duration varies with the sources of exposure and funding. Participants for which cash flows are mainly driven by purchases and sales within the Euroclear system in a back-to-back mode, only need credit for a few milliseconds, to allow the transactions to settle. Operating exposures that need to be funded by either cross-border deliveries or credits on participants' accounts from external intermediaries tend to last longer, up to several hours.

Only in unforeseen circumstances (primarily as the result of settlement failures or delayed credits) can part of the operating exposure become an end-of-day overdraft retained in the books of Euroclear Bank until the next day. Furthermore sanctioning rates act as an effective deterrent to discourage participant intraday credit exposures to translate into overnight credit exposures. Other credit exposures that can go beyond the short-term (intraday and overnight) are related to Treasury activity, **Securities Lending and Borrowing (SLB)** and **General Collateral Access (GCA)** Term lending.

	Euroclear consolidated (1) (2)				
31 December 2017 (€'000)	**Total net exposures**	**Central governments and central banks**	**Institutions**	**Corporates**	**Equities**
Less than two weeks (3)	47,517,106	4,278,069	42,986,170	252,866	–
2 weeks – 1 month	1,056,679	850,152	206,527	–	–
1 – 6 months	4,927,100	2,435,521	2,491,451	129	–
≤ 1 year	990,870	259,898	729,972	1,000	–
> 1 year ≤ 5 years	340,424	138,065	176,910	25,449	–
No Stated maturity	270,145	–	–	–	270,145
Total	**55,102,325**	**7,961,704**	**46,591,031**	**279,444**	**270,145**

(1) Any difference between total amounts and the sum of components are due to rounding.

(2) Template EU CRB-E

(3) Nearly all exposures have a maturity of one day. The two weeks correspond to the maturity adjustment that Euroclear has been allowed to use under FIRBA

Concentration risk

Concentration limits are set to ensure that the group does not take excessive exposures on a limited number of participants or counterparties. Additionally thresholds are set per collateral asset type, individual issuers, country (including geographic region), economic sector, type/activity of the issuer, rating, settlement currency, etc.

European regulation (Article 395 of Regulation (EU) 575/2013) imposes risk concentration limits that have to be respected for each applicable exposure. The Large Exposure Limit is the maximum amount that Euroclear Bank can lend to a single participant family or group of connected clients. Euroclear Bank should never have an end of day exposure on one single participant family larger than 25% of its eligible capital, after taking into account the effect of the credit risk mitigation in accordance with Articles 399 to 403 of Regulation (EU) 575/2013. Additionally limits to manage concentration risk arising from exposures to shadow banking entities (defined as under Article 395(2) of Regulation (EU) 575/2013 and that are not excluded undertakings as defined in EBA guidelines (EBA/GL/2015/20) are in place, both at individual family and aggregated level.

Euroclear SA/NV and Euroclear Belgium, both located in Belgium, are subject to capital adequacy regulations equivalent to those applicable to Euroclear Bank. This stems from their regulatory status, as a settlement institution for Euroclear Belgium, and as a company closely related to a settlement institution for Euroclear SA/NV. Consequently, both entities have to make sure that they do not breach the same concentration limits as defined for Euroclear Bank.

Concentration of credit exposures by industry or counterparty types

Given Euroclear's role as a provider of post-trade services to global capital markets, its credit exposures are highly concentrated on the financial sector. Euroclear does incur credit exposures on some non-financial industrial sectors.

	Euroclear consolidated [1] [2]				
31 December 2017 (€'000)	**Total net exposures**	**Central governments and central banks**	**Institutions**	**Corporates**	**Equities**
Finance and Insurance activities	51,363,914	4,860,526	46,027,826	224,717	250,845
Public administration and defence, compulsory social security	3,664,383	3,101,179	563,205	-	-
Administrative and support service activities	52,861	-	-	51,661	1,200
Information and communication	11,709	-	-	1,338	10,371
Others	9,457	-	-	1,727	7,730
Total	**55,102,325**	**7,961,704**	**46,591,031**	**279,444**	**270,145**

[1] Any difference between total amounts and the sum of components are due to rounding.
[2] Template EU CRB-D

Geographical concentration of credit exposures

The important geographical regions in which credit exposure is concentrated are (Western) Europe, North America and Oceania. The geographical regions are those in which Euroclear participants or counterparties are located. Cash is always classified under the country of the issuing central bank.

	Euroclear consolidated [1] [2]				
31 December 2017 (€'000)	**Total net exposures**	**Central governments and central banks**	**Institutions**	**Corporates**	**Equities**
Western Europe	50,566,985	7,548,836	42,472,273	279,410	266,466
Other Europe [3]	10,464	0	10,464	–	–
North America	1,220,507	39,120	1,177,698	10	3,679
Oceania	2,356,209	–	2,356,209	0	–
Asia	712,648	373,551	339,088	8	1
Central and South America	192,024	4	192,016	5	–
Middle East	43,371	179	43,181	11	–
Africa	116	14	102	–	–
Total	**55,102,325**	**7,961,704**	**46,591,031**	**279,444**	**270,145**

(1) Any difference between total amounts and the sum of components are due to rounding. The classification of countries does not correspond to the consolidated financial statements, where e.g. The Americas encompasses fewer countries than here the total of North and Central and South America.

(2) Template EU CRB-C

(3) Other Europe incudes Turkey.

Rating concentration of financial assets

About 98% of the settlement and treasury exposures of Euroclear Bank were taken on investment grade participants and counterparties. In addition, on average more than 99% of the settlement exposure is secured and most of this exposure is intraday. As of 2018, unsecured exposure on borrowing participants will only be permitted when allowed under CSDR (e.g. exempted entities).

As for the exposure taken on its investment and treasury books, Euroclear Bank follows a conservative approach. Any security held in these books, which in IFRS terms is to be understood as all fixed income securities belonging to the available-for-sale portfolio, needs to have a credit rating equal to, or greater than, 'AA-'.

In December 2017, 100% of the securities held by Euroclear Bank were rated 'AA' or higher.

Euroclear SA/NV standalone and Euroclear Belgium exposures are principally limited to own funds reinvestment for which the investment policy ensures sufficient diversification.

Equities under the simple risk-weighted approach

Euroclear applies the simple risk weighting method to its equity exposures, as the amount and complexity of its equity holdings is relatively limited. Under that method, a 190% risk weight is to be applied to private equity in a sufficiently diversified portfolio, 290% to exchange traded equity exposure and 370% to all other equity holdings.

	Euroclear consolidated [1] [2]					
31 December 2017 (€'000)	On-balance sheet amount	Off-balance sheet amount	Risk weight	Exposure amount	RWAs	Capital requirements
Private equity exposures	–	–	190%	–	–	–
Exchange-traded equity exposures	239,623	–	290%	239,623	694,908	55,593
Other equity exposures	30,522	–	370%	30,522	112,931	9,034
Total	**270,145**	**–**		**270,145**	**807,839**	**64,627**

[1] Any difference between total amounts and the sum of components are due to rounding.

[2] Template EU CR10

Counterparty credit risk

Counterparty credit risk is the risk that the counterparty to a transaction could default before the final settlement of the transaction's cash flows. Unlike a firm's exposure to credit risk through a loan, where the exposure to credit risk is unilateral and only the lending bank faces the risk of loss, counterparty credit risk generates a bilateral risk of loss.

Counterparty credit risk is only relevant for Euroclear Bank's treasury operations, which are related to either the management of participant balances or long-term investments intended to preserve its capital base.

In these activities, Euroclear Bank incurs counterparty credit risk on the treasury counterparties used to do short term derivative transactions and term repo transactions Such transactions expose Euroclear Bank to a counterparty credit risk and settlement risk.

As an institution located in multiple countries and active in many markets, Euroclear Bank needs to conduct foreign exchange transactions to hedge its foreign exchange and interest rate exposures. Due to their purpose, and their limited scope, Euroclear Bank's hedging activities do not constitute trading book activities but are included in the banking book. Hedging is further described in the chapter on Market risk management.

Counterparty credit risk is managed, as part of the credit risk framework, through limits at individual counterparty level and global limits at counterparty family level for all types of exposures. These limits depend on both the internal counterparty credit rating and the maturity of the deal. In addition, there are very specific restrictions on longer maturities (maximum 18 months).

The consequences of a rating downgrade of Euroclear Bank, rated 'AA+' by Fitch Ratings and 'AA' by Standard and Poors, on collateral demand can be considered nihil. Euroclear Bank is structurally a collateral taker and only posts collateral at the National Bank of Belgium to obtain liquidity for use in the TARGET system.

Counterparty credit exposures

Euroclear Bank has been authorised by the NBB to use a maturity-adjustment factor in its FIRBA model, to account for the very short durations of its exposures. At 14 days, this maturity adjustment factor has been chosen very conservatively to reflect the delays that Euroclear Bank would face when trying to realise the collateral of a defaulting participant or other counterpart. The maturity adjustment factor is not used for exposures with a clearly defined or longer maturity (e.g. derivatives contracts which are used solely for hedging purposes).

In the table below, counterparty credit exposure is limited to the foreign-exchange forward transactions used by Euroclear Bank to hedge future earnings against detrimental market movements. Euroclear Bank does not hold any credit derivatives nor any structured products, as doing this for trading investment purposes would not be in line with its risk averse policy. To calculate counterparty credit exposure, Euroclear Bank applies the original method, as per article 275 of the CRR 571/2013.

	Euroclear consolidated		
31 December 2017 (€'000)	Notional	EAD post Credit Risk Mitigation	RWAs
Original exposure [1]	3,183,302	63,822	3,755

(1) Template EU CCR1

Impaired exposures

Definition of past due and impaired

In accordance with IFRS 7, assets qualify as past due when a counterparty has failed to make a payment on the contractual due date.

The group assesses at each balance sheet date whether there is objective evidence that a financial asset or group of financial assets classified as held-to-maturity, available-for- sale or loans and receivables is impaired.

A financial asset or portfolio of financial assets is impaired and/or an impairment loss is recognised where there is objective evidence that an event occurring after initial recognition of the asset has adversely affected the amount or timing of future cash flows, and this effect can be reliably estimated.

For financial assets carried at amortised cost, the amount of the impairment loss is measured as the difference between the carrying amount of the financial asset and the present value of estimated future cash flows discounted at the original market rate of return for a similar financial asset.

Cash flows relating to short- term receivables (less than three months) are generally not discounted. Impairment losses are recognised immediately in profit and loss. If, in a subsequent period, the amount of the impairment or bad debt loss decreases and the decrease can be related objectively to an event occurring after the recognition of the original loss, the loss is reversed.

The reversal shall not result in a carrying amount of the financial asset that exceeds what the amortised cost would have been had the impairment not been recognised at the date the impairment is reversed.

For financial assets carried at fair value, if there is objective evidence of the impairment of an available-for-sale financial asset, the cumulative net loss (difference between amortised acquisition cost and current fair value less any impairment loss previously recognised in profit or loss) that has previously been recognised in equity is removed and recognised in the income statement. If in a subsequent period, the fair value of an available-for-sale debt instrument increases and the increase can be related objectively to an event occurring after recognition of the original loss, the loss may be reversed through profit and loss. Impairments on investments in equities cannot be reversed.

Value adjustments and provisions

According to its policies, Euroclear makes risk provisions for credit exposures when necessary. Such provisions are made for ‘doubtful debt’, i.e. loans and receivables for which reimbursement is uncertain.

Credit risk mitigation

Different recourses are used to cover any credit exposure that Euroclear Bank may incur due to default following a credit event e.g. a bankruptcy. Additionally the potential residual credit exposure that Euroclear Bank faces after consideration of all credit mitigation and protective measures in place is monitored on a daily basis.

The paragraphs below explain how Euroclear Bank applies credit risk mitigation techniques to its intraday and longer exposures. Appropriate credit risk mitigation has contributed to the fact that Euroclear Bank has not incurred any credit loss to date.

Collateral Framework

Due to the international scope of its activities and the multi-purpose and multi-currency nature of the credit facilities granted to its participants, the collateral pledged by a participant to Euroclear Bank is not specifically attributable to any of the different types of credit exposures Euroclear Bank has with its participant. This means that all the collateral pledged from a specific participant is there to guarantee all the obligations it has with Euroclear Bank, irrespective of the nature of the exposure and the original currency.

In accordance with Articles 10-11 of Regulation (EU) 390/2017, strict collateralisation rules apply concerning the quality and quantity of securities used as collateral for overdrafts, guarantees issued to securities lenders in the context of the SLB and GCA programmes, and reverse repos. The preferred recourse type to secure the credit exposure in Euroclear Bank is a pledge of proprietary collateral (cash and securities), fully supported by standard credit documentation.

Euroclear Bank uses a four category collateral classification system for any collateral received. The internal rating as well as a series of credit, market and liquidity indicators are used to determine the category allocation. Any collateral that cannot be categorised in one of the four categories, is not accepted as collateral to secure credit exposure. Additionally Euroclear Bank sets rules

(i) for the type of collateral that can be used to cover its liquidity risk, and

(ii) defined a concentration limit for the lowest quality collateral. The lowest quality collateral can only be relied on to a very limited extent and within a well-defined exception framework.

The key principles for collateral acceptance (securities and cash) are as follows:

- Euroclear Bank has a reliable valuation methodology to derive the collateral value for each type of security, ensuring collateral value is adequately assessed under normal and stressed conditions;
- Euroclear Bank assesses the legal risks resulting from the acceptance of collateral (per relevant jurisdiction) and obtains an opinion on the enforceability of the collateral agreement; and
- Euroclear Bank actively monitors collateral to ensure that the accepted collateral covers market, credit and liquidity risk both in normal and stressed situations.

Once the above aspects are covered, the security/cash goes through the normal collateral valuation process. Securities that are not eligible for collateral purposes (such as those which are not eligible in the four collateral categories) are valued at zero.

Euroclear Bank does not block specific assets as collateral but calculates the collateral value of all assets held in pledged accounts and ensures that sufficient collateral is available at any time in the participant's account to cover its credit exposure on the latter. Should the collateral value fall below the credit facility limit, the available credit for that participant is automatically be reduced to the level of available collateral.

Euroclear Bank vis-à-vis its participants

Participants with a credit line have the following options to secure their credit exposure in Euroclear Bank:

- **Proprietary collateral**: Participants pledge assets (i.e. assets that may be used as collateral) that are segregated from assets that cannot be pledged (e.g. underlying participants' assets). The vast majority of participants use this type of recourse
- **Pledged cash deposits**: A participant deposits a certain amount (agreed upfront) of cash in one of its pledged cash accounts for a fixed period of time.
- **Related/unrelated party arrangements**: A borrowing participant pledges proprietary collateral to support a credit facility extended to another borrowing participant (of the same and/or different family) provided that the appropriate documentation is in place (subject to legal enforceability validation by Legal Division).
- **Customer assets pledge**: A borrowing participant pledges collateral which belongs to the borrowing participant's customers provided such participant has received the customers consent (subject to legal enforceability validation by Legal Division).

In the event of a participant default, Euroclear Bank has the right to immediately appropriate pledged securities to offset any credit exposure that the defaulting participant has.

Euroclear Bank does not accept letters of credit and bank guarantees to secure its exposures on participants resulting from the granting of credit lines.

Euroclear Bank vis-à-vis its counterparties

With other counterparts, Euroclear Bank uses other mechanisms for securing its credit exposure such as

- Reverse repurchase agreements, which are used for treasury activity (and for some non-exempt entities acting as borrowing participants),
- A Letter of Credit, which is used to secure the exposures Euroclear Bank has on CBL relating to the interoperable link they mutually maintain (the Bridge).

Netting

Euroclear Bank vis-à-vis its participants

In its relationship with its participants, Euroclear Bank has a right of set-off upon termination of participation or resignation of participants based on the Terms and Conditions Governing Use of Euroclear. In these situations Euroclear Bank has the right to:

(i) set off or retain from the amounts held by participants in their cash accounts, any amounts that are due to, or may become due to Euroclear Bank; and

(ii) retain securities held in Securities Clearance Accounts for the payment in full of any amounts which are due to, or which may become due to, Euroclear Bank.

If a participant has a credit line from Euroclear Bank, it is also bound by the General Conditions Governing Extensions of Credit and the Collateral Agreement. If such participant is in breach of the Collateral Agreement (event of default), then Euroclear Bank may exercise its rights on the collateral deposited by that participant. In this respect, Euroclear Bank can exercise its right of set-off or close-out netting as provided under Belgian law.

Participant positions are not netted on a day-to-day basis, as participant positions on sub-accounts (e.g. in different currencies) are considered separately. However, participants can use their cash as collateral to mitigate an outstanding position in another currency.

Euroclear Bank vis-à-vis its counterparties

For its treasury activities, Euroclear Bank enters into **Global Master Agreements (GMRAs)** with its counterparties, which allow for close-out netting of positions in case of a counterparty default. In practice, however, the impact of the netting of positions on the aggregate value of these positions might be expected to be lower than for other banks given the limited scope of Euroclear Bank's market activities.

Nettable positions might, for example, come from opposite treasury operations intraday and at end-of-day. During the day, Euroclear Bank tries to forecast its end-of-day cash position. Typically, that position tends to be positive, generally redeposits funds into the market. In practice, the end-of-day position may diverge from the forecast, forcing Euroclear Bank to cover an unexpected debit position or to place any unexpected cash positions it might have. In situations in which Euroclear Bank would have attracted funds from the market during the day and placed funds at the end of the day, or vice versa, with any particular counterparty, exposures on that counterparty might be calculated in case of default by netting the respective positions.

Euroclear Bank uses payment netting for margin payments on its limited derivatives positions (margining is limited to interest rate and foreign exchange futures) and reverse repos.

Euroclear Bank also has a right to set-off on the interoperable link with CBL as a final settlement that extinguishes the mutual debts owed between the parties in exchange for a new net amount.

Collateral valuation and management

Intraday credit offered to participants is generally secured by financial collateral or other recourse. Euroclear Bank assesses the collateral value of the securities held in the Euroclear System on a daily basis by obtaining prices, and determining the haircut that has to be applied to each security.

In order to accurately determine the value of the collateral it takes, Euroclear Bank has developed a dynamic internal collateral valuation model taking into account market, credit, country and liquidity risks. It protects Euroclear Bank against a drop in prices with a confidence level of 99% over a 10 days period (Value-at-risk).

The market value of a security is the basis for the collateral calculation, for which the following is used:

- Observed market prices published by official sources and received from external providers,
- Evaluated prices computed by external providers,
- Internal quotation - based on transactions settled within the Euroclear system, and
- Theoretical quotation - internal calculation based on net present value methodology.

There is an internal selection and control process, which selects the "best" quotation from among all the supplied quotations. The best quotation is defined as the quotation with the most recent quotation date and the most important priority level.

In order to determine the collateral value of securities, the (estimated) market price is reduced by a haircut that depends on, among other elements:

- the estimated market risk on the security,
- the creditworthiness of the issuer of the security,
- the country in which the issuer is located, the denomination and
- the liquidity risk associated with the security.

The delay since the last quotation was obtained is also taken into account, with increasing haircuts associated with longer delays. Securities whose price is not considered as a real market price are also strongly discounted.

Euroclear Bank can override the automated valuation if it has reasons to consider that the current or future market price does not represent the true value (e.g. default or market stress).
The collateral valuation model is back-tested (daily) and stress tested (yearly). The results show that the collateral valuation model has provided continually adequate valuations, even during periods of high volatility of the markets. The Model Validation team of the Risk Management division also periodically reviews Euroclear Bank's collateral valuation model in line with model validation requirements, and provides recommendations, if needed.

The management of collateral concentrations

Collateral concentration thresholds and limits, which apply to the aggregate exposure on entity and/or family level, are set in line with Euroclear Bank's risk appetite to ensure Euroclear Bank's ability to liquidate securities pledged as collateral is not impaired. A minimum amount of collateral needs to be ECB eligible and/or fit the eligibility criteria of committed reverse repo facilities must be maintained, to ensure it can be monetized to raise sufficient liquidity when a credit facility of a borrowing participant is above a certain amount or a treasury counterpart defaults on its obligations.

Collateral monitoring against determined thresholds and limits is performed to anticipate collateral concentration and to allow actions to be taken. The Credit Department is responsible to monitor the composition of participant's collateral at portfolio level and the composition of collateral received from treasury counterparties. Particular attention is paid to the collateral issued and/or held by non-investment grade entities, the region and country of the issuer, the liquidity of the collateral, ECB eligibility as well as the type of security. Reaching a threshold or limit leads to appropriate approval and reporting requirements.

Credit risk mitigation and capital requirements

To calculate the effect of credit risk mitigation, Euroclear Bank applies the so-called comprehensive approach. Collateral valuation is based on standard supervisory haircuts, taking into account holding and revaluation periods. Euroclear Bank does not accept letters of credit and bank guarantees to secure its exposures on participants resulting from the granting of credit lines, except for the letter of credit issued by a syndicate of banks to cover part of Euroclear Bank's exposure arising from activity across the Bridge with CBL. Note that when a guarantor in the syndicate of banks has a better creditworthiness than CBL, Euroclear Bank can opt to use the Probability of Default of that particular guarantor to calculate the exposure (the so-called substitution approach under CRR).

Credit risk mitigation techniques

Credit exposures faced by the Euroclear group are covered by eligible financial collateral. All collateralised credit exposures are incurred by Euroclear Bank and are therefore subject to the FIRBA.

	Euroclear consolidated [1]				
31 December 2017 (€'000)	Exposures unsecured – Carrying amount	Exposures secured – Carrying amount	Exposure secured by collateral	Exposures secured by financial guarantees	Exposure secured by credit derivatives
Total loans	6,106,760	9,024,262	8,822,679	201,583	–
Total debt securities	5,047,772	–	–	–	–
Total other exposures	8,665,684.9	26,257,845	26,257,845	–	–
Total exposures	19,820,217	35,282,107	35,080,524	201,583	–
of which defaulted	–	–	–	–	–

[1] Template EU CR3

Impact of netting and collateral held on exposure values

Counterparty credit exposures faced by the Euroclear Bank (currently limited to foreign-exchange forward transactions) are covered by ISDA credit forms that go with a master agreement signed with all derivatives counterparts.

	Euroclear consolidated [1]				
31 December 2017 (€'000)	Gross positive fair value or net carrying amoun	Netting benefit	Netted current credit exposure	Collateral held	Net credit exposure
Derivatives	63,822,407	0	63,822,407	0	63,822,407
Total exposures	**63,822,407**	**0**	**63,822,407**	**0**	**63,822,407**

[1] Template EU CCR5 – B

Wrong-way risk

Wrong-way risk occurs when exposure to a counterparty is adversely correlated with the credit quality of that counterparty. In the case of general or conjectural wrong-way risk, this is due to the evolution of general market risk factors, e.g. interest rates, while in the case of specific wrong-way risk, it is due to the nature of the transactions with that counterparty.

Specific wrong-way risk would arise if a transaction with a counterparty was backed by own or related party collateral. To address "specific wrong way risk" Euroclear Bank however does not grant collateral value to securities belonging to the same family as the borrower (applicable for both borrowing participants and treasury counterparties).

General wrong-way risk would arise if the evolution of an economic variable would affect both the value of exposures and the credit quality of the counterparty. Euroclear Bank is mainly exposed to "General wrong-way risk", which arises from a decrease in market value of the collateral used to cover credit exposure upon default of the borrowing participant. Euroclear Bank's credit department monitors on an ongoing basis the participant's creditworthiness and their collateral portfolio through collateral concentration limits and thresholds to identify any significant wrong way risk. Depending on the situation, remedial actions include additional haircuts, specific concentration limits and/or limiting the credit facility.

Internal rating model

To comply with the qualitative and quantitative requirements of Basel, Euroclear Bank uses an internal rating model. The model allows credit officers to rate all participants, counterparties and all the countries where Euroclear Bank has credit exposure.

The internal rating system should also serve as a basis for the institution's credit risk management. Though the 'Foundation' approach implies an own assessment of the risk of default of the obligor, only institutions under the 'Advanced' approach need to apply internal estimates of loss given default. Under FIRBA, the estimates of additional risk factors are derived through the application of standard supervisory rules. For exposures under the Standardised Approach, external ratings and standard supervisory rules for other risk factors are used.

The internal rating model is used to rate all participants and counterparties granted credit or market facilities, and all the countries where the Bank has credit exposure. The rating scale is composed of 20 different rating grades and each internal rating is mapped to a probability of default. Given Euroclear Bank's absence of its own default history, it has to use external data to calibrate the probabilities of default.

The internal ratings are used not only for regulatory capital requirements calculations, but also serve Euroclear Bank's own credit risk management and can therefore be found in many applications throughout Euroclear Bank.

The performance of internal ratings is assessed annually by comparing the internal ratings to similar ratings issued by the major rating agencies. This performance review is combined with a regular review and validation of the model.

Model governance

Roles and responsibilities in respect of the internal rating model are shared between various departments of Euroclear Bank and the Risk Management Division (which is part of Euroclear SA/NV), ensuring an appropriate independence of the controlling and validation functions:

- the Credit department of Euroclear Bank has the overall responsibility for the model. It uses the model daily to assign the internal ratings. Entities are rated at least annually (more frequently for low rated entities). It is also responsible for maintaining adequate procedures. Finally, it contributes actively, as a user, to improving the model and participates in the yearly review.
- the Banking Risk function in the Risk Management Division is responsible for controlling the use of the model. These controls aim at evidencing that, among other things, procedures have been followed correctly (including for the revision and approval of ratings), the ratings of groups and of components of these groups have been conducted appropriately and entities rated 'Eb+' or lower are rated more frequently (twice a year, compared to once a year for other entities).
- The independent Model Validation functions in the Risk Management Division perform the yearly validation, issue recommendations and verify compliance. The model validation function also acts as necessary reviewer for changes in the model.
- the Credit and Assets and Liabilities Committee approves changes to the model that are proposed by the Risk Management and Banking Divisions and reviewed by Model validation.
- finally, Internal Audit reviews independently the processes related to the use of the model within Euroclear Bank.

Internal rating process

Euroclear uses different models to fit the particular characteristics of its different types of participants and other counterparts: banks, broker-dealers, asset managers, corporates, central banks and multilateral lending institutions. Euroclear Bank does not have any retail exposures.

Each participant with a credit facility and treasury counterparty with a market facility are assigned an internal rating that is reviewed at least annually. Reviews are more frequent for lower rated entities and meaningful external news or external ratings changes also trigger a reassessment of the relevant internal ratings. Countries in which Euroclear Bank has an exposure are also rated once a year. The country ratings are an important determinant of the ratings of Euroclear Bank's participants and other counterparts.

Overview of Euroclear Bank's internal rating grades

The table below provides an overview of the various rating categories, and their meaning

Investment grade	Eaaa	Extremely strong capacity to meet its financial commitments.
	Eaa+	Very strong capacity to meet its financial commitments. Upper range of 'Eaa' ratings.
	Eaa	Very strong capacity to meet its financial commitments.
	Eaa-	Very strong capacity to meet its financial commitments. Lower range of 'Eaa' ratings.
	Ea+	Strong capacity to meet its financial commitments. The clients rated 'A' is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations in higher-rated categories. Upper range of 'Ea' ratings.
	Ea	Strong capacity to meet its financial commitments. The clients rated 'A' is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations in higher-rated categories.
	Ea-	Strong capacity to meet its financial commitments. The clients rated 'A' is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than obligations in higher-rated categories. Lower range of 'Ea' ratings.
	Ebbb+	Adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitments. Upper range of 'Ebbb' ratings.
	Ebbb	Adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitments.
	Ebbb-	Conditions or changing circumstances are more likely to lead to a weakened capacity of the obligor to meet its financial commitments. Lower range of 'Ebbb' rating.
Speculative	Ebb+	Major ongoing uncertainties or exposure to adverse business, financial, or economic conditions which could lead to the obligor's inadequate capacity to meet its financial commitment on the obligation. Upper range of 'Ebb' ratings.
	Ebb	Major ongoing uncertainties or exposure to adverse business, financial, or economic conditions which could lead to the obligor's inadequate capacity to meet its financial commitment on the obligation.
	Ebb-	Major ongoing uncertainties or exposure to adverse business, financial, or economic conditions which could lead to the obligor's inadequate capacity to meet its financial commitment on the obligation. Lower range of 'Ebb' ratings.
	Eb+	Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitment on the obligation. Upper range of 'Eb' ratings.
	Eb	Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitment on the obligation. Obligor's capacity or willingness to meet its financial commitment on the obligation.
	Eb-	Adverse business, financial, or economic conditions will likely impair the obligor's capacity or willingness to meet its financial commitment on the obligation. Lower range of 'Eb' ratings.
	Eccc+	In the event of adverse business, financial, or economic conditions, the obligor is not likely to have the capacity to meet its financial commitment on the obligation.
	Eccc	Currently highly vulnerable to non-payment.
	Eccc- and below	Obligor is currently highly vulnerable to non-payment, obligor that is the subject of a bankruptcy petition or similar action which have not experienced a payment default.
Default	Ed	The institution has failed to pay one or more of its financial obligations when it became due.

Estimation of exposures

Probabilities of default are associated with all Euroclear internal rating grades. These are based on external historical default statistics gathered by a leading rating agency, as Euroclear does not have sufficient default history of its own. The mapping of these default statistics to the agency's and to Euroclear's ratings scale allows Euroclear to derive **Probabilities of Default (PDs)** that fit its particular ratings structure.

In calculating its regulatory requirements, Euroclear uses the mandatory PD floor (0.03%) for banks and corporates.

Euroclear also does not use own estimates of **Loss-Given-Default (LGD)**, because of the absence of a default history, but instead it applies standard supervisory LGDs. These are 45% for senior unsecured claims, 75% for unsecured subordinated claims and 0% for secured exposure after credit risk mitigation.

For an estimate of **Exposures At Default (EAD)**, Euroclear takes the nominal amount as reflected on its books. For some facilities (e.g. undrawn commitments) it includes an estimate of future lending prior to default.

IRB approach – Credit risk exposures by exposure class and PD range

31 December 2017 (€'000)

	Euroclear consolidated [1]											
Exposure class / PD Scale	Original on-balance sheet gross exposure (€ '000)	Off-balance sheet exposure pre CCF (€ '000)	Average CCF (%)	EAD post CRM and post-CCF (€ '000)	Average PD (%)	Number of obligors	Average LGD (%)	Average maturity (year)	RWA (€ '000)	RWA density (%)	Expected Loss (€ '000)	Value adjustments and Provisions
Institutions												
0.00 to <0.15	37,880,698	7,670,542	–	3,358,042	0.09	186	45.03	0,39	282,291	8.41	679	–
0.15 to <0.25	80,173	-	–	36,020	0.18	27	45	0,08	10,243	28.44	30	–
0.25 to <0.50	140,361	550,537	–	33,724	0.31	34	45	0,13	12,075	35.8	45	–
0.50 to <0.75	94,444	–	–	91,774	0.66	97	45	0,08	60,771	66.22	273	–
0.75 to <2.50	5,982	–	–	2,953	1.27	8	45	0,04	2,146	72.66	17	–
2.50 to <10.00	168,260	–	–	164,567	4.66	17	45	0,08	245,299	149.06	3,426	–
10.00 to <100.00	34	–	–	34	32.35	6	45	0,08	90	268.55	5	–
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	–
Subtotal	38,369,952	8,221,079	–	3,687,113	0.32	375	45.02	0,36	612,914	16.62	4,475	–
Corporate												
0.00 to <0.15	191,784	–	–	23,296	0.06	22	46.18	0,04	1,576	6.77	6	–
0.15 to <0.25	0	–	–	0	0.18	1	45	0,04	0	20.83	0	–
0.25 to <0.50	51,474	28,000	–	51,270	0.31	9	45	0,48	16,983	33.12	63	–
0.50 to <0.75	8,186	–	–	3,823	0.66	60	45	0,74	2,321	60.71	11	–
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	–
2.50 to <10.00	–	–	–	–	–	–	–	–	–	–	–	–
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	–
Subtotal	251,444	28,000	–	78,389	0.25	92	45.35	0,36	20,880	26.64	80	–
Central governments and central banks												
0.00 to <0.15	7,960,202	–	–	7,960,199	0.01	26	45	0,79	159,508	2	335	–
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	–
0.25 to <0.50	0	–	–	0	0.27	1	45	0,04	0	28.38	0	–
0.50 to <0.75	1,321	–	–	1,321	0.66	6	45	0,04	682	51.60	4	–
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	–
2.50 to <10.00	181	–	–	181	8.81	2	45	0,08	298	165.25	7	–
10.00 to <100.00	0	–	–	0	32.35	1	45	0,04	0	241.97	0	–
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	–
Subtotal	7,961,704	–	–	7,961,701	0.01	36	45	0,79	160,489	2.02	346	–
Total (all portfolios – excluding the equity portfolio)	**46,583,100**	**8,249,079**	**–**	**11,727,203**	**0.11**	**503**	**45.01**	**0,65**	**794,283**	**6.77**	**4,901**	**–**

[1] Template 21 – EU CR6 21

IRB approach – Counterparty credit risk exposures by exposure class and PD scale

31 December 2017 (€'000)

	Euroclear consolidated [1]								
Exposure class / PD Scale	EAD post CRM and post-CCF (€ '000)	Average PD (%)	Number of obligors	Average LGD (%)	Average maturity (year)	RWA (€ '000)	RWA density (%)	Expected Loss (€ '000)	Value adjustments and Provisions
Institutions									
0.00 to <0.15	63,822.41	0.06	15	45	0,97	3,755	5.88	11.51	-
0.15 to <100.00	-	-	-	-	-	-	-	-	-
100.00 (Default)	-	-	-	-	-	-	-	-	-
Total	**63,822.41**	**0.06**	**15**	**45**	**0,97**	**3,755**	**5.88**	**11.51**	**-**

[1] Template EU CCR – 4

Market risk management

Strategies and processes

Euroclear Bank

The majority of market risk in the group is concentrated at Euroclear Bank. An adequate risk framework has been put in place to measure, monitor and control the interest rate and foreign exchange risk supported by Euroclear Bank. Value-at-Risk (VaR) methodologies are used to measure interest rate and currency risk. VaR methodology will be further improved in the incoming period.

Euroclear Bank's core equity (shareholders' equity plus retained earnings) and subordinated debts are invested in debt instruments rated AA- or higher. The duration of these assets is limited to five years and is currently around six months.

Euroclear SA/NV and the Euroclear CSDs

Interest rate risk exists only to a limited extent in the CSDs and in Euroclear SA/NV. The CSDs do not operate commercial cash accounts but invest their cash positions in accordance with regulatory liquidity requirements. The average duration of the CSD's and Euroclear SA/NV's treasury portfolio should not exceed two years with initial maturity of treasury investments not beyond three years, and the types of instruments to be used are limited to straight overnight- or term deposits.

Foreign exchange risk is also very limited in the CSDs and in Euroclear SA/NV. To avoid the potential foreign exchange risk that could arise from the investment of their surplus cash, these investments can only be made in their local currency, i.e. in EUR for entities whose functional currency is EUR, in GBP for the entity located in the United Kingdom, and in SEK for the Swedish entities. The most significant source of foreign exchange risk stems from the potential change in net asset values of Euroclear SA/NV's non-euro shareholdings (e.g. Euroclear UK & Ireland and Euroclear Sweden).

Euroclear Bank's market risk appetite

Market transactions are carried out at the discretion of Euroclear Bank which accepts market risk only within its risk appetite. The risk appetite for market risk in Euroclear Bank is limited by the available capital allocated annually to market risk by the Euroclear Bank Board. In addition, Euroclear Bank complies with internal market limits, such as **Value-at- Risk (VaR)**, proposed by the Risk Management Division and approved by the Credit and Assets Liabilities Committee.

Euroclear Bank adheres to the following principles relating to the management of market risk:

- Euroclear Bank does not engage in any activity that is not considered as part of its normal business or a consequence of its clients' activity and as such will not engage in trading activity (even if, under IFRS definitions, certain transactions in derivatives do not qualify as hedges).
- the activities and instruments that Euroclear Bank can engage in must be in line with its low risk averse profile. Euroclear Bank is not exposed to equity risk or to commodity risk.
- a prudent investment strategy is applied in order to preserve the core equity of Euroclear Bank, in particular, the assets of the investment book can only be invested in highly rated and liquid debt instruments (with the exception of intra-company loans), and an appropriate hedging strategy may be applied so as to protect future earnings against adverse market conditions.

Market risk mitigation (hedging)

Given the current exceptionally low level of interest rates, and therefore the marginal downside risk, Euroclear Bank did not enter into interest rate hedges during 2017.

However, Euroclear Bank has engaged in a series of forex derivative transactions in order to hedge the foreign exchange risk resulting from future income streams in foreign currencies. It is compliant with market expectations that Euroclear Bank conducts its business prudently, as a single purpose bank. This hedging strategy must comply with strict guidelines:

- to be hedged, a future cash flow must be expected with a sufficiently high level of certainty;
- a position, once hedged, may not be re-opened; and
- any position above the anticipated level must be reversed.

Market risk measurement

Value-at-Risk (VaR)

The market risk of Euroclear Bank is measured using a VaR methodology. The VaR is the maximum loss over a determined time horizon at a given confidence level (99%). The VaR model assumes a holding period of one day, until positions can be closed. Euroclear Bank has to comply with a global VaR limit, as well as VaR limits by book.

The market risk exposure that Euroclear Bank takes is segregated in the following books:

- Investment Book: all securities purchased by Euroclear Bank with the proceeds of its subordinated debt issues and its own equity.
- Treasury Book: assets, liabilities and commitments resulting from the activity of Euroclear Bank's clients.
- Hedging Book: market transactions that are conducted to manage the risk exposure resulting from future income streams.

Given the low market risk appetite and the fact that Euroclear Bank is not engaging in trading activities, the VaR figures are low.

The table below shows the average, as well as the minimum and maximum VaR over 2017 and 2016 for the different books and types of risks that Euroclear Bank faces.

The VaR model is back-tested on an annual basis or in case of material changes.

VaR figures by book

	Euroclear Bank SA/NV					
(€'000)	**2017**			**2016**		
	average	minimum	maximum	average	minimum	maximum
Investment book IR risk	1,064	644	1,935	476	203	2,529
Treasury book FX risk	23	1	309	26	5	118
Hedging book	600	93	1,547	445	48	1,786
Aggregate VaR (Hedging & Investment book)	**1,228**	**720**	**2,046**	**662**	**225**	**2,537**

Stress tests

Stress tests provide an indication of the potential size of losses that could arise under extreme conditions. Stress movements are applied to the different risk factors, including interest and foreign exchange rates.

The stress tests follow the 'Principles for the management and supervision of interest rate risk' issued by the Basel Committee on Banking Supervision.

Equity exposure

Equity exposure includes available-for- sale financial assets and investments in unconsolidated subsidiaries and joint ventures. These concern investments in companies with a business related to the business of Euroclear. They are either strategic participations, or they are held for historical reasons. None of these investments are held in order to make capital gains.

Valuation and accounting of equity exposures

Available-for-sale investments are those financial assets including debt securities and equity shares which are intended to be held for an indefinite period of time, but which may be sold in response to changes in the group's financial environment.

Available-for-sale investments are recognised in the balance sheet on settlement date at fair value. Gains or losses arising from changes in the fair value of such assets are recognised directly in equity, until the asset is either sold, matures or becomes impaired, at which time the cumulative gain or loss previously recognised in equity is released to the income statement. Interest revenues are recognised using the effective yield method.

The fair value of listed debt securities and equity shares reflects the published price at the balance sheet date. In the case of investments with no listed market price, a valuation technique (e.g. recent transactions between willing and knowledgeable parties, discounted cash flows and market multiples) is applied. Where the fair value of unlisted equity investments cannot be reliably measured, they continue to be valued at cost.

Impairment of available for-sale equity investments

The group determines that available-for- sale equity investments are impaired when there has been a significant or prolonged decline in the fair value below its cost. This determination of what is significant or prolonged requires judgement. In making this judgement, the group evaluates among other factors, the normal volatility in share price.

In addition, impairment may be appropriate when there is evidence of a deterioration in the financial health of the investee, industry and sector performance, changes in technology, and operational and financing cash flows.

The group determines that available-for-sale equity investments are impaired when there is a constant decrease of fair value of more than 50% compared with the fair value at inception for a period greater than one year.

Where appropriate, the group has recourse to adequate valuation techniques (e.g. discounted cash flows, market multiples) to estimate the value of non-listed available- for-sale equity investments.

Subsidiaries are fully consolidated from the date that control is transferred to the group, unless immaterial. Joint ventures are accounted for using the equity method of accounting.

The table on the next page shows the balance sheet value of equity exposures held by the Euroclear group.

Balance sheet value of equity exposures held by Euroclear group

31 December 2017 (€'000)	Euroclear consolidated
Fair value of Available-for-sale financial assets disclosed in balance sheet	**305,838**
Publicly quoted share values when different from fair value	–
Exchange-traded exposures	**290,136**
- equity shares	290,136
Private equity exposures in diversified portfolios	–
Other (unlisted, but fair value determinable)	15,702
Realised gains (losses) from sales and liquidations	–
Total unrealised gains (losses)[1]	184,750
Investments in subsidiaries and joint ventures	**15,272**
Total equity exposure before deduction for 10% treshold of CET1 instruments of financial sector entities where the institution does not have a significant investment in those entities	321,110
Deduction for 10% limit	(50,964)
Total equity exposure after deduction	**270,146**

[1] included in common equity Tier 1 capital

Interest rate risk in the banking book

Euroclear typically has net long cash positions and its earnings therefore are sensitive to future changes in interest rates.

The table following shows the interest rate sensitivity of Euroclear Bank's Book positions. Assets and liabilities held in the Banking Book are predominantly denominated in euro and they are expressed at market value for the purpose of this disclosure. The economic value of the Banking Book is computed by discounting the future cash flows for assets and liabilities present in this book.

The sensitivity of the economic value of the Banking Book to interest rate shocks is presented in the first column of the table following. The 10 year borrowing amounting to €600,000,000 issued by Euroclear Investments SA to enhance the group funding flexibility and strengthen the recovery capacity of operating entities, is included in the interest rate risk of the Banking Book 2017 economic value calculation. At the level of Euroclear Bank, there is currently a maturity mismatch between the 10–year loan for €200,000,000 issued in line with the **Minimum Requirement Eligible liabilities (MREL)** and the corresponding shorter term (currently two months) cash investments.

The remainder of the table illustrates to which extent the net interest income of Euroclear Bank is sensitive to interest rate movements, compared to the amount earned in 2017. For the purpose of this disclosure, we aggregate the future earnings in euro, however, for the interest rate sensitivity we distinguish between sterling, US dollars and euros (all other currencies are converted and included in euros).

The second table illustrates to what extent the net interest income of Euroclear Bank is sensitive to interest rate movements, compared to the amount earned in 2017.

The interest rate risk and economic value are measured on a quarterly basis.

Interest rate risk in the banking book Economic value

At 31 December 2017 (€'000)			**Euroclear**	
Interest rate increase / (decrease), in basis points	**All currencies**	**EUR**	**GBP**	**USD**
300	2,491,015	2,377,279	113,598	139
200	2,494,731	2,377,129	115,656	1,946
100	2,497,217	2,375,704	117,757	3,755
–	2,498,327	2,372,854	119,905	5,568
-100	2,497,901	2,368,418	122,100	7,383
-200	2,495,758	2,362,212	124,345	9,201
-300	2,491,697	2,354,035	126,641	11,021

Income sensitivity interest result expected 2017

At 31 December 2017 (€'000)			**Euroclear**	
Interest rate increase / (decrease), in basis points	**All currencies**	**EUR**	**GBP**	**USD**
300	450,690	179,156	26,980	244,554
200	333,076	111,757	20,716	200,602
100	213,967	43,445	14,379	156,144
–	93,326	-25,805	7,966	111,166
-100	42,495	-25,837	2,676	65,655
-200	6,560	-25,805	1,647	30,718
-300	-6,751	-25,805	1,268	17,786

Liquidity risk management

Liquidity risk is the risk that Euroclear, although solvent, is unable to meet its contractual or contingent obligations or that it does not have the appropriate amount, tenor and composition of funding and liquidity to support its assets. The management of liquidity risks aims at ensuring that Euroclear has adequate funds to meet its obligations under both normal and exceptional circumstances. As of the implementation of the CSDR, Euroclear Bank will be subject to specific rules on management of its intraday liquidity risk over and above the Basel III requirements.

Strategies and processes

Euroclear Bank

Euroclear Bank is the main entity within the Euroclear group facing liquidity risk.

Liquidity risks are managed with the objective to:

- offer efficient settlement and custody services. Euroclear Bank provides the liquidity to ensure the timely cross-border settlement with domestic markets, to support the new issues and custody activity, and to allow clients to wire out the sales and income proceeds in a timely manner. Failure to prudently manage our liquidity could negatively impact the settlement efficiency, the market reputation and could generate potential systemic risks in the financial markets.
- meet all payment obligations despite the volatility of clients' settlement and money transfer activity.

Throughout the day, clients have long, but also short cash balances. These debit positions result from the secured intraday credit granted by Euroclear Bank to facilitate securities settlement a **Delivery-Versus-Payment (DVP)** basis.

Euroclear Bank processes to measure its liquidity risks and its procedures, systems and expertise to manage its liquidity risks have been assessed in 2017 through **Internal Liquidity Adequacy Assessment Process (ILAAP)**. The ILAAP captures properly the current business model to allow Euroclear Bank Board to confirm its good understanding of the liquidity position as well as its main drivers and vulnerabilities. The Euroclear Bank Board approved the ILAAP in December 2017.

The Euroclear CSDs and Euroclear SA/NV

The Euroclear CSDs and Euroclear SA/NV face negligible liquidity risk. Liquidity risk arises when awaiting the payment of fees from clients or the return of their cash surplus deposited with their bank counterparties (including Euroclear Bank).

The chapter on Credit risk management outlines how these risks are managed.

Euroclear CSDs and Euroclear SA/NV are subject to regulatory liquidity requirements. These entities are required to hold liquid reserves equal to a few months' operating expenses or be able to rely on appropriate liquidity facilities, to ensure that they can continue operating, even under extreme circumstances.

The investment guidelines that apply to Euroclear SA/NV and the group CSDs distinguish two types of cash:

- cash position linked to the regulatory liquidity requirements, for entities for which such requirements apply. This cash position should be immediately accessible when required; and
- excess cash investments should always be cash-flow driven. This means that the amount of cash and the period of the investments should take into account the evolution of working cash and capital expenditure needs.

The initial maturity of any treasury investment should not exceed three years and the average duration of the CSD's treasury portfolio should not exceed two years. The types of instruments are limited to cash deposits or similar products.

Liquidity risk management

Intraday

Further to the new issues, Clearstream Bridge and clients' settlement and custody activity, Euroclear Bank faces differences in the timing of both cash inflows and outflows.

Thanks to efficient systems and processes, Euroclear Bank actively measures, forecasts and manages its liquidity risks (needs), on an intraday basis and across all currencies. The intraday liquidity risks are assessed:

- the previous day, by forecasting the liquidity needs; and
- throughout the day, by monitoring the intraday liquidity position at the cash correspondents and by managing the liquidity flow Treasury department is responsible for this monitoring through the dedicated tools implemented for this purpose. Those tools assess intraday capacity per currency, forecast liquidity positions and perform checks to ensure there is enough liquidity before releasing payments at cash correspondents. Effective controls are performed on a daily basis by the middle office function.

Euroclear Bank offers cash services to support the multi-currency activities of its participants. These services are offered via a large network of highly rated cash correspondents in commercial bank money and via a direct access to TARGET2 system for EUR payments.

The cash correspondents are appointed after going through a rigorous selection process aiming at ensuring the risk they pose to Euroclear Bank is acceptable.

In order to raise liquidity, Euroclear Bank can use its investment book, funded by equity and retained earnings. Furthermore, Euroclear Bank has a broad access to the inter-bank market and has agreements to re-use the securities collateral received through reverse repo transactions.

End-of-day

As a result of their settlement and custody activity, clients may be long in cash. Euroclear Bank anticipates and squares the end-of-day cash position at each cash correspondent while avoiding blocking payments. End-of- day long balances are invested on a very short-term basis. However, investments can be made with a longer term but must remain within liquidity preservation limits, defined by currency and maturity buckets. These preservations limits aim at:

- avoiding any liquidity shortage in case of unusually high liquidity needs or low end- of-day client balances; and
- ensuring compliance with the Basel III **Liquidity Coverage Ratio (LCR)**.

Regulatory stress test ratio

Liquidity Coverage Ratio (LCR)

The LCR was introduced by the Capital Requirements Regulation (CRR EU No 575/2013) and is designed to ensure that financial institutions have the necessary amount of **High Quality Liquid Assets (HQLA)** to face the net cash outflows over a 30-day period of market stress.

The LCR is defined as:

$$\frac{\text{HQLA}}{\text{Outflows} - \text{Min}(\text{Inflows}, 75\%\ \text{Outflows})} >= 100\%$$

The ratio is calculated and reported daily, the NBB requires a 100% LCR as from October 2015.

The figures in the following LCR table are calculated as the simple averages of month-end observations over 2017 for Euroclear SA/NV.

The HQLA consists of cash held at our central bank, Fixed income securities and securities received in secured transactions (reverse repo's). At year-end, 90% of the HQLA is Level 1, i.e assets of extremely high liquidity and credit quality. The HQLA portofolio is managed centrally at Euroclear and the management function has access to and control of its liquid assets at all times.

The client balances represents the majority (around 75%) of our outflows because they are repayable on demand. No concentration of funding is observed. The inflows are made up mainly by unsecured and secured treasury placements, open ended amounts on clients or nostro accounts, unsecured and secured treasury placements. Except for committed treasury transactions between trade date and settlement date, Euroclear Bank has no cash-flows and no potential collateral calls related to off-balance sheet positions. Euroclear Bank does not engage in securitization. Any mismatch between the currency denomination of the liquid assets and the net liquidity outflows is covered by our capacity to monetize our liquid assets to generate cash in another currency than the asset and by our access to Fx swap committed facilities. Because of the nature of Euroclear Bank's core activity (settlement), our balance sheet may show some volatility and consequently, also the LCR.

Net Stable Funding Ratio (NSFR)

The NSFR ensures that there is a minimum level of stable sources to fund a bank's activities over a one year horizon (assets and off balance sheet). Similarly to the LCR, the NSFR should be higher than 100% and the reporting has started since March 2014 (observation period). Compliance will be required as from 2018. On 31 December 2017, the NSFR was at 374% for Euroclear SA/NV.

31 December 2017 (€'000)	**Unweighted value**	**Weighted value**
HIGH QUALITY LIQUID ASSETS (HQLA)	–	**8,417,248**
CASH OUTFLOWS		
Retail deposits and deposits from small business customers, of which:		
Stable deposits		
Less stable deposits		
Unsecured wholesale funding	18,511,911	14,723,502
Operational deposits and deposits in networks of cooperative banks	4,194,552	1,048,638
Non-operational deposits (all counterparties)	14,317,360	13,674,864
Unsecured debt		
Secured wholesale funding	–	237,656
Additional requirements		
Outflows related to derivative exposures and other collateral requirements		
Outflows related to loss of funding on debt products		
Credit and liquidity facilities		
Other contractual funding obligations	117,292	45,443
Other contingent funding obligations		
TOTAL CASH OUTFLOWS		**15,006,601**
CASH INFLOWS		
Secured lending (eg reverse repos)	8,061,625	6,070,576
Inflows from fully performing exposures	3,664,870	3,629,478
Other cash inflows	1,670,516	334,103
TOTAL CASH INFLOWS	13,397,011	10,034,157
Fully exempt inflows		
Inflows Subject to 90% Cap		
Inflows Subject to 75% Cap	13,397,011	10,034,157
TOTAL ADJUSTED VALUE		
Liquidity buffer		8,417,248
Total net cash outflows		5,041,242
LIQUIDITY COVERAGE RATIO (%)		**170%**

Liquidity stress testing

Euroclear Bank must manage its liquidity under stressed conditions. Therefore, Risk Management, using a wide range of liquidity stress tests assesses the adequacy of its liquidity sources and contingency plan. For the group CSDs and Euroclear SA/NV, liquidity stress testing is also performed to ensure, where applicable, compliance with local regulatory obligations as well as adequate funding.

Three types of stress-tests are regularly conducted:

- A liquidity back-tests performed on a daily basis, assessing whether the liquidity sources are sufficient to withstand the default of a participant (as per CPMI-IOSCO principles) and two participants (CSD-R requirements) with the largest liquidity exposure at family level both per currency and at aggregated currency level. For selected families, exposure in other currencies than the one observed must also be covered. In 2017, the frequency of the back-tests has increased to daily from quarterly which allows Euroclear to identify and react much more swiftly to structural issues. Results of the back-tests demonstrate that Euroclear Bank has enough quality liquid securities to withstand a default of one or two major participants.
- a number of plausible operational and financial scenarios are defined and analysed on an annual basis. These scenarios include idiosyncratic and market- wide stress events such as an operational failure of a key cash correspondent, a reputational incident leading to a sudden flight of participant cash balances, a financial problem with large clients and the knock-on effects, decrease in the liquidation value of the collateral, etc. In 2017, the stress testing approach has been reviewed to focus on Euroclear Bank's ability to withstand liquidity stress events in selected currencies.
- ad hoc scenarios – often also including other risk types as part of business continuity exercises – are run as role-plays. These exercises involve various layers in the organisation.

In light of the back-tests and stress tests performed by Risk Management, the amount of committed facilities have been reviewed. In 2017, new committed facility lines have been signed with investment grade liquidity providers internally rated 'Ebbb+' and above. In addition on the one hand the Risk Management Division sets concentration limits towards liquidity providers and, on the other hand overall limits per currency have been implemented by Credit Department to better control the resulting potential liquidity exposure at currency level.

Liquidity contingency plan

An adequate liquidity contingency plan is in place to ensure that Euroclear Bank can continue to operate its core settlement and custody services in a safe and sound manner under exceptional circumstances. More specifically, the contingency plan aims at providing a flexible menu of management actions based on Euroclear Bank's liquidity sources in order to cover, amongst other scenarios, the default of at least two clients (at family level) in all currencies to which Euroclear Bank has the largest liquidity exposure. The default of clients are mitigated thanks to Euroclear Bank's strict client admission policy and the continuous monitoring of their creditworthiness.

Therefore, the purpose of the contingency funding plan is to:

- establish a monitoring programme to identify, analyse, report, escalate and respond to, in a timely manner, Euroclear specific or market wide events that could lead to a liquidity strain
- implement and test the availability of contingency liquidity facilities (i.e. unsecured, FX swap and secured lines), document the relevant operational procedures and ensure access to (contingency) liquidity in the event of an operational or financial crisis.
- guide the decision-making process and define the responsibilities and the communication plan towards internal and external stakeholders.

Moreover, liquidity risks are further mitigated because Euroclear Bank limits, by currency and on aggregate basis, the credit lines granted to a single family of clients. Euroclear Bank has also implemented agreements in order to generate liquidity rapidly following the default of clients. These agreements allow Euroclear Bank to appropriate the client pledged collateral (immediate transfer of ownership). This appropriated collateral can then be re-used with liquidity providers or pledged with the National Bank of Belgium, pending full liquidation.

The table below shows the size and composition of Euroclear Bank's liquidity buffer: all unencumbered financial assets at the end of the day on the reporting date (not only HQLA).

Euroclear Bank liquidity buffer (size and composition)

31 December 2017 (€'000)	Euroclear Bank SA/NV[1]
Cash and balances at central banks	**3,240,110**
Securities and loans available at ECB/Eurosystem	**5,024,538**
Debt certificates issued by central governments and central banks	4,007,311
Debt certificates issued by non-credit institutions (multilateral development banks, public institutions,…)	1,017,227
Securities available as repo-transactions	**7,912,695**

(1) The figures for Euroclear are not expected to diverge materially from the content of this table.

Operational risk

Management of key operational risks

Euroclear Bank

Euroclear Bank is inherently exposed to operational risks. Its activities involve a significant amount of transactions per day and connects many actors on the financial market. If a disruptive event occurs in the processing of its activities (originating from its stakeholders or from itself), this could have a significant impact on Euroclear Bank, its stakeholders and the financial markets and ultimately, could lead to systemic impact. As a systemically important **Financial Market Infrastructure (FMI)** supporting the global capital markets and its users, **Euroclear Bank (EB)** must develop and maintain resilient, reliable, secure and efficient post-trade services.

Euroclear SA/NV and the Euroclear CSDs

The Euroclear CSDs face a similar sources of operational risks as Euroclear Bank. Euroclear SA/NV is also exposed to operational risks including the operational risks that may arise from services it provides to the CSDs.

Operational risk appetite

Euroclear's Risk Appetite for Operational Risk is linked to achieving the Board's strategic objectives, in particular: "Reinforce our reputation for operational excellence through providing resilient, reliable, and secure post-trade services."

Thus, Euroclear Bank in its role as an FMI has a low overall residual risk appetite for operational risks.

Qualitative and quantitative metrics are set at both an overall Operational Risk category level and at sub-category level to ensure the risk taking remains within risk appetite defined by the Boards.

Operational Risk Management Framework

Euroclear uses the **Enterprise Risk Management (ERM)** framework to ensure the coherence of its risk management activities, amongst others in the area of operational risk management. The management of operational risk is based on the processes and generic methodologies of the ERM framework, adapted as required for the specificities of operational risk.

The Operational Risk Management Policy sets the principles expected by the Boards to be applied in the way we manage operational risks. The Operational Risk Management Policy Handbook is a reference guide for the First Line to assist them in managing their Operational Risks. It details the tools and techniques to help identify & assess, analyse & prioritise, respond & control and monitor & report on risks.

Operational Risk Culture

As recognised by the Board, an appropriate risk culture that facilitates and supports the effective operation of our operational risk framework is essential. If properly embedded and functioning appropriately, our risk culture supports effective management of risks - keeping the organisation safe, meeting key stakeholders' expectations and helping us achieve our strategic objectives.

Managing Operational Risk is everyone's role. All employees, whatever their role or position, have a responsibility to identify Operational Risks that may impact their area. Employees are encouraged to identify, report and address issues or control weaknesses to ensure that processes remain adequate in order to manage Operational Risk within the limits of the Risk Appetite.

Operational Risk Categories

Operational risk is the loss resulting from inadequate or failed internal processes, people and systems, or from external events. Euroclear adopts the Basel II definition of operational risk – with some additions for model, custody and investment risk in line with relevant regulations – that views operational risk as an umbrella risk, encompassing the following risk-event types:

Employment Practice & Workplace Safety	Losses arising from acts inconsistent with employment, health or safety laws or agreements, such as from example payment of personal injury claims, or from diversity / discrimination events.
Clients, Products & Business Practices	Losses arising from unintentional or negligent failure to meet a professional obligation to specific clients (including fiduciary and suitability requirements), or from the nature or design of a product.
Execution, Delivery & Process Management	Losses from failed transaction processing or process management, including loses emanating from relations with trading counterparties and third-party vendors.
Internal Fraud	Losses due to acts of a type intended to defraud, misappropriate property or circumvent regulations, the law or company policy, excluding diversity / discrimination events, which involves at least one internal party.
External Fraud & Cyber	Losses due to acts of a type intended to defraud, misappropriate property or circumvent the law, by a third party (including cyber).
Business Disruption & Systems Failure	Losses arising from disruption of business or system failures.
Damage to or loss of physical (or other) Assets	Losses arising from loss or damage to physical assets, from natural disasters or other events.
Custody Risk	The risk of loss on assets held in custody in the event of a custodian's (or sub-custodian's) insolvency, negligence, fraud, poor administration, or inadequate recordkeeping.
Model Risk	The potential loss an institution may incur, as a consequence of decisions that could be principally based on the output of models, due to errors in the development, implementation or use of such models.
Investment Risk	The risk of loss faced by an FMI when it invests its own or its participants' assets.

Euroclear treats legal & compliance risks as a distinct risk category and defines them as the risk arising from:

- applicable laws, regulations, market rules, prescribed practices and our own internal policies in all relevant jurisdictions
- upcoming laws and changing regulatory environment
- the negotiation of rules, procedures and contracts in all relevant jurisdictions
- conflicts of laws between jurisdictions.

Incident Management

An operational incident is an event that causes the actual outcome of a process to differ from the intended outcome. Moreover, it can affect the smooth provisioning of (core) services. This can be caused by inadequate or failed processes, people and systems, or by external factors.

Euroclear CSDs have invested heavily in Straight-Through Processing (STP) and automated controls to reduce the Operational Risks inherent in their processes and systems, especially when processing financial securities transactions. Euroclear systems are designed to be inherently resilient and secure while balancing cost/benefit considerations. Nevertheless, Euroclear acknowledges that manual interventions can be necessary in some instances.

The use of manual interventions is strictly controlled through use of standard operating procedures, application of the four-eyes principle and underpinned by system-based segregation of duties controls. These arrangements help minimise operational losses.

Euroclear promotes a "raise the flag" culture. All incidents are logged, analysed and root causes are addressed as deemed appropriate. Our 2017 operational losses remain low for all Euroclear CSDs.

Security and resilience

Information security

The corporate objective of the group security activity is to assure management that **Information Security (IS)** risks in the personnel, physical, logical and technical domains are properly identified and correctly ranked and that IS control processes are effective and in line with the defined risk appetite and relevant legislation. Euroclear has adopted a standardised threat profile that is supplemented annually by a more strategic IS threat assessment. Together these provide the baseline for the annual IS risk assessment from which risk treatment plans are derived.

The IS internal control system has been included in the ERM framework, allowing compliance with the requirements associated with Euroclear's adoption of the **Advanced Measurement Approach (AMA)** under Basel. Euroclear takes as a reference for its IS framework internationally recognised standards such as ISO/IEC 27001:2013.

Euroclear is designated as critical infrastructure in Belgium, Finland, France, the Netherlands and the United Kingdom. Euroclear receives threat assessments from the national security agencies of these countries on a regular basis and can draw upon their expertise to resolve IS issues. These agencies conduct periodic assurance reviews of Euroclear's security standards and procedures.

In line with many other organisations, Euroclear has established a Cyber Resilience Programme in addition to actions for meeting the requirements of CPMI IOSCO's 2016 cyber resilience guidance and the SWIFT Customer Security Program. The Cyber Resilience Programme will support Euroclear's cyber strategy and will further increase the group's cyber risk capabilities commensurate with the evolving global threat environment.

Fraud related policies, processes and controls

Regarding fraud prevention, Euroclear has implemented a Code of conduct, an Ethical Conduct policy for accepting gifts and a whistle blowing programme.

All staff members are informed on how to report any evidence or suspicion of fraudulent activities. They follow on a regular basis awareness sessions and complete a compliance test including questions related to fraud prevention.

Euroclear has also implemented specific fraud risk related controls. For example, physical segregation and increased security in high risk areas, access badges and information security controls such as such as password protection, segregation of duties and access management.

Business resilience

To ensure continuous availability of business-critical services, Euroclear carefully reviews its use of technology, buildings and staff using CPMI-IOSCO Principles for FMIs, and ISO22301:2012, Societal security - Business continuity management systems - Requirements as a reference framework.

Euroclear Bank operates three data centres sufficiently distanced from each other to sustain operations in the event of a local- or regional- scale disaster. Euroclear SA/NV, **Euroclear France, Euroclear Belgium and Euroclear Nederland (ESES)**, Euroclear UK & Ireland and Euroclear Sweden also use these data centres. The effectiveness of the data centres and their recovery procedures is assured through the transfer of production activity between sites every two months and regional disaster recovery exercises being held at least once a year.

Euroclear Finland operates two geographically separated IT centres in which all critical systems and networks are present and data is replicated in real time.

Euroclear Finland and Sweden have access to separate backup offices outside their respective city centres with enough capacity for staff to run all critical business processes, including the IT operations.

To preserve continuity of service, Euroclear Bank and Euroclear UK & Ireland operate their respective services concurrently from multiple offices (Brussels, Braine, Krakow and Hong Kong for EB; Cannon Street and Bishops Stortford for EUI). The ESES entities use cross border recovery plans between the three entities to ensure the immediate continuity of critical services while staff are relocated. ESES can also use recovery office space in Paris and Brussels as a remote backup.

All entities perform annual business impact analyses to identify their critical business services and recovery time objectives. Business continuity plans have been harmonised at corporate and departmental levels throughout the group.

Finally, each element of the strategy is regularly maintained and tested. This includes a comprehensive crisis management training programme that uses increasingly sophisticated market-based scenarios to further develop the capabilities of the crisis response teams, including those involving top management.

Legal protection

The Euroclear CSDs

The Euroclear CSDs have in place a robust legal framework applicable to the relationship with their clients, including a liability regime reflecting their risk-averse nature and their role as market infrastructure. The respective duties of the CSDs and their clients are well-defined.

Euroclear Bank

Euroclear Bank is protected against the consequences of a bankruptcy, insolvency or contractual default of any one of its clients by a number of provisions contained in the credit documentation signed with the clients. Euroclear Bank also aims to ensure the protection of clients' assets, even if held with a sub-custodian.

Contractual protection

Euroclear Bank may offer credit facilities to its clients on an uncommitted basis. Clients benefitting from credit facilities are required to execute special credit documentation with Euroclear Bank.

Credit facilities are generally required to be secured. Secured credit facilities are typically collateralised by client assets held within the Euroclear system. Clients that pledge assets within the Euroclear system sign a collateral agreement with Euroclear Bank.

The principal legal risk that arises in connection with collateral pledged to Euroclear Bank is the uncertainty that exists as to whether or not, in the event of bankruptcy of a client, a court would recognise and enforce a Belgian law pledge.

To limit the risk associated with such uncertainty, Euroclear Bank has obtained opinions from reputable local counsel in the relevant jurisdictions, on whether or not such jurisdictions recognise that securities in the Euroclear system are located in Belgium for purposes of conflict-of-law issues, and accordingly recognise the Belgian law pledge. The legal opinions are renewed periodically. This has been further strengthened for European Union countries since the adoption of the Settlement Finality Directive, which confirmed that Belgian law (the jurisdiction where the security rights are recorded) would apply, for the purposes of enforceability of the collateral, if a Euroclear Bank client becomes insolvent.

The Terms and Conditions that clients are required to sign before becoming Euroclear Bank Participants include clauses that protect Euroclear Bank. The most important clauses are the following:

'Upon the effectiveness of any termination or resignation, or as soon thereafter as is reasonably practicable, we will affect the return to you of the amounts you hold in your Cash Account(s) and securities credited to your Securities.

Clearance Account(s), provided, however, that we, without affecting any other rights we may have, have the right to:

i. set off against or retain from such amounts to be so returned any amounts which are due to, or which may become due to, us from you.
ii. retain securities held in such Securities Clearance Account(s) to provide for the payment in full of any amounts which are due to, or which may become due to, us from you.'

‘Unity of account and right of set off – Except as otherwise provided by law or otherwise agreed in writing between you and us with respect to any specified account, all Cash Accounts and other current accounts with us in Belgium opened in your name are part of one single and indivisible current account of which they are mere subdivisions for bookkeeping purposes.

This is the case even if:

i. such subdivisions are maintained in different currencies, earn credit interest or are charged debit interest at different rates;
ii. the transactions therein are reported in different statements of account.

Consequently, we have the option, among others, of transferring the balance of any subdivision of your current account that is in credit to any subdivision that is in debit or vice versa, at any time and without prior notice.’

Liens, rights and obligations

In addition to any pledge of Securities Clearance Accounts, Transit Accounts, Cash Accounts and other assets held in the Euroclear System specifically agreed to by a client, clients’ assets held in the Euroclear System (except, unless otherwise agreed, assets held for customers and identified as such) are subject to a statutory lien in favour of Euroclear Bank, pursuant to Article 31 of the Belgian Law of 2 August, 2002 related to the supervision of the Financial sector and Financial Services.

Asset protection

Due to the fact that Euroclear Bank holds its interest in securities in a network of sub-custodians located in more than 40 countries, its holdings may also be subject to legal uncertainty in the event of the bankruptcy of a given sub-custodian. Euroclear Bank clients’ assets need protection from the risk of a sub-custodian becoming insolvent and from the risk of attachment by the creditors of such sub-custodian.

To limit the legal risk arising in connection with the holdings of securities with sub- custodians, Euroclear Bank has obtained formal legal opinions from reputable local counsel in each jurisdiction in which it holds securities with a custodian. These legal opinions are renewed periodically.

Remuneration policies and practices

Governing principles

The overall purpose of the Euroclear compensation policy is to align the interests of our employees with the long-term interests of our stakeholders.

Our compensation framework is designed to attract and retain talented human capital, in a market infrastructure business where technical knowledge is not widely available in the general market. Our compensation framework takes into account the risk profile of the Euroclear group.

The principles of the incentive compensation system are performance-related, fair and equitable across the organisation. They are made transparent to all our employees.

These principles are applied with a view to aligning the compensation policy with the company's strategy and objectives, its values, and the long term interests of the company.

Scope

These principles apply specifically to the Belgian companies within the Euroclear group but for reasons of equitable treatment, we adopt a similar approach as far as possible across all the countries in which we operate (recognising that there are certain local specificities and differing national legislative and regulatory requirements). Non-cash benefits are provided to employees appropriate to the country they work in and are market relevant.

Governance Structure

For reasons of equitable treatment, we adopt a similar approach as far as possible across all the entities/countries in which we operate, while recognising that there are certain local specificities and differing national legislative and regulatory requirements. It is the responsibility of Euroclear SA/NV, as parent company, to ensure that all remuneration-related requirements are complied with on a consolidated basis.

Remuneration Committee

The Board Remuneration Committee has the following remit:

- oversees the application of the policy and reports any breaches of the Policy to the Board;
- oversees the compensation of the non- executive Directors of Euroclear with the support of external advisors where necessary. The compensation of the non- executive directors in the operating entities below ESA is overseen by the relevant entity's Compensation / Remuneration Committee;
- periodically reviews and makes recommendations to their respective Boards in relation to remuneration of Board members within the limits set by shareholders. It has the responsibility to review such overall limit from time to time and to make recommendations to the Board to be submitted to the shareholders;
- reports to the Board on a regular basis as to the exercise of its duties;
- periodically reviews its terms of reference;
- reviews and advises the Board on the annual quantum of the remuneration and the appropriateness of the individual remuneration for the members of the Management Committee as well as the other Identified Staff and the seniors of the control functions (Compliance& Ethics, Risk Management and Internal Audit);

- recommends to the Board on the remuneration policy for the relevant entity and for each of the Identified Staff. The Renumeration Committee is supported by specialised advice from Risk Management, Compliance and Ethics, Internal Audit, HR or external consultancy where necessary; and
- oversees any malus decisions.

While preparing decisions on remuneration, the Committee takes into account the long-term interests of the shareholders, investors and other stakeholders of the Company as well as the general interest.

In 2017, the Euroclear SA/NV Remuneration Committee met five times. For Euroclear Bank, six Remuneration Committee meetings took place. For Euroclear France, Euroclear Belgium and Euroclear Nederland (ESES), Euroclear Sweden and Euroclear Finland there were four meetings and in Euroclear UK & Ireland the Remuneration Committee met twice. No external consultant assisted the Remuneration Committees in 2017.

Board of Directors

The Board of Directors has the final decision making authority in remuneration matters. The approved principles and methodology are applied uniformly across the respective operating entity boards.

Management Committee

The **Management Committee (MC)** of the relevant entity is responsible for:

- the application of the compensation principles for the Group, including any affordability or risk-related issues;
- the continuous assessment of the adequacy of the remuneration principles taking into account the company objectives and long-term interests as well as the external environment and legislative environment the company is operating in; and
- approving the variable compensation of the members of the Extended Management Committee (i.e. selected division heads, or MC-1).

The Risk Committee

The Board Risk committee shall advise the Remuneration Committee on:

- the consistency of the Compensation Policy with sound and effective risk management;
- the identification process of material risk takers in accordance with applicable legislation;
- the way the risk strategy and risk tolerance is reflected in the overall annual performance review so as to ensure that the Remuneration Committee takes into account all existing and future risks when advising the Board.

In 2017, the Euroclear SA/NV and Euroclear Bank Risk Committees both met six times. For ESES, nine Risk Committee meetings took place, and for Euroclear Sweden and Euroclear Finland, there were seven meetings. In Euroclear UK & Ireland, there were six joint Audit & Risk Committee meetings, with a further three Risk Committee meetings from October 2017 following the committees being split.

Compensation Non-Executive Directors

Compensation for the non-executive Directors (where fees have not been waived) comprises an annual gross fee for scheduled meetings. This fee is reduced for non-attended scheduled board meetings and is increased when attending non-scheduled meetings. It reflects any additional formal responsibilities held. The Chairman and Deputy Chairman of Euroclear SA/NV receive a fixed fee. The fees of the board members are set by relevant boards on the recommendation of the relevant company's Compensation/ Remuneration Committee within the overall limit set by the Shareholders.

Non-executive directors do not receive incentive compensation (short or long-term) or stock options or employment benefits (other than reimbursement of expenses).

Their remuneration is not linked to the performance of Euroclear.

Compensation Management and Staff

Compensation for all groups of employees is comprised of fixed and variable compensation. In addition a range of country-relevant benefits (including pension) is provided. Compensation is aligned to the relevant market.

The variable compensation is zero-based and carries no acquired rights.

The level of fixed remuneration is benchmarked within the Financial Services industry per geography in order to ensure competitive fixed remuneration levels. The individual fixed remuneration levels depend on the general role fulfilment of an individual, his/her development in the job and his/ her role and responsibilities.

Variable compensation comprises:

- an individual bonus based on personal performance against formal objectives which is zero-based and carries no acquired rights
- a group bonus based on the collective performance of the Group measured via a Balanced Score Card technique which includes common objectives with respect to Financial Strength, Client, Operational Performance and People and Organization. The realisation of these collective objectives are monitored closely through-out the year. The stand of affairs is periodically reported and communicated. Prior to submitting the measured results to the Company Remuneration Committee, they undergo an internal audit. After advising the Company Remuneration Committee, the Company Board decides on the Group bonus pool, also taking into consideration any other criteria that may be of relevance to preserve the long term interests of the company.

Variable compensation is paid proportionally to fixed remuneration within the limits of the overall group bonus pool decided by the Board of Directors after advice from the Remuneration Committee. It does not exceed 50% of the fixed compensation for Euroclear SA/NV and Euroclear Bank employees. For **Euroclear France, Euroclear Belgium and Euroclear Nederland (ESES)**, Euroclear UK & Ireland, Euroclear Sweden and Euroclear Finland, in no case does variable compensation exceed fixed compensation.

Identified staff

Criteria are established to identify staff, who have a material impact on the risk profile of each entity and necessarily include the heads of control functions. Variable compensation for Identified Staff is awarded in a manner which promotes sound risk management and does not induce excessive risk- taking. Failure to comply with risk and compliance expectations leads to a reduction or cancellation of the variable remuneration, independently of any disciplinary proceedings. Where variable compensation exceeds a threshold of 75,000 EUR, 50% of total variable compensation is paid in instruments subject to a retention period of 1 year following vesting and 40% of total variable compensation is deferred. The deferral period is five years for Management Committee members of Euroclear SA/NV and Euroclear Bank, and three years for all other identified staff (including control functions) as well as other staff members that exceed this threshold. Vesting happens no quicker than on a pro-rata basis.

The Euroclear group has determined which employees fall within this category and has notified such employees in their compensation letter.

The award and payment of part of the upfront and deferred compensation is linked to the overall stability of the group in terms of financial stability, risk profile and systems availability over a period of maximum three years.

Quantitative information related to remuneration is disclosed in the annual report.

CSD Regulation

The European **Central Securities Depositories Regulation (CSDR)**, adopted in the aftermath of the 2008 financial crisis, lays down uniform requirements for the settlement of financial instruments in the EU and rules on the organisation and conduct of CSDs, to promote safe, efficient and smooth settlement.

All Euroclear CSDs, including Euroclear Bank, are implementing CSDR with a view to obtain their license from their competent authorities. Most of the documents for authorization have been filed in 2017 by all CSDs to the relevant regulators. Euroclear Bank is applying for a banking license too. Filing completion and assessment thereof for all Euroclear CSDs are ongoing by our regulators.

Euroclear Bank is applying for a banking licence as part of CSDR implementation. Title IV of CSDR (Articles 54-60) sets out the detailed requirements for the provision of banking-type of ancillary services to CSD participants, applying tight restrictions on the banking activities which it can undertake. As set down in the CSDR, the credit institution/CSD:

- can only undertake banking type services directly related to core or ancillary services offered by the CSD
- treasury activities involving foreign exchange, and transferable securities related to the management of participants long balances;
- will be subject to an additional capital surcharge which reflects the risk, including credit and liquidity risks, resulting from the provision of intra-day credit;
- must report at least monthly to its Competent Authority on the extent and management of intra-day liquidity risk; and
- must have an adequate recovery plan in place to ensure continuity of service in crisis situations.

Article 59 of CSDR also sets down additional prudential requirements, for instance: requirements to fully cover corresponding credit exposures using highly liquid collateral and other equivalent financial resources; establish and apply appropriately conservative haircuts and concentration limits on collateral values; provide for effective reimbursement procedures of intraday credit and discourage overnight credit through the application of deterrent sanctioning rates.

In order to operate under CSDR, Euroclear Bank implemented the following enhancements in the area of banking and credit:

- Credit exposures continue to be covered and secured. Our credit lines are sized in proportion with participants' actual activity in their accounts and covered with appropriate eligible collateral.
- Currency-specific credit limits implemented.
- Refined collateral eligibility, valuation methods and tiering based on four collateral categories (cfr Collateral Framework Section) implemented.
- Full implementation of appropriation of pledged securities arrangements
- Thresholds to identify potential concentration on specific collateral received from borrowing participants is being implemented. Euroclear Bank is currently further enhancing its monitoring capabilities both ex-ante and ex-post in the context of CSDR

Annex 1 – Securitisation

Euroclear does not engage in any securitisation activities.

Annex 2 – Capital instruments´ main features template

In 2017, Euroclear Group entities did not have any capital instruments to be disclosed in Pillar III report.

Annex 3 – Remuneration policy disclosure

Compliance with Art 450 CRR

Euroclear decided to apply the proportionality principle laid down in Art 450(2) CRR.

Following this article, Euroclear is of the opinion that the qualitative disclosures laid down in the present document and the quantitative disclosures in Annual Report correspond to the size of the Euroclear group, its internal organization, the nature, scope and complexity of its activities.

List of acronyms

AIRBA	Advanced Internal Ratings-Based Approach for credit risk
AMA	Advanced Measurement Approach for operational risk
ARM	Assessment and Rating Methodology
BCBS	Basel Committee on Banking Supervision
BIA	Basic Indicator Approach for operational risk
CALCO	Credit, Assets and Liabilities Committee
CCF	Credit Conversion Factor
CCP	Central Counterparty
CCR	Credit Counterparty Risk
CEBS	Committee of European Banking Supervisors
CESR	Committee of European Securities Regulators
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CPMI	Committee on Payment and Market Infrastructure
CRD	Capital Requirements Directive
CRM	Corporate Risk Manager
CRO	Chief Risk Officer
CRR	Capital Requirements Regulation
CSD	Central Securities Depository
CVA	Credit Valuation Adjustement
DVP	Delivery-versus-Payment
EAD	Exposure At Default
EAR	Earnings-at-Risk
EC	Economic Capital
EDF	Expected Default Frequency
ERM	Enterprise Risk Management
ESA	Euroclear SA/NV
ESCB	European System of Central Banks
FMI	Financial Market Infrastructure
FIRBA	Foundation Internal Ratings-Based Approach for credit risk

HLCO	High Level Control Objectives
ICAAP	Internal Capital Adequacy Assessment Process
ICMA	Internal Capital Measurement Approach
ICS	Internal Controls System
ICSD	International Central Securities Depository
IFRS	International Financial Reporting Standards
ILAAP	Internal Liquidity Adequacy Assurance Process
IOSCO	International Organization of Securities Commissions
IRB	Internal Ratings-Based approach for credit risk
IS	Information Security
KPI	Key Performance Indicator
KRI	Key Risk Indicator
LCR	Liquidity Coverage Ratio
LGD	Loss-Given-Default
NBB	National Bank of Belgium
OTC	Over-the-Counter
ORX	Operational Riskdata eXchange
PAR	Positive Assurance Report
PD	Probability of Default
RCSA	Risk and Control Self-Assessment
RWA	Risk-weighted assets
SREP	Supervisory Review Evaluation Process
SRP	Supervisory Review Process
SSS	Securities Settlement System
TARGET	Trans-Automated Real-time Gross Express Transfer system, the Real-Time Gross Settlement System of the ESCB
TSA	The Standardised Approach for operational risk
VaR	Value-At-Risk