Pillar 3 disclosure 2016

Euroclear plc • July 2017

Post-trade made easy

Contents

Tables

The implementation of the Basel Framework at Euroclear

Euroclear plc is the ultimate holding company of, among others, Euroclear SA/NV, Euroclear Bank and the Central Securities Depositories (CSDs) of the Euroclear group. Euroclear Bank which being a CSD is the only CSD in the Euroclear group also to be a credit institution. The CSDs are settlement institutions. 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 view of the filing process which is planned in September 2017.

In addition, Euroclear Bank is subject to the Bank Recovery and Resolution directive. Work is currently underway to ensure compliance with these regulatory requirements. The focus of this report is solely on Pillar 3 related to the Basel III framework in 2016.

What is the Basel Framework?

The Basel III framework was implemented across European Union Member States as from 1 January 2014 through a European Regulation ('CRR') and Directive ('CRD IV'), which supersede earlier capital directives.

The new elements in the regulation address mainly aspects related to the quality, consistency and transparency of an institution's capital base; risk coverage, mainly in the area of counterparty credit risk; a leverage ratio to supplement the risk-based Basel II framework; and countercyclical measures through capital buffers.

A 30-day liquidity coverage ratio and a longer-term net stable funding ratio (NSFR) have also been added, to ensure that institutions maintain a sufficient stock of high quality liquid assets (HQLA) to cover potential liquidity gaps as well as adopt a healthy balance between short and long-term funding to cover their activities.

Banks are offered the possibility to use different risk measurement approaches for calculating their capital requirements, from simple or standardised methods to more elaborate models.

These more sophisticated approaches require the consistent understanding and use of data collected internally by the banks.

They generally allow banks to economise on capital, thus introducing an additional incentive to develop and apply strong risk management methods.

The Basel Framework differentiates between three so-called pillars, which are expected to be mutually reinforcing. **Pillar 1** is centred 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 2016.

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 did not choose 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. Euroclear uses a hybrid approach at all consolidated levels above Euroclear Bank, by combining the AMA for Euroclear Bank with a Standardised or **Basic Indicator Approach** (**BIA**) for the other group's entities.

The Standardised Approach (**TSA**) and the 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.

Pillar 2 at Euroclear

The scope of Pillar 2 is broader than that 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 will be disclosed at the highest consolidated level, i.e. Euroclear plc considering it captures all key risks it faces.

In addition, specific information, mainly on capital structure and adequacy, will be 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 licence of 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 2015 (Consolidated financial statements).

Frequency and method

Qualitative and quantitative information will be disclosed annually shortly after the publication of the Annual Report based on the situation at the end of the previous year. The frequency of the disclosure might be increased in the future to respond to market needs. The full disclosure document is published on www.euroclear.com.

Overview of risk management and Risk-weighted assets

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 across the three lines of defence. The programme aims to reinforce Euroclear's robust risk management framework in line with the increasing regulatory requirement including further clarification of the roles and responsibilities of the Board and its Committees, Senior Management, Line Management and the Control Functions. Focus has been put also on the continuous integration of the regulatory evolution in the overall risk framework.

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, meeting the Board's expectations. The framework is supported by a number of board-approved policies, management handbooks, processes, procedures, and internal control systems.

The ERM framework is structured around six core components:

- risk governance and culture
- risk, strategy and objective-setting
- risk in execution
- risk information, communication and reporting
- monitoring enterprise risk management performance and
- corporate governance matters.

The **Remuneration Committee** assists the Board of Directors:

- in defining the global compensation philosophy for the Group;
- in ensuring that the members of the Management Committee, the non-executive directors and the members of the Board committees are compensated in accordance with the Euroclear Compensation policy; and
- in advising the subsidiary companies on relevant matters arising out of the Compensation policy.

The Euroclear SA/NV Board 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 and general policy and other powers reserved to the Board or the shareholders by law or by the Articles.

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

- 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 the risk profile and control environment, reviews and approves risk and compliance related assessments and frameworks (incl. policies). It advises and/or escalates to the Management Committee, if needed. The Group Risk Committee validates material assumptions related to the capital models and risk assessments. 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 ESA 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 requirements and liquidity and cash requirements and liability.

Euroclear's CSDs

Each Euroclear´s CSD of the Group has a Board of Directors as their ultimate decision-making body. Their overarching responsibilities are to define and oversee the implementation of the strategy and objectives of the (I)CSD, as well as the risk policies (including the risk tolerance levels of the (I)CSD), and to supervise the [1] (I)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 (I)CSDs have also established a Management Committee or Executive Committee 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 have been posted on www.euroclear.com.

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

The Management Committee or Executive Committee 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.

- 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 and key assumptions and parameters used in the credit risk and asset and liability.shareholder's equity. The CALCO also advises on policy matters and key assumptions and parameters used in the credit risk and asset and liability.

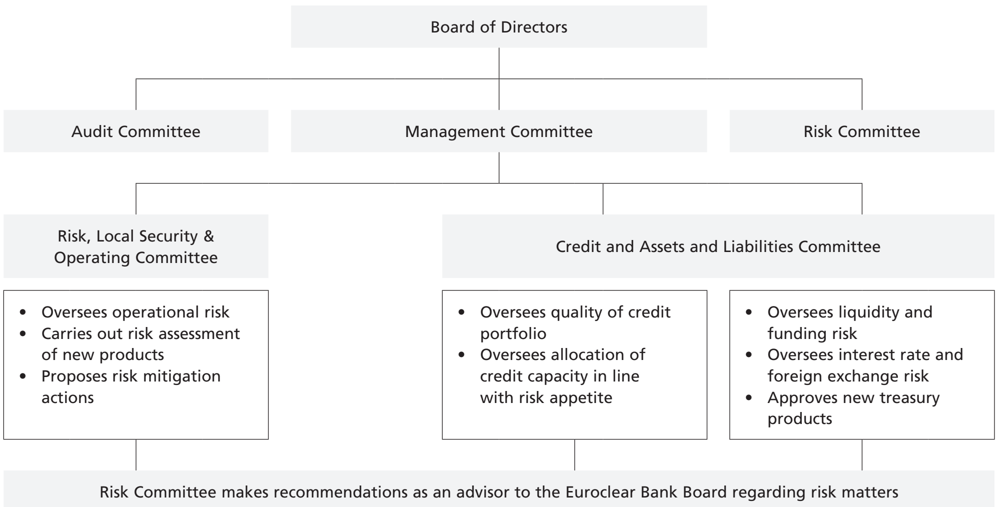
- the Group Admission Committee (for Euroclear Bank and the ESES CSDs) [1] puts forward a recommendation to Senior Management on both new admission requests (i.e. whether the candidates for admission comply with the entity's relevant admission criteria) as well as on any client no longer fulfilling the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

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.

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 & Compliance:**
  - Risk Management
    The Board oversees that well-resourced, effective and independent control functions are in place. In particular, it 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 does that by: aiming to deliver and maintain a leading ERM framework; providing the Board and Senior Management with high quality, independent advice and guidance; and helping foster a healthy risk culture throughout the organisation.

- Compliance & Ethics
  Compliance monitors, tests and reports to management on controls relating to laws and regulations and advises on remedial actions. Compliance 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 our staff's high level of 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 appetite and control environment

A risk appetite is set by the Board, within Euroclear's risk capacity. It 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. The risk appetite is articulated and monitored by way of metrics based on the criticality of key strategic objectives. As risk appetite is inherently dynamic, it is reviewed and adjusted on an ongoing basis.

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 a low residual risk appetite.

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, based around the High Level Control Objectives (HLCOs). They set the expectation on the level of internal control in each entity and division of the group. The HLCOs are complemented by more detailed Control Objectives. These are established by business management and are aligned to the mission of each business unit.

Finally, they are cascaded in controls and control processes, designed by the business describing how the risks impacting business activities are to be managed. This cascade of control objectives and controls are the foundation of Euroclear's Internal Control System (ICS).

The Risk Management division provides the framework to support the roll-out of the controls underpinning these control objectives. Line Management maintains tools to link the controls with the control objectives and monitoring activity, aiming 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 the action plans necessary to close control gap.

Euroclear risk categories

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

Threats to our reputation are not categorised as a risk type, but rather as a potential consequence of any risk materialising.

To manage these risks, the Board and Management have defined risk strategies and set limits on the amount of risk that Euroclear entities can or want to absorb (risk tolerance) and/or are prepared to accept (risk appetite).

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. Euroclear adopts the Basel II definition of operational risk which views operational risk as an umbrella risk, encompassing seven risk-event types:	
	Employment Practices & 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.	
	Client, 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 and cyber Losses due to acts of a type intended to defraud, misappropriate property or circumvent the law, by a third party.	
	Business Disruption & Systems Failure Losses arising from disruption of business or system failures (including cyber events).	
	Damage to or Loss of Physical (or other) Assets Losses arising from loss or damage to physical (or other) assets arising from natural disasters or other events.	
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 of loss (direct or contingent) arising from the failure of a counterparty to meet its obligations to Euroclear.	
Liquidity	The risk of a financial or non-financial impact arising from being unable to settle a cash or securities obligation when due. Risk of loss from: • inappropriate and/or insufficient liquidity sources intraday • inappropriate and/or insufficient liquidity sources end of day / funding	
Market	The risk of loss in (on or off balance-sheet) positions arising from adverse movements in market prices. Market risk arises from possible changes in foreign exchange rates, interest rates, equity or commodity prices.	
Business	Business risk arises from the inherent uncertainty to achieve our financial targets. It is the risk of revenues and costs being different from forecast, including losses from: • poor execution of business strategy • late time to market • cash flows and operating expenses Business risk includes project delivery risk (for projects impacting our costs and revenues) and risks related to our relationships with business partners.	
Strategic	The risk of our business model being inadequate in the medium to long term. This could result from: • an inability to implement the core strategy • implementing the wrong strategy • being unable to adapt to external changes in the environment in which Euroclear operates Strategic risks impact whole entities or the entire group; they are not limited to single business units, products or services.	
Project & change management	Risks to the organisation arising from managing change (e.g. programmes and projects) or an inability to adapt sufficiently quickly to industry and market changes and innovations	
Systemic	The risk of disruption to financial services that has the potential to have serious consequences for the financial system and/or the real economy.	

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

Amongst others, 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 manifest itself
- is it a potentially systemic risk
- what drives the risk
- which objectives are impacted by this risk
- is this risk 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 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

The four main risk response strategies used by Euroclear are:

- **Mitigate** – mitigating risks entails reducing the likelihood that they materialise or reducing their potential impact. This can be done e.g. by adding controls or, 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.

- **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 made by the business owners, at the adequate hierarchical level depending on the risk impact to ensure accountability and to ensure appropriate decision-making. All accepted risks must be regularly recertified, at least annually, taking into account the impact of accepted risks may have on other identified risks.

- **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.

Euroclear aims to implement the framework consistently across the group. Detailed implementation may vary to reflect each entity’s specificities (e.g. its size, local regulatory requirements etc.).

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

Monitor & Report

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’)**. It also shares the results with the Risk Management division, which challenges the conclusions and action plans when necessary.

Every department 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.

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.

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 ('AM')** and serves to produce Euroclear's yearly **Internal Controls System ('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 those workshops are to:

- build an accurate and consistent assessment of Euroclear's ICS;
- 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 the ICS.

The Risk Management division submits a quarterly report to the Euroclear SA/NV Board and to the Boards of Euroclear CSDs outlining the group and entities' risk profiles, respectively.

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

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 the Senior Management and help them, and the Risk Management division, improve the framework.

Risk Management function organisation and responsibilities

As part of the group-wide risk management transformation programme, the mission and organisation of the Risk Management function have also been reviewed. This new approach is being rolled out.

Euroclear's Risk Management function's mission is to provide robust, independent oversight of risk-taking activities across the Euroclear group to help it achieve its goals and deliver its strategy. To do that, the Risk Management function must strive to:

- deliver and maintain a leading 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
- receive recognition for its risk thought-leadership in the financial market infrastructure sector.

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 to ensure there is a robust independent oversight of risk-taking activities across the Euroclear group. CROs of the different Euroclear entities ('local 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 its 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.

Local CROs follow the same arrangement at the local level. In addition, they report functionally to the Euroclear group CRO.

To meet its obligation at both the group and entity level, the Risk Management function has adopted a matrix operating model which enables the local CROs to draw on Risk Management division subject matter expertise and resources as needed.

The performance of the CRO is reviewed by the Risk Committee which makes recommendations regarding the CRO's remuneration to the Remuneration Committee. The independence of the CRO is reinforced through his/her direct access to the Chairman and the members of the Euroclear SA Risk Committee.

Reporting and escalation

At least quarterly, Risk Management reports formally to the Senior Management, Euroclear SA Risk Committee and Audit & Risk committees of all entities, detailing our current risk profile, emerging risks and commenting on the key risks.

With the same frequency, the CRO reports a view on the Group Risk Profile, summarising the key risks at group level to the Euroclear SA/NV Management Committee and to the Euroclear SA/NV Risk Committee.

In addition, the Risk Management division will escalate immediately to the appropriate level material risk issues when, in its opinion, either a new risk emerges or mitigating actions for an existing risk have been insufficient in scope and/or not timely

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 Euroclear entities.

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, as Euroclear SA/NV and Euroclear plc are holding companies of a credit institution, Euroclear SA/ NV and Euroclear plc are 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, Euroclear SA/NV consolidated and Euroclear plc consolidated, use FIRBA.

Euroclear makes its own judgements about the ratings of counterparties and clients, and assigns its own probabilities of default. This gives significant capital benefits compared to the standardised approach.

Euroclear applies the standardised approach at the level of Euroclear SA/NV stand-alone, and at the level of Euroclear Belgium, as these entities bear minimal credit risk. For these entities, there is no intention to evolve towards an **Internal Ratings-Based** (**IRB**) approach in the short term, though this might be reassessed at a later stage, if deemed necessary.

For exposures that can be allocated to specific counterparties, Euroclear makes use of external ratings from the three major rating agencies, Moody’s, Standard & Poor’s and Fitch. Euroclear uses the standard conversion published by EBA to map the external credit ratings to the credit quality steps. The external ratings are used for the limited credit exposure these entities incur on corporates and institutions.

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. Euroclear uses a hybrid approach at all consolidated levels above Euroclear Bank, 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 below 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 2016.

Risk-weighted assets and regulatory capital

31 December 2016 (€'000)	**Euroclear plc consolidated**		**Euroclear Bank**	
	Risk-weighted assets[1]	Capital Requirement	Risk-weighted assets	Capital Requirement
Capital requirements for credit, counterparty credit and dilution risks and free deliveries (Internal ratings based Approach (IRB))	2,141,647	171,332	795,595	63,648
Central governments and central banks	111,564	8,925	111,243	8,899
Institutions	511,381	40,910	355,233	28,419
Corporates – SME	–	–	–	–
of which: subject to SME-supporting factor	–	–	–	–
Corporates – Specialised Lending	–	–	–	–
Corporates – Other	9,941	795	6,435	515
Capital requirements for equity under IRB	758,318	60,665	115,136	9,211
Other non credit-obligation assets	750,443	60,035	207,547	16,604
Capital requirements for position, foreign exchange and commodities risks (Standardised approaches (SA))	350,340	28,027	24,740	1,979
Foreign Exchange	350,340	28,027	24,740	1,979
Commodities	–	–	–	–
Capital requirements for operational risk (OpR)	4,157,035	332,563	3,187,500	255,000
OpR Basic indicator approach (BIA)	35,272	2,822	–	–
OpR Standardised (STA) / Alternative Standardised (ASA) approaches	834,263	66,741	–	–
OpR Advanced measurement approaches (AMA)	3,287,500	263,000	3,187,500	255,000
Total risk exposure amount for credit valuation adjustment	9,766	781	9,718	777
Standardised method	9,766	781	9,718	777
Total Capital requirements	**6,658,788**	**532,703**	**4,017,552**	**321,404**
Capital Ratios				
Total	–	36.6%	–	38.1%
Tier1	–	36.6%	–	38.1%
Common equity Tier1	–	36.6%	–	38.1%

(1) Risk-weighted assets (unaudited) 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 of capital consumption.

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.

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.

As a consequence, 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 consolidated. The 0.75% is applied in three tranches of 0.25% to each of these entities.

Euroclear SA 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 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.

	Euroclear Bank (€'000)
Pillar 1 capital requirements	321,000
Pillar 2 capital requirements	1,123,000

Composition of Capital

Euroclear plc's total capital is only made up of Tier1 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 for Euroclear plc group and Euroclear Bank as at 31 December 2016 to the audited financial statements in accordance with Article 2 in Commission implementing regulation (EU) No 1423/2013.

As at 31 December 2016, the regulatory consolidation scope is identical to the statutory consolidation scope.

Regulatory capital composition

31 December 2016 (€'000)	Euroclear plc consolidated	Euroclear Bank	Reference to balance sheet
Called up share capital and share premium	**146,451**	**843,505**	a
- Share capital	3,228	285,497	
- Share premium	143,223	558,008	
Capital redemption reserve	**603**	**–**	b
Other reserves	**1,022,613**	**94,047**	b
- of which cash flow hedge	(303)	-	c
Retained earnings (1)	2,390,719	**594,742**	
- PY retained earning	2,143,182	509,489	d
- CY retained earnings	298,192	85,253	d
- Defined benefit plan	(55,194)	–	b
- Non-taxable reserve	4,539	–	b
Shareholder's equity as per financial statements	**3,560,386**	**1,532,294**	
Proposed dividend (1)	**(119,446)**	**–**	d
Regulatory adjustments			
- Goodwill and other intangible assets	(999,845)	(9)	e
- Cash flow hedge	303	–	c
- Negative amounts resulting from the calculation of expected loss amounts	(3,178)	(2,744)	
- CET1 instruments of financial sector entites where the institution does not have a significant investment	–	–	
Common Equity Tier 1 capital	**2,438,220**	**1,529,541**	
Qualifying Tier 1 instruments	**–**	**–**	
Qualifying Tier 2 instruments	**–**	**–**	
Total capital base	**2,438,220**	**1,529,541**	

(1) Retained earnings after appropriation and transfer for Euroclear Bank, proposed dividend already deducted in shareholder's equity as par FS

Transitional own funds

Common equity tier 1 capital: instruments and reserves of Euroclear Bank stand-alone *31 December 2016 (€'000)*

		Amount at disclosure date	Amount [1]	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	594,742		d
3	Accumulated other comprehensive income (and other reserves, to include unrealised gains and losses under the applicable accounting standards)	94,047		b
6	Common Equity Tier 1 (CET1) capital before regulatory adjustments	1,532,294		
Common Equity				
8	Intangible assets (net of related tax liability) (negative amount)	-9		e
12	Negative amounts resulting from the calculation of expected loss amounts	-2,744		
28	Total regulatory adjustments to Common equity Tier 1 (CET1)	-2,753		
29	Common equity Tier 1 (CET1)	1,529,541		
45	Tier 1 capital (T1 = CET1 + AT1)	1,529,541		
58	Tier 2 (T2) capital	–		
59	Total capital (TC = T1 + T2)	1,529,541		
60	Total risk weighted assets	4,017,552		
Capital ratios and buffers				
61	Common Equity Tier 1 (as a percentage of risk exposure amount)	38.07%		
62	Tier 1 (as a percentage of risk exposure amount)	38.07%		
63	Total capital (as a percentage of risk exposure amount)	38.07%		
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]	0.88%		
65	- of which: capital conservation buffer requirement	0.63%		
68	Common equity Tier 1 available to meet buffers (as a percentage of risk exposure amount)	30.07%		
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)	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 0.25% (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 Plc *31 December 2016 (€'000)*

		Amount at disclosure date	Amount [(1)]	Reference to balance sheet
1	Capital instruments and the related share premium accounts	146,451		a
	- of which: Ordinary shares and related share premium	146,451		
2	Retained earnings	2,321,928		d
3	Accumulated other comprehensive income (and other reserves, to include unrealised gains and losses under the applicable accounting standards)	972,561		b
6	Common Equity Tier 1 (CET1) capital before regulatory adjustments	3,440,940		
Common Equity				
8	Intangible assets (net of related tax liability) (negative amount)	-999,845		e
11	Fair value reserves related to gains or losses on cash flow hedges	303		c
12	Negative amounts resulting from the calculation of expected loss amounts	-3,178		
28	Total regulatory adjustments to Common equity Tier 1 (CET1)	-1,002,720		
29	Common equity Tier 1 (CET1)	2,438,220		
45	Tier 1 capital (T1 = CET1 + AT1)	2,438,220		
58	Tier 2 (T2) capital	0		
59	Total capital (TC = T1 + T2)	2,438,220		
60	Total risk weighted assets	6,658,788		
Capital ratios and buffers				
61	Common Equity Tier 1 (as a percentage of risk exposure amount)	36.62%		
62	Tier 1 (as a percentage of risk exposure amount)	36.62%		
63	Total capital (as a percentage of risk exposure amount)	36.62%		
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)	0%		
65	- of which: capital conservation buffer requirement	0%		
68	Common equity Tier 1 available to meet buffers (as a percentage of risk exposure amount)	28.62%		
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)	223,459		
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)	114,158		

(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 plc group and Euroclear Bank as at 31 December 2016.

CRR Leverage Ratio Disclosure

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

	31 December 2016 (€'000)	Euroclear plc consolidated	Euroclear Bank
1	Total assets as per published financial statements	22,876,392	20,127,626
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	82,157	81,760
5	Adjustments for securities financing transactions 'SFTs'	115,090	115,090
6	Adjustment for off-balance sheet items (ie conversion to credit equivalent amounts of off-balance sheet exposures)	1,022,684	1,022,684
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	-999,543	-9
8	**Total leverage ratio exposure**	**23,096,780**	**21,347,151**

Table LRCom: Leverage ratio common disclosure

31 December 2016 (€'000)		Euroclear plc consolidated	Euroclear Bank
On-balance sheet exposures (excluding derivatives and SFTs)			
1	On-balance sheet items (excluding derivatives, SFTs and fiduciary assets, but including collateral)	12,696,400	9,947,634
2	(Asset amounts deducted in determining Tier 1 capital)	-999,543	-9
3	**Total on-balance sheet exposures (excluding derivatives, SFTs and fiduciary assets) (sum of lines 1 and 2)**	**11,696,857**	**9,947,625**
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	82,157	81,760
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)**	**82,157**	**81,760**
Securities financing transaction exposures			
12	Gross SFT assets (with no recognition of netting), after adjusting for sales accounting transactions	10,179,992	10,179,992
13	(Netted amounts of cash payables and cash receivables of gross SFT assets)	–	–
14	Counterparty credit risk exposure for SFT assets	115,090	115,090
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	–	–
EU-15a	(Exempted CCP leg of client-cleared SFT exposure)	–	–
16	**Total securities financing transaction exposures (sum of lines 12 to 15a)**	**10,295,081**	**10,295,081**
Other off-balance sheet exposures		–	–
17	Off-balance sheet exposures at gross notional amount	10,222,957	10,222,957
18	(Adjustments for conversion to credit equivalent amounts)	-9,200,273	-9,200,273
19	**Other off-balance sheet exposures (sum of lines 17 to 18)**	**1,022,684**	**1,022,684**
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)	**2,259,475**	**1,444,288**
21	**Total leverage ratio exposures (sum of lines 3, 11, 16, 19, EU-19a and EU-19b)**	**23,096,780**	**21,347,151**
Leverage ratio			
22	**Leverage ratio**	**9.78%**	**6.77%**
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 on page 21 is due to CY retained earnings after deduction of proposed dividends.

CRR leverage ratio exposures

31 December 2016 (€'000)		**Euroclear plc consolidated**	**Euroclear Bank**
EU-1	Total on-balance sheet exposures (excluding derivatives, SFTs, and exempted exposures), of which:	12,696,400	9,947,634
EU-2	- Trading book exposures	–	–
EU-3	Banking book exposures, of which:	12,696,400	9,947,634
EU-4	- Covered bonds	–	–
EU-5	- Exposures treated as sovereigns	6,069,149	6,067,612
EU-6	- Exposures to regional governments, MDB, international organisations and PSE NOT treated as sovereigns	–	–
EU-7	- Institutions	4,749,937	3,606,868
EU-8	- Secured by mortgages of immovable properties	–	–
EU-9	- Retail exposures	–	–
EU-10	- Corporate	45,487	34,524
EU-11	- Exposures in default	–	–
EU-12	- Other exposures (eg equity, securitisations, and other non-credit obligation assets)	1,831,827	238,630

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 plc 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

31 December 2016 (€'000)	Encumbered assets		Unencumbered assets	
	Carrying amount	Fair value	Carrying amount	Fair value
	010	040	060	090
010 – Assets of the reporting institution	35,525	–	23,523,822	–
030 – Equity instruments	–	–	237,158	237,158
040 – Debt instruments	35,525	35,525	2,603,382	2,603,382
120 – Other assets	–	–	20,683,282	–

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

- Debt instruments (2.6 Bn or 11% 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 (20.7 Bn or 88% of total assets):
  - Client end-of-day balances are invested with high quality market counterparts, preferably by using reverse repurchase agreements (81%).
  - the tangible and intangible assets 7% .

Collateral received

31 December 2016 (€'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	324,395	11,875,431
150 – Equity instruments	–	–
160 – Debt instruments	324,395	11,875,431
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. On average, 80% of total client balances are invested in reverse repurchase agreements where high credit and liquidity collateral criteria are required.

Sources of encumbrance

31 December 2016 (€'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	314,574	314,574

Activities do not lead to asset encumbrance as Euroclear plc 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.

Credit risk management

Credit risk is the risk of loss (direct or contingent) arising from the default or failure of a client or counterparty to meet its Euroclear obligations. The degree of credit risk depends on the credit standing of the client or counterparty and on the duration, amount and nature of the exposure that Euroclear has with the specific client or counterparty. As of the implementation of the CSDR, Euroclear Bank will be 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.

Strategies and processes

Euroclear Bank

Credit decisions are made at the discretion of Euroclear Bank, which only accepts credit risk within its risk appetite. The risk appetite for credit risk in Euroclear Bank 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 risk of a credit loss for Euroclear Bank is deemed very low and Euroclear Bank has proven highly resilient even during the period of market turmoil. This is largely due to the uncommitted nature coupled with the very short duration of the credit exposure which, in general, is intraday.

Additionally, Euroclear Bank applies very strict collateralisation rules concerning the quality and quantity of securities used as collateral.

Euroclear Bank also has treasury exposures resulting from clients' end-of-day cash balances. Such positions are usually re-deposited in the market with high quality counterparties. Where possible reverse repos are used, but some limited exposure remains unsecured. The risks are limited by their short duration (mainly overnight), as well as by policy limits.

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 clients, counterparties and all the countries where Euroclear Bank has credit exposure.

Short-term credit provision by Euroclear Bank

Euroclear Bank extends short-term credit to its clients to facilitate the settlement of securities transactions. Such credit extensions, which create 'operating exposure', can occur when:

- clients do not hold their cash reserves in Euroclear Bank; and/or
- there are structural time lags in the flow of funds as a result of time-zone differences and differences in operating hours of the various intermediaries involved in the payments.

In other words, operating exposure results from temporary mismatches between incoming and outgoing funds on clients' accounts.

Outgoing cash flows can:

- fund purchases of securities within the Euroclear system;
- fund cross-border receipts of securities; or
- be moved from the Euroclear system in the form of wire transfers.

Incoming funds derive from:

- sales of securities within the Euroclear system;
- cross-border deliveries of securities; and
- credit on clients accounts from external intermediaries.

Generally, the duration of operating exposure is less than 24 hours (i.e. intraday). The duration varies with the sources of exposure and funding.

Clients for which cash flows are mainly driven by purchases and sales within the Euroclear system in a back-to-back mode, need credit only 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 clients 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 the bank until the next day.

Credit facilities for Euroclear Bank's clients

Euroclear Bank may offer credit facilities to clients on an uncommitted basis. Such facilities are always multi-currency and multi- purpose and can be reduced or withdrawn at any time, without notice. Credit officers within the Credit department determine whether or not credit facilities can be offered to a given client, and the size of such facilities. The size of the credit facilities is reviewed annually. Euroclear Bank limits the aggregate operating exposure to any family of clients.

Clients may receive temporary credit in excess of their credit facilities, upon appropriate 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 clients. Thus, such additional credit contains systemic risk.

Clients that benefit from credit facilities are required to execute special credit documentation with Euroclear Bank. More information on this can be found in the chapter on Operational risk management.

Credit facilities are primarily used for the following purposes:

- intraday cash borrowing: Use of credit can allow for securities settlement without the need for pre-funding accounts.

- commitments in connection with local market settlements: Euroclear Bank may extend credit to clients to facilitate local market settlements, as from when it sends instructions to the local market for either matching or settlement purposes.

- Securities borrowing: Clients must have credit arrangements in place with Euroclear Bank as a prerequisite to borrow securities through the Euroclear Securities Lending and Borrowing Programme. A securities borrowing constitutes an extension of credit to a borrower, to cover the guarantee given by Euroclear Bank to the lender that it will be reimbursed. Securities borrowings are subject to a cap pre-set per client.

- **Global Collateral Access (GCA)**: Clients must have credit arrangements in place with Euroclear Bank as a prerequisite to borrow securities through the General Collateral Access Programme. A securities borrowing constitutes an extension of credit to a borrower, to cover the guarantee given by Euroclear Bank to the lender that it will be reimbursed. Securities borrowings are subject to a separate credit line set per client.

Credit exposures to other counterparties

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

- the placements of cash at end-of-day in the market. The majority of cash is secured through reverse repos transactions. This type of exposure is usually very short-term;

- the Investment and Treasury Book. Treasury can only invest in highly rated and liquid securities;

- short/medium-term derivative transactions. Euroclear Bank faces counterparty credit risk when it buys options or enters into forex forwards contracts to hedge its foreign exchange and interest rate exposures. More information on this can be found in the chapter on Market risk management; and

- foreign exchange transactions: as an institution located in multiple countries and active in many markets, Euroclear Bank needs to conduct foreign exchange operations, including FX swaps. Such transactions expose Euroclear Bank to settlement risk.

These credit exposures are limited by specific facilities for market transactions. Additionally, aggregate unsecured exposures to any family of clients and/or counterparties are expected to remain within the limits set by the Board.

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. Voluntary unsecured exposure on non- investment grade counterparties is not allowed.

Euroclear Bank offers cash services to support the multi-currency activities of its participants. These services are offered via a network of cash correspondents in commercial bank money. Such 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 Euroclear CSDs

The CSDs have no direct cash relationship with their clients. Consequently, they cannot extend loans or credit facilities to their customers. The CSDs can potentially face a low level of credit risk arising from the non-payment of fees by their clients. These are limited amounts, considering both the frequency of the billing and their relatively broad customer base. Each CSD of the group is required by its home regulator to hold enough liquidity to cover all relevant risks. As a result, the group CSDs are exposed to two types of credit risk; one related to fees (very small part) and the second related to the investment of capital which is mitigated by having highly rated counterparties.

To limit the credit risk taken on such counterparties, the banks that are considered for these investments should at least have a rating in the A-range, with investment maturities not exceeding three years.

Concentration risk

Concentration limits are set to ensure that the group does not take excessive exposures on a limited number of clients or counterparties.

European and Belgian banking regulations also impose risk concentration limits that have to be respected for each applicable exposure. Individual exposures above 25% of the own funds (Tier 1 + Tier 2 – deductions) are reported as breaches under the large exposures regulation.

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.

Rating concentration of financial assets

About 98% of the settlement and treasury exposures of Euroclear Bank were taken on investment grade clients and counterparties. In addition, on average more than 99% of the settlement exposure is secured and most of this exposure is intraday. Therefore, there are no expected credit losses and no impairment provision has ever been required.

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 2016, 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.

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 would face when trying to realise the collateral of a defaulting clients. 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 or investments held in the investment book).

The table on the next page shows total and average exposures under the FIRBA.

Total and average exposures under the FIRBA

	Euroclear plc consolidated and Euroclear SA/NV consolidated[1]			
31 December 2016 (€'000)	Total exposures	Central governments and central banks	Institutions	Corporates
Total gross credit exposures Euroclear plc	60,289,641	7,774,426	51,955,853	559,362
Total gross credit exposures Euroclear SA/NV	59,677,062	7,774,426	51,344,682	557,953
Average gross credit exposures Euroclear SA/NV[2]	67,151,970	5,953,129	60,660,317	538,524

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

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

The table below provides information on the geographical concentration of exposures, before credit risk mitigation, which are mostly concentrated in (Western) Europe and North America.

The geographical regions are those in which Euroclear clients or counterparties are located. Cash is always classified under the country of the issuing central bank.

Geographical concentration of credit exposures

	Euroclear plc consolidated[1]			
31 December 2016 (€'000)	Total exposures	Central governments and central banks	Institutions	Corporates
European Union	57,886,600	7,766,795	49,560,516	559,289
Other Europe[2]	33,718	–	33,718	–
North America	1,373,539	8	1,373,527	4
Central and South America	212,912	3	212,891	18
Asia	695,734	7,201	688,517	16
Middle East	60,601	417	60,166	17
Africa	549	2	536	10
Oceania	24,995	0	24,987	8
Other	994	–	994	–
Total	60,289,641	7,774,426	51,955,853	559,362

(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) Other Europe incudes Turkey.

Given Euroclear's role as a provider of post-trade services to global capital markets, its exposures are highly concentrated on the financial sector, and as a consequence it does not incur exposures from non-financial industrial sectors.

The table below provides information on the residual contract maturity breakdown of the entire portfolio. Most exposures are very short-term, generally one day.

Residual maturity breakdown of credit exposures

	Euroclear plc consolidated[1]			
31 December 2016 (€'000)	**Total exposures**	**Central governments and central banks**	**Institutions**	**Corporates**
Less than two weeks[2]	53,887,967	5,750,343	47,578,334	559,290
2 weeks - 1 month	2,039,145	102,531	1,936,541	72
1 - 6 months	3,107,292	1,642,569	1,464,724	–
6 months - 1 year	805,573	237,113	568,460	–
More than 1 year	449,664	41,870	407,793	–
Total	60,289,641	7,774,426	51,955,853	559,362

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

(2) 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

Credit exposure on equities

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.

The table below shows the gross exposure on equity investments, by risk weight.

Equity exposure, simple risk weights

31 December 2016 (€'000)	**Euroclear plc consolidated**
Risk weight	**Total gross exposure**
190%	–
290%	220,864
370%	31,841

Other non credit-obligation assets

Euroclear applies a 100% risk weight to exposures that are considered as non-material and not related to its core activities. These include other assets, accruals and tangible fixed assets. These exposures cannot be allocated to specific counterparties.

The table below shows total exposures related to non credit-obligation assets.

31 December 2016 (€'000)	**Risk weight**	**Euroclear plc consolidated**
Total exposures under standardised approach	–	579,206
On balance sheet items	100%	465,047
On balance sheet items	250%	114,158

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, and in line with sound banking practices and banking regulations, Euroclear makes risk provisions for credit exposures when necessary. Such provisions are made for ‘doubtful debt’, i.e. loans which reimbursement is uncertain. Euroclear does not have any risk provision for credit exposure at present, because it does not have any impaired assets.

Credit risk mitigation

Secured exposures

Due to the international scope of its activities and the multi-purpose and multi-currency nature of the credit facilities granted to its clients, the collateral pledged by a client to Euroclear Bank is not specifically attributable to any of the different types of credit exposures Euroclear Bank has with such client. This means that all the collateral pledged from a specific client is there to guarantee all the obligations it has with Euroclear Bank without differentiating within the nature of the exposure and the original currency.

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.

Netting

Euroclear Bank vis-à-vis its clients

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

Client positions are not netted on a day-to-day basis, as clients positions on sub-accounts (e.g. in different currencies) are considered separately. However, clients 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 master agreements with its counterparties. These agreements 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 futures).

Collateral valuation and management

Intraday credit offered to clients is generally secured by financial collateral or other recourse. Every business day, Euroclear Bank assesses the collateral value of the securities held, based on prices obtained from a number of recognised external information providers, whereby the most appropriate price is selected according to the quotation selection rules.

More than 80% of securities pledged in Euroclear Bank are priced every day, or every second day. Securities for which Euroclear Bank does not obtain regular external quotations can also be valued according to the price associated with securities transactions in the Euroclear system, or according to agreed theoretical models.

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.

Types of collateral taken

As a general rule, all Euroclear Bank credit facilities should be secured with CPMI-IOSCO compliant recourse types. 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.

The management of (market or credit) risk concentrations

Euroclear Bank uses collateral concentration thresholds as risk indicators to identify exceptional levels of specific collateral that have an impact on the credit risk exposure of Euroclear Bank. Particular attention is paid to the collateral issued and/or held by non-investment grade entities. Other dimensions monitored concern the region and country of the issuer, the liquidity of the collateral, whether it is ESCB eligible, as well as the type of security. Reaching a threshold 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.

The table following shows the exposures faced by the Euroclear group that are covered by eligible financial collateral.

All collateralised exposures are incurred by Euroclear Bank and are therefore subject to the FIRBA.

End of day exposures (after netting) covered by (after haircuts) eligible financial collateral

	Euroclear plc consolidated			
31 December 2016 (€'000)	**Total exposures**	**Central governments and central banks**	**Institutions**	**Corporates**
Foundation Internal ratings-based approach (FIRBA)	38,574,749	1,593,979	36,931,134	49,636

Note that in the Consolidated financial statements, reverse repos, overdrafts and exposures related to securities lending and borrowing are considered as secured. In this table, they are only considered as secured when the related collateral is eligible under Basel III.

Only a few credit risk exposures that Euroclear Bank faces are covered by guarantees. Though these guarantees represent valid risk mitigation, they are not taken into account in Euroclear Bank's calculation of regulatory capital requirements. This leads to more conservative estimates of the risks incurred.

One guarantee, however, is accurately captured in the model: the letter of credit issued by a syndicate of banks to cover part of Euroclear Bank's exposure arising from activity across the electronic Bridge with Clearstream Banking Luxemburg. Euroclear Bank applies the substitution approach, when relevant. As this information concerns an individual client, the details are considered to be confidential and can not be disclosed.

Credit Risk Mitigation

	Euroclear plc consolidated				
31 December 2016 (€'000)	Exposures unsecured – Carrying amount	Exposure to be secured	Exposure secured by collateral	Exposures secured by financial guarantees	Exposure secured by credit derivatives
Total loans	7,505,447	10,882,662	10,882,662	–	–
Total debt securities	2,599,597	–	–	–	–
Total exposures	10,105,044	10,882,662	10,882,662	–	–
of which defaulted	–	–	–	–	–

Internal rating model

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 rates all clients 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 an overall 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 annually. It is also responsible for maintaining adequate procedures. Finally, it contributes actively, as a user, to improving the model and the procedures 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). Attention is also given to the migration of ratings over time.

- the Banking Risk and Validation functions in the Risk Management Division perform the yearly validation, issue recommendations and verify compliance. The Risk Management Division also acts as necessary approver 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 Treasury and Credit Divisions.

- 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 clients: banks, broker-dealers, asset managers, corporates, central banks and multilateral lending institutions. Euroclear Bank does not have any retail exposures or significant exposure to equities.

Each client 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 clients.

Given Euroclear Bank's long-standing relationship with its clients, the ratings are long-term.

The table on the next page provides an overview of the various rating categories, and their meaning.

Overview of Euroclear Bank's internal rating grades

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.
	Ecc	Currently highly vulnerable to non-payment.
	Ec	Obligor is currently highly vulnerable to nonpayment, 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.

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.

The tables on the next page shows the credit risk exposure per PD class and the credit risk exposure class and PD range.

Credit risk exposure per PD class

31 December 2016 (€'000)

		Euroclear plc consolidated			
PD ranges (in %)	Total exposures[(1)] RWA Exposure-Weighted Average (EWA) LGD	Total	Central governments and central banks	Institutions	Corporates
0.0094%	Total exposures	6,762,026	6,762,026	–	–
	RWA	50,817	50,817	–	–
	EWA LGD	34%	34%	–	–
0.0137%	Total exposures	8	8	–	–
	RWA	0	0	–	–
	EWA LGD	45%	45%	–	–
0.0199%	Total exposures	1,004,461	1,004,461	–	–
	RWA	58,405	58,406	–	–
	EWA LGD	45%	45%	–	–
0.0300%	Total exposures	12,407,289	–	12,407,258	31
	RWA	134,299	–	134,298	1
	EWA LGD	8%	–	8%	45%
0.0422%	Total exposures	3,313,510	4,845	3,301,919	6,746
	RWA	34,780	248	34,528	4
	EWA LGD	7%	45%	7%	1%
0.0616%	Total exposures	16,895,205	–	16,400,335	494,870
	RWA	149,843	–	145,457	4,387
	EWA LGD	5%	–	5%	5%
0.0899%	Total exposures	12,864,751	0	12,848,965	15,785
	RWA	68,128	0	68,128	0
	EWA LGD	2%	45%	2%	0%
0.1310%	Total exposures	6,149,897	–	6,133,717	16,180
	RWA	23,952	–	23,952	0
	EWA LGD	1%	–	1%	0%
0.1911%	Total exposures	86,664	–	79,888	6,776
	RWA	1,897	–	1,897	0
	EWA LGD	4%	–	4%	0%
0.2785%	Total exposures	678,272	0	665,031	13,241
	RWA	5,791	0	3,064	2,727
	EWA LGD	3%	45%	1%	32%
0.3640%	Total exposures	7,134	–	6,721	413
	RWA	1,437	–	1,436	1
	EWA LGD	25%	–	27%	0%
0.6833%	Total exposures	68,391	2,668	60,411	5,312
	RWA	30,872	1,415	26,650	2,807
	EWA LGD	37%	45%	36%	45%
1.2827%	Total exposures	10,794	–	10,794	–
	RWA	6,187	–	6,187	–
	EWA LGD	34%	–	34%	–
2.4080%	Total exposures	149	–	149	–
	RWA	11	–	11	–
	EWA LGD	4%	–	4%	–
4.5206%	Total exposures	168	2	158	9
	RWA	15	2	0	13
	EWA LGD	3%	45%	0%	45%
8.4864%	Total exposures	40,922	417	40,505	0
	RWA	66,450	677	65,772	1
	EWA LGD	45%	45%	45%	45%
29.9081%	Total exposures	0	0	0	–
	RWA	0	0	0	–
	EWA LGD	45%	45%	45%	–
Total	**Total exposures**	**60,289,641**	**7,774,426**	**51,955,853**	**559,362**
	RWA	**632,886**	**111,564**	**511,381**	**9,941**
	EWA LGD	**10%**	**36%**	**5%**	**6%**

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

(1) Total exposure: exposure at default as defined under Basel II (pre conversion factors). This does not include intraday exposure.

Credit risk exposures by exposure class and PD range

31 December 2016 (€'000)

	Euroclear plc consolidated											
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	13,247,540	37,762,502	–	4,535,598	0,05%	219	0,45	0,33	406,362	9%	1,025	–
0.15 to <0.25	17,549	62,339	–	8,580	0,19%	27	0,45	0,08	1,897	22%	7	–
0.25 to <0.50	17,362	654,390	–	14,523	0,30%	35	0,45	0,05	4,500	31%	20	–
0.50 to <0.75	50,943	9,465	–	49,856	0,68%	111	0,45	0,10	26,650	53%	153	–
0.75 to <2.50	2,336	8,606	–	8,114	1,28%	10	0,45	0,04	6,199	76%	47	–
2.50 to <10.00	40,662	–	–	40,477	8,49%	6	0,45	0,08	65,772	162%	1,546	–
10.00 to <100.00	0	–	–	0	29,91%	3	0,45	0,04	0	269%	0	–
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	–
Sub-total	13,376,394	38,497,302	–	4,657,147	0,13%	411	0,45	0,33	511,381	11%	2,798	–
Corporate												
0.00 to <0.15	514,872	18,740	–	57,113	0,06%	17	0,46	0,04	4,392	8%	16	–
0.15 to <0.25	6,588	188	–	0	0,19%	5	0,45	0,04	0	22%	0	–
0.25 to <0.50	13,570	84	–	9,424	0,28%	11	0,45	0,04	2,728	29%	12	–
0.50 to <0.75	5,312	–	–	5,311	0,68%	65	0,45	0,04	2,807	53%	16	–
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	–
2.50 to <10.00	9	–	–	9	4,71%	3	0,45	0,04	14	148%	0	–
10.00 to <100.00	–	–	–	–	–	–	–	–	–	–	–	–
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	–
Sub-total	540,350	19,012	–	71,859	0,14%	101	0,45	0,04	9,941	14%	44	–
Central governments and central banks												
0.00 to <0.15	7,766,063	5,277	0,01%	6,177,361	0,01%	24	0,45	0,37	109,470	2%	309	–
0.15 to <0.25	–	–	–	–	–	–	–	–	–	–	–	–
0.25 to <0.50	0	–	–	0	0,28%	1	0,45	0,04	0	38%	0	–
0.50 to <0.75	2,668	–	–	2,668	0,68%	6	0,45	0,07	1,415	53%	8	–
0.75 to <2.50	–	–	–	–	–	–	–	–	–	–	–	–
2.50 to <10.00	418	–	–	418	8,47%	2	0,45	0,08	679	162%	16	–
10.00 to <100.00	0	–	–	0	29,91%	1	0,45	0,04	0	269%	0	–
100.00 (Default)	–	–	–	–	–	–	–	–	–	–	–	–
Sub-total	7,769,149	5,277	0,01%	6,180,447	0,01%	34	0,45	0,37	111,564	2%	334	–
Total (all portfolios)	**21,685,893**	**38,521,591**	**0,00%**	**10,909,453**	**0,06%**	**546**	**0,45**	**0,35**	**632,886**	**6%**	**3,176**	**–**

Counterparty credit risk

Counterparty credit risk is defined by the Basel Committee on Banking Supervision as '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 relevant only for Euroclear Bank, and the following information therefore applies only to Euroclear Bank.

By policy, Euroclear Bank does not engage in any activity that is not part of its normal course of business or a consequence of client activity.

This means that Euroclear Bank's treasury operations are related to either the management of client 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 hedge its future earnings or its currency exposures against detrimental market movements and its term repo activity.

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.

Derivatives instruments used by Euroclear Bank to hedge its future earnings are currently limited to foreign-exchange forward transactions. 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.

Counterparty credit risk is managed through global limits at counterparty family level and limits at individual counterparty 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 (longer than one year).

Collateral for counterparty credit risk

Euroclear Bank is rated AA by Standard and Poors and AA+ by Fitch Ratings. The consequences of a rating downgrade on collateral demand can be considered nil, as Euroclear Bank is structurally a collateral-taker. Euroclear Bank needs to post collateral only at the National Bank of Belgium to obtain liquidity for use in the TARGET system or uses collateral (through collateral providers) to support its settlement in local markets.

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 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. General or conjectural 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.

Wrong-way risk is not a major concern for Euroclear Bank, given the limited scope of its derivatives activity. Additionally, Euroclear Bank avoids specific wrong-way risk in its settlement activity as it does not, as a rule, grant credit to clients based on collateral issued by themselves or related parties.

Counterparty credit exposures

The table on the next page shows the gross fair value of contracts that have been entered into by Euroclear group.

Gross fair value of contracts

31 December 2016 (€'000)	Euroclear plc consolidated[1]	
Gross fair value of contracts	**Assets**	**Liabilities**
Interest rates derivatives	–	–
- Interest rate options	–	–
- Interest rate swaps	–	–
- Interest rate futures	–	–
Foreign exchange derivatives		
- Forward foreign exchange instruments held for trading	40,063	32,292
- Forward foreign exchange designated as cash flow hedges	568	1,026
- Foreign exchange options designed as cash flow hedges	–	–
- Forward foreign exchange hedges of net investments in a foreign operation	–	–
Stock options[2]	**90**	**90**
Netting benefits	–	–
Collateral held	–	–
Net derivatives credit exposure under the FIRBA[2]	**82,157**	–

Source: Euroclear plc Consolidated financial statements 2016.

(1) See *Consolidated financial statements* for more information on this item.

(2) Expressed as exposure at default (notional value X add-on).

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.

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 one year.

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 entities 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 highly 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 2016.

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 will not engage in trading activities, the VaR figures are low.

The table below shows the average, as well as the minimum and maximum VaR over 2016 and 2015 for the different books and types of risks that Euroclear Bank faces.

The VaR model is back-tested on regular basis.

VaR figures by book

	Euroclear Bank SA/NV					
(€'000)	**average**		**minimum**		**maximum**	
	2016	2015	2016	2015	**2016**	**2015**
Investment book interest rate risk	476	372	203	105	2.529	1,183
Treasury book foreign exchange risk	26	26	5	5	118	125
Hedging book	445	678	48	117	1.786	1,588
Total VaR	**662**	**796**	**225**	**181**	**2.537**	**1,575**

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 2016 (€'000)	**Euroclear plc consolidated**
Fair value of Available-for-sale financial assets disclosed in balance sheet	**235,432**
Publicly quoted share values when different from fair value	–
Exchange-traded exposures	**220,864**
- equity shares	220,864
Private equity exposures in diversified portfolios	–
Other (unlisted, but fair value determinable)	14,568
Realised gains (losses) from sales and liquidations	2,516
Total unrealised gains (losses)[1]	115,577
Investments in subsidiaries and joint ventures	**17,273**
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	252,705
Deduction for 10% limit	–
Total equity exposure after deduction	**252,705**

[1] included in common equity Tier 1 capital

Interest rate risk in the banking book

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

The table below shows the interest rate sensitivity of Euroclear's banking book positions. The figures relate to Euroclear SA/NV consolidated, as communicated to the National Bank of Belgium in the framework of standardised reporting under Pillar 2 of Basel. The figures for Euroclear plc are not expected to diverge materially from the content of this table. 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 table below. In the context of the Recovery and Resolution plan, Euroclear Bank received a convertible loan from Euroclear Investment of EUR 200 million to reinforce the capital base in a recovery situation. The convertible loan is included in the IRRBB 2016 economic value calculation, there is currently a maturity mismatch between the loan of 10 years and the cash investment. By policy, the available cash will be invested in debt instruments rated AA- or higher.

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 2016. For the purpose of this disclosure, we aggregate the future earnings in euro; however, for the interest rate sensitivity we distinguish between GBP, USD and Euros (all other currencies are converted and included in Euro).

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 2016 (€'000)		**Euroclear SA/NV consolidated[1]**		
Interest rate increase / (decrease), in basis points	**All currencie**	**EUR**	**GBP**	**USD**
300	1.775.220	1.643.119	132.457	-356
200	1.772.062	1.638.166	132.881	1.015
100	1.767.231	1.631.533	133.310	2.387
–	1.760.522	1.623.018	133.743	3.761
(100)	1.751.705	1.612.388	134.180	5.137
(200)	1.740.523	1.599.387	134.622	6.513
(300)	1.726.686	1.583.726	135.068	7.892

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

Income sensitivity interest result expected 2017

(€'000)		**Euroclear SA/NV consolidated[1]**		
Interest rate increase / (decrease), in basis points	**All currencies**	**EUR[2]**	**GBP**	**USD**
300	451.605	175.655	25.274	250.675
200	337.037	115.005	18.799	203.233
100	221.061	53.572	12.247	155.241
–	103.638	-8.664	5.618	106.685
(100)	50.571	-8.602	1.623	57.550
(200)	12.979	-8.557	1.307	20.229
(300)	3.860	-8.511	1.307	11.064

(1) The figures for Euroclear plc are not expected to diverge materially from the content of this table.
Interest result effective for 2016: EUR 123.059

(2) Corrective action will be taken before the negative interest rate sensitivity would materialise.

Liquidity risk management

Liquidity risk is the risk of being unable to effect timely settlement of payment obligations due to insufficient funds. 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.

The Euroclear CSDs and Euroclear SA/NV

The Euroclear CSDs and Euroclear SA/NV face negligible liquidity risk. Liquidity risk arises from the related credit risk that they are exposed to when awaiting the payment of fees from clients or depositing their cash surplus 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 all 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

- surplus cash, including the working cash requirements of these entities. Surplus 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 average duration of the CSD’s treasury portfolio should not exceed two years with initial maturity of treasury investments not beyond three 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 managing the liquidity flow.

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 and its participants are acceptable.

In order to raise liquidity, Euroclear Bank can also 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.

For Euroclear Bank, the LCR on 31 December 2016 was as follows:

Euroclear Bank Liquidity Coverage Ratio

31 December 2016 (€'000)	Unweighted value	Weighted value
High Quality Liquid Assets (HQLA)	**8,348,166**	**8,123,981**
Net liquidity outflow	**5,941,697**	**4,569,533**
Liquidity coverage ratio (%)	**–**	**177.79%**
Numerator calculations		
Level 1 assets other than extremely high quality covered bonds	6,489,955	6,489,955
Level 1 extremely high quality covered bonds	879,036	817,504
Level 2A assets	934,100	793,985
Level 2B assets	45,075	22,537
High Quality Liquid Assets (HQLA)	**8,348,166**	**8,123,981**
Denominator calculations		
Unsecured wholesale funding	17,249,464	13,627,451
Operational deposits	3,941,042	985,261
Non-operational deposits	13,308,422	12,642,191
Secured wholesale funding	476,904	371,614
Other	66,091	432
Outflows	**17,792,460**	**13,999,498**
Unsecured lending	3,113,969	2,628,322
Secured lending	8,736,794	6,801,642
Inflows	**11,850,763**	**9,429,964**

The HQLA consists of cash held at our central bank, Investment Book securities and securities received in secured transactions (reverse repo's). The majority of our outflows (client balances) is repayable on demand. The inflows are made up mainly by 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 related to off-balance sheet positions. Euroclear Bank does not engage in securitisation. 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 2016, the NSFR was at 196.73%.

Liquidity stress testing

Euroclear Bank must manage its liquidity under stressed conditions. Therefore, Risk Management, using a wide range of extreme but plausible scenarios, regularly performs idiosyncratic and market wide liquidity stress tests to assess 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 test (run quarterly but using daily data) is conducted in order to assess whether the committed and contingency liquidity sources are sufficient to withstand the default of one family (as per principle 7 of CPMI-IOSCO) and two families (as per CSD-R) with the largest aggregate payment obligation.
- 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 financial problem with a large client, sudden drop of clients' balances, etc.
- 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.

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. The contingency plan documents the relevant operational procedures and ensures access to (contingency) liquidity in the event of an operational or financial crisis. It also guides the decision-making process, defines the responsibilities and the communication plan towards internal and external stakeholders.

More specifically, the contingency plan aims at generating an adequate level of intraday liquidity in order to cover, in all currencies, the default of at least two clients (at family level) 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.

Moreover, liquidity risks are further mitigated because the credit extended to clients is capped by a global limit of credit applied to any 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 contingency plan and the availability of contingency liquidity are regularly tested and subject to stress-testing.

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 2016 (€'000)	**Euroclear Bank SA/NV[1]**
Cash and balances at central banks	**3,779,316**
Securities and loans available at ECB/Eurosystem	**2,564,205**
Debt certificates issued by central governments and central banks	2,314,172
Debt certificates issued by non-credit institutions (multilateral development banks, public institutions,…)	250,033
Securities available as repo-transactions	**9,932,026**

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

Operational risk management

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 which views operational risk as an umbrella risk, encompassing seven risk-event types:

Employment Practice & Workplace Safety	Losses arising from acts inconsistent with employment, health or safety laws or agreements.
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 arising from: • failed transaction processing or process management • relations with trade counterparties, vendors, suppliers, outsourcers
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.
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.

Euroclear's definition of operational risk now excludes legal & compliance risk, which is categorised as a separate risk type (see chapter *Enterprise risk management framework*).

Legal & compliance risk is defined 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.

Management of key operational risks

Euroclear uses the 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.

Operational risk monitoring and controls

Operational risk is monitored and managed with the help of a number of tools.

- Euroclear has set up a database of risks and control weaknesses, and records incidents in another specific database. Euroclear's incident database now has more than ten years of historical data on operational losses. Internal data is complemented by external loss data, as Euroclear is among the banks that provide information to the ORX-database [1].

- All group departments participate in annual Risk & Control Self- Assessments. Through workshops, the business owners revalidate both the high level control objectives and control objectives, and identify weaknesses.

- Standard operating procedures help employees to execute their tasks appropriately and reduce the risk of errors.

[1] The Operational Riskdata eXchange Association (ORX) was founded in 2002 with the primary objective of creating a platform for the secure exchange of (anonymous) high-quality operational risk loss data. ORX currently has more than 60 members and has developed a database with more than 350,000 operational risk losses, each over EUR 20,000 in value, totaling a little bit less than EUR 200 billion (April 2014).

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 AMA under Basel. Euroclear takes as a reference for its IS framework internationally recognised standards such as ISO 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.

Euroclear established a Cyber Resilience Programme, which will increase company's ability to commensurate with evolving threat environment.

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 from three data centres sufficiently distanced from each other to sustain operations in the event of a local- or regional- scale disaster. Euroclear Sweden also operates in two of these centres. The effectiveness of data centres and recovery procedures is assured through the transfer of production activity between sites every two months and regional disaster recovery exercises 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, Hong Kong for EB; Cannon Street and Bishops Stortford for EUI). The ESES entities (Euroclear France, Euroclear Belgium and Euroclear Nederland) utilise 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 effect 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 pervision of the Financial sector and Finacial 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.

Insurance

In addition to these control processes, Euroclear maintains a comprehensive insurance programme to protect against operational risk. All insurance policies are held with first-rank insurance companies, rated at least A-. The programme includes coverage for crime and civil liability, physical securities loss and cyber risks.

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

Remuneration Committee

The Remuneration Committee has the following remit:

- oversees the application of the policy;
- 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 Identified Staff members of the Management Committee as well as the heads 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 Remuneration Committee is supported by specialised advice from Risk, Audit, HR or external consultancy where necessary; and
- oversees any malus decisions.

In 2016, the Remuneration Committee met three times for ESA, for EB one Remuneration Committee meeting took place. No external consultant assisted the Remuneration Committees in 2016.

Board of Directors

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

Management Committee

The Management Committee of the relevant entity is responsible for:

- 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).

Compensation Non-Executive Directors

Compensation for the non-executive Directors (where fees have not been waived) comprises an annual gross fee. This fee is pro-rated to the number of board meetings attended and reflects any additional formal responsibilities held. The Chairman and Deputy Chairman of ESA and PLC 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.

Variable compensation rewards for performance, individually and/or collectively, and is based on pre-set qualitative and quantitative objectives.

Variable compensation is paid proportionally to fixed remuneration within the limits of the overall group bonus pool decided by the Board of Directors after advise of the Remuneration Committee.

The primary measure of performance is progress against the strategic priorities of the Group. These not only cover financial strength but also client, risk awareness, operational performance and people and organisation. These objectives are advised on an annual basis by the Remuneration Committee prior to the approval by the Board.

The realisation of these collective objectives are monitored closely through-out the year. The stand of affairs is periodically reported and communicated.

At year-end, the results are internally audited prior to submission to the Remuneration Committee. The Board consequently decides on the bonus pool, also taking into consideration any other criteria that may be of relevance to preserve the long term interests of the company.

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

Deferred Compensation for Top Management

It is a group-wide policy, to defer part of the overall compensation on behalf of the members of the Management Committee, the Extended Management Committee, the heads of the Control functions and any other function that could have – individually or collectively – an impact on the overall risk profile of the Group.

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.

Annex 1 – Securitisation

Euroclear does not engage in any securitisation activities.

Annex 2 – CSD Regulation

Euroclear Bank is applying for a banking license.

One of the most complex parts of the CSDR is Title IV (Articles 54-60), which sets out the detailed requirements for the provision of banking-type of ancillary services for CSD participants. In effect these provisions deliver a legal framework to govern the provision of commercial bank money settlement by CSDs to their participants and restrict the banking activities.

CSDR foresees that a CSD is permitted to provide commercial bank money services to its participants either:

- through a credit institution under the **Capital Requirements Directive** (**CRD IV**), which is actually the same legal entity as the CSD; or

- through a separate legal entity, authorised as a credit institution under CRD IV, which is located either within, or outside, the group of which the CSD is a part.

In either of the above options, the credit institution is subject to very tight restrictions on the banking business which it can undertake, and to a very intensive supervisory regime. 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 such as:
  - providing cash accounts and accepting deposits from its participants;
  - providing cash credit for reimbursement no later than the following business day, cash lending to pre-finance corporate actions and lending securities to holders of securities accounts;
  - payment services involving the processing of cash and foreign exchange transactions;
  - guarantees and commitments related to securities lending and borrowing;
  - 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 very detailed prudential requirements which are applicable to all credit institutions or CSDs authorised to provide such banking services. These include requirements to:

- fully cover corresponding credit exposures using highly liquid collateral (with minimal credit and market risk) and other equivalent financial resources;

- establish and apply appropriately conservative haircuts and concentration limits on collateral values; and

- provide for effective reimbursement procedures of intraday credit and discourage overnight credit through the application of deterrent sanctioning rates.

Annex 3 – Capital instruments´ main features template

In 2016, Euroclear Group entities did not have any capital instruments to be disclosed in Pillar III report.

Annex 4 – 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
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
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
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
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